

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



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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
metres unless
otherwise stated



Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Borehole No.

BH16

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

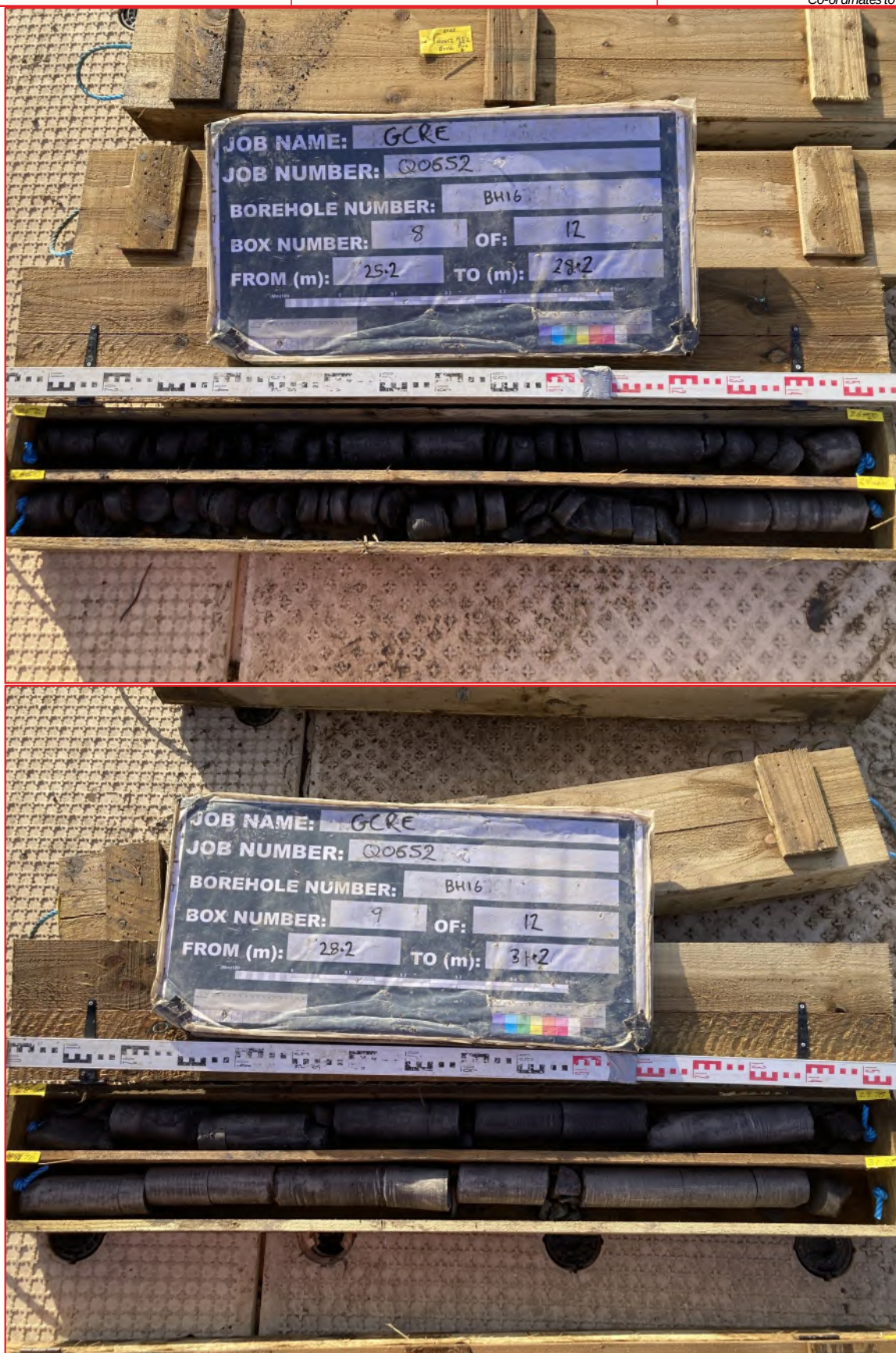
Job Number : Q0652

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

Location :

Engineer : ARUP

Coordinates: 283439.29 E
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Co-ordinates to National Grid



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Borehole No.

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

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Borehole No.

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

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Level to Ordnance Datum

Location :

Engineer : ARUP

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



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Tel: 01554744880
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All measurements in
metres unless
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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				MADE GROUND: Grey clayey GRAVEL. Gravel is fine coarse angular mudstone (Colliery Spoil)									
	1										1.2	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			 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							 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.			
9	100	60	8		20	67	120	17					(3.85)										
10.20 - 11.70									9.70	C2						5.60							
10	73	31	8		30	85	120	13															

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		

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

Operator:
QGL

Logged By:
P Darby

Logged Date:

Equipment Used:
Rig: Commachio 600.

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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																				Borehole No. BH17									
Client : Global Centre of Rail Excellence										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							
Dates : 25/11/21 - 26/11/21										Location :																			
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	

Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Borehole No.

BH17

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

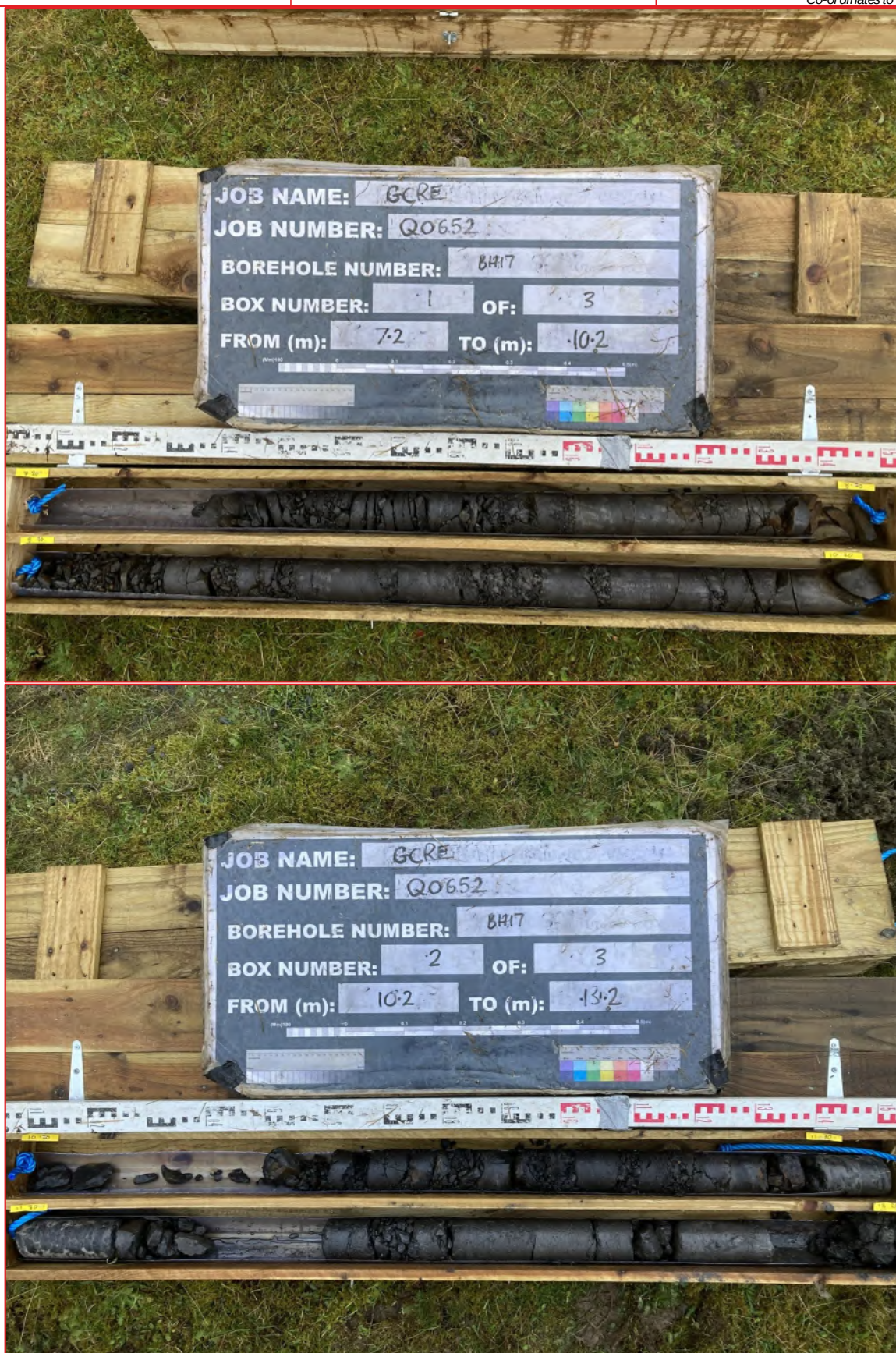
Job Number : Q0652

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



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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Contract : Global Centre of Rail Excellence

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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QGL

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P Darby

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Page**
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All measurements in
metres unless
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Contract : Global Centre of Rail Excellence

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

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		

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.

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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

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.	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				 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					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						(1.20)												
					70	80	90	2															
								32.70 - 33.10	C5	(1.50)				Medium strong grey SILTSTONE with one discontinuity set. (SOUTH WALES COAL MEASURES) between 32.3 and 33.4mbgl thinly laminated		243.13							
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											
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. 3 Of 5		m Per Page 11		All measurements in metres unless otherwise stated		AGS			

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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 :					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								
33m 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								
	33.70 - 35.20	98	91	79	20	137	400	10	33.44 - 33.57	C6				33.40 (0.30)	Strong grey SANDSTONE. (SOUTH WALES COAL MEASURES)	xxxxxx	241.63				Between 32.3 and 32.8mbgl 60 to 80 degree discontinuity rough stepped and undulating, tight, clean / fresh. drilling induced. Between 33.45 and 33.7mbgl 80 degree discontinuity rough planar, open, with orange surface staining and calcite deposits. Sub-horizontal (bedding) discontinuity set medium spaced, smooth to rough planar, open, locally with silt surface coating. Between 33.7 and 33.8mbgl 80 degree discontinuity rough planar, partly open, clean.								
	35.2	100	97	91	10	250	730	5	34.65 - 35.05	C7				33.70 (1.70)	Strong grey SILTSTONE with one discontinuity set. (SOUTH WALES COAL MEASURES)	xxxxxx	241.33	33.70											
														35.40	Hard Drill - Drillers Description, No returns		239.63												
														(2.90)															
														38.30 (0.70)	Soft Drill - Drillers Description, No returns		236.73												
														39.00	Hard Drill - Drillers Description, No returns		236.03												
														(2.30)															
														41.30 (1.10)	Soft Drill - Drillers Description, No returns		233.73												
														42.40	Hard Drill - Drillers Description, No returns		232.63												
														(2.80)															
	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															
	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. 4 Of 5			m Per Page 11		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																				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																		
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	

Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Borehole No.

BH18

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



Plas Newydd
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Tel: 01554744880
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Sheet No.
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Location :

Engineer : ARUP

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All measurements in
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Contract : Global Centre of Rail Excellence												Borehole No.	
Client : Global Centre of Rail Excellence												BH19	
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																
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 (1.50)					
20											19.20	Terminated at 19.20mbgl, unable to progress casing through boulders		235.85		
								SPT (C) 50/15mm (25/10mm-50/15mm-)								

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	19.20	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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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		

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
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															
8.7								SPT (C) 50/80mm (13-12/15mm-38-12/15mm--)	8.70 - 13.20	D3					
9															
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

 Quantum Geotech	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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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

 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															
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:

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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. <i>Level to Ordnance Datum</i>			
Location : Around former opencast area						Engineer : ARUP				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
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				(18.00)				
10								SPT (C) 28 (5-6-6-7-7-8)							
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				18.00	DRILLERS DESCRIPTION - Hard bands of Siltstone and boulders		195.01	
19								SPT (C) 50/225mm (9-10-15-25-10-)							
20									19.50 - 21.00	B5					

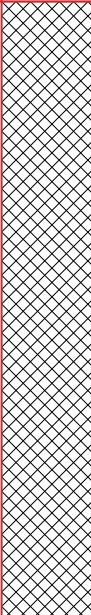
Hole Progress / Water Obs				Casing		Groundwater				Flush		
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns
22/11/2021 17:00	9.00	9.00		21.00	116.00			No ground water encountered				
23/11/2021 08:00	9.00	9.00										
23/11/2021 17:00	21.00	21.00										
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:	Logged By:	Sheet No.	m Per Page	All measurements in metres unless otherwise stated	
		E Demaj	S Picton	1 Of 2	21		

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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

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator: E Demaj	Logged By: S Picton	Sheet No. 2 Of 2	m Per Page 21	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. <i>Level to Ordnance Datum</i>
Location : Around former opencast area		Engineer : ARUP		Coordinates: 282101.25E 212011.30 N <i>Co-ordinates to National Grid</i>



	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	
		E Demaj	S Picton	1 Of 6	2		

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

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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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

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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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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



Plas Newydd
Swansea
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E Demaj

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S Picton

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Page
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All measurements in
metres unless
otherwise stated



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.	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									0.30 - 4.20	D1				Colliery Spoil (Drillers Description). Arisings are fine to coarse angular mudstone and siltstone										
1																								
2																								
3																								
4									4.20 - 8.70	D2	SPT (C) 50/170mm (5-10-15-21-14/20mm--)	4.2												
5																								
6																								
7																								
8																								
9									8.70 - 13.20	D3	SPT (C) 50/80mm (18-7/0mm-39-11/5mm--)	8.7												
10																								
11												(21.40)												
12																								
13									13.20 - 17.70	D4	SPT (C) 50/35mm (25/50mm-50/35mm--)	13.2												
14																								
15																								
16																								
17																								
18									17.70 - 21.40	D5	SPT (C) 50/120mm (8-17/20mm-22-28/45mm--)	17.7												
19																								
20																								

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	
06/01/2022 16:30 07/01/2022 08:00	13.20 13.20	13.20 13.20						No ground water encountered		0.00 - 25.20	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

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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

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1 Of 1

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Page
2

All measurements in
metres unless
otherwise stated



Contract : Global Centre of Rail Excellence												Borehole No. BH24	
Client : Global Centre of Rail Excellence													
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.		
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:	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												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							22.2	SPT (C) 50/150mm (10-15/60mm-21-21-8/0mm-)	22.20 - 26.70	D6		Colliery Spoil (Drillers Description). Arisings are fine to coarse angular mudstone and siltstone				
22																
23																
24																
25																
26							26.7	SPT (C) 50/150mm (10-15/60mm-21-21-8/0mm-)	26.70 - 31.20	D7						
27																
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		

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



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: 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												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	(49.20)						
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																
41							SPT (C) 50/40mm (20-5/0mm-50/40mm-)	40.20 - 44.70	D10							

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												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.		
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:	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

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.

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.

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												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. <i>Level to Ordnance Datum</i>			
Location : Around washery area						Engineer : ARUP				Coordinates: 282777.93 E 210976.89 N <i>Co-ordinates to National Grid</i>			

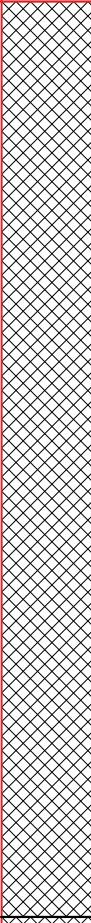
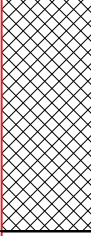
m B.G.L.	Run Details				Fractures		Insitu Tests		Samples		Strata				
	Core Run	TCR %	SCR %	RQD %	Min Avg	FI	Depth	Test Results	Depth	Type No. Blows	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	Water
21												MADE GROUND - Grass over dark grey black slightly sandy clayey GRAVEL with medium 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															
28								SPT (C) 50/115mm (14-11/45mm-26-24/40mm-)							
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@quantumgeotechnic.co.uk	Operator:	Logged By:	Sheet No.	m Per Page	All measurements in metres unless otherwise stated	
		S Picton		2 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	
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: S Picton	Logged By: S Picton	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												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.		
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									4.20 - 5.10	D2						
5								SPT (C) 50/15mm (25/5mm-50/15mm--)			5.10	Dense Colliery Spoil (Drillers Description). Arisings are fine to coarse angular mudstone Gravel		272.27		
6																
7																
8																
9									8.70 - 13.20	D3						
10								SPT (C) 40/175mm (5-5-11-11-18/25mm--)								
11																
12																
13									13.20 - 17.70	D4						
14								SPT (C) 30/85mm (8-12-15-15/10mm--)			(17.90)					
15																
16																
17																
18									17.70 - 22.20	D5						
19								SPT (C) 50/83mm (15-10/5mm-29-21/8mm--)								
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		

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. 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	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--)	23.00 - 26.00	D6	23.00	Brown Sandstone Boulders (Drillers Description)		254.37		
23											(3.00)					
24																
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							44.7	SPT (C) 50/25mm (25/30mm-50/25mm--)								
46																
47																
48																
49							49.2	SPT (C) 50/150mm (11-11-20-25-5/0mm-)			49.20	Terminated at 49.20mbgl. Unable to progress casing		228.17		
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		

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. 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.				
21										Siltstone / Mudstone (Drillers Description)	x x x x x					
22											x x x x x					
23											x x x x x					
24											x x x x x					
25											x x x x x					
26									(17.70)		x x x x x					
27											x x x x x					
28											x x x x x					
29											x x x x x					
30											x x x x x					
31											x x x x x					
32											x x x x x					
33											x x x x x					
34											x x x x x					
35									35.00	Terminated at 35.0mbgl (Scheduled Depth)	x x x x x	195.74				
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 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: Samson Drilling		Logged By: G Blades		Sheet No. 2 Of 2		m Per Page 21		All measurements in metres unless otherwise stated			

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.

1

2

3

4

5

6

7

8

9

10

Run Details

Core Run

TCR %

SCR %

RQD %

Fracture Details

Min

Avg

Max

FI

Samples

Depth

Type No. Blows

Insitu Tests

Depth

Test Results

Strata

Depth (Thick-ness)

Description

Legend

Red. Level A.O.D.

Depth (Thick-ness)

Dip

Direction

Fracture Set

Discontinuities

Discontinuity Description

Water

Install/ Backfill

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

(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

(0.90)

7.50

Weathered Mudstone (Drillers Description)

(0.70)

8.20

Medium strong grey MUDSTONE with one discontinuity set. (SOUTH WALES COAL MEASURES)
..... between 8.48 and 8.8mbgl thinly laminated

(1.50)

9.70

VOID

(2.00)

8.20 - 9.70

93

83

23

10

74

120

18

8.70 - 8.80

C1

9.35 - 9.42

C2

Sub-horizontal discontinuity set (bedding) extrmely close to vlosely spaced, rough planar, open, generally clean locally with orange surface staining.

Hole Progress / Water Obs

Date / Time

H. Depth

C. Depth

Water

Casing

Depth

Diam.

Groundwater

Struck

Rose To

Behaviour

Sealed

Flush

Depth

Type

Returns

Colour

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

Quantum Geotech

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

AGS

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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
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

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
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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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: 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

22m B.G.L.

22

23

24

25

26

27

28

29

30

31

32

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	

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.
3 Of 3

m Per Page
11

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.

BH30R

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

Job Number : Q0652

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

Location :

Engineer : ARUP

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



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

Operator:
Samson
Drilling

Logged By:
S Picton

Sheet No.
1 Of 2

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.

