



Trial Pit Photographs: TP09

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Trial Pit Photographs: TP10

12826: Foel Trawsnant Windfarm

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Trial Pit Photographs: TP11

12826: Foel Trawsnant Windfarm

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Trial Pit Photographs: TP12

12826: Foel Trawsnant Windfarm

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Trial Pit Photographs: TP13

12826: Foel Trawsnant Windfarm

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Trial Pit Photographs: TP14

12826: Foel Trawsnant Windfarm

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Trial Pit Photographs: TP15

12826: Foel Trawsnant Windfarm

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Trial Pit Photographs: TP16

12826: Foel Trawsnant Windfarm

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Trial Pit Photographs: TP17

12826: Foel Trawsnant Windfarm

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Trial Pit Photographs: TP18

12826: Foel Trawsnant Windfarm

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Trial Pit Photographs: TP19

12826: Foel Trawsnant Windfarm

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Trial Pit Photographs: TP20

12826: Foel Trawsnant Windfarm

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Trial Pit Photographs: TP21

12826: Foel Trawsnant Windfarm

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Trial Pit Photographs: TP22

12826: Foel Trawsnant Windfarm

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Trial Pit Photographs: TP23

12826: Foel Trawsnant Windfarm

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Tel: 029 2080 7991



Trial Pit Photographs: TP24

12826: Foel Trawsnant Windfarm

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Trial Pit Photographs: TP25

12826: Foel Trawsnant Windfarm

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CF83 2AX
Tel: 029 2080 7991



Trial Pit Photographs: TP26

12826: Foel Trawsnant Windfarm

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Trial Pit Photographs: TP27

12826: Foel Trawsnant Windfarm

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Tel: 029 2080 7991



Trial Pit Photographs: TP28

12826: Foel Trawsnant Windfarm

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Tel: 029 2080 7991



Trial Pit Photographs: TP29

12826: Foel Trawsnant Windfarm

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Tel: 029 2080 7991



Trial Pit Photographs: TP30

12826: Foel Trawsnant Windfarm

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Trial Pit Photographs: TP31

12826: Foel Trawsnant Windfarm

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Trial Pit Photographs: TT1

12826: Foel Trawsnant Windfarm

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Trial Pit Photographs: TT2

12826: Foel Trawsnant Windfarm

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Suspected fault zone



Trial Pit Photographs: TT3

12826: Foel Trawsnant Windfarm

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Tel: 029 2080 7991



Trial Pit Photographs: TT4

12826: Foel Trawsnant Windfarm

Intégral
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Caerphilly
CF83 2AX
Tel: 029 2080 7991

APPENDIX H

ROTARY BOREHOLE LOGS

		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm			Project No.: 12826		Borehole No.: BHT1 Sheet 1 of 6	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd			Coordinates: 283959.00mE 193522.00mN		Hole Type: RC	
Equipment: Klemm				Diameter of Casing: 115mm			Level:		Scale 1:25	
Diameter of Boring:				Depth of Casing: 4.50m			Dates 21/06/2021 - 21/06/2021		Logged By: RAH+APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
							0.20				Grass over, soft brown sandy silty CLAY with roots. (Topsoil)	
							0.80				Firm to stiff orange brown slightly silty slightly sandy slightly gravelly CLAY. Gravel comprises fine to coarse sub-angular to angular sandstone. (Glacial Till)	
							1.50				(Medium dense) grey mottled brown and orange brown slightly silty sandy GRAVEL of fine to coarse angular to sub-angular blocky sandstone. (Glacial Till/Highly Weathered Bedrock)	1
							1.63				Firm grey slightly sandy slightly gravelly silty CLAY. Gravel comprises fine to medium angular to sub-angular mudstone bordering on lithorelicts. (Highly Weathered Bedrock)	
							1.90				Black bright COAL. Recovered as slightly gravelly coarse sand. Gravel is fine sub-angular coal. (Highly Weathered Bedrock)	
							2.40				Stiff to hard grey mottled light brown and orange brown silty CLAY with frequent, becoming abundant, fine to medium angular to sub-angular mudstone lithorelicts. (Completely to Highly Weathered Bedrock)	2
											...Grading into mudstone towards base.	
											Extremely weak grey, mottled grey brown and rusty brown, fissile and friable MUDSTONE. Easily fragmented. (Highly Weathered Bedrock)	3
												4
							4.50				Extremely weak to very weak extremely closely to closely fractured dark grey and orange brown very thinly bedded to thinly laminated carbonaceous MUDSTONE with frequent coal traces (1mm - 2mm thick). (Weathered Bedrock)	
									Fracture set 1: Predominantly sub-horizontal, tight and open, planar, rough and irregular and stepped. (Bedding)	5		

