

Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Borehole No.

BH16

Dates : 14/12/21 - 16/12/21

Job Number : Q0652

Ground Level : 280.71 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : ARUP

Coordinates: 283439.29 E
211441.07 N
Co-ordinates to National Grid



Plas Newydd
Swansea
Tel: 01554744880
email: enquiries@quantumgeotechnic.co.uk

Operator:
QGL

Logged By:
P Darby

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All measurements in
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Borehole No.

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Dates : 14/12/21 - 16/12/21

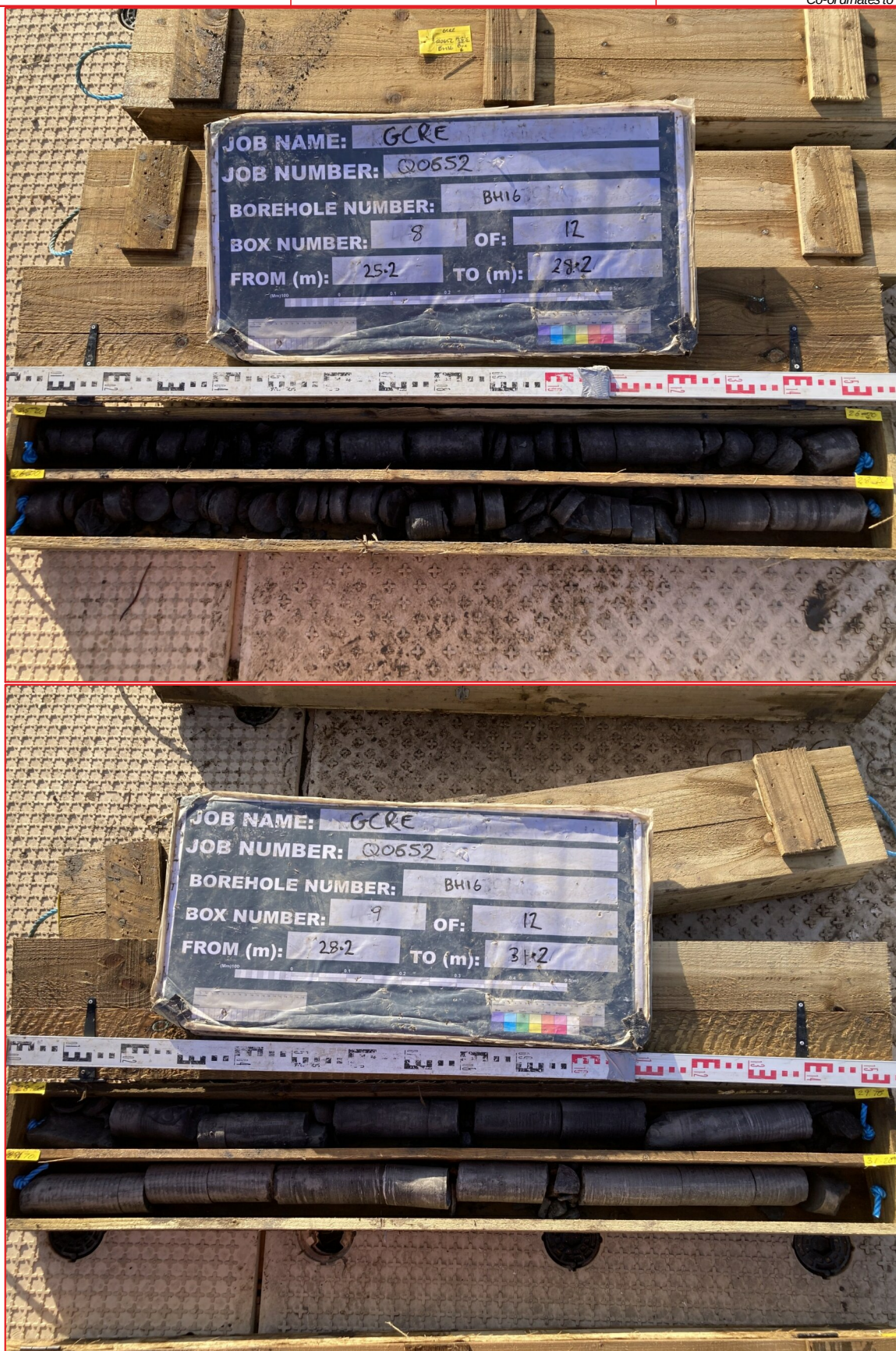
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Ground Level : 280.71 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : ARUP

Coordinates: 283439.29 E
211441.07 N
Co-ordinates to National Grid



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Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Dates : 25/11/21 - 26/11/21

Location :

Job Number : Q0652

Engineer : ARUP

Ground Level : 276.83 m A.O.D.
Level to Ordnance Datum

Coordinates: 283274.06 E
211061.09 N
Co-ordinates to National Grid

Orientation & Inclination:

Orientation: N/A

Inclination: N/A

Borehole No. BH17

0 m B.G.L.	Run Details				Fracture Details				Samples		Insitu Tests		Strata					Discontinuities					Water
	Core Run	TCR %	SCR %	RQD %	Min	Avg	Max	FI	Depth	Type No. Blows	Depth	Test Results	Depth (Thick-ness)	Description	Legend	Red. Level A.O.D.	Depth (Thick-ness)	Dip	Direction	Fracture Set	Discontinuity Description		
									0.00 - 2.70	D1			(1.20)	MADE GROUND: Grey clayey GRAVEL. Gravel is fine coarse angular mudstone (Colliery Spoil)									
	1											SPT (C) 40/155mm (5-5-5-30/5mm-)	1.20	Colliery Spoil (Drillers Description). Arisings are grey Clay and Gravel. Gravel is fine angular Mudstone		275.63							
	2												(1.50)										
	3								2.70 - 3.90	D2	2.7	SPT (C) 50/55mm (25/40mm-50/15mm-)	2.70	Gravelly CLAY and boulders (Drillers Description). Arisings are gravelly Clay. Gravel is fine sub-angular to sub-rounded mudstone		274.13							
	4																						
	5																						
	6								4.20 - 5.70	D3	4.2	SPT (C) 50/95mm (15-10/30mm-21-29/20mm-)	(3.70)										
	7										5.7	SPT (C) 50/25mm (25/10mm-50/15mm-)											
7.20 - 8.70							NI	7.20	C6	7.2	SPT (C) 50/75mm (25/40mm-50/35mm-)	7.20	Weathered Mudstone (Drillers Description). Arisings are grey angular mudstone Gravel		270.43								
8	73	39	7		10	64	100	13	7.90 - 8.00	C1			7.20	 between 7.2 and 7.8mbgl locally highly to completely weathered to fine to coarse angular to sub-angular Gravel Medium strong dark grey MUDSTONE with one discontinuity set. (SOUTH WALES COAL MEASURES)		269.63	7.20			Sub-horizontal to 15 degree discontinuity set (bedding) extremely closely spaced, smooth to rough planar, locally planar to stepped, tight to partly open, slightly weathered with orange surface staining.			
8.70 - 10.20							NI						(3.85)	 between 8.7 and 9.0mbgl highly to completely weathered to fine fine to coarse angular Gravel and gravelly Clay						Between 8.0 and 8.4mbgl sub-vertical discontinuity smooth planar to undulating, tight to partly open, slightly weathered with orange surface staining.			
10	100	60	8		20	67	120	17	9.70	C2													
10.20 - 11.70	73	31	8	30	85	120	13									5.60							

Hole Progress / Water Obs				Casing		Groundwater				Flush				Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. ODEX GL-7.2mbgl, Rotary coring 7.2-14.7mbgl, Rotary 'open hole' 14.7-30.0mbgl
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns	Colour	
				7.20	115.00	3.90	2.80	Medium groundwater inflow	4.20	0.00 - 11.70	Mist	100		

Quantum Geotech

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Operator:

QGL

Logged By:

P Darby

Logged Date:

Equipment Used:

Rig: Commachio 600.

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All measurements in metres unless otherwise stated

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Contract : Global Centre of Rail Excellence																				Borehole No. BH17							
Dates : 25/11/21 - 26/11/21										Job Number : Q0652					Ground Level : 276.83 m A.O.D. Level to Ordnance Datum				Coordinates: 283274.06 E 211061.09 N Co-ordinates to National Grid				Orientation & Inclination: Orientation: N/A Inclination: N/A				
Location :										Engineer : ARUP																	
22m B.G.L.	Run Details				Fracture Details				Samples		Insitu Tests		Strata							Discontinuities							Water
	Core Run	TCR %	SCR %	RQD %	Min	Avg	Max	FI	Depth	Type No. Blows	Depth	Test Results	Depth (Thick-ness)	Description	Legend	Red. Level A.O.D.	Depth (Thick-ness)	Dip	Direction	Fracture Set	Discontinuity Description						
22													(15.30)														
23																											
24																											
25																											
26																											
27																											
28																											
29																											
30													30.00	Terminated at 30.0mbgl (Scheduled Depth)		246.83											
31																											
32																											
Hole Progress / Water Obs					Casing		Groundwater					Flush				Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. ODEX GL-7.2mbgl, Rotary coring 7.2-14.7mbgl, Rotary 'open hole' 14.7-30.0mbgl											
Date / Time		H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns	Colour													
Operator: QGL										Logged By: P Darby		Logged Date:		Equipment Used: Rig: Commachio 600.					Sheet No. 3 Of 3		m Per Page 11	All measurements in metres unless otherwise stated		AGS			

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Client : Global Centre of Rail Excellence

Borehole No.