BH30R

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

Job Number : Q0652

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

Location :

Engineer : ARUP

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



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

Operator:
Samson
Drilling

Logged By:
S Picton

Sheet No.
2 Of 2

m Per
Page
2

All measurements in
metres unless
otherwise stated



Contract : Global Centre of Rail Excellence										Borehole No. BH31		
Client : Global Centre of Rail Excellence												
Dates : 29/11/21 - 1/12/21					Job Number : Q0652			Ground Level : 238.61 m A.O.D. Level to Ordnance Datum				
Location : Around washery area					Engineer : ARUP			Coordinates: 284880.77 E 210454.81 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			(0.70)	MADE GROUND - Grey sandy silty GRAVEL. Gravel is fine to coarse angular to sub-angular Limestone		(0.70)	
	0.50 - 1.20	B2							
1	1.20	ES3	1.20	SPT (C) 10 (1-2-3-2-3)	0.70	MADE GROUND - Black dark grey slightly silty slightly clayey sandy GRAVEL. Gravel is fine to coarse angular to sub-angular Mudstone with coal		237.91	
	1.20 - 1.70	B5							
2	2.00	ES6	2.00	SPT (C) 7 (1-1-2-1-2-2)					
	2.00 - 2.50	B8							
3	3.00	ES9	3.00	SPT (C) 10 (1-2-2-3-2-3)					
	3.00 - 3.50	B11			(6.00)			(6.00)	
4	4.00	ES12	4.00	SPT (C) 11 (3-3-3-2-3-3)					
	4.00 - 4.50	B14							
5	5.00	ES15	5.00	SPT (C) 14 (2-3-3-3-4-4)					
	5.00 - 5.50	B17							
6	6.50	ES18	6.50	SPT (C) 9 (2-3-3-2-2-2)					
	6.50 - 6.80	B20			6.70	Soft brown to dark brown fibrous PEAT		231.91	
7	6.70	B1			(1.10)			(1.10)	
	6.80	U1 - /%							
	6.80 - 7.30	D21							
		B22							
8	7.80	D23	8.00	SPT (S) 14 (2-3-3-4-4-3)	7.80	Soft to firm brown grey slightly sandy slightly gravelly slightly silty CLAY with low to medium cobble content. Gravel is fine to coarse sub-angular to sub-rounded Mudstone, Siltstone and Sandstone. Cobbles are rounded to sub-rounded Sandstone		230.81	
	8.00	SPT24			(1.70)			(1.70)	
	8.00 - 8.50	B25							
9	9.50 - 10.00	B27	9.50	SPT (C) 37 (5-8-9-9-9-10)	9.50	Medium dense to dense dark grey silty sandy GRAVEL. Gravel is fine to coarse angular to sub-angular Mudstone		229.11	
					(0.90)			(0.90)	
10	10.00 - 10.40	B29	10.00	SPT (C) 35 (5-7-8-8-10-9)	10.40	Firm to stiff grey brown mottled slightly sandy gravelly CLAY with medium cobble and boulder content. Gravel is fine to coarse rounded to sub-rounded Siltstone and		228.21	
					(0.20)			(0.20)	
	10.60 - 10.80	B30	10.80	SPT (C) 50/40mm (25/45mm-50/40mm-)	10.60			228.01	

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
29/11/2021 16:00	3.00	3.00		10.60	150.00	6.80	3.50	Medium ground water strike at 3.50mbgl		9.60	10.00	1:00
30/11/2021 08:00	3.00	3.00								10.00	10.40	1:00
30/11/2021 16:00	10.00	10.00	4.20							10.60	10.80	1:00
01/12/2021 08:00	10.00	10.00	3.15									

Equipment / plant used: Dando 2000 cable percussive 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-10.8mbgl

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotech.co.uk	Operator:	Logged By.	Sheet No.	m Per Page	All measurements in metres unless otherwise stated	
		P Osborn	S Picton	1 Of 2	11		

Form Name: SA/SPT. 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. BH31		
Client : Global Centre of Rail Excellence												
Dates : 29/11/21 - 1/12/21				Job Number : Q0652				Ground Level : 238.61 m A.O.D. Level to Ordnance Datum				
Location : Around washery area				Engineer : ARUP				Coordinates: 284880.77 E 210454.81 N Co-ordinates to National Grid				

m B.G.L.	Samples		Insitu Test Results		Strata				Legend	Red. Level A.O.D.	Water
	Depth	Type No. Blows	Depth	Test Results	Depth (Thickness)	Description					
11					10.80	Sandstone. Cobbles and boulders are rounded to sub-rounded Sandstone Weak to strong dark grey SILTSTONE. Recovered as fine to coarse angular to sub-angular GRAVEL (SOUTH WALES COAL MEASURES) Terminated at 10.80mbgl upon refusal. Progressed using rotary drilling methods			227.81		
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											

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

Equipment / plant used: Dando 2000 cable percussive 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-10.8mbgl

 Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator: P Osborn	Logged By: S Picton	Sheet No. 2 Of 2	m Per Page 11	All measurements in metres unless otherwise stated	
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Contract : Global Centre of Rail Excellence										Borehole No. BH31R	
Client : Global Centre of Rail Excellence											
Dates : 6/12/21 - 6/12/21					Job Number : Q0652					Ground Level : 238.61 m A.O.D. Level to Ordnance Datum	
Location :					Engineer : ARUP					Coordinates: 284880.77 E 210454.81 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 (Thickness)	Description	Legend	Red. Level A.O.D.		
0									(0.70)	MADE GROUND - Grey sandy silty GRAVEL. Gravel is fine to coarse angular to sub-angular Limestone. Progressed using Cable Percussive Drilling techniques		237.91		
1									0.70	MADE GROUND - Black dark grey slightly silty slightly clayey sandy GRAVEL. Gravel is fine to coarse angular to sub-angular Mudstone with coal. Progressed using Cable Percussive Drilling techniques				
2														
3														
4									(6.10)					
5														
6														
7									6.80	Soft brown to dark brown fibrous PEAT. Progressed using Cable Percussive Drilling techniques		231.81		
8									7.80	Soft to firm brown grey slightly sandy slightly gravelly slightly silty CLAY with low to medium cobble content. Gravel is fine to coarse sub-angular to sub-rounded Mudstone, Siltstone and Sandstone. Cobbles are rounded to sub-rounded Sandstone. Progressed using Cable Percussive Drilling techniques		230.81		
9									(1.70)					
10									9.50	Medium dense to dense dark grey silty sandy GRAVEL. Gravel is fine to coarse angular to sub-angular Mudstone. Progressed using Cable Percussive Drilling techniques		229.11		
11									10.40	Medium dense to dense dark grey silty sandy GRAVEL. Gravel is fine to coarse angular to sub-angular Mudstone. Progressed using Cable Percussive Drilling techniques		228.21		
12									(0.20)			228.01		
13									10.60	Firm to stiff grey brown mottled slightly sandy gravelly 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		227.81		
14									(5.20)					
15										Weak to strong dark grey SILTSTONE. Recovered as fine to coarse angular to sub-angular GRAVEL (SOUTH WALES COAL MEASURES). Progressed using Cable Percussive Drilling techniques				
16									16.00	Mudstone / Siltstone (Drillers Description)		222.61		
17									(1.10)	Coal (Drillers Description)				
18									17.10	Dark grey Mudstone (Drillers Description)		221.51		
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
				11.70	115.00					10.80 - 35.00	Mist	100

Plant: Dando 2000 cable percussive rig

Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. No Groundwater Strike Observed. Cable Percussive GL-10.8mbgl, ODEX 10.8-11.7mbgl, Rotary 'open hole' 11.7-35.0mbgl

	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	
		P Osborn	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											Borehole No. BH31R		
Client : Global Centre of Rail Excellence													
Dates : 6/12/21 - 6/12/21					Job Number : Q0652					Ground Level : 238.61 m A.O.D. Level to Ordnance Datum			
Location :					Engineer : ARUP					Coordinates: 284880.77 E 210454.81 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.		
21									(8.40)	Dark grey Mudstone (Drillers Description)				
22														
23														
24														
25														
26									25.50 (1.00)	Coal (Drillers Description)		213.11		
27									26.50 (1.60)	Dark grey Mudstone (Drillers Description)		212.11		
28									28.10	Mudstone / Siltstone (Drillers Description)		210.51		
29														
30														
31														
32									(6.90)					
33														
34														
35									35.00	Terminated at 35.0mbgl (Scheduled Depth)		203.61		
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 2000 cable percussive rig

Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. No Groundwater Strike Observed. Cable Percussive GL-10.8mbgl, ODEX 10.8-11.7mbgl, Rotary 'open hole' 11.7-35.0mbgl

	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	
		P Osborn	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										BH32		
Dates : 6/12/21 - 6/12/21					Job Number : Q0652			Ground Level : 244.73 m A.O.D. Level to Ordnance Datum				
Location : Around washery area					Engineer : ARUP			Coordinates: 284967.95 E 210230.01 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				Grass over soft to firm brown sandy gravelly silty CLAY with medium cobble content. Gravel is fine to coarse sub-angular to sub-rounded Mudstone, Siltstone and Sandstone. Cobbles are rounded to sub-rounded Sandstone		(3.60)	
	0.50 - 1.00	B2							
1	1.00	ES3							
	1.20 - 1.70	B5	1.20	SPT (C) 50/190mm (2-4-9-21-20/40mm-)	(3.60)				
2	2.00	ES6	2.00	SPT (C) 50/125mm (7-10-27-23/50mm-)		Stiff grey brown mottled slightly sandy very gravelly 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		241.13	
	2.00 - 2.50	B8						(0.70)	
3	3.00	ES9	3.00	SPT (C) 32 (4-7-7-8-8-9)					
	3.00 - 3.50	B11				Weak to strong dark grey black MUDSTONE with coal bands. Recovered as fine to coarse angular to sub-angular GRAVEL (SOUTH WALES COAL MEASURES)		240.43	
4	4.00	ES12	4.00	SPT (C) 50/225mm (8-10-12-15-23-)	3.60 (0.70)			(0.70)	
	4.30 - 5.00	B14			4.30 (0.70)	Terminated at 5.00mbgl upon refusal. Progressed using rotary drilling methods		239.73	
5			5.00	SPT (C) 50/100mm (22/55mm-36-14/25mm-)	5.00				
6									
7									
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
				4.50	150.00	4.50	3.80	Medium ground water strike at 4.50mbgl		1.20	1.60	1:00
										2.40	2.80	1:00
										4.70	5.00	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-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	11		

Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Dates: 9/12/21 - 14/12/21

Location :

Job Number : Q0652

Engineer : ARUP

Ground Level : 244.73 m A.O.D.
Level to Ordnance Datum

Coordinates: 284967.95 E
210230.01 N
Co-ordinates to Local Grid

Orientation & Inclination:

Orientation: N/A

Inclination: N/A

Borehole No. BH32R

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							
														Grass over soft to firm brown sandy gravelly silty CLAY with medium cobble content. Gravel is fine to coarse sub-angular to sub-rounded Mudstone, Siltstone and Sandstone. Cobbles are rounded to sub-rounded Sandstone. Progressed using Cable Percussive drilling methods														
													(3.60)															
													3.60 (0.70)	Stiff grey brown mottled slightly sandy very gravelly 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 methods		241.13												
													4.30 (0.70)	Weak to strong dark grey black MUDSTONE with coal bands. Recovered as fine to coarse angular to sub-angular GRAVEL (SOUTH WALES COAL MEASURES). Progressed using Cable Percussive drilling methods		240.43												
													5.00	Weak dark grey MUDSTONE. Highly to completely weathered to fine to coarse angular gravel, locally sandy and clayey. (SOUTH WALES COAL MEASURES)		239.73												
	5.70 - 7.20		90	20	17				NI																			
	7.20 - 8.70		87	0	0				NI																			
	8.70 - 10.20												(6.80)															
10.20 - 11.70		73	25	0				NI																				
														 below 10.6mgl with one discontinuity set			10.60				10 to 20 degree discontinuity set (bedding) extremely closely spaced, smooth planar, tight to partly open, clean.							
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. No Groundwater Strike Observed. Cable Percussive GL-5.0mbgl, ODEX 5.0-5.7mbgl, Rotary coring 7.5-16.2mbgl, Rotary 'open hole' 16.2-35.0mbgl														
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns	Colour															
				5.70	115.00						5.00 - 35.00	Mist	100															
Operator: P Osborn										Logged By: S Picton		Logged Date: 07/12/2021		Equipment Used: Rig: Dando 2000 cable percussive drill rig.		Sheet No. 1 Of 4		m Per Page 11		All measurements in metres unless otherwise stated		AGS						

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

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: 9/12/21 - 14/12/21

Location :

Job Number : Q0652

Engineer : ARUP

Ground Level : 244.73 m A.O.D.
Level to Ordnance Datum

Coordinates: 284967.95 E
210230.01 N
Co-ordinates to Local Grid

Orientation & Inclination:

Orientation: N/A

Inclination: N/A

Borehole No. BH32R

11m 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						
		73	25	0				NI	11.10 - 11.15	C1							1.20				Between 10.9 and 11.0mbgl clayey fine to medium angular gravel infill.						
	11.70 - 13.20												11.80	Weak black COAL. Highly weathered to fine to coarse angular Gravel and cobbles. (SOUTH WALES COAL MEASURES)		232.93											
		57	5	0				NI																			
	13.20 - 14.70												(3.20)														
		87	13	9				NI	13.85 - 14.00	C2																	
	14.70 - 16.20							NI																			
		90	63	63	200	240	250	3	15.10 - 15.35	C3			15.00	Medium strong to strong grey mudstone CONGLOMERATE with one discontinuity set. (SOUTH WALES COAL MEASURES)		229.73	15.00				10 to 15 degree discontinuity set closely spaced, smooth to rough undulating, tight to partly open, clean.. At 15.3mbgl possible slickened surface.						
													(1.20)				1.20										
	16.2											16.20	Mudstone and Siltstone (Drillers Description)		228.53												
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. No Groundwater Strike Observed. Cable Percussive GL-5.0mbgl, ODEX 5.0-5.7mbgl, Rotary coring 7.5-16.2mbgl, Rotary 'open hole' 16.2-35.0mbgl													
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: P Osborn		Logged By: S Picton		Logged Date: 07/12/2021		Equipment Used: Rig: Dando 2000 cable percussive drill rig.				Sheet No. 2 Of 4		m Per Page 11		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: 9/12/21 - 14/12/21

Location :

Job Number : Q0652

Engineer : ARUP

Ground Level : 244.73 m A.O.D.
Level to Ordnance Datum

Coordinates: 284967.95 E
210230.01 N
Co-ordinates to Local Grid

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

Borehole No. BH32R

22m B.G.L.

23

24

25

26

27

28

29

30

31

32

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	
												(18.80)											

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. No Groundwater Strike Observed. Cable Percussive GL-5.0mbgl, ODEX 5.0-5.7mbgl, Rotary coring 7.5-16.2mbgl, Rotary 'open hole' 16.2-35.0mbgl
Date / Time	H. Depth	C. Depth	Water	Depth	Diam.	Struck	Rose To	Behaviour	Sealed	Depth	Type	Returns	Colour	



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

Operator:
P Osborn

Logged By:
S Picton

Logged Date:
07/12/2021

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

Sheet No.
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m Per Page
11

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: 9/12/21 - 14/12/21

Location :

Job Number : Q0652

Engineer : ARUP

Ground Level : 244.73 m A.O.D.
Level to Ordnance Datum

Coordinates: 284967.95 E
210230.01 N
Co-ordinates to Local Grid

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

Borehole No. BH32R

33m 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				
33																									
34																									
35													35.00	Terminated at 35.0mbgl (Scheduled Depth)		209.73									
36																									
37																									
38																									
39																									
40																									
41																									
42																									
43																									

Hole Progress / Water Obs

Date / Time

H. Depth

C. Depth

Water

Casing

Depth

Diam.

Groundwater

Struck

Rose To

Behaviour

Sealed

Flush

Depth

Type

Returns

Colour

Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. No Groundwater Strike Observed. Cable Percussive GL-5.0mbgl, ODEX 5.0-5.7mbgl, Rotary coring 7.5-16.2mbgl, Rotary 'open hole' 16.2-35.0mbgl



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

Operator:
P Osborn

Logged By:
S Picton

Logged Date:
07/12/2021

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

Sheet No.
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m Per Page
11

All measurements in metres unless otherwise stated



Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Borehole No.

BH32R

Dates : 9/12/21 - 14/12/21

Job Number : Q0652

Ground Level : 244.73 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : ARUP

Coordinates: 284967.95E
210230.01 N
Co-ordinates to National Grid



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

Operator:
P Osborn

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.

BH32R

Dates : 9/12/21 - 14/12/21

Job Number : Q0652

Ground Level : 244.73 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : ARUP

Coordinates: 284967.95E
210230.01 N
Co-ordinates to National Grid



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

Operator:
P Osborn

Logged By:
S Picton

Sheet No.
2 Of 2

m Per
Page
2

All measurements in
metres unless
otherwise stated



Contract : Global Centre of Rail Excellence										Borehole No. BH33		
Client : Global Centre of Rail Excellence												
Dates : 25/11/21 - 26/11/21				Job Number : Q0652				Ground Level : 230.51 m A.O.D. Level to Ordnance Datum				
Location : Around washery area				Engineer : ARUP				Coordinates: 284397.04 E 210700.88 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 silty slightly clayey sandy GRAVEL. Gravel is fine to coarse angular to sub-angular Mudstone with coal			
	0.50 - 1.00	B2							
1	1.00	ES3			(2.00)			(2.00)	
	1.20	SPT4							
	1.20 - 1.70	B5	1.20	SPT (S) 6 (1-1-1-2-1-2)					
2	2.00	ES6			2.00	Soft brown to dark brown fibrous PEAT		228.51	
	2.00 - 2.50	SPT7 B8		SPT (S) 7 (1-1-2-2-1-1)					
	2.70	U1 - /%							
3	3.00	ES9			(2.00)			(2.00)	
	3.00 - 3.50	SPT10 B11		SPT (S) 6 (1-1-2-1-2-1)					
4	4.00	ES12			4.00	Medium dense to dense dark grey silty sandy GRAVEL. Gravel is fine to coarse angular to sub-angular Mudstone		226.51	
	4.00 - 4.50	B14		SPT (C) 9 (1-2-2-2-3)	(0.90)			(0.90)	
5	4.90 - 5.00	D16	5.00	SPT (C) 50/100mm (14-9/30mm-39-11/25mm-)	4.90 (0.10) 5.00	Weak to strong dark grey MUDSTONE. Recovered as fine to coarse angular to sub-angular GRAVEL (SOUTH WALES COAL MEASURES) Terminated at 5.00mbgl upon refusal. Progressed using rotary drilling methods		225.61 (0.10) 225.51	
6									
7									
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
25/11/2021 17:00	4.00	4.00	0.70	4.00	115.00	1.00	0.70	Medium ground water strike at 1.00mbgl		4.70	5.00	1:00
26/11/2021 08:00	4.00	4.00	2.60									

Equipment / plant used: Dando 2000 Cable Percussion 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	11		

Form Name: SA/SPT. 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: 1/12/21 - 2/12/21

Location :

Job Number : Q0652

Engineer : ARUP

Ground Level : 230.51 m A.O.D.
Level to Ordnance Datum

Coordinates: 284397.04 E
210700.88 N
Co-ordinates to National Grid

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

Borehole No.
BH33R

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 - Grass over black dark grey slightly silty slightly clayey sandy GRAVEL. Gravel is fine to coarse angular to sub-angular Mudstone with coal. Progressed using Cable Percussive Drilling techniques										
													2.00	Soft brown to dark brown fibrous PEAT. Progressed using Cable Percussive Drilling techniques		228.51								
													(2.00)											
													4.00	Medium dense to dense dark grey silty sandy GRAVEL. Gravel is fine to coarse angular to sub-angular Mudstone. Progressed using Cable Percussive Drilling techniques		226.51								
													(0.90)											
													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 techniques		225.61								
													(0.10)			225.51								
													5.00											
												(0.70)												
	5.70 - 7.20									5.40 - 5.90	C1		5.70	Weathered Mudstone (Drillers Description) Weak grey SILTSTONE with one discontinuity set. between 5.7 and 5.95mbgl highly weathered to fine to coarse angular tabular Gravel between 5.95 and 6.5mbgl thick sandstone laminations		224.81	5.70				Sub-horizontal discontinuity set (bedding) extremely closely spaced, smooth planar, partly open to open, clean, generally fresh locally highly weathered to fine angular gravel up to 5mm penetration.			
		100	69	33	20	63	500	19				(1.50)				1.50								
	7.20 - 8.70												7.20	Weak to medium strong dark grey MUDSTONE with one discontinuity set. Locally thinly laminated. (SOUTH WALES COAL MEASURES)		223.31	7.20				Sub-horizontal discontinuity set (beeding) extremely closely spaced, smooth planar, tight to partly open, clean, generally fresh locally highly weathered to fine to coarse angular gravel upto 5mm penetration. Between 7.48 and 7.6mbgl sub-vertical discontinuity smooth planar and undulating, tight to partly open, clean, fresh locally with clay infill.			
		97	77	0	10	54	60	26																
	8.70 - 10.20									9.20	C2													
		100	90	8	5	40	120	37																
	10.20 - 11.70												(6.00)	 between 10.2 and 10.45mbgl highly weathered to coarse angular Gravel between 10.8 and 11.1mbgl highly weathered to fine to coarse		6.00								
		95	47	0	20	50	120	6		10.70	C3													

Hole Progress / Water Obs

Date / Time

H. Depth

C. Depth

Water

Casing

Depth

Diam.

Groundwater

Struck

Rose To

Behaviour

Sealed

Flush

Depth

Type

Returns

Colour

Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. No Groundwater Strike Observed. Cable Percussive GL-5.0mbgl, ODEX 5.0-5.7mbgl, Rotary coring 5.7- 16.2mbgl, Rotary 'open hole' 16.2-35.0mbgl

02/12/2021 07:30	7.20	5.70	2.00	5.70	115.00					5.00 - 35.00	Mist	100	
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Plas Newydd
Swansea
Tel: 01554744880
email: enquiries@quantumgeotechnic.co.uk

Operator:
P Osborn

Logged By:
S Picton

Logged Date:
29/11/2021

Equipment Used:
Rig: Dando 2000 Cable Percussion rig.

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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: 1/12/21 - 2/12/21

Location :

Job Number : Q0652

Engineer : ARUP

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

Coordinates: 284397.04 E
210700.88 N
Co-ordinates to National Grid

Orientation & Inclination:
Orientation:
N/A

Inclination:
N/A

Borehole No.
BH33R

33m 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			
33																								
34																								
35													35.00	Terminated at 35.0mbgl (Scheduled Depth)		195.51								
36																								
37																								
38																								
39																								
40																								
41																								
42																								
43																								

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

Remarks: BH set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken. No Groundwater Strike Observed. Cable Percussive GL-5.0mbgl, ODEX 5.0-5.7mbgl, Rotary coring 5.7- 16.2mbgl, Rotary 'open hole' 16.2-35.0mbgl



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

Operator:
P Osborn

Logged By:
S Picton

Logged Date:
29/11/2021

Equipment Used:
Rig: Dando 2000 Cable Percussion rig.