Remarks: Dynamic sampled to 4.5mbgl, rotary cored to 21.0mbgl, rotary open hole drilled to 30mbgl. Water strikes recorded at approximately 6.0mbgl and 18.0mbgl.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		
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Intégral Géotechnique		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT1 Sheet 2 of 6			
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283959.00mE 193522.00mN		Hole Type: RC			
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:25			
Diameter of Boring:				Depth of Casing: 4.50m				Dates 21/06/2021 - 21/06/2021		Logged By: RAH+APEX			
Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description		
		Depth (m)	TCR	SCR	RQD	FI							
	6.00 	4.50 - 6.00	97	20	8	>20	5.57				Fracture set 2: Vertical to sub-vertical, irregular, rough, stepped and tight. <i>Fmin = 1mm, Fmax = 210mm</i>		
							6.00				Bright very closely fractured black COAL with localised disseminated pyrite. Non-intact from 5.8m to 6.0mbgl.		
		6.00 - 7.50	100	11	0	>20				Extremely weak to very weak extremely closely to closely spaced fractured dark grey very thinly bedded to thinly laminated moderately to highly weathered fissile SILTSTONE/ MUDSTONE. (Weathered Bedrock) Fracture set 1: Sub-horizontal, tight, planar. (Bedding) Fracture set 2: 30° to 90° irregular, rough, stepped and tight. Non intact: 6.0m - 6.8m, 7.5m - 7.66m, 7.78m - 7.8m, 7.9m - 8.0m. Recovered as fine to medium angular gravel. Non intact: 8.75m - 9.0m - Recovered as fine to medium angular gravel with localised stiff grey clay and abundant mudstone lithorelicts. <i>Fmin = 1mm, Fmax = 70mm</i>	6		
											<i>Fmin = 1mm, Fmax = 100mm</i>		
		7.50 - 9.00	100	27	27	>20							
							9.00				Extremely weak to very weak extremely closely to closely spaced fractured brownish grey medium bedded to thinly bedded moderately weathered SILTSTONE with frequent coal traces (1mm - 2mm thick). (Weathered Bedrock) Fracture set 1: Sub-horizontal to 10°, planar, tight, rough and smooth. (Bedding) Fracture set 2: Occasional sub-vertical to 70°, planar, rough and tight. Below 13.5m coal traces are occasional. <i>Fmin = 1mm, Fmax = 180mm</i>	9	
		9.00 - 10.50	100	51	27	>20							
Remarks: Dynamic sampled to 4.5mbgl, rotary cored to 21.0mbgl, rotary open hole drilled to 30mbgl. Water strikes recorded at approximately 6.0mbgl and 18.0mbgl.										Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone) W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation			

		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm			Project No.: 12826		Borehole No.: BHT1 Sheet 3 of 6	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd			Coordinates: 283959.00mE 193522.00mN		Hole Type: RC	
Equipment: Klemm				Diameter of Casing: 115mm			Level:		Scale 1:25	
Diameter of Boring:				Depth of Casing: 4.50m			Dates 21/06/2021 - 21/06/2021		Logged By: RAH+APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
		10.50 - 12.00	100	48	19	12						11
		12.00 - 13.50	100	27	7	>20						12
		13.50 - 15.00	100	72	29	>20						13
							15.00					14
												15