BH17

Dates : 25/11/21 - 26/11/21

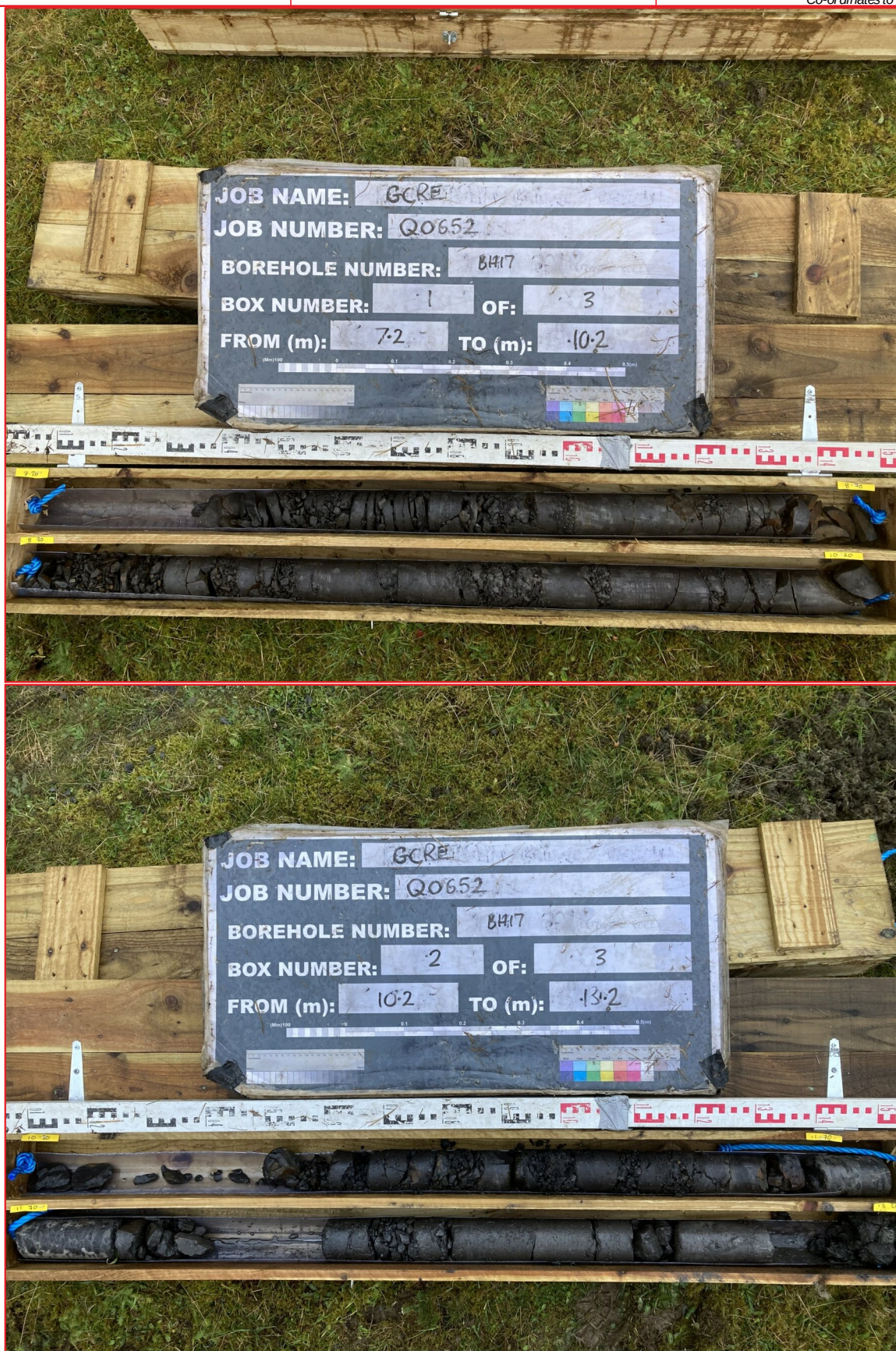
Job Number : Q0652

Ground Level : 276.83 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : ARUP

Coordinates: 283274.06E
211061.09 N
Co-ordinates to National Grid



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Operator:
QGL

Logged By:
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Contract : Global Centre of Rail Excellence

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Borehole No.

BH17

Dates : 25/11/21 - 26/11/21

Job Number : Q0652

Ground Level : 276.83 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : ARUP

Coordinates: 283274.06E
211061.09 N
Co-ordinates to National Grid



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All measurements in metres unless otherwise stated



Contract : Global Centre of Rail Excellence																				Borehole No. BH18						
Client : Global Centre of Rail Excellence																										
Dates: 23/11/21 - 25/11/21										Job Number : Q0652					Ground Level : 275.03 m A.O.D. Level to Ordnance Datum			Coordinates: 283148.40 E 210982.78 N Co-ordinates to National Grid			Orientation & Inclination: Orientation: N/A Inclination: N/A					
Location :										Engineer : ARUP																
0 m B.G.L.	Run Details				Fracture Details				Samples		Insitu Tests		Strata						Discontinuities						Water	
	Core Run	TCR %	SCR %	RQD %	Min	Avg	Max	FI	Depth	Type No. Blows	Depth	Test Results	Depth (Thick-ness)	Description	Legend	Red. Level A.O.D.	Depth (Thick-ness)	Dip	Direction	Fracture Set	Discontinuity Description					
0									0.00 - 0.50	B1			(0.50)	MADE GROUND - Soft dark organic silty CLAY.												
1									0.50 - 1.00	B2			0.50	MADE GROUND - Grey clayey GRAVEL. Gravel is fine to coarse angular mudstone. below 1.2mbgl Colliery Spoil (Drillers Description). Arisings were grey clayey, locally very clayey, fine to medium angular mudstone Gravel		274.53										
2									1.20 - 4.20	D1		SPT (C) 75/75mm (10-15/10mm-56-19/0mm--)	1.2													
3												SPT (C) 50/80mm (25/15mm-75/65mm--)	2.7													
4									4.20 - 5.70	D2		SPT (C) 19 (6-6-5-4-5)	4.2													
5									5.70 - 8.70	D3		SPT (C) 36 (8-8-6-6-12-12)	5.7													
6																										
7																										
8																										
9									8.70 - 11.70	D4		SPT (C) 15 (3-3-3-4-4-4)	8.7													
10																										
Hole Progress / Water Obs					Casing		Groundwater					Flush				Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. ODEX GL-24.7mbgl, Rotary coring 24.7-35.3mbgl, Rotary 'open hole' 35.3-45.2mbgl										
Date / Time		H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns	Colour												
24/11/2021 07:30		4.20	4.20								0.00 - 30.70	Mist	100													
Operator: QGL										Logged By: P Darby		Logged Date:		Equipment Used: Rig: Commachio 600.					Sheet No. 1 Of 5		m Per Page 11		All measurements in metres unless otherwise stated		AGS	

Contract : Global Centre of Rail Excellence																				Borehole No. BH18									
Client : Global Centre of Rail Excellence										Job Number : Q0652					Ground Level : 275.03 m A.O.D. Level to Ordnance Datum			Coordinates: 283148.40 E 210982.78 N Co-ordinates to National Grid			Orientation & Inclination: Orientation: N/A Inclination: N/A								
Dates: 23/11/21 - 25/11/21										Location :																			
m B.G.L.	Run Details				Fracture Details				Samples		Insitu Tests		Strata						Discontinuities						Water				
	Core Run	TCR %	SCR %	RQD %	Min	Avg	Max	FI	Depth	Type No. Blows	Depth	Test Results	Depth (Thick-ness)	Description	Legend	Red. Level A.O.D.	Depth (Thick-ness)	Dip	Direction	Fracture Set	Discontinuity Description								
11									11.70 - 14.70	D5	11.7	SPT (C) 49/150mm (16-9/20mm-21-24-40mm-)	(23.50)																
12																													
13																													
14									14.70 - 17.70	D6	14.7	SPT (C) 38 (5-3-3-10-13-12)																	
15																													
16																													
17																													
18									17.70 - 20.70	D7	17.7	SPT (C) 33 (10-11-9-8-8-8)																	
19																													
20																													
21									20.70 - 23.70	D8	20.2	SPT (C) 50/125mm (25/60mm-31/65mm---																	
Hole Progress / Water Obs				Casing		Groundwater				Flush				Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. ODEX GL-24.7mbgl, Rotary coring 24.7-35.3mbgl, Rotary 'open hole' 35.3-45.2mbgl															
Date / Time		H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns											Colour					
Quantum Geotech Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk										Operator: QGL		Logged By: P Darby		Logged Date:		Equipment Used: Rig: Commachio 600.				Sheet No. 2 Of 5		m Per Page 11		All measurements in metres unless otherwise stated		AGS			

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Client : Global Centre of Rail Excellence

Dates : 23/11/21 - 25/11/21

Location :

Job Number : Q0652

Engineer : ARUP

Ground Level : 275.03 m A.O.D.
Level to Ordnance Datum

Coordinates: 283148.40 E
210982.78 N
Co-ordinates to National Grid

Orientation & Inclination:
Orientation: N/A
Inclination: N/A

Borehole No. BH18

23m B.G.L.

23

24

25

26

27

28

29

30

31

32

Run Details				Fracture Details				Samples		Insitu Tests		Strata				Discontinuities						Water
Core Run	TCR %	SCR %	RQD %	Min	Avg	Max	FI	Depth	Type No. Blows	Depth	Test Results	Depth (Thick-ness)	Description	Legend	Red. Level A.O.D.	Depth (Thick-ness)	Dip	Direction	Fracture Set	Discontinuity Description		
								23.70 - 24.00	D9	23.7	SPT (C) 50/185mm (12-13/40mm-20-20-10/35mm)											
24.70 - 26.20							NI					24.00	Medium strong grey SILTSTONE with one discontinuity set. (SOUTH WALES COAL MEASURES) between 24.7 and 25.2mbgl recovered as sub-angular to angular Gravel		251.03	24.00				Sub-horizontal to 15 degree (bedding) extremely close to closely spaced, rough planar, open, locally with iron surface staining and highly weathered to coarse angular gravel.		
26.20 - 27.70	50	25	0	20	60	90	4	25.20 - 25.30	C1											Below 26.2mbgl extremely close to closely spaced. At 26.58mbgl 45 degree rough planar, open, with sand surface coating. At 26.85mbgl sub-horizontal discontinuity with coarse angular gravel infill and orange surface staining.		
27.70 - 29.20	79	66	60	40	147	230	7	27.10 - 27.25	C2			(6.70)								Below 27.7mbgl sub-horizontal discontinuities close to medium spaced.		
29.20 - 30.70	100	88	69	10	150	380	9	29.05 - 29.20	C3				 below 29.0mbgl occasional thin Coal laminae		9.70					At 28.3 at 28.4mbgl 45 degree discontinuity rough planar, partly open, clean / fresh. Between 28.4 and 28.8mbgl 70 to 80 degree discontinuity smooth planar, partly open.		
30.70 - 32.20	100	83	61	10	125	330	11	29.50 - 29.85	C4						-8.50					Between 29.2 and 29.32mbgl sub-vertical discontinuity smooth planar with silt surface coating. Sub-horizontal discontinuity at mudstone / coal laminae interface at 29.85mbgl striated.		
32.20 - 33.70	17	9	0	AZCL								30.70	 between 30.4 and 30.6mbgl locally slightly weathered with reduction in strength to weak and highly weathered to fine to medium angular Gravel Actual Zone of Core Loss between 30.7 and 31.9mbgl very soft, no recovery, loss of returns		244.33							
				70	80	90	2					31.90	Medium strong grey SILTSTONE with one discontinuity set. (SOUTH WALES COAL MEASURES) between 32.3 and 33.4mbgl thinly laminated		243.13							
	98	91	79	20	137	400	10	32.70 - 33.10	C5			(1.50)										

Hole Progress / Water Obs

Casing

Groundwater

Flush

Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. ODEX GL-24.7mbgl, Rotary coring 24.7-35.3mbgl, Rotary 'open hole' 35.3-45.2mbgl

Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns	Colour
25/11/2021 07:30	29.20	24.70		24.70	115.00					30.70 - 45.20	Mist	0	

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QGL

Logged By:
P Darby

Logged Date:

Equipment Used:
Rig: Commachio 600.