Sheet No.
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m Per Page
11

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.

BH33R

Dates : 1/12/21 - 2/12/21

Job Number : Q0652

Ground Level : 230.51 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : ARUP

Coordinates: 284397.04E
210700.88 N
Co-ordinates to National Grid



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

Operator:
P Osborn

Logged By:
S Picton

Sheet No.
1 Of 2

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.

BH33R

Dates : 1/12/21 - 2/12/21

Job Number : Q0652

Ground Level : 230.51 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : ARUP

Coordinates: 284397.04E
210700.88 N
Co-ordinates to National Grid



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

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P Osborn

Logged By:
S Picton

Sheet No.
2 Of 2

m Per
Page
2

All measurements in
metres unless
otherwise stated



Contract : Global Centre of Rail Excellence										Borehole No. BH34		
Client : Global Centre of Rail Excellence												
Dates : 24/11/21 - 25/11/21					Job Number : Q0652			Ground Level : 232.64 m A.O.D. Level to Ordnance Datum				
Location : Around washery area					Engineer : ARUP			Coordinates: 284419.61 E 210543.60 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 silty clayey sandy GRAVEL. Gravel is fine to coarse angular to sub-angular Mudstone with coal			
	0.50 - 1.00	B2							
1	1.00	ES3							
	1.20	SPT4	1.20	SPT (S) 9 (2-3-3-2-2-2)	(3.30)			(3.30)	
	1.20 - 1.70	B5							
2	2.00	ES6							
		SPT7	2.00	SPT (S) 11 (1-2-2-3-3-3)					
		B8							
3	3.00	ES9							
	3.30	SPT10	3.00	SPT (S) 11 (1-2-3-3-3-3)	3.30	MADE GROUND - Soft brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse angular to sub-angular Mudstone		229.34	
	3.30 - 3.80	D11 B12						(1.50)	
4	4.00	ES13							
	4.00 - 4.50	SPT14 B15	4.00	SPT (S) 7 (1-1-2-1-2-2)	(1.50)				
5	5.00	ES16							
		SPT17	5.00	SPT (S) 6 (1-2-1-2-1-2)	4.80 (0.15) 4.95	MADE GROUND - Soft grey silty CLAY with fibrous Peat MADE GROUND - Soft brown to dark brown fibrous PEAT		227.84 (0.15) 227.69	
6	6.00 - 6.50	B18							
	6.20	B1							
	6.50	U1 - /% SPT19	6.50	SPT (S) 12 (2-3-4-3-2-3)	(1.95)			(1.95)	
	6.50 - 6.90	B20							
7	7.50 - 8.00	B21							
					6.90 (1.10)	MADE GROUND - Soft to firm black brown sandy gravelly CLAY. Gravel is fine to coarse sub-angular to angular Mudstone and ash		225.74 (1.10)	
8	8.00	ES22							
	8.00 - 8.50	B24	8.00	SPT (C) 34 (4-6-8-8-9-9)	8.00	Grey light brown mottled slightly clayey slightly silty sandy GRAVEL with medium cobble and boulder content. Gravel is fine to coarse sub-rounded to sub-angular Siltstone and Sandstone. Cobbles are rounded to sub-rounded Sandstone		224.64 (1.90)	
9									
			9.50	SPT (C) 35 (5-7-8-8-9-10)	(1.90)				
10	9.90 - 10.00	B26	10.00	SPT (C) 50/100mm (10-15/35mm-36-14/25mm--)	9.90 (0.10) 10.00	Strong dark grey SILTSTONE (SOUTH WALES COAL MEASURES) Terminated at 10.00mbgl upon refusal. Progressed using rotary drilling methods		222.74 (0.10) 222.64	

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
24/11/2021 17:00	8.00	8.00	4.60	10.00	150.00	3.50	2.40	Medium ground water strike at 3.50mbgl				
25/11/2021 08:00	8.00	8.00	4.00									

Equipment / plant used: Dando 2000 Cable Percussive 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-10.0mbgl

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

Form Name: SA/SPT. 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. BH34R	
Client : Global Centre of Rail Excellence											
Dates : 1/12/21 - 1/12/21					Job Number : Q0652					Ground Level : 232.63 m A.O.D. Level to Ordnance Datum	
Location :					Engineer : ARUP					Coordinates: 284419.61 E 210543.60 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														
1									(3.30)	MADE GROUND - Grass over black dark grey slightly silty clayey sandy GRAVEL. Gravel is fine to coarse angular to sub-angular Mudstone with coal. Progressed using Cable Percussive drilling techniques				
2									3.30	MADE GROUND - Soft brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse angular to sub-angular Mudstone. Progressed using Cable Percussive drilling techniques		229.33		
3									4.80 (0.15)	MADE GROUND - Soft grey silty CLAY with fibrous Peat. Progressed using Cable Percussive drilling techniques		227.83		
4									4.95 (1.95)	MADE GROUND - Soft brown to dark brown fibrous PEAT. Progressed using Cable Percussive drilling techniques		227.68		
5									6.90	MADE GROUND - Soft to firm black brown sandy gravelly CLAY. Gravel is fine to coarse sub-angular to angular Mudstone and ash. Progressed using Cable Percussive drilling techniques		225.73		
6									8.00	Grey light brown mottled slightly clayey slightly silty sandy GRAVEL with medium cobble and boulder content. Gravel is fine to coarse sub-rounded to sub-angular Siltstone and Sandstone. Cobbles are rounded to sub-rounded Sandstone. Progressed using Cable Percussive drilling techniques		224.63		
7									9.90 (0.10)	Strong dark grey SILTSTONE (SOUTH WALES COAL MEASURES). Progressed using Cable Percussive drilling techniques		222.73		
8									10.00 (1.70)	Weathered Mudstone (Drillers Description)		222.63		
9									11.70	Mudstone (Drillers Description)		220.93		
10									(2.80)					
11									14.50	Mudstone / Siltstone Bands (Drillers Description)		218.13		
12														
13														
14														
15														
16														
17														
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
				11.70	115.00	14.00 19.50	6.40	Medium groundwater inflow at 14.0mbgl Fast Groundwater inflow at 19.5mbgl		0.00 - 30.00	Mist	100

Plant: Dando 2000 Cable Percussive 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-10.0mbgl, ODEX 10.0-11.7mbgl, Roatry 'open hole' 11.7-30.0mbgl

	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 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. BH34R		
Client : Global Centre of Rail Excellence													
Dates : 1/12/21 - 1/12/21					Job Number : Q0652					Ground Level : 232.63 m A.O.D. Level to Ordnance Datum			
Location :					Engineer : ARUP					Coordinates: 284419.61 E 210543.60 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.		
21										Mudstone / Siltstone Bands (Drillers Description)				
22									22.10	Weak Coal (Drillers Description)		210.53		
23									(1.90)					
24									24.00	Mudstone / Siltstone Bands (Drillers Description)		208.63		
25														
26														
27									(6.00)					
28														
29														
30									30.00	Terminated at 30.0mbgl (Scheduled Depth)		202.63		
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

Plant: Dando 2000 Cable Percussive 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-10.0mbgl, ODEX 10.0-11.7mbgl, Roatry 'open hole' 11.7-30.0mbgl

	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	2 Of 2	21		

Unit 8
 Orton Enterprise Centre
 Orton Southgate
 Peterborough
 PE2 6XU

SPT Hammer Ref: SAM1
 Test Date: 02/05/2021
 Report Date: 02/05/2021
 File Name: SAM1.spt
 Test Operator: PR

Instrumented Rod Data

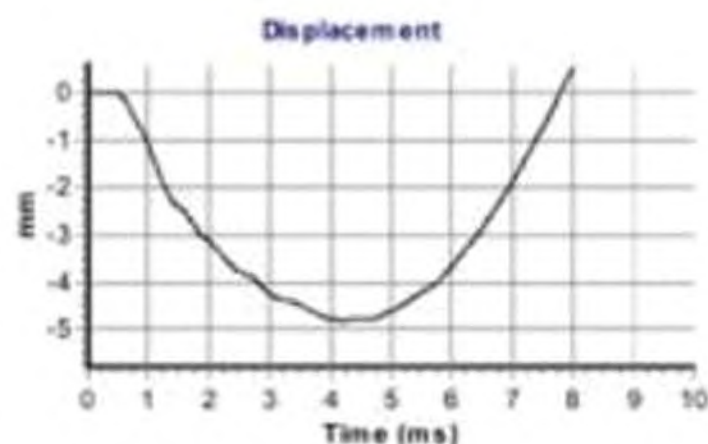
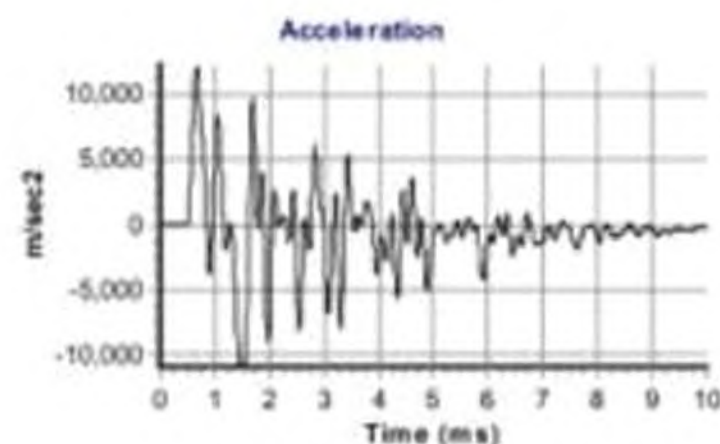
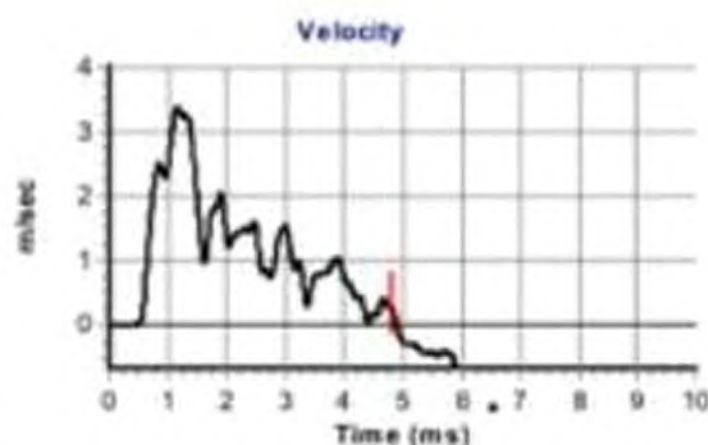
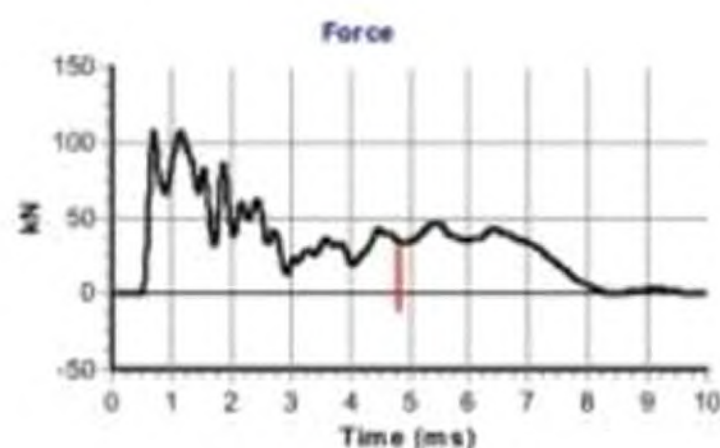
Diameter d_r (mm): 54
 Wall Thickness t_r (mm): 6.3
 Assumed Modulus E_s (GPa): 208
 Accelerometer No.1: 11853
 Accelerometer No.2: 10332

SPT Hammer Information

Hammer Mass m (kg): 63.0
 Falling Height h (mm): 760
 SPT String Length L (m): 15.0

Comments / Location

Recommended calibration interval is 6 months, maximum 12



Calculations

Area of Rod A (mm²): 944
 Theoretical Energy E_{theor} (J): 473
 Measured Energy E_{meas} (J): 358

Energy Ratio E_r (%): **76**

P. Rodgman
 Signed: PR
 Title: Operator

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Unit 8
Orton Enterprise Centre
Orton Southgate
Peterborough
PE2 6XU

SPT Hammer Ref: XL140 (Sonic Dual Head)

Test Date: 28/12/2021

Report Date: 28/12/2021

File Name: XL140.spt

Test Operator: CR

Instrumented Rod Data

Diameter d_r (mm): 54

Wall Thickness t_r (mm): 6.3

Assumed Modulus E_a (GPa): 208

Accelerometer No.1: 11941

Accelerometer No.2: 11942

SPT Hammer Information

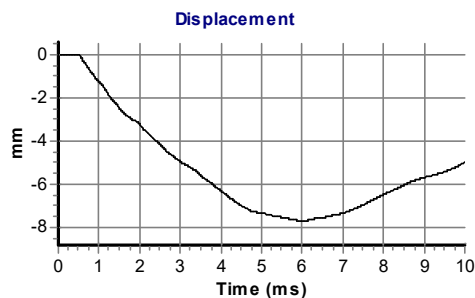
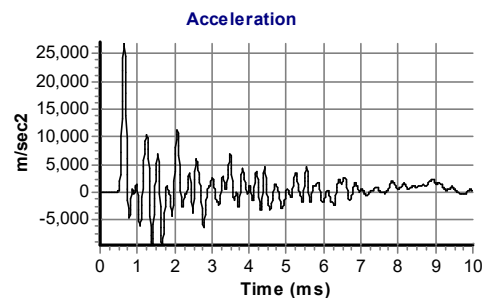
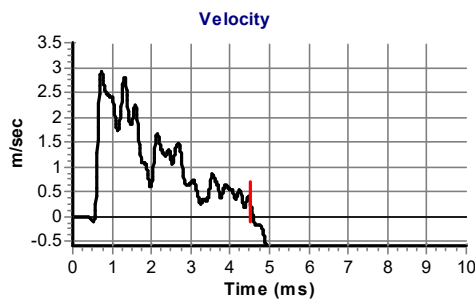
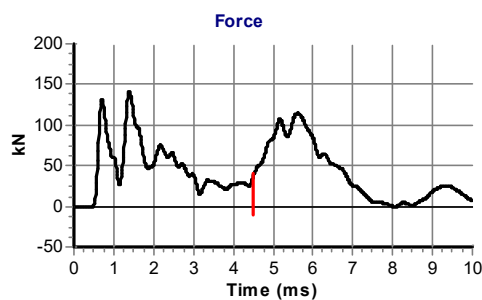
Hammer Mass m (kg): 63.5

Falling Height h (mm): 760

SPT String Length L (m): 15.0

Comments / Location

Recommended calibration interval is 6 months.
 Sonic CPT



Calculations

Area of Rod A (mm²): 944

Theoretical Energy E_{theor} (J): 473

Measured Energy E_{meas} (J): 382

Energy Ratio E_r (%): **71**

CR

Signed: CR

Title: Operator



SPT Calibration Report

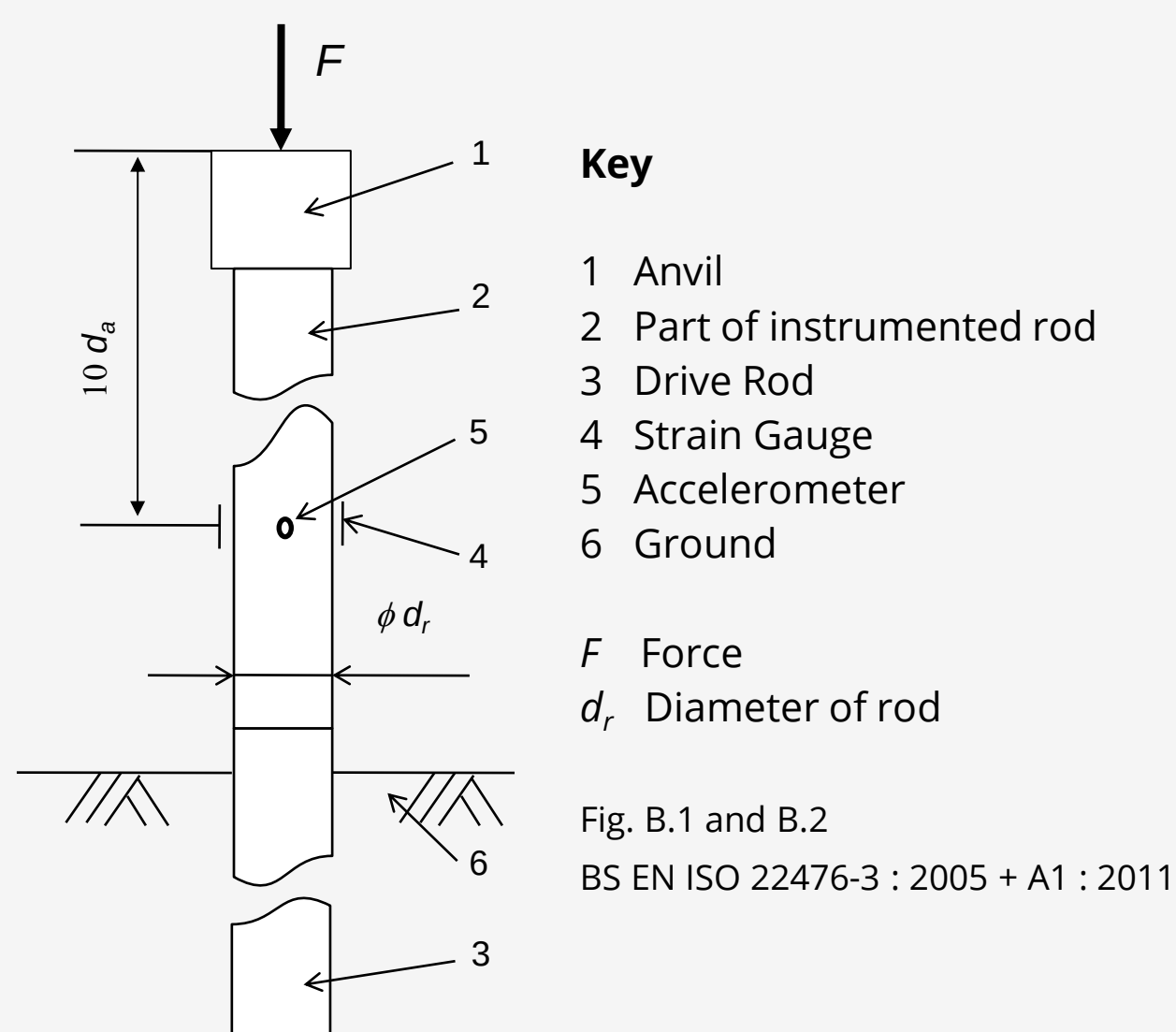
Hammer Energy Measurement Report

Type of Hammer SPT HAMMER
Test No EQU2808
Client QUANTUM GEOTECHNIC

Test Depth (m) 9.80
Mass of hammer $m = 63.5\text{kg}$
Falling height $h = 0.76\text{m}$
 $E_{\text{theor}} = m \times g \times h = 473\text{J}$

Characteristics of the instrumented rod

Diameter $d_r = 0.052\text{ m}$
Length of instrumented rod 0.558 m
Area $A = 11.61\text{ cm}^2$
Modulus $E_a = 206843\text{ MPa}$