Remarks: Dynamic sampled to 4.5mbgl, rotary cored to 21.0mbgl, rotary open hole drilled to 30mbgl. Water strikes recorded at approximately 6.0mbgl and 18.0mbgl.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT1 Sheet 5 of 6	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283959.00mE 193522.00mN		Hole Type: RC	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:25	
Diameter of Boring:				Depth of Casing: 4.50m				Dates 21/06/2021 - 21/06/2021		Logged By: RAH+APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
		19.50 - 21.00	100	21	0	>20					Fracture set 2: Sub-vertical to vertical highly irregular, rough and undulating. Non intact: 19.35m - 19.5m recovered as coarse angular gravel. 19.6m - 19.8m - Concentrated fracture zone. <i>Fmin = 1mm, Fmax = 80mm</i>	
							21.00				SANDSTONE. (Driller's Description)	21
							22.50				SANDSTONE/MUDSTONE. (Driller's Description)	23
												24
												25

Remarks: Dynamic sampled to 4.5mbgl, rotary cored to 21.0mbgl, rotary open hole drilled to 30mbgl. Water strikes recorded at approximately 6.0mbgl and 18.0mbgl.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation					
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT1-A Sheet 1 of 1	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283967.00mE 193526.00mN		Hole Type: RO	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:200	
Diameter of Boring: 115mm				Depth of Casing: 1.50m				Dates 22/06/2021 - 22/06/2021		Logged By: APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description		
		Depth (m)	TCR	SCR	RQD	FI							
											BOULDER CLAY. (Driller's Description)	1	
													2
													3
													4
													5
													6
													7
													8
													9
													10
													11
													12
													13
													14
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											32		
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											34		
											35		
											36		
											37		
											38		
											39		
											40		

Remarks: Rotary open hole drilled to 30mbgl. Water strike not recorded.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation					
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT1-B Sheet 1 of 1	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283963.00mE 193513.00mN		Hole Type: RO	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale: 1:200	
Diameter of Boring: 115mm				Depth of Casing: 1.50m				Dates: 22/06/2021 - 22/06/2021		Logged By: APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description		
		Depth (m)	TCR	SCR	RQD	FI							
											BOULDER CLAY. (Driller's Description)	1	
													2
												MUDSTONE. (Driller's Description)	3
												COAL. (Driller's Description)	4
												MUDSTONE. (Driller's Description)	5
													6
													7
													8
													9
													10
													11
													12
													13
													14
													15
												COAL. (Driller's Description)	16
												MUDSTONE with SANDSTONE bands. (Driller's Description)	17
													18
													19
													20
													21
													22
													23
													24
										SANDSTONE. (Driller's Description)	25		
											26		
											27		
											28		
											29		
											30		
										End of Borehole at 30.00 m	31		
											32		
											33		
											34		
											35		
											36		
											37		
											38		
											39		
											40		

Remarks: Rotary open hole drilled to 30mbgl. Water strike/wet at 17mbgl.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation					
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT1-C Sheet 1 of 1	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283950.00mE 193517.00mN		Hole Type: RO	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:200	
Diameter of Boring: 115mm				Depth of Casing: 1.50m				Dates 22/06/2021 - 22/06/2021		Logged By: APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
							2.00				BOULDER CLAY. (Driller's Description)	1
							2.50				COAL. (Driller's Description)	2
											MUDSTONE. (Driller's Description)	3
												4
												5
												6
												7
												8
												9
												10
												11
												12
												13
												14
												15
												16
												17
												18
												19
												20
	 21.00										21	
											22	
											23	
											24	
											25	
											26	
											27	
											28	
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											36	
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											38	
											39	
											40	