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Client : Global Centre of Rail Excellence																												
Dates : 23/11/21 - 25/11/21										Job Number : Q0652					Ground Level : 275.03 m A.O.D. Level to Ordnance Datum				Coordinates: 283148.40 E 210982.78 N Co-ordinates to National Grid				Orientation & Inclination: Orientation: N/A Inclination: N/A					
Location :										Engineer : ARUP																		
m B.G.L.	Run Details				Fracture Details				Samples		Insitu Tests		Strata							Discontinuities							Water	
	Core Run	TCR %	SCR %	RQD %	Min	Avg	Max	FI	Depth	Type No. Blows	Depth	Test Results	Depth (Thick-ness)	Description	Legend	Red. Level A.O.D.	Depth (Thick-ness)	Dip	Direction	Fracture Set	Discontinuity Description							
44																												
45													45.20	Terminated at 45.2mbgl (Investigation Supervisors Instruction)		229.83												
46																												
47																												
48																												
49																												
50																												
51																												
52																												
53																												
54																												
Hole Progress / Water Obs					Casing		Groundwater					Flush				Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. ODEX GL-24.7mbgl, Rotary coring 24.7-35.3mbgl, Rotary 'open hole' 35.3-45.2mbgl												
Date / Time		H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns	Colour														
Operator: QGL										Logged By: P Darby		Logged Date:		Equipment Used: Rig: Commachio 600.							Sheet No. 5 Of 5		m Per Page 11		All measurements in metres unless otherwise stated		AGS	

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Client : Global Centre of Rail Excellence

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Job Number : Q0652

Ground Level : 275.03 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : ARUP

Coordinates: 283148.40E
210982.78 N
Co-ordinates to National Grid



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Dates : 23/11/21 - 25/11/21

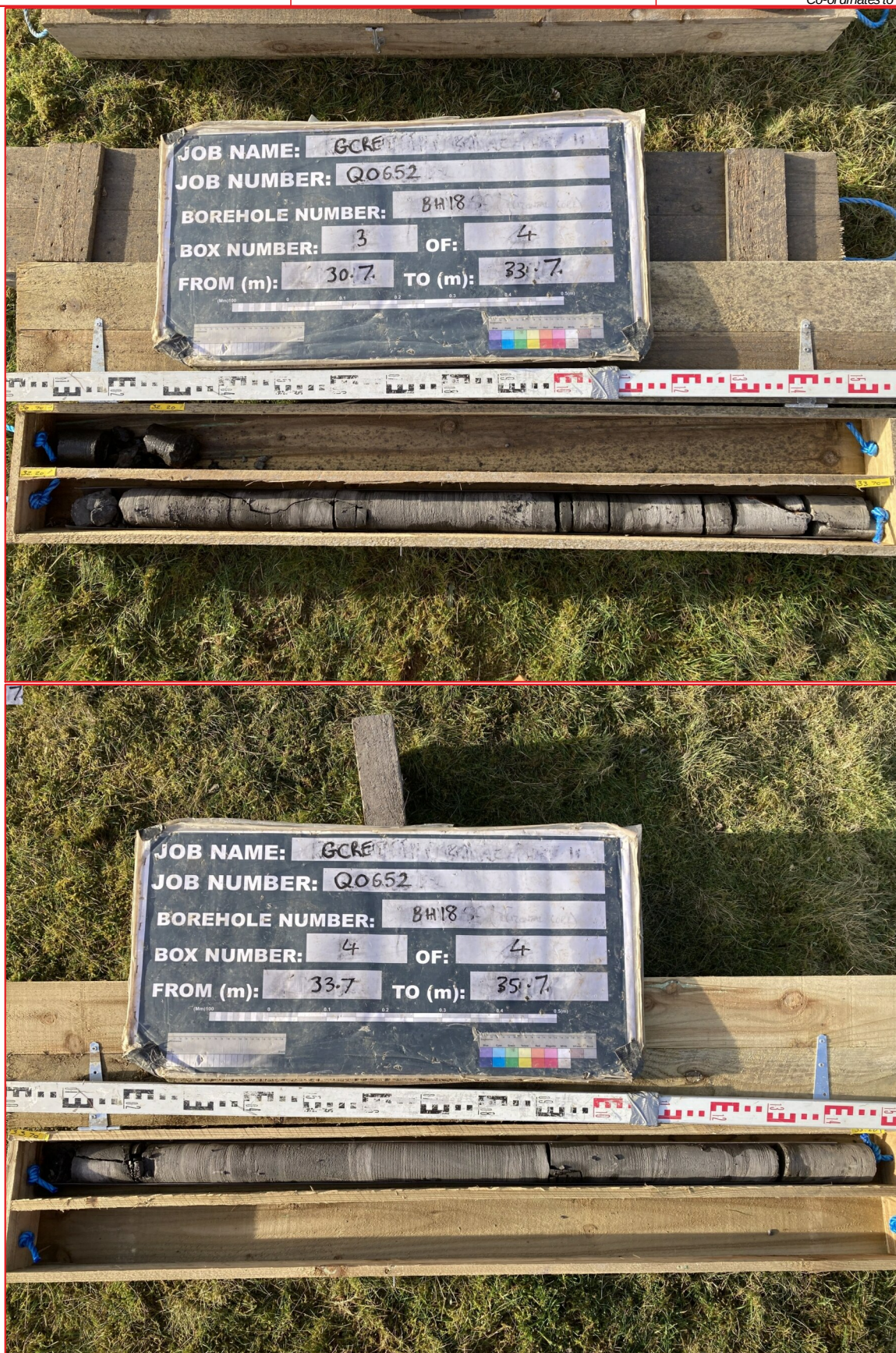
Job Number : Q0652

Ground Level : 275.03 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : ARUP

Coordinates: 283148.40E
210982.78 N
Co-ordinates to National Grid



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Contract : Global Centre of Rail Excellence												Borehole No. BH19	
Client : Global Centre of Rail Excellence													
Dates : 17/1/22 - 18/1/22						Job Number : Q0652				Ground Level : 255.05 m A.O.D. Level to Ordnance Datum			
Location : Around washery area						Engineer : ARUP				Coordinates: 281397.52 E 211205.94 N Co-ordinates to National Grid			

m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.		
0									0.00 - 4.20	D1		MADE GROUND - Brown Clay and Boulders (Drillers Description) Arisings are fine to coarse angular clayey mudstone and siltstone Gravel				
1											(5.10)					
2																
3																
4									4.20 - 5.10	D2						
5								SPT (C) 50/150mm (8-17/60mm-21-22-7/0mm-)			5.10	Dense Colliery Spoil (Drillers Description). Arisings are fine to coarse angular mudstone and siltstone Gravel		249.95		
6																
7																
8																
9									8.70 - 13.20	D3						
10								SPT (C) 50/155mm (19-6/0mm-18-21-11/5mm-)								
11																
12											(12.60)					
13									13.20 - 17.70	D4						
14								SPT (C) 50/130mm (20-5/0mm-22-28/55mm-)								
15																
16																
17																
18									17.70 - 19.20	D5		Large Sandstone Boulders (Drillers Description)		237.35		
19								SPT (C) 50/195mm (15-10/30mm-15-16-19/45mm-)			17.70					
20											(1.50)					
								SPT (C) 50/15mm (25/10mm-50/15mm-)			19.20	Terminated at 19.20mbgl, unable to progress casing through boulders		235.85		

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns
17/01/2022 17:00	8.70	8.70		19.20	115.00			No ground water encountered		0.00 - 19.20	Air Mist	100
18/01/2022 08:00	8.70	8.70										

Plant: Comacchio MC600 tracked drilling rig

Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. ODEX GL-19.2mbgl

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator:	Logged By.	Sheet No.	m Per Page	All measurements in metres unless otherwise stated	
		G Blades	S Picton	1 Of 1	21		

Form Name: ROTARY. Version 2.11.000, 22/05/15 Output By: Phil Darby. Library File: C:\USERS\PHIL DARBY\ONEDRIVE - QUANTUM GEOTECHNIC LTD\QUANTUM 4.GLB.

Contract : Global Centre of Rail Excellence Client : Global Centre of Rail Excellence														Borehole No. BH19A	
Dates : 18/1/22 - 19/1/22 Location : Around washery area						Job Number : Q0652 Engineer : ARUP				Ground Level : 255.32 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 281399.06 E 211202.03 N <i>Co-ordinates to National Grid</i>					

m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata					Water	Install/ Backfill
	Core Run	TCR %	SCR %	RQD %	Min Avg	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.			
0												Brown Clay and Boulders (Drillers Description) Arisings are fine to coarse angular clayey mudstone and siltstone Gravel					
1											(5.10)						
2																	
3																	
4																	
5											5.10	Dense Colliery Spoil (Drillers Description). Arisings are fine to coarse angular mudstone and siltstone Gravel		250.22			
6																	
7																	
8																	
9																	
10																	
11																	
12											(14.10)						
13																	
14																	
15																	
16																	
17																	
18																	
19											19.20 - 22.20	D1	Large Sandstone Boulders (Drillers Description)		236.12		
20																	
											(3.00)						

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns
								No ground water encountered		0.00 - 28.20	Air Mist	100

Plant: Comacchio MC600 tracked drilling rig
Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. ODEX GL-28.2mbgl

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator: G Blades	Logged By: S Picton	Sheet No. 1 Of 2	m Per Page 21	All measurements in metres unless otherwise stated	
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Form Name: ROTARY. Version 2.11.000, 22/05/15 Output By: Phil Darby. Library File: C:\USERS\PHIL DARBY\ONEDRIVE - QUANTUM GEOTECHNIC LTD\QUANTUM 4.GLB.

Contract : Global Centre of Rail Excellence												Borehole No.	
Client : Global Centre of Rail Excellence												BH19A	
Dates : 18/1/22 - 19/1/22						Job Number : Q0652				Ground Level : 255.32 m A.O.D. Level to Ordnance Datum			
Location : Around washery area						Engineer : ARUP				Coordinates: 281399.06 E 211202.03 N Co-ordinates to National Grid			

m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill
	Core Run	TCR %	SCR %	RQD %	Min Avg	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.		
21												Large Sandstone Boulders (Drillers Description)				
22							22.2	SPT (C) 49/78mm (18-7/0mm-38-11/3mm--)	22.20 - 26.70	D2	22.20	Dense Colliery Spoil (Drillers Description). Arisings are fine to coarse angular mudstone and siltstone Gravel		233.12		
23											(4.50)					
24																
25																
26																
27							26.7	SPT (C) 50/10mm (25/5mm-50/10mm--)	26.70 - 28.20	D3	26.70	Large Sandstone Boulders (Drillers Description)		228.62		
28							28.2	SPT (C) 50/75mm (25/15mm-41-9/0mm--)			28.20	Terminated at 28.20mbgl, unable to progress casing through boulders		227.12		
29																
30																
31																
32																
33																
34																
35																
36																
37																
38																
39																
40																
41																

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns
18/01/2022 17:00	22.20	22.20		28.20	115.00							
19/01/2022 08:00	22.20	22.20										

Plant: Comacchio MC600 tracked drilling rig
Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. ODEX GL-28.2mbgl

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator:	Logged By.	Sheet No.	m Per Page	All measurements in metres unless otherwise stated	
		G Blades	S Picton	2 Of 2	21		

Form Name: ROTARY. Version 2.11.000, 22/05/15 Output By: Phil Darby. Library File: C:\USERS\PHIL DARBY\ONEDRIVE - QUANTUM GEOTECHNIC LTD\QUANTUM 4.GLB.