DATE OF TEST VALID UNTIL HAMMER ID

21/04/2021 21/04/2022 Q2 AR830

$E_{\text{meas}} = 0.320\text{ kN-m}$

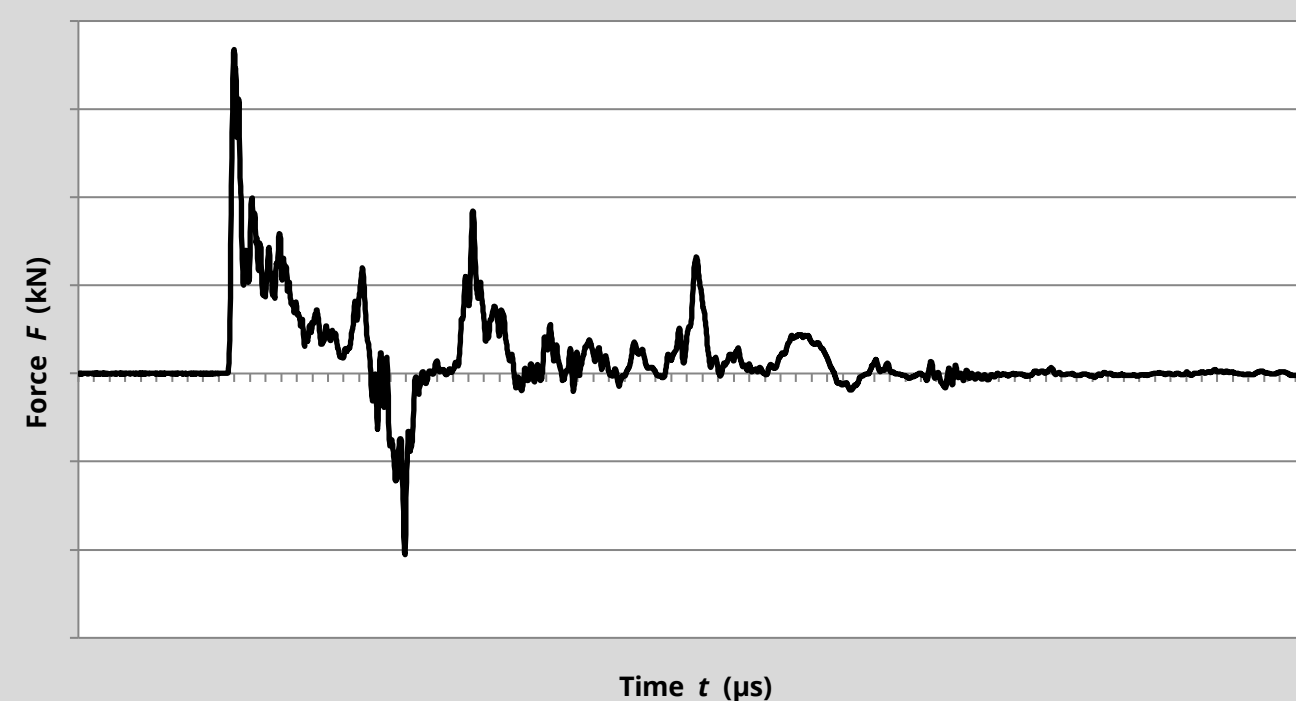
$E_{\text{theor}} = 0.473\text{ kN-m}$

Comments

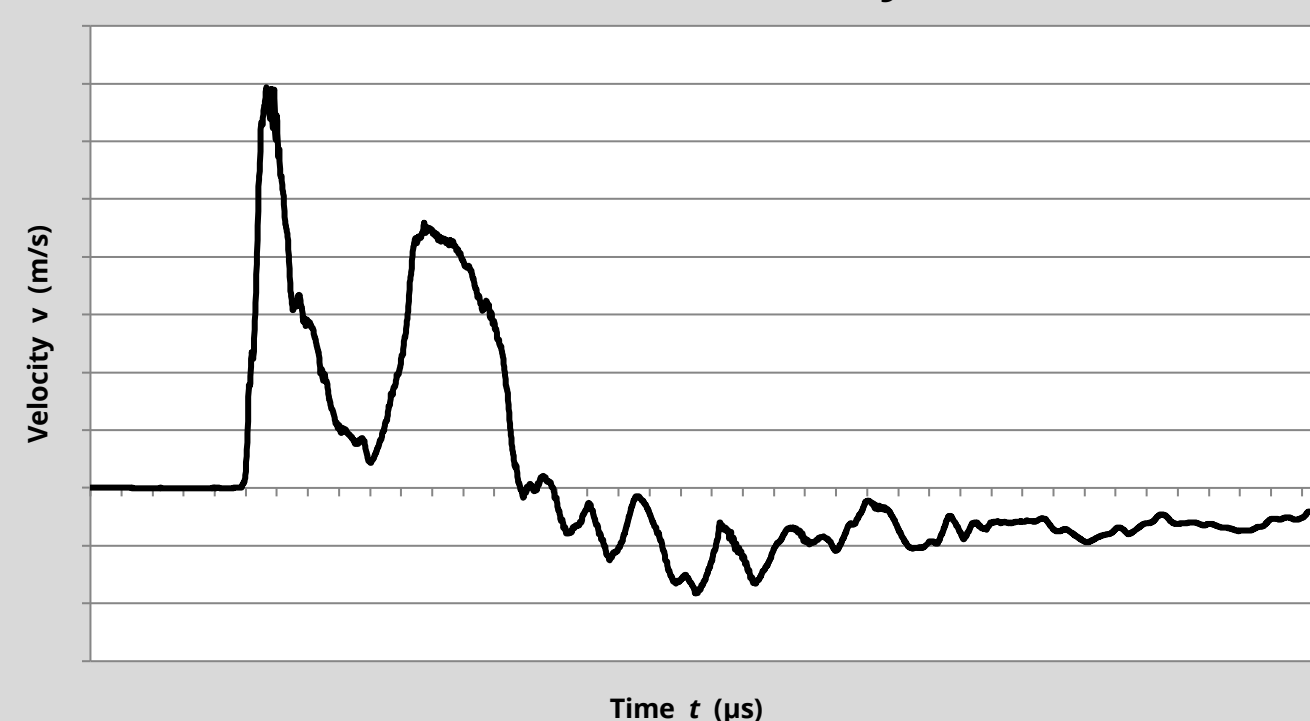
$$\text{Energy Ratio (Er)} = \frac{E_{\text{meas}}}{E_{\text{theor}}}$$

67.69%
© COPYRIGHT 2021

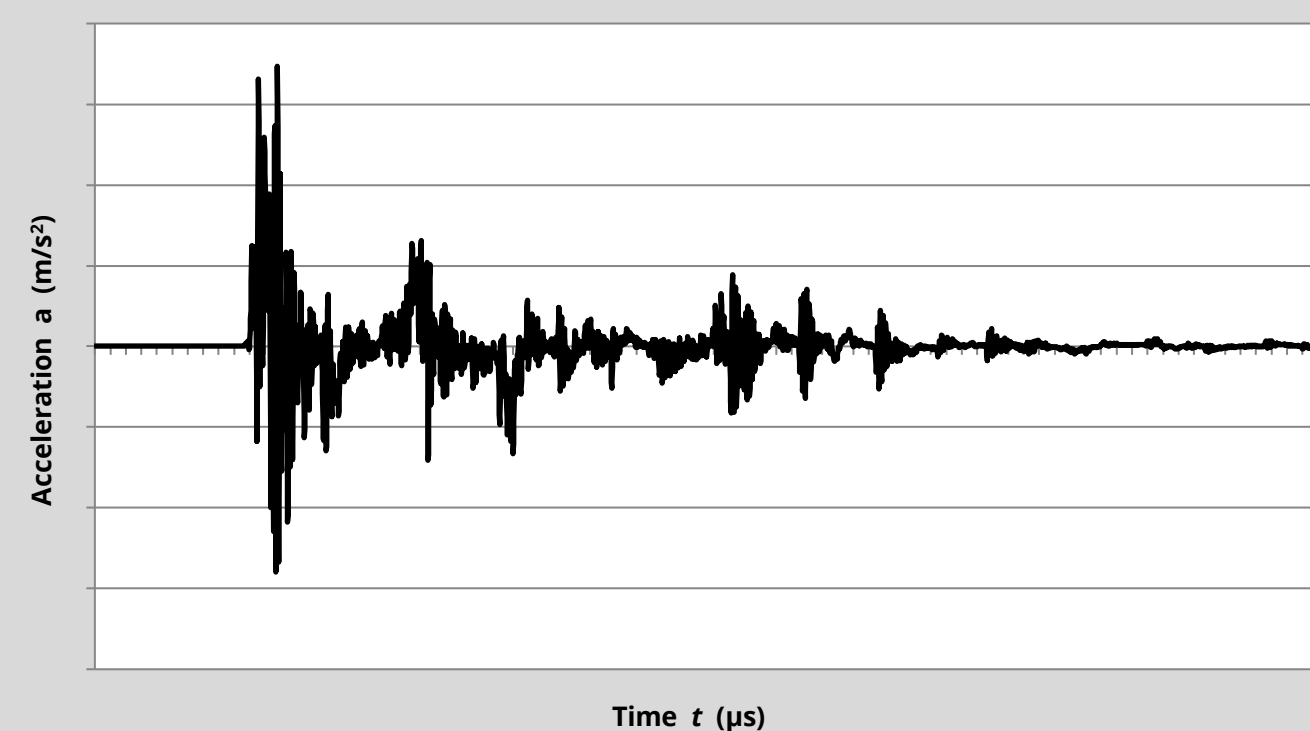
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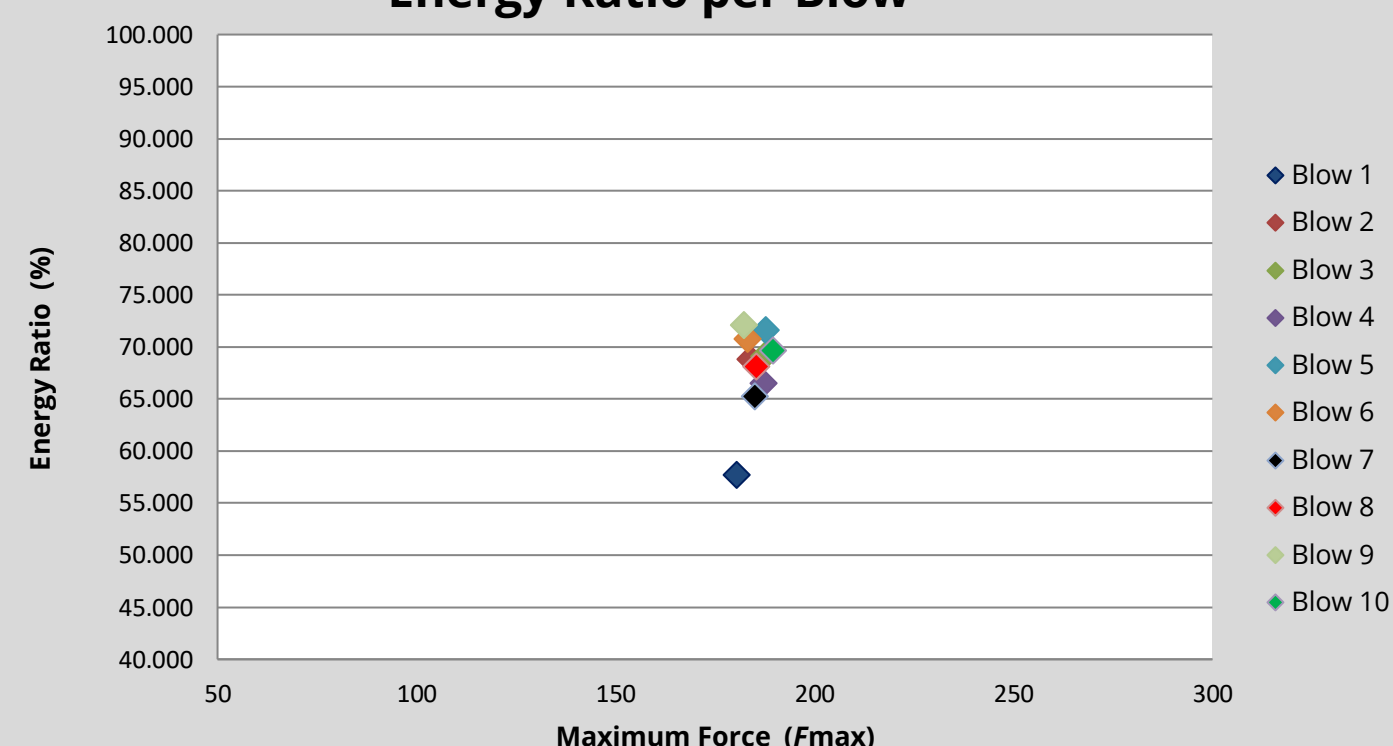
Particle Velocity



Acceleration



Energy Ratio per Blow



Equipe SPT Analyzer Operator

JL

Certificate prepared by

27/04/2021

Certificate checked by

27/04/2021

Certificate date

27/04/2021



SPT Calibration Report

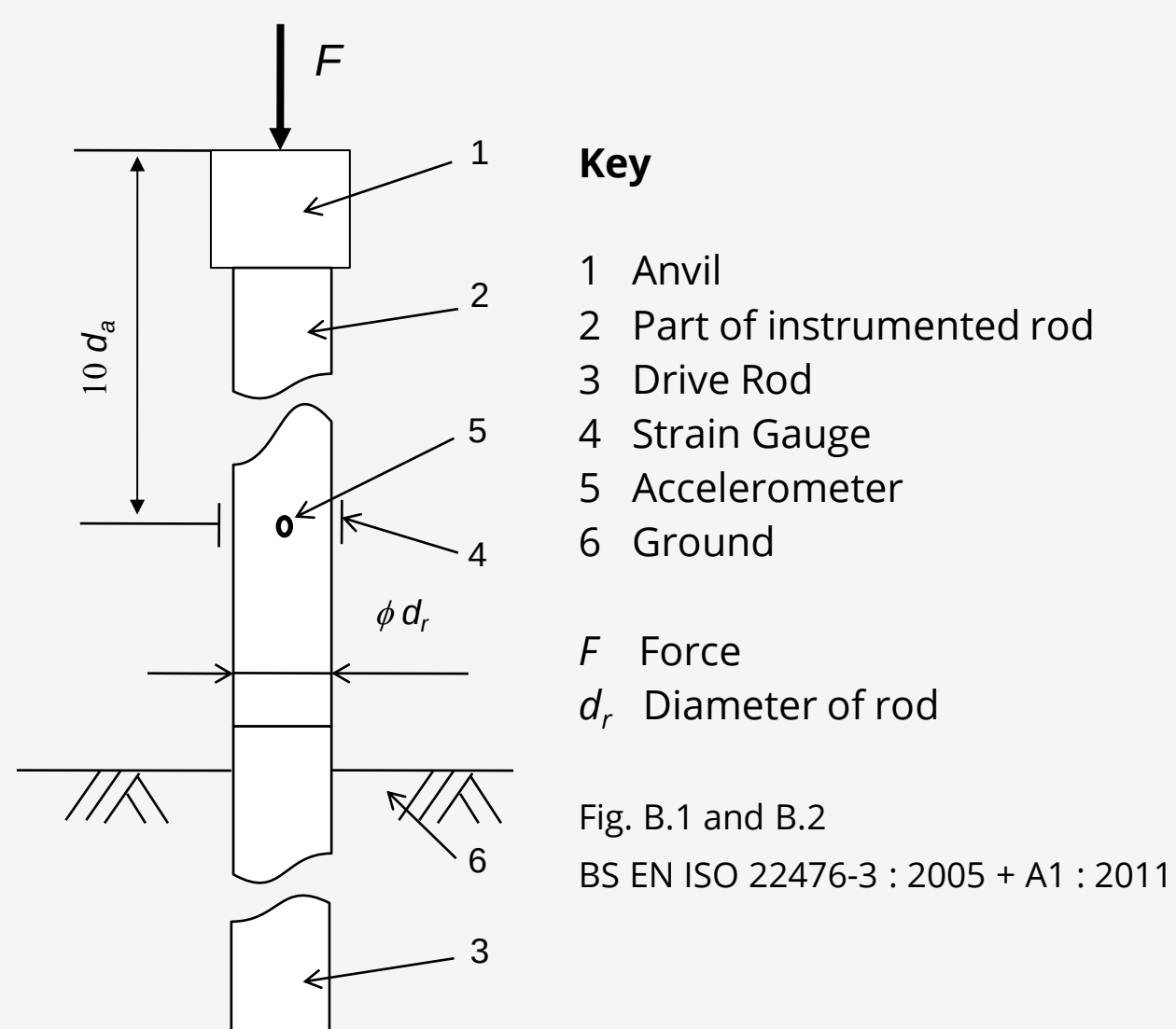
Hammer Energy Measurement Report

Type of Hammer SPT HAMMER
Test No EQU2810
Client QUANTUM GEOTECHNIC

Test Depth (m) 9.80
Mass of hammer $m = 63.5\text{kg}$
Falling height $h = 0.76\text{m}$
 $E_{\text{theor}} = m \times g \times h = 473\text{J}$

Characteristics of the instrumented rod

Diameter $d_r = 0.052\text{ m}$
Length of instrumented rod 0.558 m
Area $A = 11.61\text{ cm}^2$
Modulus $E_a = 206843\text{ MPa}$



DATE OF TEST VALID UNTIL HAMMER ID

21/04/2021

21/04/2022

Q5

$E_{\text{meas}} = 0.285\text{ kN-m}$

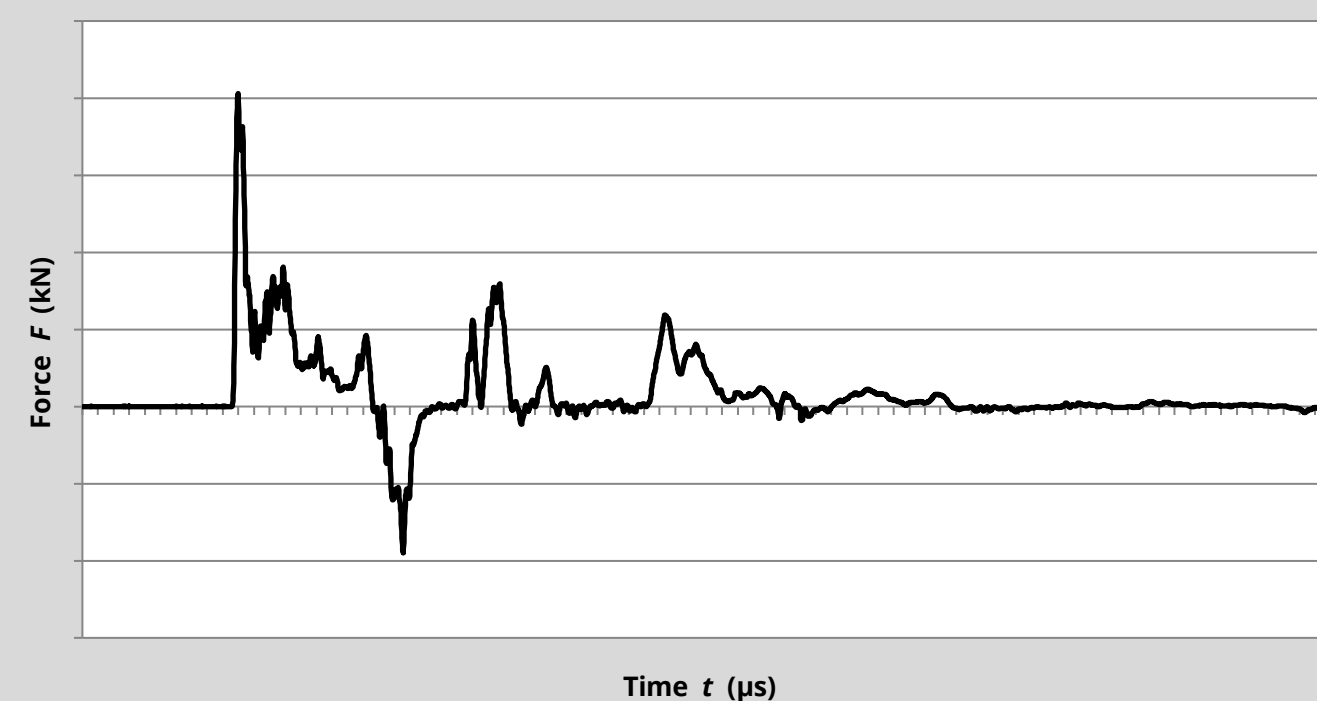
$E_{\text{theor}} = 0.473\text{ kN-m}$

Comments

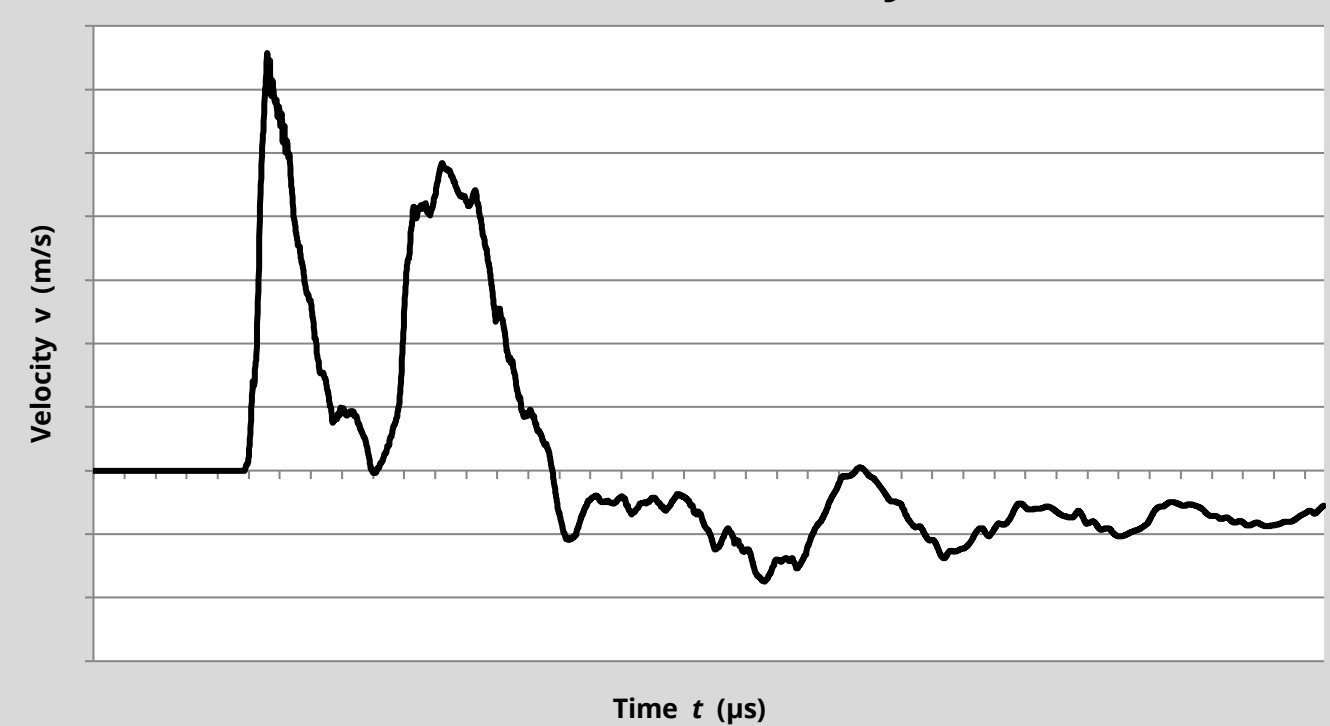
$$\text{Energy Ratio (Er)} = \frac{E_{\text{meas}}}{E_{\text{theor}}}$$