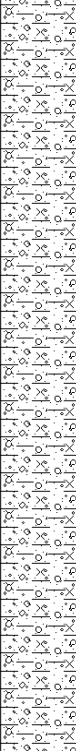
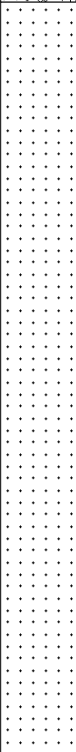
Remarks: Rotary open hole drilled to 30mbgl. Water strike/wet at 21mbgl.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation					
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT1-D Sheet 1 of 1	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283954.00mE 193530.00mN		Hole Type: RO	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:200	
Diameter of Boring: 115mm				Depth of Casing: 1.50m				Dates 22/06/2021 - 22/06/2021		Logged By: APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
											BOULDER CLAY. (Driller's Description)	1
											COAL. (Driller's Description)	2
											MUDSTONE. (Driller's Description)	3
												4
												5
												6
												7
											COAL. (Driller's Description)	7
											MUDSTONE with SANDSTONE bands. (Driller's Description)	8
												9
												10
												11
												12
												13
												14
												15
												16
												17
												18
											COAL. (Driller's Description)	19
											SANDSTONE with MUDSTONE bands. (Driller's Description)	20
												21
												22
												23
												24
												25
												26
												27
												28
												29
	30											
	31											
	32											
	33											
	34											
	35											
	36											
	37											
	38											
	39											
	40											

Remarks: Rotary open hole drilled to 30mbgl. Water strike not recorded.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation					
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		Integral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT2 Sheet 1 of 6	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283850.00mE 193725.00mN		Hole Type: RO	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:25	
Diameter of Boring: 115mm				Depth of Casing: 3.00m				Dates 05/07/2021 - 06/07/2021		Logged By: APEX+RAH	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
							2.50				BOULDER CLAY. (Driller's Description)	1
											SANDSTONE. (Driller's Description)	3
												4
												5

Remarks: Rotary open hole drilled to 9.0mbgl, rotary cored to 15.0mbgl, rotary hole hole drilled to 30mbgl. Water strike not recorded.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation					
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 Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT2 Sheet 3 of 6	
		Location: Maesteg				Client: Pennant Walters (FOELT) Ltd		Coordinates: 283850.00mE 193725.00mN	
Equipment: Klemm		Diameter of Casing: 115mm				Level:		Hole Type: RO	
Diameter of Boring: 115mm		Depth of Casing: 3.00m				Dates 05/07/2021 - 06/07/2021		Scale 1:25	
Logged By: APEX+RAH									

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
		10.50 - 12.00	100	83	43	12					<i>Fmin = 15mm, Fmax = 370mm</i> <i>Fmin = 10mm, Fmax = 270mm</i>	11
		12.00 - 13.50	100	73	53	14					<i>Fmin = 10mm, Fmax = 300mm</i> 13.0m - 13.4m: Heavy ironstone mineralisation. Generally non-intact recovered as fine to coarse sub-angular to angular gravel and cobbles.	12
		13.50 - 15.00	100	93	40	>20					Medium strong to strong closely to medium spaced fractured grey locally brown slightly weathered fine to medium grained SANDSTONE. (Weathered Bedrock) Fractures are sub-horizontal, planar, open, rough and stepped. Locally tight. (Bedding) <i>Fmin = 5mm, Fmax = 270mm</i>	13
							13.50					
							15.00					

Remarks: Rotary open hole drilled to 9.0mbgl, rotary cored to 15.0mbgl, rotary hole hole drilled to 30mbgl. Water strike not recorded.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		
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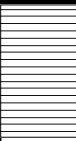
[illegible]