Contract : Global Centre of Rail Excellence												Borehole No.	
Client : Global Centre of Rail Excellence												BH20	
Dates : 14/1/22 - 17/1/22						Job Number : Q0652				Ground Level : 251.05 m A.O.D. <i>Level to Ordnance Datum</i>			
Location : Around washery area						Engineer : ARUP				Coordinates: 281652.88 E 211668.60 N <i>Co-ordinates to National Grid</i>			

m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	Water
0									0.00 - 4.20	D1		Dense Colliery Spoil (Drillers Description). Arisings are fine to coarse angular mudstone and siltstone Gravel			
1															
2															
3															
4							4.2	SPT (C) 50/15mm (25/10mm-50/15mm--)	4.20 - 8.70	D2					
5															
6															
7															
8															
9							8.7	SPT (C) 50/80mm (13-12/15mm-38-12/15mm--)	8.70 - 13.20	D3					
10															
11															
12															
13							13.2	SPT (C) 50/90mm (21-4/0mm-31-19/15mm--)	13.20 - 17.70	D4					
14															
15															
16											(31.20)				
17															
18									17.70 - 22.20	D5					
19															
20															

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns
								No ground water encountered		0.00 - 40.20	Air Mist	100

Plant: Comacchio MC600 tracked drilling rig
Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. ODEX GL-40.2mbgl

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator:	Logged By.	Sheet No.	m Per Page	All measurements in metres unless otherwise stated	
		G Blades	S Picton	1 Of 2	21		

Form Name: ROTARY. Version 2.11.000, 22/05/15 Output By: Phil Darby. Library File: C:\USERS\PHIL DARBY\ONEDRIVE - QUANTUM GEOTECHNIC LTD\QUANTUM 4.GLB.

Contract : Global Centre of Rail Excellence Client : Global Centre of Rail Excellence												Borehole No. BH20	
Dates : 14/1/22 - 17/1/22 Location : Around washery area				Job Number : Q0652 Engineer : ARUP				Ground Level : 251.05 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 281652.88 E 211668.60 N <i>Co-ordinates to National Grid</i>					

m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	Water
21															
22							22.2	SPT (C) 50/35mm (25/50mm-50/35mm--)	22.20 - 26.70	D6		Dense Colliery Spoil (Drillers Description). Arisings are fine to coarse angular mudstone and siltstone Gravel			
23															
24															
25															
26															
27							26.7	SPT (C) 50/115mm (10-15/55mm-24-26/40mm--)	26.70 - 31.20	D7					
28															
29															
30															
31							31.2	SPT (C) 50/12mm (25/5mm-50/12mm--)	31.20 - 35.70	D8	31.20	Brown large Sandstone Boulders (Drillers Description)		219.85	
32															
33															
34															
35															
36															
37															
38															
39															
40															
41							40.2	SPT (C) 50/15mm (25/10mm-50/15mm--)			40.20	Terminated at 40.20mbgl, unable to progress casing further		210.85	

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns
14/01/2022 15:30	31.20	31.20		40.20	115.00							
17/01/2022 08:00	31.20	31.20										

Plant: Comacchio MC600 tracked drilling rig
Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. ODEX GL-40.2mbgl

 Quantum Geotech Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator: G Blades	Logged By: S Picton	Sheet No. 2 Of 2	m Per Page 21	All measurements in metres unless otherwise stated	
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Contract : Global Centre of Rail Excellence											Borehole No.		
Client : Global Centre of Rail Excellence											BH21		
Dates : 15/11/21 - 17/11/21					Job Number : Q0652					Ground Level : 228.23 m A.O.D. <i>Level to Ordnance Datum</i>			
Location :					Engineer : ARUP					Coordinates: 281893.75 E 211906.21 N <i>Co-ordinates to National Grid</i>			

m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	Water
21												MADE GROUND - Soft to firm grey slightly sandy gravelly silty CLAY with low to medium cobble content and high boulder content. Gravel is fine to coarse angular siltstone, mudstone and occasional coal. Cobbles are angular siltstone.			
22															
23															
24															
25															
26															
27															
28															
29															
30															
31															
32															
33															
34												Terminated at 33.0mbgl on possible bedrock. Unable to progress casing further to prove		195.23	
35															
36															
37															
38															
39															
40															
41															

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns

Plant:
Remarks:

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator:	Logged By:	Sheet No.	m Per Page	All measurements in metres unless otherwise stated	
				2 Of 2	21		

Contract : Global Centre of Rail Excellence Client : Global Centre of Rail Excellence												Borehole No. BH22	
Dates : 22/11/21 - 24/11/21 Location : Around former opencast area						Job Number : Q0652 Engineer : ARUP				Ground Level : 213.01 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 282101.25 E 212011.30 N <i>Co-ordinates to National Grid</i>			

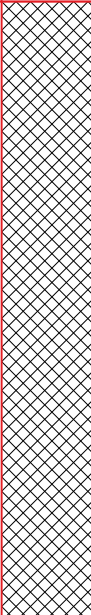
m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	Water
0												MADE GROUND - Vegetation over dark grey black slightly sandy clayey GRAVEL with medium cobble content. Gravel is fine to coarse angular to sub-angular Mudstone with ash and coal. Cobbles are angular to sub-angular Mudstone and Siltstone			
1									1.50 - 3.00	B1					
2															
3															
4							4.5								
5								SPT (C) 37 (7-8-9-9-9-10)							
6									6.00 6.00 - 7.50	B B2					
7															
8															
9							9								
10								SPT (C) 28 (5-6-6-7-7-8)			(18.00)				
11									10.50 - 12.00	B3					
12															
13															
14							13.5								
15								SPT (C) 34 (6-7-8-8-9-9)							
16									15.00 15.00 - 16.50	B B4					
17															
18							18								
19								SPT (C) 50/225mm (9-10-15-25-10-)			18.00	DRILLERS DESCRIPTION - Hard bands of Siltstone and boulders		195.01	
20									19.50 - 21.00	B5					

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns
22/11/2021 17:00	9.00	9.00		21.00	116.00			No ground water encountered				
23/11/2021 08:00	9.00	9.00										
23/11/2021 17:00	21.00	21.00										
24/11/2021 08:00	21.00	21.00										

Plant: Dando 3000 Sonic rig
Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator: E Demaj	Logged By: S Picton	Sheet No. 1 Of 2	m Per Page 21	All measurements in metres unless otherwise stated	
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Contract : Global Centre of Rail Excellence Client : Global Centre of Rail Excellence												Borehole No. BH22	
Dates : 22/11/21 - 24/11/21 Location : Around former opencast area				Job Number : Q0652 Engineer : ARUP				Ground Level : 213.01 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 282101.25 E 212011.30 N <i>Co-ordinates to National Grid</i>					

m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				
	Core Run	TCR %	SCR %	RQD %	Min Avg	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	Water
21												DRILLERS DESCRIPTION - Hard bands of Siltstone and boulders			
22															
23															
24															
25															
26															
27															
28															
29															
30															
31															
32											31.50 (0.50)	DRILLERS DESCRIPTION - Dark grey SILTSTONE		181.51	
33											32.00	Terminated at 32.00mbgl unable to progress casing past 21.00mbgl, hole collapsing		181.01	
34															
35															
36															
37															
38															
39															
40															
41															

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns

Plant: Dando 3000 Sonic rig
Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken

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Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Borehole No.

BH22

Dates : 22/11/21 - 24/11/21

Job Number : Q0652

Ground Level : 213.01 m A.O.D.
Level to Ordnance Datum

Location : Around former opencast
area

Engineer : ARUP

Coordinates: 282101.25E
212011.30 N
Co-ordinates to National Grid



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E Demaj

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m Per
Page
2

All measurements in
metres unless
otherwise stated



Contract : Global Centre of Rail Excellence		Borehole No.
Client : Global Centre of Rail Excellence		BH22
Dates : 22/11/21 - 24/11/21	Job Number : Q0652	Ground Level : 213.01 m A.O.D. Level to Ordnance Datum
Location : Around former opencast area	Engineer : ARUP	Coordinates: 282101.25E 212011.30 N Co-ordinates to National Grid



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			E Demaj	S Picton	2 Of 6	2		

Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Borehole No.

BH22

Dates : 22/11/21 - 24/11/21

Job Number : Q0652

Ground Level : 213.01 m A.O.D.
Level to Ordnance Datum

Location : Around former opencast
area

Engineer : ARUP

Coordinates: 282101.25E
212011.30 N
Co-ordinates to National Grid



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E Demaj

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S Picton

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Page
2

All measurements in
metres unless
otherwise stated



Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Borehole No.

BH22

Dates : 22/11/21 - 24/11/21

Job Number : Q0652

Ground Level : 213.01 m A.O.D.
Level to Ordnance Datum

Location : Around former opencast
area

Engineer : ARUP

Coordinates: 282101.25E
212011.30 N
Co-ordinates to National Grid



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E Demaj

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m Per
Page
2

All measurements in
metres unless
otherwise stated



Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Borehole No.

BH22

Dates : 22/11/21 - 24/11/21

Job Number : Q0652

Ground Level : 213.01 m A.O.D.
Level to Ordnance Datum

Location : Around former opencast
area

Engineer : ARUP

Coordinates: 282101.25E
212011.30 N
Co-ordinates to National Grid



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Operator:
E Demaj

Logged By:
S Picton

Sheet No.
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m Per
Page
2

All measurements in
metres unless
otherwise stated



Contract : Global Centre of Rail Excellence		Borehole No.
Client : Global Centre of Rail Excellence		BH22
Dates : 22/11/21 - 24/11/21	Job Number : Q0652	Ground Level : 213.01 m A.O.D. Level to Ordnance Datum
Location : Around former opencast area	Engineer : ARUP	Coordinates: 282101.25E 212011.30 N Co-ordinates to National Grid



Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Dates : 6/1/22 - 7/1/22

Location : Around washery area

Job Number : Q0652

Engineer : ARUP

Ground Level : 199.76 m A.O.D.
Level to Ordnance Datum

Coordinates: 282565.87 E
211985.86 N
Co-ordinates to National Grid

Orientation & Inclination:
Orientation: N/A
Inclination: N/A

Borehole No.
BH23

0 m B.G.L.

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

Run Details				Fracture Details				Samples		Insitu Tests		Strata				Discontinuities						Water
Core Run	TCR %	SCR %	RQD %	Min	Avg	Max	FI	Depth	Type No. Blows	Depth	Test Results	Depth (Thick-ness)	Description	Legend	Red. Level A.O.D.	Depth (Thick-ness)	Dip	Direction	Fracture Set	Discontinuity Description		
								0.30 - 4.20	D1				Colliery Spoil (Drillers Description). Arisings are fine to coarse angular mudstone and siltstone									
								4.20 - 8.70	D2	4.2	SPT (C) 50/170mm (5-10-15-21-14/20mm--)											
								8.70 - 13.20	D3	8.7	SPT (C) 50/80mm (18-7/0mm-39-11/5mm--)											
								13.20 - 17.70	D4	13.2	SPT (C) 50/35mm (25/50mm-50/35mm--)											
								17.70 - 21.40	D5	17.7	SPT (C) 50/120mm (8-17/20mm-22-28/45mm--)											

Hole Progress / Water Obs

Casing

Groundwater

Flush

Date / Time

H. Depth

C. Depth

Water

Depth

Diam.

Struck

Rose To

Behaviour

Sealed

Depth

Type

Returns

Colour

06/01/2022 16:30

13.20

13.20

No ground water encountered

0.00 - 25.20

Air Mist

100

Grey

07/01/2022 08:00

13.20

13.20

Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. ODEX GL-36.0mbgl, Rotary coring 36.0-37.0mbgl

Plas Newydd
Swansea
Tel: 01554744880
email: enquiries@quantumgeotechnic.co.uk

Operator:
G Blades

Logged By:
S Picton

Logged Date:

Equipment Used:
Rig: Commachio MC600.