60.24%
© COPYRIGHT 2021

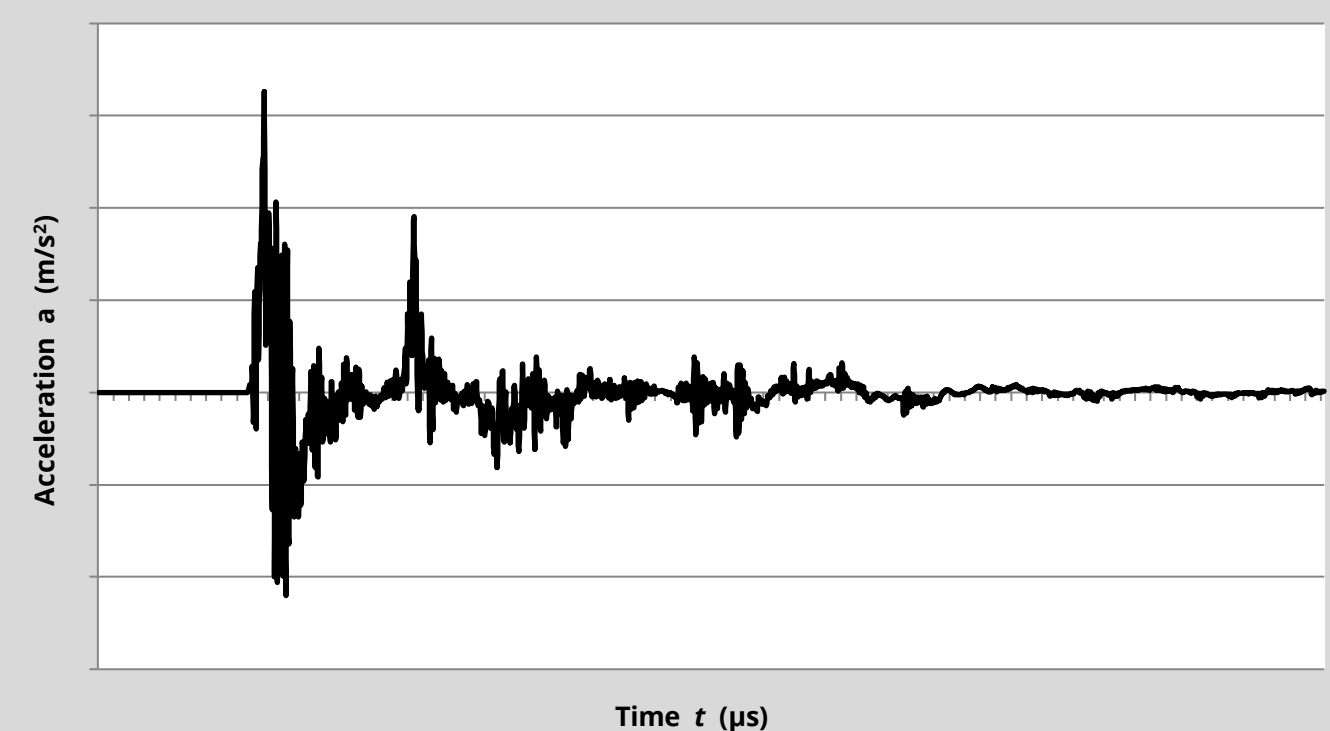
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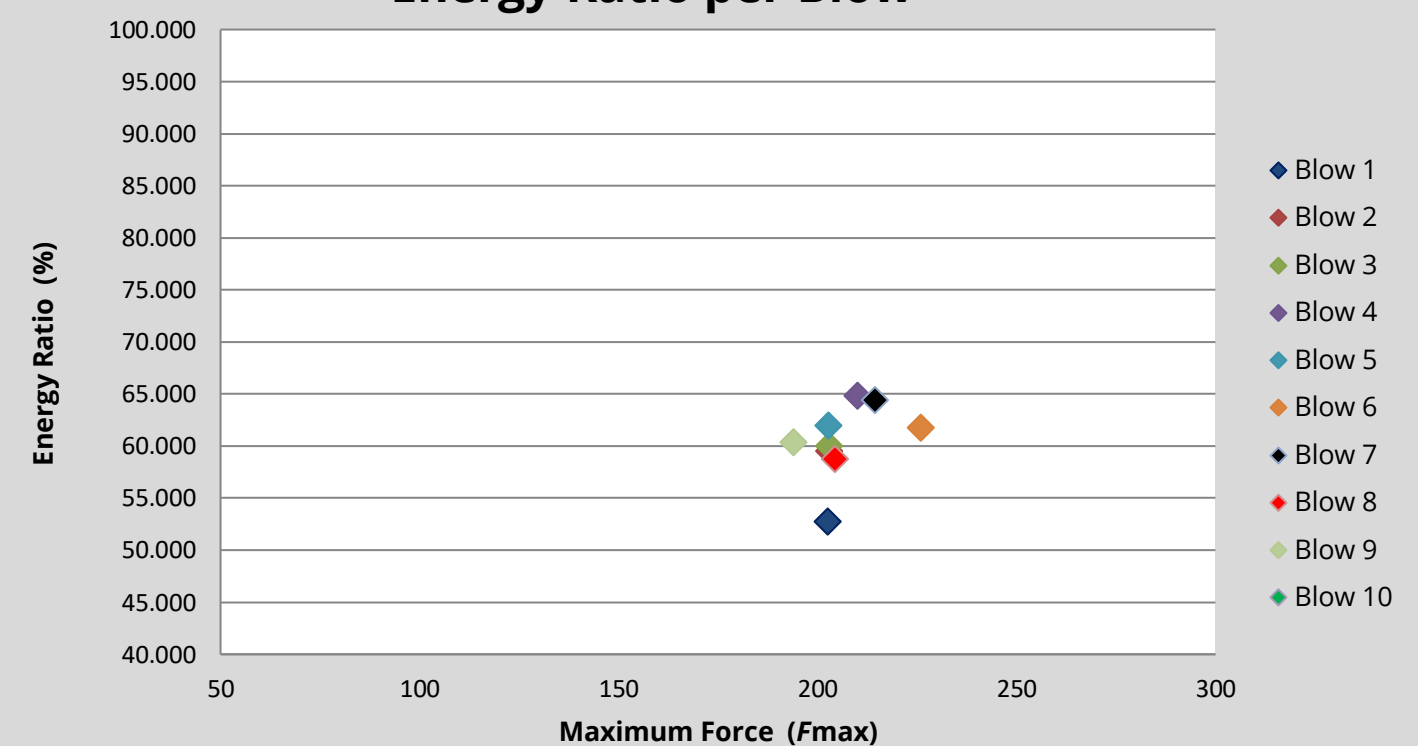
Particle Velocity



Acceleration



Energy Ratio per Blow



Equipe SPT Analyzer Operator

JL

Certificate prepared by

27/04/2021

Certificate checked by

27/04/2021

Certificate date

27/04/2021

KEY TO BOREHOLE AND TRIAL PIT LOGS

MATERIAL LEGENDS

	Made Ground		Topsoil		Clay
	Gravel		Sand		Silt
	Peat		Boulders		Cobbles
	Chalk		Conglomerate		Volcaniclastic
	Asphalt		Void		Mudstone
	Siltstone		Sandstone		Limestone
	Ironstone		Mudstone / Siltstone		Breccia
	Coal		Coral		Bedrock
	Shale		Gypsum		Igneous (Coarse Grained)
	Igneous (Fine Grained)		Igneous (Medium Grained)		Metamorphic (Coarse Grained)
	Metamorphic (Fine Grained)		Metamorphic (Medium Grained)		

INSTALLATION / BACKFILL DETAILS

	Arisings		Concrete		Bentonite cement grout
	Bentonite seal		Filter		Pea Gravel
	Plain pipe		Slotted pipe		Piezometer / Standpipe tip

NOTE:
Legend symbols in accordance with BS 5930 (2015)

KEY TO BOREHOLE AND TRIAL PIT LOGS

m.A.O.D. metres Above Ordnance Datum.

SAMPLE AND TEST TYPES

U	Undisturbed driven tube sample - 102mm diameter, 450mm long.
P	Undisturbed pushed piston sample - 102mm diameter, 1000mm long.
TW	Undisturbed thin walled push in sample - 100mm diameter, 750mm long.
B	Bulk disturbed sample.
BLK	Block Sample
CBR	Heavy duty undisturbed sample - 154 mm diameter (CBR mould).
D	Small disturbed sample.
LB	Large Bulk disturbed sample (for earthworks testing)
C	Core sample
W	Water sample
G	Gas sample
ES	Environmental sample (soil)
j	Jar sample
t	Tub sample
p	Pot sample
s	Small sample
v	Vial sample
S	Standard Penetration Test using split spoon sampler. (See Note).
C	Standard Penetration Test using a solid 60 degree cone. (See Note).

NOTE: Where a single value is quoted this is the N value for 300 mm penetration following a seating drive of 150 mm. Where this full penetration is not achieved the number of blows is quoted for the penetration below the seating drive eg. 63/160 mm.
Where total penetration is less than the seating drive this is indicated by a + and the number of blows for total penetration is quoted eg. +50/75 mm.

HV	Hand Vane Test. Vane undrained shear strength, c_u , quoted in kPa.
V	Borehole Vane Test. Vane undrained shear strength, c_u , quoted in kPa.
FHT/RHT	Falling / Rising Head Permeability Test.

CORE RUN DETAILS

TCR	Total Core Recovery, %
SCR	Solid Core Recovery, %
RQD	Rock Quality Designation, %
FI	Fracture Index. NI - Non intact where > 25 No. per metre length.

WATER COLUMN SYMBOLS

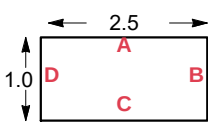
 	First water strike, second water strike etc.
 	Standing water level after first strike, second strike etc.
	Seepage.

NOTE:
Legend symbols in accordance with BS 5930 (2015)

APPENDIX III – ENGINEERS MACHINE EXCAVATED TRENCH & PIT LOGS

Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP01	
Dates : 7/1/22 - 7/1/22			Job Number : Q0652			Ground Level : 229.98 m A.O.D. <i>Level to Ordnance Datum</i>		
Location : Around washery area			Engineer : ARUP			Coordinates: 284246.92 E 210515.99 N <i>Co-ordinates to National Grid</i>		

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1	0.20 -	ES1			0.60	MADE GROUND - Grass over brown clayey sandy silty GRAVEL with high cobble and boulder content. Gravel is fine to coarse angular to sub-angular of Brick, Concrete and Mudstone. Cobbles are angular to sub-rounded Concrete and Brick with metal, glass and timber throughout.			
	0.50 -	B1			0.60	MADE GROUND - Loose black to dark grey slightly silty sandy GRAVEL. Gravel is fine to coarse angular to sub-angular Mudstone with coal, ash and clinker			
	1.00 -	B2 ES2			2.20				
	2.00 -	B3 ES3							
2	2.80 -	B4			2.80	Terminated at 2.80mbgl, sides unstable and collapsing. Unable to undertake soakaway test due to high ground water encountered		227.18	

PLAN 	Groundwater: High ground water strike at 1.80mbgl Stability: Unstable and collapsing below 1.00mbgl Shoring: N/A	Remarks: TP set out by QGL in liaison with ARUP. Services checked and area CAT scanned
--	--	--

Equipment Used: 9 tonne tracked 360 excavator							
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	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator:	J Lewis	Logged By:	S Picton	Sheet No.	1 Of 2	m Per Page	5	All measurements in metres unless otherwise stated	
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Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Trial Pit No.

TP01

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

Job Number : Q0652

Ground Level : 229.98 m A.O.D.
Level to Ordnance Datum

Location : Around washery area

Engineer : ARUP

Coordinates: 284246.92 E
210515.99 N
Co-ordinates to National Grid



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

Operator:
J Lewis

Logged By:
S Picton

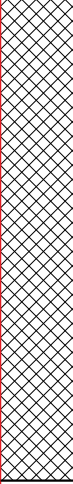
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2 Of 2

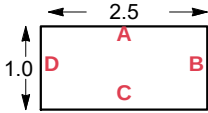
**m Per
Page**

All measurements in
metres unless
otherwise stated



Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP02	
Dates : 7/1/22 - 7/1/22			Job Number : Q0652			Ground Level : 231.44 m A.O.D. <i>Level to Ordnance Datum</i>		
Location : Around washery area			Engineer : ARUP			Coordinates: 284410.81 E 210600.05 N <i>Co-ordinates to National Grid</i>		

m B.G.L.	Samples		Tests		Strata			Red. Level A.O.D.	WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend		
1	0.20 -	B1			0.30	MADE GROUND - Black COAL			
	0.30 -	ES1			0.30	MADE GROUND - Red slightly sandy GRAVEL. Gravel is fine to coarse angular to sub-angular Clinker and Slag with ash		231.14	
	0.40 -	ES2			0.10			231.04	
		B2			0.40				
	1.00 -	B3 ES3			1.90				
2	2.00 - 2.30	B4							
	2.00 -	ES4			2.30	Terminated at 2.80mbgl, sides unstable and collapsing. Unable to undertake soakaway test due to high ground water encountered		229.14	

PLAN 		Groundwater: High ground water strike at 1.30mbgl Stability: Unstable and collapsing below 1.00mbgl Shoring: N/A	Remarks: TP set out by QGL in liaison with ARUP. Services checked and area CAT scanned
--	--	--	--

Equipment Used: 9 tonne tracked 360 excavator

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator: J Lewis	Logged By: S Picton	Sheet No. 1 Of 2	m Per Page 5	All measurements in metres unless otherwise stated	
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Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Trial Pit No.

TP02

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

Job Number : Q0652

Ground Level : 231.44 m A.O.D.
Level to Ordnance Datum

Location : Around washery area

Engineer : ARUP

Coordinates: 284410.81 E
210600.05 N
Co-ordinates to National Grid



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

Operator:
J Lewis

Logged By:
S Picton

Sheet No.
2 Of 2

**m Per
Page**

All measurements in
metres unless
otherwise stated



Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP03	
Dates : 10/1/22 - 10/1/22			Job Number : Q0652			Ground Level : 234.92 m A.O.D. <i>Level to Ordnance Datum</i>		
Location : Around washery area			Engineer : ARUP			Coordinates: 284554.78 E 210496.56 N <i>Co-ordinates to National Grid</i>		

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1	0.20 -	ES1			0.60	MADE GROUND - Grass over loose black to dark grey slightly sandy silty GRAVEL. Gravel is fine to coarse angular to sub-angular Mudstone with coal, ash, bricks and concrete ...At 0.10mbgl row of bricks encountered within side wall of pit			
	0.50 -	B1			0.60	MADE GROUND - Loose black dark grey silty sandy GRAVEL with medium cobble content. Gravel is fine to coarse angular to sub-angular Mudstone. Cobbles are angular to sub-angular Mudstone		234.32	
	0.80 - 1.00	ES2							
	1.00 -	B2							
2	2.00 -	B3 ES3			2.70	 sample at 2.0mbgl slightly sandy gravelly CLAY			
	3.00 - 3.30 3.00 -	B4 ES4			3.30	Terminated at 3.30mbgl, sides unstable and collapsing no progress being made		231.62	

PLAN 		Groundwater: Slight ground water seepage at 2.80mbgl Stability: Unstable and collapsing below 1.50mbgl Shoring: N/A	Remarks: TP set out by QGL in liaison with ARUP. Services checked and area CAT scanned
-----------------	--	---	--

Equipment Used: 9 tonne tracked 360 excavator

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator: J Lewis	Logged By: S Picton	Sheet No. 1 Of 2	m Per Page 5	All measurements in metres unless otherwise stated	
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Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Trial Pit No.

TP03

Dates : 10/1/22 - 10/1/22

Job Number : Q0652

Ground Level : 234.92 m A.O.D.
Level to Ordnance Datum

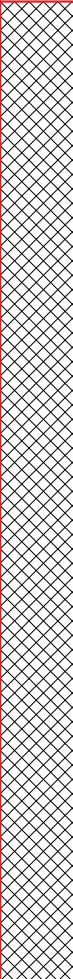
Location : Around washery area

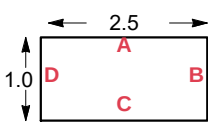
Engineer : ARUP

Coordinates: 284554.78 E
210496.56 N
Co-ordinates to National Grid



Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP04	
Dates : 10/1/22 - 10/1/22			Job Number : Q0652			Ground Level : 239.16 m A.O.D. <i>Level to Ordnance Datum</i>		
Location : Around washery area			Engineer : ARUP			Coordinates: 284819.63 E 210502.79 N <i>Co-ordinates to National Grid</i>		

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1	0.20 -	ES1				MADE GROUND - Grass over loose black to dark grey slightly clayey sandy silty GRAVEL. Gravel is fine to coarse angular to sub-angular Mudstone with coal, ash and timber			
	0.50 -	B1							
	1.00 -	B2 ES2							
2					3.60				
	2.00 -	B3 ES3							
3									
	3.00 -	B4 ES4							
	3.60 -	B5			3.60	Terminated at 3.60mbgl, unable to proceed past cobbles/boulders at base of pit		235.56	

PLAN 		Groundwater: Medium ground water strike at 1.50mbgl Stability: Unstable below 1.80mbgl Shoring: N/A	Remarks: TP set out by QGL in liaison with ARUP. Services checked and area CAT scanned
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Equipment Used: 9 tonne tracked 360 excavator

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator: J Lewis	Logged By: S Picton	Sheet No. 1 Of 2	m Per Page 5	All measurements in metres unless otherwise stated	
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Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Trial Pit No.

TP04

Dates : 10/1/22 - 10/1/22

Job Number : Q0652

Ground Level : 239.16 m A.O.D.
Level to Ordnance Datum

Location : Around washery area

Engineer : ARUP

Coordinates: 284819.63 E
210502.79 N
Co-ordinates to National Grid



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

Operator:
J Lewis

Logged By:
S Picton

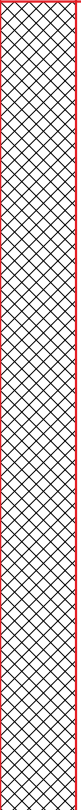
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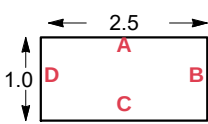
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All measurements in metres unless otherwise stated



Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP05	
Dates : 10/1/22 - 10/1/22			Job Number : Q0652		Ground Level : 240.57 m A.O.D. <i>Level to Ordnance Datum</i>			
Location : Around washery area			Engineer : ARUP		Coordinates: 284970.62 E 210390.89 N <i>Co-ordinates to National Grid</i>			

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1	0.20 -	ES1				MADE GROUND - Grass over loose black to dark grey slightly sandy slightly silty GRAVEL. Gravel is fine to coarse angular to sub-angular Mudstone with coal, ash, bricks, roots and rootlets			
	0.50 -	B1 B2							
	1.00 -	B2 ES2							
2	2.00 -	B3 ES3			3.00	Terminated at 3.00mbgl, sides unstable and collapsing no progress being made		237.57	
	3.00 -	B4 ES4			3.00				

PLAN 		Groundwater: No ground water encountered Stability: Unstable and collapsing below 1.30mbgl Shoring: N/A	Remarks: TP set out by QGL in liaison with ARUP. Services checked and area CAT scanned
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Equipment Used: 9 tonne tracked 360 excavator

 Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator: J Lewis	Logged By: S Picton	Sheet No. 1 Of 2	m Per Page 5	All measurements in metres unless otherwise stated	
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Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Trial Pit No.

TP05

Dates : 10/1/22 - 10/1/22

Job Number : Q0652

Ground Level : 240.57 m A.O.D.
Level to Ordnance Datum

Location : Around washery area

Engineer : ARUP

Coordinates: 284970.62 E
210390.89 N
Co-ordinates to National Grid



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Operator:
J Lewis

Logged By:
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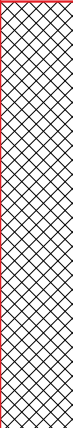
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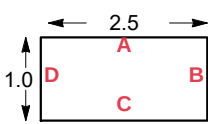
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Contract : Global Centre of Rail Excellence Client : Global Centre of Rail Excellence							Trial Pit No. TP06	
Dates : 10/1/22 - 10/1/22 Location : Around washery area			Job Number : Q0652 Engineer : ARUP			Ground Level : 237.14 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 285168.40 E 210396.23 N <i>Co-ordinates to National Grid</i>		

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1	0.20 -	ES1				MADE GROUND - Grass over loose black to dark grey slightly sandy silty GRAVEL. Gravel is fine to coarse angular to sub-angular Mudstone with coal, ash, roots and rootlets sample at 1.0mbgl sandy gravelly CLAY			
	0.50 -	B1			1.60				
	1.00 -	B2 ES2							
2					1.60	Firm grey brown mottled slightly sandy very gravelly CLAY with medium cobble and boulder content. Gravel is fine to coarse sub-angular to sub-rounded Mudstone and Siltstone. Cobbles and boulders are rounded to sub-rounded Sandstone		235.54	
	2.00 -	B3 ES3			1.20				
	2.80 -	B4			2.80				
						Terminated at 2.80mbgl, unable to proceed past cobbles/boulders at base of pit		234.34	

PLAN 		Groundwater: No ground water encountered Stability: Unstable below 1.50mbgl Shoring: N/A	Remarks: TP set out by QGL in liaison with ARUP. Services checked and area CAT scanned
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Equipment Used: 9 tonne tracked 360 excavator

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Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Trial Pit No.