		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT2-A Sheet 1 of 1	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283851.00mE 193734.00mN		Hole Type: RO	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:200	
Diameter of Boring: 115mm				Depth of Casing: 3.00m				Dates 06/07/2021 - 06/07/2021		Logged By: APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
							2.70				PEAT over BOULDER CLAY. (Driller's Description)	1
											SANDSTONE with MUDSTONE bands. (Driller's Description)	2
												3
												4
												5
												6
												7
												8
												9
												10
												11
												12
												13
												14
												15
												16
												17
												18
												19
												20
												21
												22
												23
												24
												25
												26
												27
												28
												29
									30.00			End of Borehole at 30.00 m
											31	
											32	
											33	
											34	
											35	
											36	
											37	
											38	
											39	
											40	

Remarks: Rotary open hole drilled to 30mbgl. Water strike not recorded.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation				
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT2-B Sheet 1 of 1	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283853.00mE 193715.00mN		Hole Type: RO	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:200	
Diameter of Boring: 115mm				Depth of Casing: 3.00m				Dates 06/07/2021 - 06/07/2021		Logged By: APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
							2.70				PEAT over BOULDER CLAY. (Driller's Description)	1
											2	
											3	
											4	
											5	
											6	
											7	
											8	
											9	
											10	
											11	
											12	
											13	
											14	
											15	
											16	
											17	
											18	
											19	
											20	
											21	
											22	
											23	
											24	
											25	
											26	
											27	
											28	
											29	
												25.50
						26.50			26			
										MUDSTONE. (Driller's Description)	27	
										28		
										29		
										30		
						30.00				End of Borehole at 30.00 m		30
												31
												32
												33
												34
												35
												36
												37
												38
												39
												40

Remarks: Rotary open hole drilled to 30mbgl. Water strike not recorded.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT2-C Sheet 1 of 1	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283843.00mE 193717.00mN		Hole Type: RO	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:200	
Diameter of Boring: 115mm				Depth of Casing: 3.00m				Dates 06/07/2021 - 06/07/2021		Logged By: APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
							2.70				PEAT over BOULDER CLAY. (Driller's Description)	1
											2	
											3	
											4	
											5	
											6	
											7	
											8	
											9	
											10	
											11	
											12	
											13	
											14	
											15	
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											20	
											21	
											22	
											23	
											24	
											25	
											26	
											27	
											28	
											29	
												30.00
									31			
										MUDSTONE. (Driller's Description)	32	
										33		
										34		
										35		
										36		
										37		
										38		
										39		
										40		
										41		
End of Borehole at 30.00 m												

Remarks: Rotary open hole drilled to 30mbgl. Water strike not recorded.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation					
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Intégral Géotechnique		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT202 Sheet 2 of 6			
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283835.00mE 193698.00mN		Hole Type: RC			
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:25			
Diameter of Boring:				Depth of Casing: 1.50m				Dates 23/06/2021 - 23/06/2021		Logged By: RAH+APEX			
Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description		
		Depth (m)	TCR	SCR	RQD	FI							
		4.70 - 6.20	100	47	27	18	6.20				Bedrock) Fracture set 1: Sub-horizontal to 20° rough, tight and open and planar. (Bedding) Fracture set 2: Sub-vertical to 45°, rough, undulating, open. Locally stepped. Frequent iron staining along planes. Non intact: 4.7m - 4.9m. Recovered as fine to coarse angular gravel. 6.0m - 6.2m. Recovered as coarse gravel and cobbles of angular sandstone. <u>Fmin = 10mm, Fmax = 120mm</u>	6	
		6.20 - 7.70	100	64	40	19					Very weak to medium strong very closely to medium spaced fractured grey mottled rusty brown thinly to medium bedded fine to medium grained SANDSTONE. (Weathered Bedrock) Fracture set 1: Sub-horizontal to 20° rough, tight and open and planar. (Bedding) Fracture set 2: Sub-vertical to 45°, rough, undulating, open. Locally stepped. Frequent iron staining along planes. Non intact: 6.2m - 6.3m. Recovered as cobbles. Non intact: 8.05m - 8.3m. Recovered as fine to coarse blocky sandstone with frequent iron and manganese staining. <u>Fmin = 1mm, Fmax = 280mm</u>	7	
		7.70 - 9.20	100	45	38	12	8.50				<u>Fmin = 10mm, Fmax = 570mm</u>	8	
		9.20									Medium strong to strong closely to medium spaced fractured grey thinly to medium bedded slightly weathered fine to medium grained SANDSTONE with occasional thin coal traces (<1mm thick). (Weathered Bedrock) Fractures are sub-horizontal to 10° rough, undulating and open. Often along coal traces. (Bedding)	9	
											9.20 - 10.70	100	64
Remarks: Dynamic sampled to 1.7mbgl, rotary cored to 15.2mbgl, rotary open hole drilled to 30mbgl. Water strike not recorded.										Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone) W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation			