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21

All measurements in metres unless otherwise stated

Form Name: ROTARY A3. Version 2.11.000, 22/05/15 Output By: Phil Darby. Library File: C:\USERS\PHIL DARBY\ONEDRIVE - QUANTUM GEOTECHNIC LTD\QUANTUM 4.GLB.

Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Dates : 6/1/22 - 7/1/22

Location : Around washery area

Job Number : Q0652

Engineer : ARUP

Ground Level : 199.76 m A.O.D.
Level to Ordnance Datum

Coordinates: 282565.87 E
211985.86 N
Co-ordinates to National Grid

Orientation & Inclination:

Orientation: N/A

Inclination: N/A

Borehole No. BH23

m B.G.L.	Run Details				Fracture Details				Samples		Insitu Tests		Strata				Discontinuities						Water
	Core Run	TCR %	SCR %	RQD %	Min	Avg	Max	FI	Depth	Type No. Blows	Depth	Test Results	Depth (Thick-ness)	Description	Legend	Red. Level A.O.D.	Depth (Thick-ness)	Dip	Direction	Fracture Set	Discontinuity Description		
	22.20 - 23.70										22.2	SPT (C) 50/15mm (25/5mm-50/15mm---)	21.40 (0.80)	Grey weathered Mudstone (Drillers Description) Arisings are fine to coarse angular mudstone ...Vertical fracture from 22.00 - 22.30mbgl Strong dark grey MUDSTONE/SILTSTONE (SOUTH WALES COAL MEASURES)		178.36					Vertical discontinuity from 22.00 - 22.30mbgl.. Bedding fracture set, dipping 5°, 10°, undulating smooth, matt, clay, fresh, horizontal.		
	23.70 - 25.20	100	100	47									22.20			177.56	22.20	5	10	1			
	25.2	100	100	40	5	10	60	16					(3.00)		3.00								
												25.20	Terminated at 25.20mbgl (Scheduled Depth)			174.56							
Hole Progress / Water Obs				Casing		Groundwater				Flush				Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. ODEX GL-36.0mbgl, Rotary coring 36.0-37.0mbgl									
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns	Colour										
				22.20	115.00																		
Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk										Operator: G Blades		Logged By: S Picton		Logged Date:		Equipment Used: Rig: Commachio MC600.				Sheet No. 2 Of 2	m Per Page 21	All measurements in metres unless otherwise stated	

Form Name: ROTARY A3. Version 2.11.000, 22/05/15 Output By: Phil Darby. Library File: C:\USERS\PHIL DARBY\ONEDRIVE - QUANTUM GEOTECHNIC LTD\QUANTUM 4.GLB.

Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Borehole No.

BH23

Dates : 6/1/22 - 7/1/22

Job Number : Q0652

Ground Level : 199.76 m A.O.D.
Level to Ordnance Datum

Location : Around washery area

Engineer : ARUP

Coordinates: 282565.87E
211985.86 N
Co-ordinates to National Grid



Plas Newydd
Swansea
Tel: 01554744880
email: enquiries@quantumgeotechnic.co.uk

Operator:
G Blades

Logged By:
S Picton

Sheet No.
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m Per Page
2

All measurements in
metres unless
otherwise stated



Contract : Global Centre of Rail Excellence Client : Global Centre of Rail Excellence												Borehole No. BH24	
Dates : 4/1/21 - 5/1/21 Location :						Job Number : Q0652 Engineer : ARUP				Ground Level : 258.67 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 283944.59 E 211545.58 N <i>Co-ordinates to National Grid</i>			

m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.		
0									0.00 - 0.90	D1	(0.90)	Topsoil and Clay (Drillers Description)				
1									0.90	D1	0.90	Colliery Spoil (Drillers Description). Arisings are fine to coarse angular mudstone and siltstone		257.77		
2																
3																
4							4.2	SPT (C) 50/15mm (25/10mm-50/15mm--)	4.20 - 8.70	D2						
5																
6																
7																
8																
9							8.7	SPT (C) 50/80mm (9-16/10mm-31-19/5mm--)	8.70 - 13.20	D3						
10																
11																
12																
13							13.2	SPT (C) 50/65mm (25/50mm-50/65mm--)	13.20 - 17.70	D4						
14																
15																
16																
17																
18							17.7	SPT (C) 50/20mm (5-20/35mm-50/20mm--)	17.70 - 22.20	D5						
19																
20																

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns
						15.00	14.00	Medium groundwater inflow below 15.0mbgl		0.00 - 50.70	Mist	100

Plant: Commachio 600
Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. ODEX GL-49.2mbgl, Rotary coring 49.2-50.2mbgl

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator: QGL	Logged By.	Sheet No. 1 Of 3	m Per Page 21	All measurements in metres unless otherwise stated	
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Contract : Global Centre of Rail Excellence												Borehole No.	
Client : Global Centre of Rail Excellence												BH24	
Dates : 4/1/21 - 5/1/21						Job Number : Q0652				Ground Level : 258.67 m A.O.D. Level to Ordnance Datum			
Location :						Engineer : ARUP				Coordinates: 283944.59 E 211545.58 N Co-ordinates to National Grid			

m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.		
21												Colliery Spoil (Drillers Description). Arisings are fine to coarse angular mudstone and siltstone				
22							22.2	SPT (C) 50/150mm (10-15/60mm-21-21-8/0mm-)	22.20 - 26.70	D6						
23																
24																
25																
26											(48.30)					
27							26.7	SPT (C) 50/150mm (10-15/60mm-21-21-8/0mm-)	26.70 - 31.20	D7						
28																
29																
30																
31							31.2	SPT (C) 50/35mm (25/5mm-50/35mm-)	31.20 - 35.70	D8						
32																
33																
34																
35																
36							35.7	SPT (C) 50/85mm (6-19/45mm-35-15/10mm-)	35.70 - 40.20	D9						
37																
38																
39																
40																
41							40.2	SPT (C) 50/150mm (15-10/15mm-20-25-5/0mm-)	40.20 - 44.70 40.50	D10 C1						

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns
04/01/2022 16:30	35.70	35.70	14.00									
05/01/2022 08:00	35.70	35.70	14.00									

Plant: Commachio 600

Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. ODEX GL-49.2mbgl, Rotary coring 49.2-50.2mbgl

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator:	Logged By.	Sheet No.	m Per Page	All measurements in metres unless otherwise stated	
		QGL		2 Of 3	21		

Form Name: ROTARY. Version 2.11.000, 22/05/15 Output By: Phil Darby. Library File: C:\USERS\PHIL DARBY\ONEDRIVE - QUANTUM GEOTECHNIC LTD\QUANTUM 4.GLB.

Contract : Global Centre of Rail Excellence												Borehole No.	
Client : Global Centre of Rail Excellence												BH24	
Dates : 4/1/21 - 5/1/21						Job Number : Q0652				Ground Level : 258.67 m A.O.D. Level to Ordnance Datum			
Location :						Engineer : ARUP				Coordinates: 283944.59 E 211545.58 N Co-ordinates to National Grid			

m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata					Water	Install/ Backfill
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.			
42												Colliery Spoil (Drillers Description). Arisings are fine to coarse angular mudstone and siltstone					
43																	
44																	
45							44.7	SPT (C) 50/80mm (25/55mm-39-11/5mm--)	44.70 - 49.20	D11							
46																	
47																	
48																	
49	49.20						49.2	SPT (C) 50/15mm (25/5mm-50/15mm--)			49.20 (1.50)	...Unable to progress casing past 49.20mbgl Strong dark grey SILTSTONE BOULDER.		209.47			
50		33	33	0													
51	50.7										50.70	Terminated at 50.7mbgl, unable to progress casing		207.97			
52																	
53																	
54																	
55																	
56																	
57																	
58																	
59																	
60																	
61																	
62																	

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns
05/01/2021 14:00	50.70	49.20	14.00	49.20 50.70	115.00 115.00							

Plant: Commachio 600
Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. ODEX GL-49.2mbgl, Rotary coring 49.2-50.2mbgl

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator:	Logged By.	Sheet No.	m Per Page	All measurements in metres unless otherwise stated	
		QGL		3 Of 3	21		

Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Borehole No.

BH24

Dates : 4/1/21 - 5/1/21

Job Number : Q0652

Ground Level : 258.67 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : ARUP

Coordinates: 283944.59E
211545.58 N
Co-ordinates to National Grid



Plas Newydd
Swansea
Tel: 01554744880
email: enquiries@quantumgeotechnic.co.uk

Operator:
QGL

Logged By:

Sheet No.
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Page**
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All measurements in
metres unless
otherwise stated



Contract : Global Centre of Rail Excellence												Borehole No.	
Client : Global Centre of Rail Excellence												BH25	
Dates : 10/1/21 - 11/1/21						Job Number : Q0652				Ground Level : 257.68 m A.O.D. Level to Ordnance Datum			
Location :						Engineer : ARUP				Coordinates: 283952.65 E 211213.21 N Co-ordinates to National Grid			

m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.		
0									0.40 - 4.20	D1		Colliery Spoil (Drillers Description). Arisings are fine to coarse angular mudstone and siltstone.				
1																
2																
3																
4							4.2	SPT (C) 50/80mm (5-20/60mm-39-11/5mm--)	4.20 - 8.70	D2						
5																
6																
7																
8																
9							8.7	SPT (C) 50/30mm (25/10mm-50/30mm--)	8.70 - 13.20	D3						
10																
11																
12																
13							13.2	SPT (C) 50/165mm (12-17/35mm-19-21/10/15mm--)	13.20 - 17.70	D4						
14																
15																
16																
17																
18							17.7	SPT (C) 50/30mm (25/45mm-50/30mm--)	17.70 - 22.20	D5						
19																
20																

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns
						14.00	14.00	Medium groundwater inflow		0.00 - 49.20	Mist	100

Plant: Commachio 600
Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. ODEX GL-49.2mbgl

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator:	Logged By.	Sheet No.	m Per Page	All measurements in metres unless otherwise stated	
		QGL		1 Of 3	21		

Form Name: ROTARY. Version 2.11.000, 22/05/15 Output By: Phil Darby. Library File: C:\USERS\PHIL DARBY\ONEDRIVE - QUANTUM GEOTECHNIC LTD\QUANTUM 4.GLB.