TP06

Dates : 10/1/22 - 10/1/22

Job Number : Q0652

Ground Level : 237.14 m A.O.D.
Level to Ordnance Datum

Location : Around washery area

Engineer : ARUP

Coordinates: 285168.40 E
210396.23 N
Co-ordinates to National Grid



Plas Newydd
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J Lewis

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metres unless
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Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP07	
Dates : 10/1/22 - 10/1/22			Job Number : Q0652			Ground Level : 232.57 m A.O.D. Level to Ordnance Datum		
Location : Around washery area			Engineer : ARUP			Coordinates: 285325.24 E 210402.83 N Co-ordinates to National Grid		

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1	0.20 -	ES1				MADE GROUND - Grass over loose black to dark grey slightly sandy silty GRAVEL. Gravel is fine to coarse angular to sub-angular Mudstone with coal, ash, metal, rubber, roots and rootlets			
	0.50 -	B1							
	1.00 -	B2 ES2							
2	2.00 -	B3 ES3			3.80				
3	3.00 -	B4 ES4							
4	3.80 - 4.00	B5			3.80	Firm grey brown mottled slightly sandy very gravelly CLAY with medium cobble and boulder content. Gravel is fine to coarse sub-angular to sub-rounded Mudstone and Siltstone. Cobbles and boulders are rounded to sub-rounded Sandstone Terminated at 4.00mbgl specified depth		228.77	
					0.20				
	4.00 -	ES5			4.00				228.57

PLAN

Groundwater: Slight ground water seepage at 0.30mbgl,
Medium ground water strike at 2.60mbgl

Stability: Unstable and collapsing below 2.00mbgl

Shoring: N/A

Remarks: TP set out by QGL in liaison with ARUP.
Services checked and area CAT scanned

Equipment Used: 9 tonne tracked 360 excavator

 Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator: J Lewis	Logged By: S Picton	Sheet No. 1 Of 2	m Per Page 5	All measurements in metres unless otherwise stated	
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Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Trial Pit No.

TP07

Dates : 10/1/22 - 10/1/22

Job Number : Q0652

Ground Level : 232.57 m A.O.D.
Level to Ordnance Datum

Location : Around washery area

Engineer : ARUP

Coordinates: 285325.24 E
210402.83 N
Co-ordinates to National Grid



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Swansea
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email: enquiries@quantumgeotechnic.co.uk

Operator:
J Lewis

Logged By:
S Picton

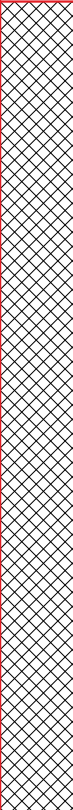
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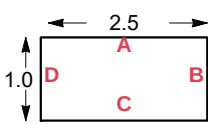
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Contract : Global Centre of Rail Excellence							Trial Pit No. TP08	
Client : Global Centre of Rail Excellence								
Dates : 11/1/22 - 11/1/22			Job Number : Q0652			Ground Level : 243.46 m A.O.D. <i>Level to Ordnance Datum</i>		
Location : Around washery area			Engineer : ARUP			Coordinates: 284939.20 E 210661.10 N <i>Co-ordinates to National Grid</i>		

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1	0.20 -	ES1				MADE GROUND - Loose black to dark grey slightly silty sandy GRAVEL with medium to high cobble and boulder content. Gravel is fine to coarse angular to sub-angular Mudstone. Cobbles and boulders are sub-angular to sub-rounded Mudstone with coal, ash and railway sleepers			
	0.50 -	B1							
	1.00 -	B2 ES2							
2					3.00				
	2.00 -	B3 ES3							
3	3.00 -	B4 ES4			3.00	Terminated at 3.00mbgl, sides unstable and collapsing no progress being made		240.46	

PLAN 		Groundwater: Slight ground water seepage at 0.80mbgl Stability: Unstable and collapsing below 0.50mbgl Shoring: N/A	Remarks: TP set out by QGL in liaison with ARUP. Services checked and area CAT scanned
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Equipment Used: 9 tonne tracked 360 excavator

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Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Trial Pit No.

TP08

Dates : 11/1/22 - 11/1/22

Job Number : Q0652

Ground Level : 243.46 m A.O.D.
Level to Ordnance Datum

Location : Around washery area

Engineer : ARUP

Coordinates: 284939.20 E
210661.10 N
Co-ordinates to National Grid



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

Operator:
J Lewis

Logged By:
S Picton

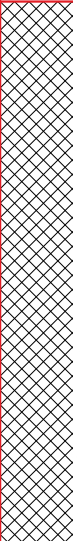
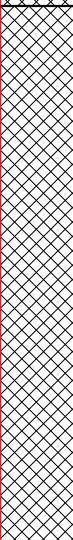
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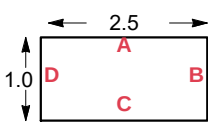
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Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP09	
Dates : 11/1/22 - 11/1/22			Job Number : Q0652			Ground Level : 243.47 m A.O.D. <i>Level to Ordnance Datum</i>		
Location : Around washery area			Engineer : ARUP			Coordinates: 285134.98 E 210589.13 N <i>Co-ordinates to National Grid</i>		

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1	0.20 -	ES1				MADE GROUND - Grass over soft black to dark grey slightly sandy slightly gravelly silty CLAY with medium cobble content. Gravel is fine to coarse angular to sub-angular Mudstone. Cobbles are sub-angular to angular Mudstone with coal, ash, roots and rootlets			
	0.50 -	B1							
2	1.00 -	B2 ES2			2.00	MADE GROUND - Loose black to dark grey slightly sandy silty GRAVEL. Gravel is fine to coarse angular to sub-angular Mudstone with coal and ash		241.47	
	2.00 -	B3 ES3			2.00				
3	3.00 -	B4 ES4			2.00	Terminated at 4.00mbgl specified depth		239.47	
4	4.00 -	B5 ES5			4.00				

PLAN 	Groundwater: Slight ground water seepage at 0.20mbgl	Remarks: TP set out by QGL in liaison with ARUP. Services checked and area CAT scanned
	Stability: Unstable and collapsing below 2.00mbgl	
	Shoring: N/A	

Equipment Used: 9 tonne tracked 360 excavator

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Contract : Global Centre of Rail Excellence		Trial Pit No.	
Client : Global Centre of Rail Excellence		TP09	
Dates : 11/1/22 - 11/1/22	Job Number : Q0652	Ground Level :	243.47 m A.O.D. <i>Level to Ordnance Datum</i>
Location : Around washery area	Engineer : ARUP	Coordinates:	285134.98 E 210589.13 N <i>Co-ordinates to National Grid</i>



	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	
		J Lewis	S Picton	2 Of 2			

Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP10	
Dates : 7/12/21 - 7/12/21			Job Number : Q0652		Ground Level : 257.77 m A.O.D. Level to Ordnance Datum			
Location :			Engineer : ARUP		Coordinates: 283248.02 E 210699.94 N Co-ordinates to National Grid			

m B.G.L.	Samples		Tests		Strata			WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	
1	0.10 -	D1			0.15	TOPSOIL: Brown very gravelly CLAY with many rootlets.		
	0.30 -	D2			0.15	MADE GROUND: Brown clayey slightly sandy GRAVEL. Gravel is angular to sub angular fine to coarse siltstone.		257.62
	0.30 - 0.50	LB3			0.45			
	1.00 - 1.50	B4			0.60	MADE GROUND: Dark grey slightly clayey slightly sandy GRAVEL with low cobble content of siltstone. Gravel is angular to sub angular fine to coarse siltstone.		257.17
2	2.00 -	B5			2.00			
	2.00 - 2.50	LB5						
	2.60 -	D6			2.60	Trial Pit terminated at 2.6mbgl, sides collapsing, pit unstable.		255.17

PLAN 		Groundwater: No groundwater encountered Stability: Sides collapsing from surface Shoring: None	Remarks: Position marked out using co-ordinates supplied by the engineer. Area CAT and GENNY scanned with permit to excavate issued by QGL prior to starting work. On completion hole backfilled with arisings, compacted in layers in reverse order of excavation.
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Equipment Used: 9tonne tracked 360 excavator

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Contract : Global Centre of Rail Excellence

Client : GCRE Limited

**Trial Pit No.
TP10**

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

Job Number : Q0652

Ground Level :

Location :

Engineer : Ove Arup and Partners
Ltd

Coordinates: 283248.02 E
210699.94 N
Co-ordinates to National Grid



Plas Newydd, Llanedi, Pontarddulais, Swansea
SA4 0FQ
Tel: 01554 744880
email: enquiries@quantumgeotech.co.uk

Operator:
JL

Logged By:
A Jones

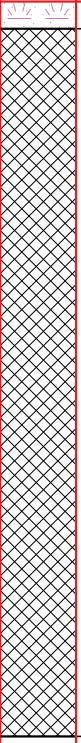
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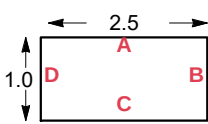
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Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP11	
Dates : 10/1/22 - 10/1/22			Job Number : Q0652		Ground Level : 251.09 m A.O.D. <i>Level to Ordnance Datum</i>			
Location :			Engineer : ARUP		Coordinates: 283484.77 E 210766.09 N <i>Co-ordinates to National Grid</i>			

m B.G.L.	Samples		Tests		Strata			WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	
1	0.01 -	D1			0.10	TOPSOIL: Brown clayey slightly sandy GRAVEL with many rootlets. Gravel is angular to sub angular fine to coarse siltstone.		250.99
	0.30 -	D2			0.10	MADE GROUND: Dark grey slightly silty slightly sandy GRAVEL with medium cobble content and low boulder content of siltstone. Gravel is angular to sub angular fine to coarse siltstone, rare fine to medium coal and sub angular to sub rounded fine to coarse sandstone with plastic and timber.		
	0.50 - 1.00	LB3						
2	1.50 - 2.00	LB4			2.60			
					2.70	Trial pit terminated at 2.7mbgl, sides collapsing due to fast groundwater ingress.		248.39

PLAN 		Groundwater: Fast ground water ingress at 2.2mbgl Stability: Sides collapsing from 1.5mbgl. Shoring: None	Remarks: Position marked out using co-ordinates supplied by the engineer. Area CAT and GENNY scanned with permit to excavate issued by QGL prior to starting work. On completion hole backfilled with arisings, compacted in layers in reverse order of excavation.
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Equipment Used: 15Tonne tracked 360

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Contract : Global Centre of Rail Excellence

Client : GCRE Limited

Trial Pit No.

TP11

Dates : 10/1/22 - 10/1/22

Job Number : Q0652

Ground Level :

Location :

Engineer : Ove Arup and Partners
Ltd

Coordinates: 283484.77 E
210766.09 N
Co-ordinates to National Grid



Plas Newydd, Llanedi, Pontarddulais, Swansea
SA4 0FQ
Tel: 01554 744880
email: enquiries@quantumgeotech.co.uk

Operator:
AA

Logged By:
A Jones

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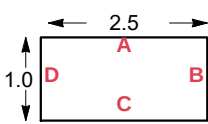
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Contract : Global Centre of Rail Excellence Client : Global Centre of Rail Excellence							Trial Pit No. TP12	
Dates : 11/1/21 - 11/1/21 Location :			Job Number : Q0652 Engineer : ARUP			Ground Level : 242.24 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 285143.13 E 210543.08 N <i>Co-ordinates to National Grid</i>		

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1						Dense black slightly clayey sandy Gravel with medium cobble content, many wood fragments and occasional pockets of soft brown clay. Gravel is fine to coarse angular mudstone and siltstone. Cobbles are angular mudstone and occasional brick.			
2					4.50	 at 2.3mbgl possible / suspected concrete railway sleeper			
3									
4					4.50	Terminated at 4.5mbgl		237.74	

PLAN 	Groundwater: Stability: Stable Shoring: N/A	Remarks: TP set out by QGL in liaison with ARUP. Services checked, area CAT scanned No Groundwater Encountered
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Equipment Used: 13 tonne excavator	
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	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator: QGL	Logged By: P Darby	Sheet No. 1 Of 2	m Per Page 5	All measurements in metres unless otherwise stated	
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Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Trial Pit No.

TP12

Dates : 11/1/21 - 11/1/21

Job Number : Q0652

Ground Level : 242.24 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : ARUP

Coordinates: 285143.13 E
210543.08 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
metres unless
otherwise stated



Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP13	
Dates : 11/1/21 - 11/1/21			Job Number : Q0652			Ground Level : 238.83 m A.O.D. <i>Level to Ordnance Datum</i>		
Location :			Engineer : ARUP			Coordinates: 285116.03 E 210469.73 N <i>Co-ordinates to National Grid</i>		

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1						MADE GROUND - Dark grey to black very silty sandy GRAVEL with high cobble content. Gravel is fine to coarse angular mudstone. Cobbles are angular mudstone. At northern end of pit much cable, steel rope, metal sheeting, concrete cobbles and boulders, timber and occasional plastic bags.			
2					3.90				
3									
4					3.90 0.10 4.00	Grey slightly silty GRAVEL. Gravel is fine to coarse angular mudstone. Terminated at 4.0mbgl		234.93 234.83	

PLAN 	Groundwater: Moderate localised groundwater inflow between 3.8 and 3.9mbgl Stability: Signifint instability at norther end of pit Shoring: N/A	Remarks: Excavation restricted by nearby trees. Located approximately 1.5m from scheduled location
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Equipment Used: 13 tonne tracked excavator

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Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Trial Pit No.

TP13

Dates : 11/1/21 - 11/1/21

Job Number : Q0652

Ground Level : 238.83 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : ARUP

Coordinates: 285116.03 E
210469.73 N
Co-ordinates to National Grid



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

Operator:
QGL

Logged By:

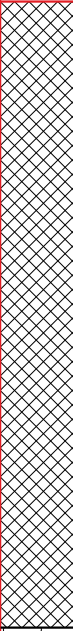
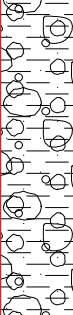
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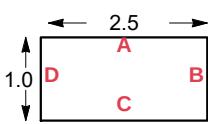
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Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP14	
Dates : 11/1/22 - 11/1/22			Job Number : Q0652			Ground Level : 233.46 m A.O.D. <i>Level to Ordnance Datum</i>		
Location : Around washery area			Engineer : ARUP			Coordinates: 285232.47 E 210442.23 N <i>Co-ordinates to National Grid</i>		

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1					2.30	MADE GROUND - Grass over loose black to dark grey slightly sandy silty GRAVEL with high cobble and boulder content. Gravel is fine to coarse angular to sub-angular Mudstone. Cobbles and boulders are sub-angular to angular Sandstone with coal, ash, metal, fabric, glass, clinker, bricks, bones, roots and rootlets			
2					2.30	Loose grey light brown mottled slightly sandy clayey GRAVEL with high cobble and boulder content. Gravel is fine to coarse sub-angular to sub-rounded Mudstone and Siltstone. Cobbles and boulders are rounded to sub-rounded Sandstone with iron staining		231.16	
3					1.20				
					3.50	Terminated at 3.50mbgl, sides unstable and collapsing		229.96	

PLAN 		Groundwater: Slight ground water seepage at 2.30mbgl Stability: Unstable and collapsing Shoring: N/A	Remarks: TT set out by QGL in liaison with ARUP. Services checked and area CAT scanned
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Equipment Used: 9 tonne tracked 360 excavator

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator: J Lewis	Logged By: S Picton	Sheet No. 1 Of 3	m Per Page 5	All measurements in metres unless otherwise stated	
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Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Trial Pit No.

TP14

Dates : 11/1/22 - 11/1/22

Job Number : Q0652

Ground Level : 233.46 m A.O.D.
Level to Ordnance Datum

Location : Around washery area

Engineer : ARUP

Coordinates: 285232.47 E
210442.23 N
Co-ordinates to National Grid



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Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Trial Pit No.

TP14

Dates : 11/1/22 - 11/1/22

Job Number : Q0652

Ground Level : 233.46 m A.O.D.
Level to Ordnance Datum

Location : Around washery area

Engineer : ARUP

Coordinates: 285232.47 E
210442.23 N
Co-ordinates to National Grid



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All measurements in
metres unless
otherwise stated



Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP14A	
Dates : 11/1/22 - 11/1/22				Job Number : Q0652		Ground Level : 232.94 m A.O.D. <i>Level to Ordnance Datum</i>		
Location : Around washery area				Engineer : ARUP		Coordinates: 285233.98 E 210444.91 N <i>Co-ordinates to National Grid</i>		

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1					1.70	MADE GROUND - Grass over loose black to dark grey slightly sandy silty GRAVEL with high cobble and boulder content. Gravel is fine to coarse angular to sub-angular Mudstone. Cobbles and boulders are sub-angular to angular Sandstone with coal, ash, metal,			
2					1.70 1.80	Loose grey light brown mottled slightly sandy very clayey GRAVEL with high cobble and boulder content. Gravel is fine to coarse sub-angular to sub-rounded Mudstone and Siltstone. Cobbles and boulders are rounded to sub-rounded Sandstone with iron staining		231.24	
3					3.50	Terminated at 3.50mbgl, sides unstable and collapsing		229.44	

PLAN 		Groundwater: No ground water encountered Stability: Unstable and collapsing Shoring: N/A	Remarks: TT set out by QGL in liaison with ARUP. Services checked and area CAT scanned
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Equipment Used: 9 tonne tracked 360 excavator

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Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Trial Pit No.

TP14A

Dates : 11/1/22 - 11/1/22

Job Number : Q0652

Ground Level : 232.94 m A.O.D.
Level to Ordnance Datum

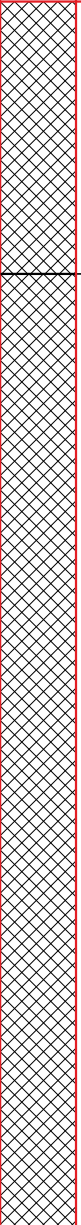
Location : Around washery area

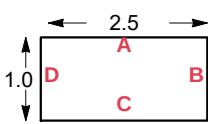
Engineer : ARUP

Coordinates: 285233.98 E
210444.91 N
Co-ordinates to National Grid



Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP15	
Dates : 12/1/22 - 12/1/22			Job Number : Q0652			Ground Level : 248.11 m A.O.D. Level to Ordnance Datum		
Location :			Engineer : ARUP			Coordinates: 284779.25 E 210390.75 N Co-ordinates to National Grid		

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1					1.00	MADE GROUND - Dense black very silty sandy GRAVEL with high cobble content. Gravel is fine to coarse sub-angular coal. Cobbles are sub-angular coal.			
					1.00	MADE GROUND - Dense grey slightly silty sandy GRAVEL with high cobble content and medium boulder content. Gravel is fine to coarse angular gravel. Cobbles and boulders are mudstone.		247.11	
2						 below 1.6mbgl loose to medium dense very silty sandy Gravel with low cobble and boulder content.			
					3.50				
3									
4									
					4.50	Terminated at 4.5mbgl		243.61	

PLAN 		Groundwater: Stability: Stable Shoring: N/A	Remarks: TP set out by QGL in liaison with ARUP. Services checked, area CAT scanned and hand dug pit to 1.20mbgl undertaken No groundwater encountered
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Equipment Used: 13 tonne tracked excavator

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Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Trial Pit No.

TP15

Dates : 12/1/22 - 12/1/22

Job Number : Q0652

Ground Level : 248.11 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : ARUP

Coordinates: 284779.25 E
210390.75 N
Co-ordinates to National Grid



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Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP17	
Dates : 17/1/22 - 17/1/22			Job Number : Q0652			Ground Level : 247.22 m A.O.D. <i>Level to Ordnance Datum</i>		
Location : Around washery area			Engineer : ARUP			Coordinates: 284728.00 E 210394.00 N <i>Co-ordinates to National Grid</i>		

m B.G.L.	Samples		Tests		Strata			WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	
1					0.30	MADE GROUND - Dense dark grey slightly silty sandy GRAVEL with high cobble content and medium boulder content. Gravel is fine to coarse angular gravel. Cobbles and boulders are mudstone		246.92
					0.30	MADE GROUND - Dense black very silty sandy GRAVEL with medium to high cobble content. Gravel is fine to coarse sub-angular coal. Cobbles are sub-angular coal and Mudstone		
2					3.70			
3								
4					4.00	Terminated at 4.00mbgl specified depth		243.22

PLAN 	Groundwater: No ground water encountered Stability: Unstable below 2.50mbgl Shoring: N/A	Remarks: TP set out by QGL in liaison with ARUP. Services checked and area CAT scanned
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Equipment Used: 9 tonne tracked 360 excavator

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Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Trial Pit No.