		Integral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT202 Sheet 3 of 6	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283835.00mE 193698.00mN		Hole Type: RC	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:25	
Diameter of Boring:				Depth of Casing: 1.50m				Dates 23/06/2021 - 23/06/2021		Logged By: RAH+APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
		10.70 - 12.20	100	81	71	10	12.20				spaced) fracture zone. Recovered as fine to coarse angular gravel. 11.80m - Localised coal traces up to 2mm thick. <i>Fmin = 60mm, Fmax = 400mm</i> <i>Fmin = 10mm/20mm, Fmax = 330mm</i>	11
		12.20 - 13.70	95	63	48	14					Medium strong to strong very closely to medium spaced fractured grey thinly to medium bedded slightly weathered fine to medium grained SANDSTONE with occasional thin coal traces (<1mm thick) and localised sub-rounded gravel sized clasts of mixed lithologies. (Weathered Bedrock) Fractures are generally sub-horizontal to 10° rough, undulating and open. Often along coal traces. (Bedding) Non intact: 13.0m - 13.1m - Concentrated (extremely closely spaced) fracture zone. Recovered as fine to coarse angular gravel. 13.23m - 13.27m. Recovered as fine to medium angular gravel. 14.8m - 15.1m. Recovered as lighter grey medium to coarse sub-angular to angular cobbles. <i>Fmin = 10mm, Fmax = 250mm</i>	13
		13.70 - 15.20	96	55	49	6					<i>Stiff to hard grey brown CLAY band.</i> <i>Fmin = 30mm, Fmax = 400mm</i>	14

Remarks: Dynamic sampled to 1.7mbgl, rotary cored to 15.2mbgl, rotary open hole drilled to 30mbgl. Water strike not recorded.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation					
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT202 Sheet 4 of 6	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283835.00mE 193698.00mN		Hole Type: RC	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:25	
Diameter of Boring:				Depth of Casing: 1.50m				Dates 23/06/2021 - 23/06/2021		Logged By: RAH+APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
							15.20				NO RETURNS. (Driller's Description)	
							18.00				Very Soft Drill. Possible Coal. No recovery. (Driller's Description)	
							18.80				Normal drill. No recovery. (Driller's Description) [Sandstone]	

Remarks: Dynamic sampled to 1.7mbgl, rotary cored to 15.2mbgl, rotary open hole drilled to 30mbgl. Water strike not recorded.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation					
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT202 Sheet 6 of 6	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283835.00mE 193698.00mN		Hole Type: RC	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:25	
Diameter of Boring:				Depth of Casing: 1.50m				Dates 23/06/2021 - 23/06/2021		Logged By: RAH+APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description										
		Depth (m)	TCR	SCR	RQD	FI															
							27.00					26									
							28.20				Soft drill. No recovery. (Driller's Description)	27									
							30.00				Normal drill. No recovery. (Driller's Description)	28									
							30.00				[Sandstone]	29									
							30.00					30									
End of Borehole at 30.00 m																					

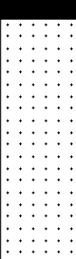
Remarks:
 Dynamic sampled to 1.7mbgl, rotary cored to 15.2mbgl, rotary open hole drilled to 30mbgl.
 Water strike not recorded.