Contract : Global Centre of Rail Excellence												Borehole No.	
Client : Global Centre of Rail Excellence												BH25	
Dates : 10/1/21 - 11/1/21						Job Number : Q0652				Ground Level : 257.68 m A.O.D. Level to Ordnance Datum			
Location :						Engineer : ARUP				Coordinates: 283952.65 E 211213.21 N Co-ordinates to National Grid			

m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata					
	Core Run	TCR %	SCR %	RQD %	Min Avg	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	Water	Install/ Backfill
21												Colliery Spoil (Drillers Description). Arisings are fine to coarse angular mudstone and siltstone.				
22							SPT (C) 50/160mm (16-9/40mm-15-15-20/10mm-)	22.20 - 26.70	D6							
23																
24																
25																
26																
27							SPT (C) 50/75mm (25/60mm-41-9/0mm-)	26.70 - 31.20	D7							
28																
29																
30																
31							SPT (C) 50/10mm (25/50mm-50/10mm-)	31.20 - 35.70	D8							
32																
33																
34																
35																
36							SPT (C) 50/95mm (18-7/0mm-27-23/20mm-)	35.70 - 40.20	D9							
37																
38																
39																
40							SPT (C) 50/40mm (20-5/0mm-50/40mm-)	40.20 - 44.70	D10							
41																

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns
10/01/2022 16:30	35.70	35.70	14.00									
11/01/2022 07:00	35.70	35.70	14.00									

Plant: Commachio 600
Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. ODEX GL-49.2mbgl

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator:	Logged By.	Sheet No.	m Per Page	All measurements in metres unless otherwise stated	
		QGL		2 Of 3	21		

Contract : Global Centre of Rail Excellence Client : Global Centre of Rail Excellence												Borehole No. BH25	
Dates : 10/1/21 - 11/1/21 Location :				Job Number : Q0652 Engineer : ARUP				Ground Level : 257.68 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 283952.65 E 211213.21 N <i>Co-ordinates to National Grid</i>					

m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.		
42												Colliery Spoil (Drillers Description). Arisings are fine to coarse angular mudstone and siltstone.				
43																
44																
45							44.7	SPT (C) 50/65mm (25/35mm-50/65mm--)	44.70 - 49.20	D11						
46																
47																
48																
49							49.2	SPT (C) 50/30mm (25/30mm-50/30mm--)			49.20	Terminated at 49.2mbgl. Unable to progress casing		208.48		
50																
51																
52																
53																
54																
55																
56																
57																
58																
59																
60																
61																
62																

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns
11/01/2021 12:00	49.20	49.20	14.00	49.20	115.00							

Plant: Commachio 600
Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. ODEX GL-49.2mbgl

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator: QGL	Logged By:	Sheet No. 3 Of 3	m Per Page 21	All measurements in metres unless otherwise stated	
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Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Dates: 17/12/21 - 20/12/21

Location: Around washery area

Job Number : Q0652

Engineer : ARUP

Ground Level : 273.07 m A.O.D.
Level to Ordnance Datum

Coordinates: 283672.55 E
211574.00 N
Co-ordinates to National Grid

Orientation & Inclination:
Orientation: N/A
Inclination: N/A

Borehole No. BH26

0 m B.G.L.	Run Details				Fracture Details				Samples		Insitu Tests		Strata				Discontinuities						Water
	Core Run	TCR %	SCR %	RQD %	Min	Avg	Max	FI	Depth	Type No. Blows	Depth	Test Results	Depth (Thick-ness)	Description	Legend	Red. Level A.O.D.	Depth (Thick-ness)	Dip	Direction	Fracture Set	Discontinuity Description		
0									0.80	D1				Grass over MADE GROUND - brown CLAY (Drillers Description)									
1													(4.20)										
2																							
3																							
4									4.20	D2	4.2	SPT (C) 50/85mm (12-13/30mm-29-21/10mm--)	4.20	Black dark grey collery spoil (Drillers Description)		268.87							
5																							
6																							
7																							
8																							
9									8.70	D3	8.7	SPT (C) 50/5mm (25/55mm-31/5mm-19/mm--)											
10																							
11																							
12																							
13									13.20	D4	13.2	SPT (C) 50/80mm (10-15/40mm-38-12/5mm--)											
14																							
15																							
16																							
17																							
18									17.70	D5	17.7	SPT (C) 50/75mm (14-11/50mm-20-21/0mm-9/mm--)											
19																							
20													(31.00)										

Hole Progress / Water Obs				Casing		Groundwater				Flush				Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. ODEX GL-35.7mbgl, Rotary coring 35.7-40.2mbgl
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns	Colour	
17/12/2021 16:30 20/12/2021 07:30	17.70 17.70	17.70 17.70						No ground water encountered		0.00 - 40.20	Air Mist	100	Grey	

Plas Newydd
Swansea
Tel: 01554744880
email: enquiries@quantumgeotechnic.co.uk

Operator:
G Blades

Logged By:
S Picton

Logged Date:

Equipment Used:
Rig: Commachio MC600.

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All measurements in metres unless otherwise stated

Form Name: ROTARY A3. Version 2.11.000, 22/05/15 Output By: Phil Darby. Library File: C:\USERS\PHIL DARBY\ONEDRIVE - QUANTUM GEOTECHNIC LTD\QUANTUM 4.GLB.

Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Dates: 17/12/21 - 20/12/21

Location: Around washery area

Job Number : Q0652

Engineer : ARUP

Ground Level : 273.07 m A.O.D.

Level to Ordnance Datum

Coordinates: 283672.55 E

211574.00 N

Co-ordinates to National Grid

Orientation & Inclination:

Orientation: N/A

Inclination: N/A

Borehole No. BH26

m B.G.L.	Run Details				Fracture Details				Samples		Insitu Tests		Strata					Discontinuities					Water
	Core Run	TCR %	SCR %	RQD %	Min	Avg	Max	FI	Depth	Type No. Blows	Depth	Test Results	Depth (Thick-ness)	Description	Legend	Red. Level A.O.D.	Depth (Thick-ness)	Dip	Direction	Fracture Set	Discontinuity Description		
21																							
22								22.20	D6	22.2	SPT (C) 50/60mm (25/15mm-50/60mm--)												
23																							
24																							
25																							
26																							
27								26.70	D7	26.7	SPT (C) 50/150mm (11-14/25mm-21-21-8/0mm-)												
28																							
29																							
30																							
31								31.20	D8	31.2	SPT (C) 50/75mm (10-15/10mm-45-5/0mm-)												
32																							
33																							
34																							
35																							
35.70 - 37.20					5	2	10	6		35.7	SPT (C) 50/15mm (25/5mm-50/15mm--)	35.20 (0.50)	Grey weathered MUDSTONE (Drillers Description)		237.87								
	100	63	0					NI				35.70 (0.50)	Weak to strong grey MUDSTONE with some Siltstone bands (SOUTH WALES COAL MEASURES)		237.37	35.70	0	10	1	Bedding fracture set, dipping 0°, 10°, planar smooth to striated, polished, clay.			
								1				36.20 (1.00)	Weak black COAL (SOUTH WALES COAL MEASURES)		236.87								
37.20 - 38.70					5	15	30	NI				37.20	Strong dark grey SILTSTONE with Mudstone bands (SOUTH WALES COAL MEASURES)		235.87								
	100	97	27					NI					...From 38.00 to 38.25mbgl iron pyrite conglomerate			4.50							
38.70 - 40.20					3	16	25	NI				(3.00)											
	100	100	50					17															
40.2																							
40.2													40.20	Terminated at 40.20mbgl (Scheduled Depth)		232.87							
41																							

Hole Progress / Water Obs				Casing		Groundwater				Flush				Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. ODEX GL-35.7mbgl, Rotary coring 35.7-40.2mbgl
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns	Colour	
				35.70	115.00									

Quantum Geotech

Plas Newydd

Swansea

Tel: 01554744880

email: enquiries@quantumgeotechnic.co.uk

Operator:

G Blades

Logged By:

S Picton

Logged Date:

Equipment Used:

Rig: Commachio MC600.

Sheet No.

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m Per Page

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All measurements in metres unless otherwise stated

AGS

Form Name: ROTARY A3. Version 2.11.000, 22/05/15 Output By: Phil Darby. Library File: C:\USERS\PHIL DARBY\ONEDRIVE - QUANTUM GEOTECHNIC LTD\QUANTUM 4.GLB.

Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Borehole No.

BH26

Dates : 17/12/21 - 20/12/21

Job Number : Q0652

Ground Level : 273.07 m A.O.D.
Level to Ordnance Datum

Location : Around washery area

Engineer : ARUP

Coordinates: 283672.55 E
211574.00 N
Co-ordinates to National Grid



Plas Newydd
Swansea
Tel: 01554744880
email: enquiries@quantumgeotechnic.co.uk

Operator:
G Blades

Logged By:
S Picton

Sheet No.
1 Of 1

m Per
Page
2

All measurements in
metres unless
otherwise stated



Contract : Global Centre of Rail Excellence												Borehole No.	
Client : Global Centre of Rail Excellence												BH27	
Dates : 25/11/21 - 9/12/21						Job Number : Q0652				Ground Level : 283.50 m A.O.D. Level to Ordnance Datum			
Location : Around washery area						Engineer : ARUP				Coordinates: 282777.93 E 210976.89 N Co-ordinates to National Grid			

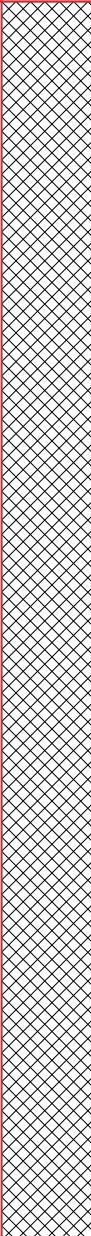
m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				
	Core Run	TCR %	SCR %	RQD %	Min Avg	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	Water
0												MADE GROUND - Grass over dark grey black slightly sandy clayey GRAVEL with medium cobble and boulder content. Gravel is fine to coarse angular to sub-angular Mudstone with ash and coal. Cobbles are angular to sub-angular Mudstone and Siltstone			
1									1.00	B1					
2									1.50 - 3.00	B2					
3															
4															
5							4.5	SPT (C) 50/210mm (18-7/10mm-28-22-)	4.50 - 6.00	B3					
6															
7															
8															
9							9	SPT (C) 11 (6-4-3-3-2-3)							
10															
11									10.50 - 12.00	B4					
12															
13															
14							13.5	SPT (C) 19 (2-3-4-3-5-7)							
15															
16															
17									16.50 - 18.00	B5					
18							18	SPT (C) 31 (4-6-7-8-8-8)							
19															
20															

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns

Plant: Mito
Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator:	Logged By:	Sheet No.	m Per Page	All measurements in metres unless otherwise stated	
		S Picton		1 Of 3	21		

Contract : Global Centre of Rail Excellence Client : Global Centre of Rail Excellence												Borehole No. BH27	
Dates : 25/11/21 - 9/12/21 Location : Around washery area				Job Number : Q0652 Engineer : ARUP				Ground Level : 283.50 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 282777.93 E 210976.89 N <i>Co-ordinates to National Grid</i>					

m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				
	Core Run	TCR %	SCR %	RQD %	Min Avg	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	Water
21												MADE GROUND - Grass over dark grey black slightly sandy clayey GRAVEL with medium cobble and boulder content. Gravel is fine to coarse angular to sub-angular Mudstone with ash and coal. Cobbles are angular to sub-angular Mudstone and Siltstone			
22															
23							SPT (C) 45 (10-12-18-11-8-8)								
24															
25								25.00 - 26.50	B6						
26															
27							SPT (C) 50/115mm (14-11/45mm-26-24/40mm--)								
28															
29										(57.50)					
30															
31															
32							SPT (C) 34 (7-8-8-12-7-7)								
33															
34															
35															
36							SPT (C) 44 (6-8-10-10-12-12)								
37															
38															
39								38.50 - 40.00	B7						
40															
41							SPT (C) 50/95mm (15-10-31-19-20mm--)								