TP17

Dates : 17/1/22 - 17/1/22

Job Number : Q0652

Ground Level : 247.22 m A.O.D.
Level to Ordnance Datum

Location : Around washery area

Engineer : ARUP

Coordinates: 284728.00 E
210394.00 N
Co-ordinates to National Grid



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Operator:
G Jones

Logged By:
S Picton

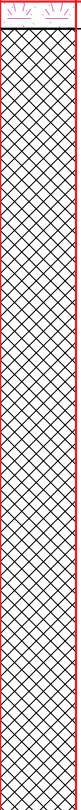
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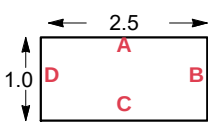
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Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP18	
Dates : 6/12/21 - 6/12/21			Job Number : Q0652			Ground Level : 221.20 m A.O.D. Level to Ordnance Datum		
Location :			Engineer : ARUP			Coordinates: 283467.81 E 210253.53 N Co-ordinates to National Grid		

m B.G.L.	Samples		Tests		Strata			WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	
1	0.50 - 1.00	B1 D1			0.10	TOPSOIL - Dark brown SILT / CLAY with many rootlets		221.10
	0.50 -				0.10	MADE GROUND - Dark grey gravelly CLAY with low cobble content. Gravel is fine to coarse angular mudstone and rare coal. Cobbles are sub-angular mudstone. (COLLIERY SPOIL)		
2	1.50 - 2.00	B2 D2			2.90			
	1.50 -							
3	2.50 - 3.00	B3 D3						
	2.50 -							
					3.00	Terminated at 3.0mbgl due to significant instability		218.20

PLAN 	Groundwater: Stability: Significant Instability Shoring: N/A	Remarks: TP set out by QGL in liaison with ARUP. Services checked, area CAT scanned Damp between 1.5 and 2.5mbgl
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Equipment Used: 9 tonne tracked excavator

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Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Trial Pit No.

TP18

Dates : 6/12/21 - 6/12/21

Job Number : Q0652

Ground Level : 221.20 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : ARUP

Coordinates: 283467.81 E
210253.53 N
Co-ordinates to National Grid



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Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Trial Pit No.

TP18

Dates : 6/12/21 - 6/12/21

Job Number : Q0652

Ground Level : 221.20 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : ARUP

Coordinates: 283467.81 E
210253.53 N
Co-ordinates to National Grid



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Operator:
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Logged By:
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Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP19	
Dates : 8/12/21 - 8/12/21			Job Number : Q0652			Ground Level : 247.39 m A.O.D. Level to Ordnance Datum		
Location :			Engineer : ARUP			Coordinates: 282624.08 E 210468.10 N Co-ordinates to National Grid		

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1	0.00 - 0.10	D1	0.3	Vane - P=36 - R=18kN/m2 Vane - P=40 - R=20kN/m2 Vane - P=32 - R=16kN/m2	0.20	TOPSOIL: Black slightly silty slightly sandy organic CLAY.		247.19	
	0.30 -	D2			0.20	Soft to firm yellowish brown grey sandy gravelly CLAY with low cobble content of sandstone. Gravel is sub angular to sub rounded fine to coarse sandstone.			
	0.50 - 1.00	LB3			0.85				
	1.50 -	B4			1.05	Firm dark grey slightly sandy gravelly CLAY with low cobble content of sandstone. Gravel is angular to sub rounded fine to coarse sandstone, angular to sub angular fine to coarse siltstone. at 1.5mbgl very silty / clayey slightly sandy Gravel			246.34
2.50 - 3.00	LB5	2.95	with low boulder content of siltstone from 2.4mbgl						
3.20 -	D6								
3.50 - 4.00	B7								
4					4.00	Trial Pit terminated at scheduled depth of 4.0mbgl		243.39	

PLAN 		Groundwater: No groundwater encountered Stability: Stable Shoring: None	Remarks: Position marked out using co-ordinates supplied by the engineer. Area CAT and GENNY scanned with permit to excavate issued by QGL prior to starting work. Soakaway test carried out within pit. On completion hole backfilled with arisings, compacted in layers in reverse order of excavation.
Equipment Used: 9tonne tracked 360 excavator			

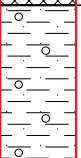
 Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator: JL	Logged By: A Jones	Sheet No. 1 Of 1	m Per Page 5	All measurements in metres unless otherwise stated	
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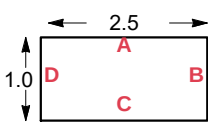
Contract : Global Centre of Rail Excellence Client : GCRE Limited		Trial Pit No. TP19
Dates : 8/12/21 - 8/12/21 Location :	Job Number : Q0652 Engineer : Ove Arup and Partners Ltd	Ground Level : 247.39 m A.O.D. <i>Level to Ordnance Datum</i> Coordinates: 282624.08 E 210468.10 N <i>Co-ordinates to National Grid</i>



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Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP20	
Dates : 8/12/21 - 8/12/21			Job Number : Q0652			Ground Level : 275.01 m A.O.D. Level to Ordnance Datum		
Location :			Engineer : ARUP			Coordinates: 283231.19 E 211035.80 N Co-ordinates to National Grid		

m B.G.L.	Samples		Tests		Strata			WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	
1	0.00 - 0.05	D1			0.05	TOPSOIL: Brown clayey GRAVEL with many rootlets. Gravel is angular fine to coarse siltstone. MADE GROUND: Dark grey clayey slightly sandy GRAVEL with low cobble content and low boulder content of siltstone. Gravel is angular to sub angular fine to coarse siltstone and sandstone.		274.96
	0.30 -	D2			0.05			
	0.50 - 1.00	B3						
2	1.50 - 1.50 - 2.00	B4 LB4			3.35	Firm brown slightly sandy gravelly silty CLAY. Gravel is sub angular to sub rounded fine to coarse sandstone.		271.61
	2.50 - 3.00	B5						
	3.50 - 4.00	B6						
4	4.00 -	D7			4.00	Trial Pit terminated at scheduled depth of 4.0mbgl		271.01

PLAN 		Groundwater: No groundwater encountered Stability: Stable Shoring: None		Remarks: Position marked out using co-ordinates supplied by the engineer. Area CAT and GENNY scanned with permit to excavate issued by QGL prior to starting work. Soakaway test carried out within pit. On completion hole backfilled with arisings, compacted in layers in reverse order of excavation.	
Equipment Used: 9tonne tracked 360 excavator					

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Contract : Global Centre of Rail Excellence

Client : GCRE Limited

Trial Pit No.

TP20

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

Job Number : Q0652

Ground Level : 275.01 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : Ove Arup and Partners
Ltd

Coordinates: 283231.19 E
211035.80 N
Co-ordinates to National Grid



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Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP21	
Dates : 9/12/21 - 9/12/21			Job Number : Q0652		Ground Level : 230.34 m A.O.D. Level to Ordnance Datum			
Location :			Engineer : ARUP		Coordinates: 283037.70 E 211907.98 N Co-ordinates to National Grid			

m B.G.L.	Samples		Tests		Strata			WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	
1	0.10 -	D1			0.15	TOPSOIL: Brown slightly sandy gravelly CLAY with many rootlets. Gravel is angular to sub angular fine to coarse siltstone. MADE GROUND: Brownish grey clayey slightly sandy GRAVEL with low cobble content of siltstone. Gravel is angular to sub angular fine to coarse siltstone and sandstone.		230.19
	0.30 -	D2			0.15			
	0.50 - 1.00	B3						
	1.00 - 1.00 - 1.50	B4 LB4			1.45			
2	2.00 - 2.50	LB5			1.60	MADE GROUND: Brownish grey slightly clayey slightly sandy GRAVEL with low cobble content of siltstone. Gravel is angular to sub angular fine to coarse siltstone, sandstone and fine to medium coal.		228.74
					1.00			
	2.60 - 2.70	D6			2.60	Soft grey slightly sandy organic CLAY with rootlets		
3					0.10	Firm orange brown with grey mottling slightly sandy very gravelly silty CLAY with low cobble content of sandstone.		227.64
					2.70			
	3.00 - 3.50	B7			1.30			
4	4.00 -	D8			4.00	Trial Pit terminated at scheduled depth of 4.0mbgl		226.34

PLAN 		Groundwater: No groundwater encountered Stability: Sides collapsing 0-2.6mbgl Shoring: None	Remarks: Position marked out using co-ordinates supplied by the engineer. Area CAT and GENNY scanned with permit to excavate issued by QGL prior to starting work. Soakaway test carried out within pit. On completion hole backfilled with arisings, compacted in layers in reverse order of excavation.
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Equipment Used: 9tonne tracked 360 excavator

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Contract : Global Centre of Rail Excellence

Client : GCRE Limited

Trial Pit No.

TP21

Dates : 9/12/21 - 9/12/21

Job Number : Q0652

Ground Level : 230.34 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : Ove Arup and Partners
Ltd

Coordinates: 283037.70 E
211907.98 N
Co-ordinates to National Grid



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GJ

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Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP22	
Dates : 8/12/21 - 8/12/21			Job Number : Q0652			Ground Level : 279.12 m A.O.D. <i>Level to Ordnance Datum</i>		
Location :			Engineer : ARUP			Coordinates: 282687.91 E 210984.95 N <i>Co-ordinates to National Grid</i>		

m B.G.L.	Samples		Tests		Strata			WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	
1	0.00 - 0.10	D1			0.10	TOPSOIL: Brown clayey sandy GRAVEL with many rootlets. Gravel is angular fine to coarse siltstone.		279.02
	0.20 - 0.50	LB2			0.10			
	0.60 -	D3			0.60	MADE GROUND: Brown clayey slightly sandy GRAVEL. Gravel is angular to sub angular fine to coarse siltstone and sandstone.		
	1.00 - 1.50	B4			0.70			
2	2.00 - 2.50	LB5				MADE GROUND: Dark grey slightly clayey slightly sandy GRAVEL with low cobble content and low boulder content of siltstone. Gravel is angular to sub angular fine to coarse siltstone, sub angular sandstone and rare fine to medium coal.		278.42
					3.60			
3	3.00 - 3.50	B6						
4	4.00 - 4.20	B7						
					4.30	Trial Pit terminated at 4.3mbgl, sides collapsing, pit unstable.		274.82

PLAN 	Groundwater: No groundwater encountered Stability: Sides collapsing Shoring: None	Remarks: Position marked out using co-ordinates supplied by the engineer. Area CAT and GENNY scanned with permit to excavate issued by QGL prior to starting work. On completion hole backfilled with arisings, compacted in layers in reverse order of excavation.
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Equipment Used: 9tonne tracked 360 excavator

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Contract : Global Centre of Rail Excellence

Client : GCRE Limited

Trial Pit No.

TP22

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

Job Number : Q0652

Ground Level : 279.12 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : Ove Arup and Partners
Ltd

Coordinates: 282687.91 E
210984.95 N
Co-ordinates to National Grid



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SA4 0FQ
Tel: 01554 744880
email: enquiries@quantumgeotech.co.uk

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JL

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A Jones

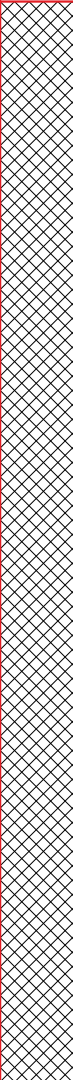
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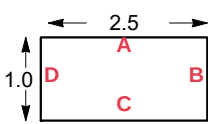
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Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP23	
Dates : 11/1/22 - 11/1/22			Job Number : Q0652			Ground Level : 248.13 m A.O.D. <i>Level to Ordnance Datum</i>		
Location : Around washery area			Engineer : ARUP			Coordinates: 281381.91 E 211314.37 N <i>Co-ordinates to National Grid</i>		

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1	0.50 - 0.50 - 1.00	B1 D1				MADE GROUND - Dense black to dark grey slightly sandy silty GRAVEL with high cobble and boulder content. Gravel is fine to coarse angular to sub-angular Mudstone. Cobbles and boulders are sub-angular to sub-rounded Mudstone and Siltstone			
	1.00 -	B2							
2	2.00 -	D2 B3			4.00				
3	3.00 -	D3 B4							
4	4.00 -	D4 B5			4.00	Terminated at 4.00mbgl specified depth		244.13	

PLAN 	Groundwater: No ground water encountered Stability: Unstable and collapsing below 2.00mbgl Shoring: N/A	Remarks: TP set out by QGL in liaison with ARUP. Services checked and area CAT scanned
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Equipment Used: 30 tonne tracked 360 excavator

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator: CE	Logged By: S Picton	Sheet No. 1 Of 2	m Per Page 5	All measurements in metres unless otherwise stated	
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Contract : Global Centre of Rail Excellence		Trial Pit No.	
Client : Global Centre of Rail Excellence		TP23	
Dates : 11/1/22 - 11/1/22	Job Number : Q0652	Ground Level :	248.13 m A.O.D. <i>Level to Ordnance Datum</i>
Location : Around washery area	Engineer : ARUP	Coordinates:	281381.91 E 211314.37 N <i>Co-ordinates to National Grid</i>



	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	
		CE	S Picton	2 Of 2			

Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP24	
Dates : 7/1/22 - 7/1/22			Job Number : Q0652		Ground Level : 228.44 m A.O.D. <i>Level to Ordnance Datum</i>			
Location :			Engineer : ARUP		Coordinates: 281948.55 E 211934.42 N <i>Co-ordinates to National Grid</i>			

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
	0.10 - 0.30	B2			0.40	MADE GROUND: Dark grey brown slightly clayey slightly sandy GRAVEL with low cobble content of siltstone. Gravel is angular to sub angular fine to coarse siltstone, sandstone, and red brick with rare fine coal and many rootlets.			
	0.20 -	D1			0.40	MADE GROUND: Grey slightly clayey slightly silty slightly sandy GRAVEL with low cobble and low boulder content of siltstone. Gravel is angular to sub angular fine to coarse siltstone and rare fine to medium coal.		228.04	
1	1.00 - 1.50	LB3							
2	2.00 - 2.50	B4			4.10				
3	3.00 - 3.50	LB5							
4	4.00 - 4.50	B6							
					4.50	Trial Pit terminated at scheduled depth of 4.5mbgl		223.94	

PLAN 	Groundwater: Slow groundwater ingress at 4.5mbgl Stability: Sides collapsing on removal of boulders Shoring: None	Remarks: Position marked out using co-ordinates supplied by the engineer. Area CAT and GENNY scanned with permit to excavate issued by QGL prior to starting work. On completion hole backfilled with arisings, compacted in layers in reverse order of excavation.
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Equipment Used: 15Tonne tracked 360

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Contract : Global Centre of Rail Excellence

Client : GCRE Limited

Trial Pit No.

TP24

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

Job Number : Q0652

Ground Level : 228.44 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : Ove Arup and Partners
Ltd

Coordinates: 281948.55 E
211934.42 N
Co-ordinates to National Grid



Plas Newydd, Llanedi, Pontarddulais, Swansea
SA4 0FQ
Tel: 01554 744880
email: enquiries@quantumgeotech.co.uk

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Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP25	
Dates : 10/1/22 - 10/1/22			Job Number : Q0652			Ground Level : 255.63 m A.O.D. <i>Level to Ordnance Datum</i>		
Location :			Engineer : ARUP			Coordinates: 283990.42 E 211456.97 N <i>Co-ordinates to National Grid</i>		

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1	0.00 - 0.01 0.10 - 0.30	D1 B2			0.30	MADE GROUND: Brown slightly sandy gravelly CLAY with many rootlets.			
	0.50 - 1.00	LB3			0.30	MADE GROUND: Grey clayey slightly sandy GRAVEL with low cobble content of siltstone. Gravel is angular to sub angular fine to coarse siltstone and rare coal, sub angular to sub rounded fine to coarse sandstone.		255.33	
2	1.50 - 2.00	B4				...with low boulder content of siltstone from 1.3mbgl			
	2.50 - 2.50 - 3.00	B5 LB5			4.20				
3	3.50 - 4.00	B6							
					4.50	Trial Pit terminated at scheduled depth of 4.5mbgl.		251.13	

PLAN 		Groundwater: Seepage at 0.3mbgl Stability: Stable Shoring: None	Remarks: Position marked out using co-ordinates supplied by the engineer. Area CAT and GENNY scanned with permit to excavate issued by QGL prior to starting work. On completion hole backfilled with arisings, compacted in layers in reverse order of excavation.
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Equipment Used: 15Tonne tracked 360	
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 Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator: AA	Logged By: A Jones	Sheet No. 1 Of 1	m Per Page 5	All measurements in metres unless otherwise stated	
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Contract : Global Centre of Rail Excellence

Client : GCRE Limited

Trial Pit No.

TP25

Dates : 10/1/22 - 10/1/22

Job Number : Q0652

Ground Level : 255.63 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : Ove Arup and Partners
Ltd

Coordinates: 283990.42 E
211456.97 N
Co-ordinates to National Grid



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SA4 0FQ
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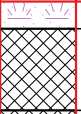
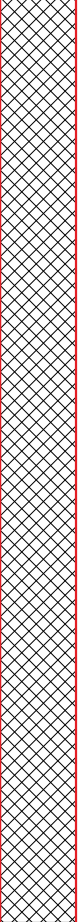
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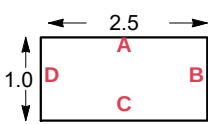
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otherwise stated



Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP26	
Dates : 7/12/21 - 7/12/21			Job Number : Q0652			Ground Level : 286.05 m A.O.D. <i>Level to Ordnance Datum</i>		
Location :			Engineer : ARUP			Coordinates: 282977.92 E 210985.14 N <i>Co-ordinates to National Grid</i>		

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1	0.00 - 0.05	D1			0.10	TOPSOIL: Brown clayey sandy GRAVEL with many rootlets. Gravel is angular fine to coarse siltstone.		285.95	
	0.20 - 0.40	LB2			0.10	MADE GROUND: Brown clayey slightly sandy GRAVEL. Gravel is angular to sub angular fine to coarse siltstone with rare angular coarse red brick.			
	0.30 -	D3			0.30				
	0.50 - 1.00	B4			0.40	MADE GROUND: Dark grey slightly clayey slightly sandy GRAVEL with low cobble content and low boulder content of siltstone. Gravel is angular to sub angular fine to coarse siltstone, sub angular sandstone and rare fine to medium coal.			285.65
2	1.50 - 1.50 - 2.00	B5 LB5			3.40				
3	2.50 - 3.00	B6							
	3.50 -	D7							
					3.80	Trial Pit terminated at 3.8mbgl, sides collapsing, pit unstable.		282.25	

PLAN 	Groundwater: No groundwater encountered Stability: Sides collapsing Shoring: None	Remarks: Position marked out using co-ordinates supplied by the engineer. Area CAT and GENNY scanned with permit to excavate issued by QGL prior to starting work. On completion hole backfilled with arisings, compacted in layers in reverse order of excavation.
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Equipment Used: 9tonne tracked 360 excavator

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator: JL	Logged By: A Jones	Sheet No. 1 Of 1	m Per Page 5	All measurements in metres unless otherwise stated	
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Contract : Global Centre of Rail Excellence

Client : GCRE Limited

Trial Pit No.

TP26

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

Job Number : Q0652

Ground Level : 286.05 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : Ove Arup and Partners
Ltd

Coordinates: 282977.92 E
210985.14 N
Co-ordinates to National Grid



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SA4 0FQ
Tel: 01554 744880
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JL

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All measurements in
metres unless
otherwise stated



Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP27	
Dates : 7/12/21 - 7/12/21			Job Number : Q0652		Ground Level : 239.62 m A.O.D. Level to Ordnance Datum			
Location :			Engineer : ARUP		Coordinates: 282341.17 E 210344.22 N Co-ordinates to National Grid			

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1	0.10 - 0.20	D1	1.2	Vane - P=12 - R=4kN/m2 Vane - P=10 - R=2kN/m2 Vane - P=14 - R=4kN/m2	0.15	TOPSOIL: Brown slightly sandy gravelly CLAY with many rootlets.		239.47	
	0.20 - 0.50	B2			0.15	MADE GROUND: Brown gravelly sandy slightly organic CLAY			
	0.60 - 0.80	D3			0.60				
	0.80 - 0.90	B4			0.75	Dark brown very fibrous PEAT.		238.87	
	0.90 - 1.00	D5			0.15				
	1.00 - 1.20	B6			0.90	Very soft yellow brown slightly silty slightly sandy slightly gravelly CLAY.		238.72	
	1.20 - 1.50	D7			0.35				
	1.50 - 2.00	B8			1.25	Firm dark grey slightly sandy gravelly CLAY with low cobble and low boulder content of siltstone. Gravel is angular to sub angular fine to coarse siltstone and sandstone,		238.37	
2									
3	2.50 - 3.00	LB10							
4	3.50 - 4.00	B11							
	4.50 -	D9			4.50	Trial Pit terminated at scheduled depth of 4.5mbgl		235.12	

PLAN 		Groundwater: No groundwater encountered Stability: Stable Shoring: None	Remarks: Position marked out using co-ordinates supplied by the engineer. Area CAT and GENNY scanned with permit to excavate issued by QGL prior to starting work. On completion hole backfilled with arisings, compacted in layers in reverse order of excavation.
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Equipment Used: 9tonne tracked 360 excavator

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Contract : Global Centre of Rail Excellence

Client : GCRE Limited

Trial Pit No.

TP27

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

Job Number : Q0652

Ground Level : 239.62 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : Ove Arup and Partners
Ltd

Coordinates: 282341.17 E
210344.22 N
Co-ordinates to National Grid



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SA4 0FQ
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Operator:
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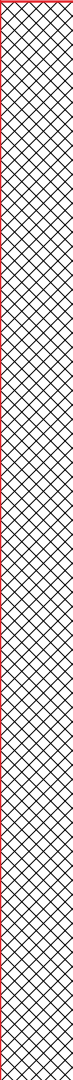
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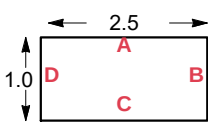
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Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP28	
Dates : 11/1/22 - 11/1/22			Job Number : Q0652			Ground Level : 251.05 m A.O.D. <i>Level to Ordnance Datum</i>		
Location : Around washery area			Engineer : ARUP			Coordinates: 281604.40 E 211639.77 N <i>Co-ordinates to National Grid</i>		

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1	0.50 -	B1 D1				MADE GROUND - Dense black to dark grey slightly sandy silty GRAVEL with high cobble and boulder content. Gravel is fine to coarse angular to sub-angular Mudstone. Cobbles and boulders are sub-angular to sub-rounded Mudstone and Siltstone			
	1.00 -	B2 D2							
2	2.00 -	B3 D3			4.00				
3	3.00 -	B4 D4							
4	4.00 -	B5 D5			4.00	Terminated at 4.00mbgl specified depth		247.05	

PLAN 		Groundwater: No ground water encountered Stability: Stable Shoring: N/A	Remarks: TP set out by QGL in liaison with ARUP. Services checked and area CAT scanned
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Equipment Used: 30 tonne tracked 360 excavator

 Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator: CE	Logged By: S Picton	Sheet No. 1 Of 2	m Per Page 5	All measurements in metres unless otherwise stated	
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Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Trial Pit No.

TP28

Dates : 11/1/22 - 11/1/22

Job Number : Q0652

Ground Level : 251.05 m A.O.D.
Level to Ordnance Datum

Location : Around washery area

Engineer : ARUP

Coordinates: 281604.40 E
211639.77 N
Co-ordinates to National Grid



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email: enquiries@quantumgeotech.co.uk

Operator:
C E

Logged By:
S Picton

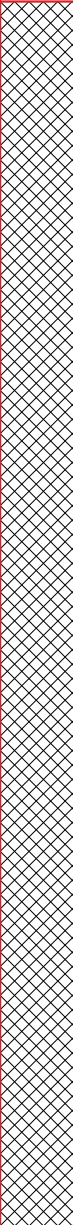
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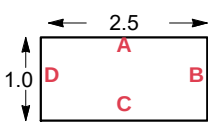
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Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP29	
Dates : 7/1/22 - 7/1/22			Job Number : Q0652			Ground Level : 230.74 m A.O.D. <i>Level to Ordnance Datum</i>		
Location :			Engineer : ARUP			Coordinates: 282282.62 E 212062.10 N <i>Co-ordinates to National Grid</i>		

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1	0.50 - 1.00	B1				MADE GROUND: Grey slightly clayey slightly silty slightly sandy GRAVEL with medium cobble and low boulder content of siltstone. Gravel is angular to sub angular fine to coarse siltstone and rare fine to medium coal.			
						with high boulder content from 1.0-2.0mbgl (difficult dig)			
2	1.50 - 2.00	LB2							
3	2.50 - 3.00	B3			4.50				
4	3.50 - 4.00	LB4							
	4.50 -	D5			4.50	Trial Pit terminated at scheduled depth of 4.5mbgl - Collapsed back to 4.0mbgl		226.24	

PLAN 		Groundwater: Slight seepage at 0.5mbgl. Stability: Sides collapsing from 3.0mbgl Shoring: None	Remarks: Position marked out using co-ordinates supplied by the engineer. Area CAT and GENNY scanned with permit to excavate issued by QGL prior to starting work. On completion hole backfilled with arisings, compacted in layers in reverse order of excavation.
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Equipment Used: 15Tonne tracked 360

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Contract : Global Centre of Rail Excellence

Client : GCRE Limited

Trial Pit No.

TP29

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

Job Number : Q0652

Ground Level :

Location :

Engineer : Ove Arup and Partners
Ltd

Coordinates:



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SA4 0FQ
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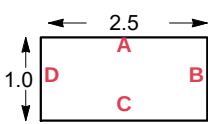
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All measurements in
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Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP30	
Dates : 10/1/22 - 10/1/22			Job Number : Q0652		Ground Level : 252.69 m A.O.D. Level to Ordnance Datum			
Location :			Engineer : ARUP		Coordinates: 284010.55 E 211327.16 N Co-ordinates to National Grid			

m B.G.L.	Samples		Tests		Strata			WATER	
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend		Red. Level A.O.D.
1	0.00 - 0.10	D1			0.10	TOPSOIL: Brown clayey slightly sandy GRAVEL with many rootlets. Gravel is angular to sub angular fine to coarse siltstone. MADE GROUND: Brown slightly clayey slightly sandy GRAVEL. Gravel is angular to sub angular fine to coarse siltstone.		252.59	
	0.30 - 0.80	LB3			0.10				
	0.50 -	D2			0.80				
2	1.00 - 1.50	B4			0.90	MADE GROUND: Grey clayey slightly sandy GRAVEL with low cobble and low boulder content of siltstone. Gravel is angular to sub angular fine to coarse siltstone and rare coal, sub angular to sub rounded fine to coarse sandstone.		251.79	
	2.00 - 2.50	LB5							
3	3.00 - 3.50	B6							
	4.00 - 4.50	B7							
					4.50	Trial Pit terminated at scheduled depth of 4.5mbgl.		248.19	

PLAN 	Groundwater: No groundwater encountered Stability: Stable Shoring: None	Remarks: Position marked out using co-ordinates supplied by the engineer. Area CAT and GENNY scanned with permit to excavate issued by QGL prior to starting work. On completion hole backfilled with arisings, compacted in layers in reverse order of excavation.
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Equipment Used: 15Tonne tracked 360

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Contract : Global Centre of Rail Excellence

Client : GCRE Limited

Trial Pit No.

TP30

Dates : 10/1/22 - 10/1/22

Job Number : Q0652

Ground Level : 252.69 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : Ove Arup and Partners
Ltd

Coordinates: 284010.55 E
211327.16 N
Co-ordinates to National Grid



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SA4 0FQ
Tel: 01554 744880
email: enquiries@quantumgeotech.co.uk

Operator:
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Logged By:
A Jones

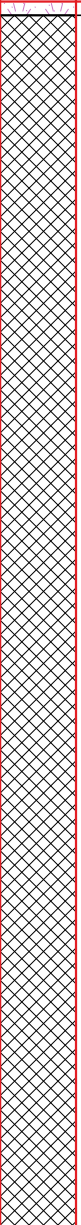
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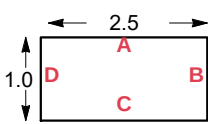
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Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP31	
Dates : 9/12/21 - 9/12/21			Job Number : Q0652		Ground Level : 232.41 m A.O.D. <i>Level to Ordnance Datum</i>			
Location :			Engineer : ARUP		Coordinates: 282490.13 E 211876.52 N <i>Co-ordinates to National Grid</i>			

m B.G.L.	Samples		Tests		Strata			Red. Level A.O.D.	WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend		
1	0.00 - 0.05	D1			0.05	TOPSOIL: Brown slightly sandy gravelly CLAY with many rootlets. Gravel is angular to sub angular fine to coarse siltstone.		232.36	
	0.50 - 1.00	B2			0.05	MADE GROUND: Brown and grey slightly sandy gravelly CLAY with low cobble content and low boulder content of siltstone and sandstone. Gravel is angular to sub angular fine to coarse siltstone, sandstone and fine to medium coal with timber.			
	1.50 - 2.00	LB3				 sample between 1.5 and 2.0mbgl clayey silty slightly sandy Gravel			
	2.50 - 3.00	B4			4.45	very clayey from 2.2mbgl			
	3.50 - 4.00	LB5							
4	4.50 -	D6			4.50	Trial Pit terminated at scheduled depth of 4.5mbgl		227.91	

PLAN 		Groundwater: No groundwater encountered Stability: Sides collapsing 0-2.2mbgl Shoring: None	Remarks: Position marked out using co-ordinates supplied by the engineer. Area CAT and GENNY scanned with permit to excavate issued by QGL prior to starting work. On completion hole backfilled with arisings, compacted in layers in reverse order of excavation.
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Equipment Used: 9tonne tracked 360 excavator

	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator: GJ	Logged By: A Jones	Sheet No. 1 Of 1	m Per Page 5	All measurements in metres unless otherwise stated	
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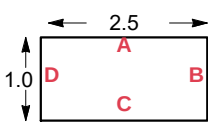
Contract : Global Centre of Rail Excellence		Trial Pit No.
Client : GCRE Limited		TP31
Dates : 9/12/21 - 9/12/21	Job Number : Q0652	Ground Level : 232.41 m A.O.D. <i>Level to Ordnance Datum</i>
Location :	Engineer : Ove Arup and Partners Ltd	Coordinates: 282490.13 E 211876.52 N <i>Co-ordinates to National Grid</i>



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		GJ	A Jones	2 Of 2			

Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP32	
Dates : 8/12/21 - 8/12/21			Job Number : Q0652			Ground Level : 235.63 m A.O.D. <i>Level to Ordnance Datum</i>		
Location :			Engineer : ARUP			Coordinates: 282814.33 E 211902.59 N <i>Co-ordinates to National Grid</i>		

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1	0.00 - 0.10	D1			0.10	TOPSOIL: Brown clayey GRAVEL with many rootlets. Gravel is angular to sub angular fine to coarse siltstone.		235.53	
	0.10 - 0.50	B2			0.10	MADE GROUND: Dark grey very clayey slightly sandy GRAVEL with low cobble content and low boulder content of siltstone. Gravel is angular to sub angular fine to coarse siltstone, sandstone and brick.			
2	0.50 - 1.00					with steel wire at 1.0-1.1mbgl			
3	2.00 - 2.50	B4				from 2.0mbgl with fine to coarse coal.			
4	2.80 - 3.00	D5							
	3.00 - 3.50	B6							
4	4.00 - 4.50	LB7							
					4.50	Trial Pit terminated at scheduled depth of 4.5mbgl		231.13	

PLAN 	Groundwater: No groundwater encountered Stability: Slight collapse of sides. Shoring: None	Remarks: Position marked out using co-ordinates supplied by the engineer. Area CAT and GENNY scanned with permit to excavate issued by QGL prior to starting work. On completion hole backfilled with arisings, compacted in layers in reverse order of excavation.
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Equipment Used: 9tonne tracked 360 excavator

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Contract : Global Centre of Rail Excellence Client : GCRE Limited		Trial Pit No. TP32	
Dates : 8/12/21 - 8/12/21 Location :	Job Number : Q0652 Engineer : Ove Arup and Partners Ltd	Ground Level : 235.63 m A.O.D. <i>Level to Ordnance Datum</i>	Coordinates: 282814.33 E 211902.59 N <i>Co-ordinates to National Grid</i>



	Plas Newydd, Llanedi, Pontarddulais, Swansea SA4 0FQ Tel: 01554 744880 email: enquiries@quantumgeotech.co.uk	Operator:	Logged By:	Sheet No.	m Per Page	All measurements in metres unless otherwise stated	
		JL	A Jones	2 Of 2			

Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP33	
Dates : 9/12/21 - 9/12/21			Job Number : Q0652		Ground Level : 236.29 m A.O.D. Level to Ordnance Datum			
Location :			Engineer : ARUP		Coordinates: 283304.69 E 211902.41 N Co-ordinates to National Grid			

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1	0.10 -	D1	3.5	Vane - P=48 - R=14kN/m2 Vane - P=56 - R=16kN/m2 Vane - P=54 - R=16kN/m2	0.45	TOPSOIL: Brown slightly sandy gravelly CLAY with many rootlets. Gravel is angular to sub angular fine to coarse siltstone.			
	0.50 - 1.00	LB2			0.45	MADE GROUND: Black slightly silty slightly clayey slightly sandy GRAVEL with low cobble content of siltstone and brick. Gravel is angular to sub angular fine to coarse siltstone.		235.84	
					0.70				
2	1.50 - 2.00	LB3			1.15	MADE GROUND: Brown and grey slightly sandy very gravelly CLAY with low cobble content of siltstone and sandstone. Gravel is angular to sub angular fine to coarse siltstone, sandstone and fine to medium coal. sample between 1.5 and 2.0mbgl clayey silty slightly snady Gravel		235.14	
					1.25				
	2.30 -	D4			2.40	Soft to firm black slightly sandy organic CLAY with rootlets.		233.89	
3	2.50 -	D5			2.65	Firm pale brownish grey sandy slightly gravelly silty CLAY.		233.64	
	2.80 - 3.20	B6			0.95				
	3.50 -	D7	3.60	Grey clayey slightly sandy GRAVEL with low cobble content of sandstone. Gravel is sub angular to sub rounded fine to coarse sandstone.		232.69			
4	3.80 - 4.20	B8	0.90						
			4.50	Trial Pit terminated at scheduled depth of 4.5mbgl		231.79			

PLAN

Groundwater: Seepage at 3.4mbgl

 Stability: Stable

 Shoring: None

Remarks: Position marked out using co-ordinates supplied by the engineer. Area CAT and GENNY scanned with permit to excavate issued by QGL prior to starting work. On completion hole backfilled with arisings, compacted in layers in reverse order of excavation.

Equipment Used: 9tonne tracked 360 excavator

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Contract : Global Centre of Rail Excellence

Client : GCRE Limited

Trial Pit No.

TP33

Dates : 9/12/21 - 9/12/21

Job Number : Q0652

Ground Level : 236.29 m A.O.D.
Level to Ordnance Datum

Location :

Engineer : Ove Arup and Partners
Ltd

Coordinates: 283304.69 E
211902.41 N
Co-ordinates to National Grid



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GJ

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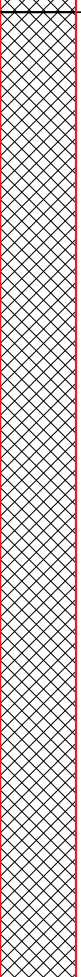
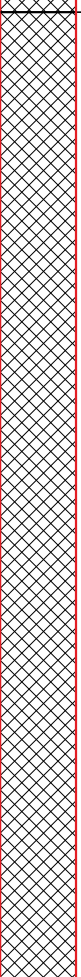
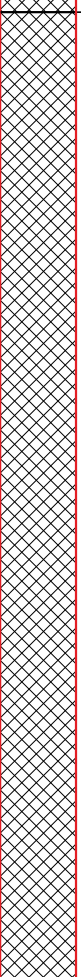
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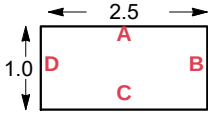
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All measurements in
metres unless
otherwise stated



Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP34	
Dates : 10/1/22 - 10/1/22			Job Number : Q0652		Ground Level : 253.80 m A.O.D. <i>Level to Ordnance Datum</i>			
Location :			Engineer : ARUP		Coordinates: 283918.94 E 211654.19 N <i>Co-ordinates to National Grid</i>			

m B.G.L.	Samples		Tests		Strata			WATER		
	Depth	Type No.	Depth	Test Results	Depth (Thick-ness)	Description	Legend		Red. Level A.O.D.	
1	0.10 -	D1			0.20	TOPSOIL: Brown clayey slightly sandy GRAVEL with many rootlets. Gravel is angular to sub angular fine to coarse siltstone.		253.60		
	0.50 - 0.90	LB2			0.20	MADE GROUND: Brown slightly clayey slightly sandy GRAVEL. Gravel is angular to sub angular fine to coarse siltstone.				
					0.75					
					0.95	MADE GROUND: Grey clayey slightly sandy GRAVEL with low cobble content of siltstone. Gravel is angular to sub angular fine to coarse siltstone and rare coal, sub angular to sub rounded fine to coarse sandstone.			252.85	
2	1.50 - 2.00	B3								
	2.50 - 3.00	LB4								
						3.55				
3	3.50 - 4.00	B5								
4										
					4.50	Trial Pit terminated at scheduled depth of 4.5mbgl.				249.30

PLAN 		Groundwater: Very wet at 0.5mbgl Stability: Stable Shoring: None	Remarks: Position marked out using co-ordinates supplied by the engineer. Area CAT and GENNY scanned with permit to excavate issued by QGL prior to starting work. On completion hole backfilled with arisings, compacted in layers in reverse order of excavation.
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Equipment Used: 15Tonne tracked 360

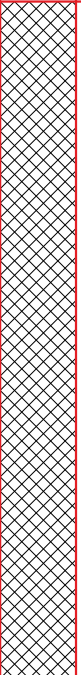
	Plas Newydd Swansea Tel: 01554744880 email: enquiries@quantumgeotechnic.co.uk	Operator: AA	Logged By: A Jones	Sheet No. 1 Of 1	m Per Page 5	All measurements in metres unless otherwise stated	
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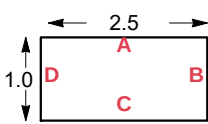
Contract : Global Centre of Rail Excellence		Trial Pit No.	
Client : GCRE Limited		TP34	
Dates : 10/1/22 - 10/1/22	Job Number : Q0652	Ground Level :	253.80 m A.O.D. <i>Level to Ordnance Datum</i>
Location :	Engineer : Ove Arup and Partners Ltd	Coordinates:	283918.94 E 211654.19 N <i>Co-ordinates to National Grid</i>



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Contract : Global Centre of Rail Excellence							Trial Pit No. TP34A	
Client : Global Centre of Rail Excellence								
Dates : 7/1/22 - 7/1/22			Job Number : Q0652			Ground Level : 230.76 m A.O.D. <i>Level to Ordnance Datum</i>		
Location : Around washery area			Engineer : ARUP			Coordinates: 284641.85 E 210699.97 N <i>Co-ordinates to National Grid</i>		

m B.G.L.	Samples		Tests		Strata				WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	Red. Level A.O.D.	
1	0.20 -	ES1				MADE GROUND - Loose black to dark grey slightly sandy silty GRAVEL. Gravel is fine to coarse angular to sub-angular Mudstone with coal, ash, metal and wooden railway sleepers			
	0.50 -	B1							
	1.00 -	B2 ES2							
2	2.00 - 2.50	B3				Terminated at 2.50mbgl, sides unstable and collapsing. Unable to undertake soakaway test due to high ground water encountered		228.26	
	2.00 -	ES3							

PLAN


Groundwater: Slight ground water seepage at 0.30mbgl, High ground water strike at 1.00mbgl

Stability: Unstable and collapsing below 1.00mbgl

Shoring: N/A

Remarks: TP set out by QGL in liaison with ARUP. Services checked and area CAT scanned

Equipment Used: 9 tonne tracked 360 excavator

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Contract : Global Centre of Rail Excellence

Client : Global Centre of Rail Excellence

Trial Pit No.

TP34A

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

Job Number : Q0652

Ground Level : 230.76 m A.O.D.
Level to Ordnance Datum

Location : Around washery area

Engineer : ARUP

Coordinates: 284641.85 E
210699.97 N
Co-ordinates to National Grid



Contract : Global Centre of Rail Excellence							Trial Pit No.	
Client : Global Centre of Rail Excellence							TP35	
Dates : 12/1/22 - 12/1/22			Job Number : Q0652			Ground Level : 234.77 m A.O.D. Level to Ordnance Datum		
Location : Around washery area			Engineer : ARUP			Coordinates: 285316.16 E 210289.51 N Co-ordinates to National Grid		

m B.G.L.	Samples		Tests		Strata			WATER
	Depth	Type No.	Depth	Test Results	Depth (Thickness)	Description	Legend	
1					0.05	Grass/vegetation over MADE GROUND - brown sandy SILT with roots and rootlets	x x	234.72
					0.05	MADE GROUND - Grass over loose black to dark grey slightly sandy silty GRAVEL with high cobble and boulder content. Gravel is fine to coarse angular to sub-angular Mudstone. Cobbles and boulders are sub-angular to angular Sandstone with coal, ash, and metal		
2					1.45			
					1.50	Loose grey light brown mottled slightly sandy very clayey GRAVEL with high cobble and boulder content. Gravel is fine to coarse sub-angular to sub-rounded Mudstone and Siltstone. Cobbles and boulders are rounded to sub-rounded Sandstone with iron staining		233.27
3					2.50			
					4.00	Terminated at 4.00mbgl specified depth		230.77
4								

PLAN 		Groundwater: High ground water strike at 2.00mbgl Stability: Sides unstable and collapsing Shoring: N/A	Remarks: TP set out by QGL in liaison with ARUP. Services checked and area CAT scanned
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Equipment Used: 9 tonne tracked 360 excavator

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Contract : Global Centre of Rail Excellence		Trial Pit No.	
Client : Global Centre of Rail Excellence		TP35	
Dates : 12/1/22 - 12/1/22	Job Number : Q0652	Ground Level :	234.77 m A.O.D. <i>Level to Ordnance Datum</i>
Location : Around washery area	Engineer : ARUP	Coordinates:	285316.16 E 210289.51 N <i>Co-ordinates to National Grid</i>



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