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns

Plant: Mito
Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotech.co.uk	Operator: S Picton	Logged By: S Picton	Sheet No. 2 Of 3	m Per Page 21	All measurements in metres unless otherwise stated	
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Contract : Global Centre of Rail Excellence												Borehole No.	
Client : Global Centre of Rail Excellence												BH27	
Dates : 25/11/21 - 9/12/21				Job Number : Q0652				Ground Level : 283.50 m A.O.D. Level to Ordnance Datum					
Location : Around washery area				Engineer : ARUP				Coordinates: 282777.93 E 210976.89 N Co-ordinates to National Grid					

m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				
	Core Run	TCR %	SCR %	RQD %	Min Avg	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	Water
42												MADE GROUND - Grass over dark grey black slightly sandy clayey GRAVEL with medium cobble and boulder content. Gravel is fine to coarse angular to sub-angular Mudstone with ash and coal. Cobbles are angular to sub-angular Mudstone and Siltstone			
43															
44							44	SPT (C) 50/150mm (18-7/10mm-19-26-5/0mm-)							
45															
46															
47															
48															
49							48.5	SPT (C) 50/135mm (20-5/0mm-27-23/60mm-)	48.00 - 50.00	B9					
50															
51															
52															
53							53	SPT (C) 50/0mm (19-6/0mm-50/0mm-)	53.00 - 54.00	B10					
54									54.00 - 55.00	B11					
55															
56															
57							57.5	SPT (C) 50/160mm (14-11/40mm-18-22-10/10mm-)			57.50	DRILLERS DESCRIPTION - Hard bands of Siltstone and boulders		226.00	
58											(4.00)				
59															
60															
61															
62											61.50	Terminated at 61.50mbgl unable to progress casing past 50.00mbgl, Borehole collapsing		222.00	

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns

Plant: Mito
Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator:	Logged By:	Sheet No.	m Per Page	All measurements in metres unless otherwise stated	
			S Picton	3 Of 3	21		

Contract : Global Centre of Rail Excellence												Borehole No. BH28	
Client : Global Centre of Rail Excellence													
Dates : 12/1/22 - 13/1/22						Job Number : Q0652				Ground Level : 277.37 m A.O.D. Level to Ordnance Datum			
Location : Around washery area						Engineer : ARUP				Coordinates: 282572.65 E 210970.19 N Co-ordinates to National Grid			

m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.		
0									0.20 - 4.20	D1	(0.20)	Grass over Topsoil (Drillers Description)		277.17		
1											0.20	Brown Sandstone Boulders (Drillers Description)				
2											(4.90)					
3																
4							4.2	SPT (C) 50/15mm (25/5mm-50/15mm--)	4.20 - 5.10	D2						
5											5.10	Dense Colliery Spoil (Drillers Description). Arisings are fine to coarse angular mudstone Gravel		272.27		
6																
7																
8																
9							8.7	SPT (C) 40/175mm (5-5-11-11-18/25mm--)	8.70 - 13.20	D3						
10																
11																
12																
13							13.2	SPT (C) 30/85mm (8-12-15-15/10mm--)	13.20 - 17.70	D4						
14											(17.90)					
15																
16																
17																
18							17.7	SPT (C) 50/83mm (15-10/5mm-29-21/8mm--)	17.70 - 22.20	D5						
19																
20																

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns
								No ground water encountered		0.00 - 49.20	Air Mist	100

Plant: Comacchio MC600 tracked drilling rig
Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. ODEX GL-49.2mbgl

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator:	Logged By.	Sheet No.	m Per Page	All measurements in metres unless otherwise stated	
		G Blades	S Picton	1 Of 3	21		

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Contract : Global Centre of Rail Excellence Client : Global Centre of Rail Excellence												Borehole No. BH28	
Dates : 12/1/22 - 13/1/22 Location : Around washery area				Job Number : Q0652 Engineer : ARUP				Ground Level : 277.37 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 282572.65 E 210970.19 N <i>Co-ordinates to National Grid</i>					

m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.		
21												Dense Colliery Spoil (Drillers Description). Arisings are fine to coarse angular mudstone Gravel				
22							22.2	SPT (C) 50/25mm (25/10mm-50/25mm--)								
23									23.00 - 26.00	D6	23.00	Brown Sandstone Boulders (Drillers Description)		254.37		
24											(3.00)					
25																
26											26.00	Dense Colliery Spoil (Drillers Description). Arisings are fine to coarse angular mudstone and siltstone Gravel		251.37		
27							26.7	SPT (C) 50/150mm (6-19/40mm-21-22-7/0mm--)								
28																
29																
30																
31							31.2	SPT (C) 50/0mm (25/60mm-41/0mm-9/mm--)			31.20 - 35.70	D7				
32																
33																
34																
35																
36							35.7	SPT (C) 49/160mm (10-15/55mm-20-21-8/10mm--)			35.70 - 40.20	D8				
37																
38											(23.20)					
39																
40							40.2	SPT (C) 50/30mm (25/25mm-50/30mm--)			40.20 - 44.70	D9				
41																

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns
12/01/2022 17:00	31.20	31.20										
13/01/2022 07:30	31.20	31.20										

Plant: Comacchio MC600 tracked drilling rig
Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. ODEX GL-49.2mbgl

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator: G Blades	Logged By: S Picton	Sheet No. 2 Of 3	m Per Page 21	All measurements in metres unless otherwise stated	
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Contract : Global Centre of Rail Excellence												Borehole No.	
Client : Global Centre of Rail Excellence												BH28	
Dates : 12/1/22 - 13/1/22						Job Number : Q0652				Ground Level : 277.37 m A.O.D. Level to Ordnance Datum			
Location : Around washery area						Engineer : ARUP				Coordinates: 282572.65 E 210970.19 N Co-ordinates to National Grid			

m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				Water	Install/ Backfill
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.		
42												Dense Colliery Spoil (Drillers Description). Arisings are fine to coarse angular mudstone and siltstone Gravel				
43																
44																
45																
46																
47																
48																
49																
50																
51																
52																
53																
54																
55																
56																
57																
58																
59																
60																
61																
62																

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns
				49.20	115.00							

Plant: Comacchio MC600 tracked drilling rig
Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. ODEX GL-49.2mbgl

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator:	Logged By.	Sheet No.	m Per Page	All measurements in metres unless otherwise stated	
		G Blades	S Picton	3 Of 3	21		

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Contract : Global Centre of Rail Excellence										Borehole No. BH29		
Client : Global Centre of Rail Excellence												
Dates : 26/11/21 - 29/11/21					Job Number : Q0652			Ground Level : 230.74 m A.O.D. Level to Ordnance Datum				
Location : Around washery area					Engineer : ARUP			Coordinates: 284719.48 E 210705.39 N Co-ordinates to National Grid				

m B.G.L.	Samples		Insitu Test Results		Strata				Water
	Depth	Type No. Blows	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
0	0.20	ES1				MADE GROUND - Grass over black dark grey slightly sandy silty clayey GRAVEL. Gravel is fine to coarse angular to sub-angular Mudstone with coal		(3.40)	
	0.50 - 1.00	B2							
1	1.00	ES3							
	1.00 - 1.50	B5							
	1.20	SPT4	1.20	SPT (C) 7 (1-1-2-1-2-2)	(3.40)				
2	2.00	ES6	2.00	SPT (C) 11 (1-2-3-3-2-3)					
	2.00 - 2.50	SPT7 B8							
3	3.00	ES9	3.00	SPT (C) 12 (1-2-3-3-3-3)					
	3.00 - 3.40	B11							
	3.70	U1 - /%			3.40	Soft brown to dark brown fibrous PEAT		227.34	
4	4.00	SPT12	4.00	SPT (S) 7 (1-2-1-2-2-2)	(1.10)			(1.10)	
	4.00 - 4.50	ES13							
	4.50 - 4.80	B14 B15							
5			5.00	SPT (C) 50/100mm (9-15-39-11/25mm--)	4.50 (0.40)	Medium dense to dense dark grey slightly clayey slightly silty sandy GRAVEL. Gravel is fine to coarse angular to sub-angular Mudstone		226.24 (0.40)	
					4.90 (0.10)	Weak to strong dark grey MUDSTONE. Recovered as fine to coarse angular to sub-angular GRAVEL. (SOUTH WALES COAL MEASURES)		225.84 (0.10)	
6					5.00	Terminated at 5.00mbgl upon refusal. Progressed using rotary drilling methods		225.74	
7									
8									
9									
10									
11									
12									
13									
14									

Hole Progress / Water Obs				Casing		Groundwater				Chiselling		
Date / Time	H. Depth	C. Depth	Water	Depth	Cas. Dia.	Struck	Rose To	Behaviour	Sealed	From	To	Hours
26/11/2021 15:00	3.00	3.00	0.50	10.00	150.00	0.70	0.50	Slight ground water seepage at 0.70mbgl		4.70	5.00	1:00
29/11/2021 08:00	3.00	3.00	0.50									

Equipment / plant used: Dando 2000 Cable Percussive drill rig

Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. Cable Percussive GL-5.0mbgl

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator:	Logged By.	Sheet No.	m Per Page	All measurements in metres unless otherwise stated	
		P Osborn	S Picton	1 Of 1	15		

Contract : Global Centre of Rail Excellence											Borehole No. BH29R	
Client : Global Centre of Rail Excellence												
Dates : 3/12/21 - 3/12/21					Job Number : Q0652					Ground Level : 230.74 m A.O.D. Level to Ordnance Datum		
Location :					Engineer : ARUP					Coordinates: 284719.48 E 210705.39 N Co-ordinates to National Grid		

m B.G.L.	Run Details				Fractures		Samples		Strata				Water	Install/ Backfill
	Core Run	TCR %	SCR %	RQD %	Min Avg Max	FI	Depth	Type No. Blows	Depth (Thick-ness)	Description	Legend	Red. Level A.O.D.		
0										MADE GROUND - Grass over black dark grey slightly sandy silty clayey GRAVEL. Gravel is fine to coarse angular to sub-angular Mudstone with coal. Progressed using Cable Percussive Drilling				
1									(3.40)					
2									3.40	Soft brown to dark brown fibrous PEAT. Progressed using Cable Percussive Drilling		227.34		
3									(1.10)					
4									4.50	Medium dense to dense dark grey slightly clayey slightly silty sandy GRAVEL. Gravel is fine to coarse angular to sub-angular Mudstone. Progressed using Cable Percussive Drilling		226.24		
5									(0.40)			225.84		
6									4.90	Weak to strong dark grey MUDSTONE. Recovered as fine to coarse angular to sub-angular GRAVEL. (SOUTH WALES COAL MEASURES). Progressed using Cable Percussive Drilling		225.74		
7									(0.10)					
8									5.00	Weathered Mudstone (Drillers Description)		223.54		
9									(2.20)	Siltstone / Mudstone (Drillers Description)				
10									7.20					
11									(7.80)					
12														
13														
14														
15									15.00	Dark Grey Mudstone (Drillers Description)		215.74		
16									(2.30)					
17									17.30	Siltstone / Mudstone (Drillers Description)		213.44		
18														
19														
20														

Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns
				7.20	115.00	7.20	1.80	Fast groundwater inflow		5.00 - 35.00	Mist	100

Plant: Dando 2000
Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. Cable Percussive GL-5.0mbgl, ODEX 5.0-7.2mbgl, Rotary 'open hole' 7.2-35.0mbgl

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator:	Logged By:	Sheet No.	m Per Page	All measurements in metres unless otherwise stated	
		Samson Drilling	G Blades	1 Of 2	21		

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Contract : Global Centre of Rail Excellence										Borehole No. BH30		
Client : Global Centre of Rail Excellence												
Dates : 1/12/21 - 2/12/21					Job Number : Q0652			Ground Level : 239.10 m A.O.D. Level to Ordnance Datum				
Location : Around washery area					Engineer : ARUP			Coordinates: 284925.69 E 210549.41 N Co-ordinates to National Grid				

m B.G.L.	Samples		Insitu Test Results		Strata				Water
	Depth	Type No. Blows	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
0	0.20	ES ES1				MADE GROUND - Black dark grey slightly silty slightly clayey sandy GRAVEL. Gravel is fine to coarse angular to sub-angular Mudstone with coal and ash			
	0.50 - 1.00	B2							
1	1.00	ES3							
	1.20 - 1.70	B5	1.20	SPT (C) 11 (2-3-3-2-3-3)					
2	2.00	ES6	2.00	SPT (C) 12 (1-2-2-3-3-4)	(4.00)			(4.00)	
	2.00 - 2.50	B8							
3	3.00	ES9	3.00	SPT (C) 13 (2-3-4-3-3-3)					
	3.00 - 3.50	B11							
4	4.00	ES12	4.00	SPT (C) 17 (2-2-4-4-4-5)	4.00	Firm to stiff grey brown mottled slightly sandy very gravelly silty CLAY with medium cobble and boulder content. Gravel is fine to coarse rounded to sub-rounded Siltstone and Sandstone. Cobbles and boulders are rounded to sub-rounded Sandstone		235.10	
	4.00 - 4.50	B14							
5	5.00	ES15	5.00	SPT (C) 31 (6-7-8-8-7-8)	(2.60)	...Slow drilling from 5.60-6.60mbgl			(2.60)
	5.00 - 5.50	B17							
6	6.00	ES18	6.50	SPT (C) 38 (12-10-9-9-10-10)	6.60	Weak to strong dark grey to grey SILTSTONE. Recovered as fine to coarse angular to sub-angular GRAVEL (SOUTH WALES COAL MEASURES)		232.50	
	6.00 - 6.50	B20			(0.90)				(0.90)
7	7.00 - 7.50		7.50	SPT (C) 50/125mm (9-16-28-22/50mm--)	7.50	Terminated at 7.50mbgl upon refusal. Progressed using rotary drilling methods		231.60	
8									
9									
10									

Hole Progress / Water Obs				Casing		Groundwater				Chiselling		
Date / Time	H. Depth	C. Depth	Water	Depth	Cas. Dia.	Struck	Rose To	Behaviour	Sealed	From	To	Hours
01/12/2021 16:00	4.00	4.00		7.00	150.00	6.60	3.50	Medium ground water strike at 6.60mbgl		5.60	6.60	3:50
02/12/2021 08:00	4.00	4.00								7.20	7.50	1:00

Equipment / plant used: Dando 2000 cable percussive drill rig

Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. Cable Percussive GL-7.5mbgl

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator:	Logged By:	Sheet No.	m Per Page	All measurements in metres unless otherwise stated	
		Samson Drilling	S Picton	1 Of 1	11		

Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Dates: 7/12/21 - 8/12/21

Location :

Job Number : Q0652

Engineer : ARUP

Ground Level : 239.10 m A.O.D.
Level to Ordnance Datum

Coordinates: 284925.69 E
210549.41 N
Co-ordinates to National Grid

Orientation & Inclination:

Orientation: N/A

Inclination: N/A

Borehole No.
BH30R

0m B.G.L.	Run Details				Fracture Details				Samples		Insitu Tests		Strata				Discontinuities						Water	Install/ Backfill
	Core Run	TCR %	SCR %	RQD %	Min	Avg	Max	FI	Depth	Type No. Blows	Depth	Test Results	Depth (Thick-ness)	Description	Legend	Red. Level A.O.D.	Depth (Thick-ness)	Dip	Direction	Fracture Set	Discontinuity Description			
														MADE GROUND - Black dark grey slightly silty slightly clayey sandy GRAVEL. Gravel is fine to coarse angular to sub-angular Mudstone with coal and ash. Progressed using Cable Percussive Drilling Techniques										
													(4.00)											
													4.00	Firm to stiff grey brown mottled slightly sandy very gravelly silty CLAY with medium cobble and boulder content. Gravel is fine to coarse rounded to sub-rounded Siltstone and Sandstone. Cobbles and boulders are rounded to sub-rounded Sandstone. Progressed using Cable Percussive Drilling Techniques		235.10								
													(2.60)	...Slow drilling from 5.60-6.60mbgl										
													6.60	Weak to strong dark grey to grey SILTSTONE. Recovered as fine to coarse angular to sub-angular GRAVEL (SOUTH WALES COAL MEASURES). Progressed using Cable Percussive Drilling Techniques		232.50								
													(0.90)											
													7.50	Weathered Mudstone (Drillers Description)		231.60								
													(0.70)											
8.20 - 9.70												8.20	Medium strong grey MUDSTONE with one discontinuity set. (SOUTH WALES COAL MEASURES) between 8.48 and 8.8mbgl thinly laminated		230.90	8.20				Sub-horizontal discontinuity set (bedding) extrmely close to vlosely spaced, rough planar, open, generally clean locally with orange surface staining.				
	93	83	23	10	74	120	18	8.70 - 8.80	C1			(1.50)					1.50							
								9.35 - 9.42	C2															
												9.70	VOID		229.40									
												(2.00)												

Hole Progress / Water Obs				Casing		Groundwater				Flush				Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. Cable Percussive GL-7.5mbgl. ODEX 7.5-8.2mbgl. Rotary coring 8.2-20.2mbgl, Rotary 'open hole' 20.2-27.8mbgl
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns	Colour	
						8.20	4.10	Fast groundwater inflow		0.00 - 20.10	Mist	100		

Plas Newydd
Swansea
Tel: 01554744880
email: enquiries@quantumgeotechnic.co.uk

Operator:
Samson Drilling

Logged By:
S Picton

Logged Date:
03/12/2021

Equipment Used:
Rig: Dando 2000 cable percussive drill rig.

Sheet No.
1 Of 3

m Per Page
11

All measurements in metres unless otherwise stated

Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Dates: 7/12/21 - 8/12/21

Location :

Job Number : Q0652

Engineer : ARUP

Ground Level : 239.10 m A.O.D.
Level to Ordnance Datum

Coordinates: 284925.69 E
210549.41 N
Co-ordinates to National Grid

Orientation & Inclination:
Orientation: N/A
Inclination: N/A

Borehole No.
BH30R

1 m B.G.L.

11

12

13

14

15

16

17

18

19

20

21

Run Details				Fracture Details				Samples		Insitu Tests		Strata				Discontinuities						Water	Install/ Backfill
Core Run	TCR %	SCR %	RQD %	Min	Avg	Max	FI	Depth	Type No. Blows	Depth	Test Results	Depth (Thick-ness)	Description	Legend	Red. Level A.O.D.	Depth (Thick-ness)	Dip	Direction	Fracture Set	Discontinuity Description			
12.70 - 14.20	99	73	30	10	64	450	22	13.10 - 13.15	C3			11.70	Medium strong grey MUDSTONE with one discontinuity set. (SOUTH WALES COAL MEASURES)		227.40	11.70							
												(1.00)			1.00								
14.20 - 15.70	100	63	45	10	110	370	10	14.90 - 15.25 15.01	C4 C8			12.70	Weak dark grey MUDSTONE with one discontinuity set. (SOUTH WALES COAL MEASURES)		226.40	12.70				Sub-horizontal discontinuity set (bedding) extremely closely spaced, smooth to rough planar, open, locally highly weathered to medium angular gravel upto 10mm penetration.			
												(0.94)			0.94								
15.70 - 17.20	100	87	56	160	88	340	16	16.00 - 16.20	C5			13.64	Weak to medium strong black COAL. (SOUTH WALES COAL MEASURES)		225.46								
												(0.56)											
17.20 - 18.70	80	70	67	40	133	300	5	17.70 - 17.95	C6			14.20	Weak dark grey MUDSTONE. (SOUTH WALES COAL MEASURES) Highly weathered to fine to coarse angular Gravel		224.90								
												(0.28)											
18.70 - 20.20	90	57	51	20	113	300	11	19.60 - 19.80	C7			14.48	Medium strong grey MUDSTONE with one discontinuity set. (SOUTH WALES COAL MEASURES)		224.62	14.48				Sub-horizontal discontinuity set (bedding) close to medium spaced, smooth to rough planar, partly open to open, clean..			
20.2													 between 15.45 and 15.65mbgl highly weathered to coarse angular Gravel			2.72							
												17.20	Strong light grey SILTSTONE with two discontinuity sets. (SOUTH WALES COAL MEASURES)		221.90	17.20				Sub-horizontal discontinuity set (bedding) close to medium spaced, smooth planar, open, locally with silt surface coating 70 degree discontinuity set (joint) medium spaced, rough planar, partly open, with silt surface coating..			
												(2.10)			2.10								
												19.30	Medium strong grey MUDSTONE with one discontinuity set. (SOUTH WALES COAL MEASURES)		219.80	19.30				Sub-horizontal discontinuity set (bedding) closely spaced, smooth planar, open, clean.			
												(0.80)			0.90								
												20.10	VOID		219.00								
												(1.00)											
												21.10	Soft Drill (Drillers Description)		218.00								
												(0.90)											

Hole Progress / Water Obs

Casing

Groundwater

Flush

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Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns	Colour
08/12/2021 07:30	15.70	12.70	3.90	12.70	115.00					20.10 - 27.80	Mist	0	

Plas Newydd
Swansea
Tel: 01554744880
email: enquiries@quantumgeotechnic.co.uk

Operator:
Samson Drilling

Logged By:
S Picton

Logged Date:
03/12/2021

Equipment Used:
Rig: Dando 2000 cable percussive drill rig.

Sheet No.
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m Per Page
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All measurements in metres unless otherwise stated

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Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Dates: 7/12/21 - 8/12/21

Location :

Job Number : Q0652

Engineer : ARUP

Ground Level : 239.10 m A.O.D.
Level to Ordnance Datum

Coordinates: 284925.69 E
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Co-ordinates to National Grid

Orientation & Inclination:
Orientation: N/A
Inclination: N/A

Borehole No.
BH30R

22m B.G.L.

22

23

24

25

26

27

28

29

30

31

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Run Details				Fracture Details				Samples		Insitu Tests		Strata				Discontinuities							
Core Run	TCR %	SCR %	RQD %	Min	Avg	Max	FI	Depth	Type No. Blows	Depth	Test Results	Depth (Thick-ness)	Description	Legend	Red. Level A.O.D.	Depth (Thick-ness)	Dip	Direction	Fracture Set	Discontinuity Description	Water	Install/ Backfill	
												22.00	Hard Drill (Drillers Description)		217.10								
												(5.80)											
												27.80	Terminated at 27.8mbgl, unable to progress as borehole sides collapsing below 21.1mbgl		211.30								

Hole Progress / Water Obs				Casing		Groundwater				Flush				Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. Cable Percussive GL-7.5mbgl. ODEX 7.5-8.2mbgl. Rotary coring 8.2-20.2mbgl, Rotary 'open hole' 20.2-27.8mbgl
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns	Colour	

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