Key:
 D - Small disturbed sample
 B - Bulk disturbed sample
 ES - Environmental soil sample
 SPT - Standard Penetration Test (split spoon)
 CPT - Standard Penetration Test (solid cone)

W - Water sample
 U - Undisturbed sample
 TCR - Total Core Recovery
 SCR - Solid Core Recovery
 RQD - Rock Quality Designation

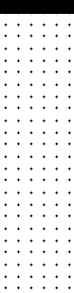


		Integral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT202-D Sheet 1 of 1	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283830.00mE 193689.00mN		Hole Type: RO	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:200	
Diameter of Boring: 115mm				Depth of Casing: 1.50m				Dates 23/06/2021 - 24/06/2021		Logged By: APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description				
		Depth (m)	TCR	SCR	RQD	FI									
							1.70				BOULDER CLAY. (Driller's Description)	1			
												SANDSTONE. (Driller's Description)	2		
													3		
													4		
													5		
													6		
													7		
													8		
													9		
													10		
													11		
													12		
												14.00		COAL. (Driller's Description)	14
														SANDSTONE. (Driller's Description)	15
													16		
													17		
													18		
													19		
													20		
													21		
												21.80		VOID. (Driller's Description)	22
												22.10		Normal drill. No recovery. (Driller's Description)	23
												22.60		BACKFILLED WORKINGS.	
											24.00		Broken ground with voids. (Driller's Description)	24	
													Normal drill. No recovery. (Driller's Description)	25	
														26	
														27	
														28	
														29	
											30.00				30
			31												
			32												
			33												
			34												
			35												
			36												
			37												
			38												
			39												
			40												

Remarks: Rotary open hole drilled to 30mbgl. Water strike not recorded.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation					
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		Integral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT202-E Sheet 1 of 1	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283825.00mE 193698.00mN		Hole Type: RO	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:200	
Diameter of Boring: 115mm				Depth of Casing: 1.50m				Dates 23/06/2021 - 23/06/2021		Logged By: APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description			
		Depth (m)	TCR	SCR	RQD	FI								
							1.70				BOULDER CLAY. (Driller's Description)	1		
											SANDSTONE. (Driller's Description)	2		
												3		
												4		
												5		
												6		
												7		
												8		
												9		
												10		
												11		
												12		
												13		
												14		
										14.50			COAL with MUDSTONE. (Driller's Description)	15
										15.80			SANDSTONE with MUDSTONE bands. (Driller's Description)	16
														17
														18
														19
														20
														21
														22
										23.30			VOID.	23
										24.00			BACKFILLED WORKINGS. (Driller's Description)	24
24.50			Normal Drill. No recovery. (Driller's Description)	25										
				26										
				27										
				28										
				29										
30.00			End of Borehole at 30.00 m	30										
				31										
				32										
				33										
				34										
				35										
				36										
				37										
				38										
				39										
				40										

Remarks: Rotary open hole drilled to 30mbgl. Water strike not recorded.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation					
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT5 Sheet 1 of 6	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283092.00mE 194327.00mN		Hole Type: RC	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:25	
Diameter of Boring:				Depth of Casing: 3.00m				Dates 02/07/2021 - 05/07/2021		Logged By: RAH+APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
							0.15				Grass over, soft brown/dark brown slightly silty slightly sandy peaty CLAY with frequent roots. (Topsoil)	
											Stiff orange brown mottled brown and grey slightly silty slightly sandy to sandy gravelly CLAY. Gravel comprises fine to coarse sub-rounded to sub-angular sandstone. (Glacial Till)	1
							1.10					
											(Medium dense) orange brown and grey slightly silty sandy GRAVEL of fine to coarse sub-angular to sub-angular blocky sandstone. (Highly Weathered Bedrock)	2
							3.00					
		3.00 - 4.50	100	61	18	>20				Weak to medium strong (and strong) extremely closely to closely spaced fractured brown and grey thinly to very thinly bedded moderately weathered medium to coarse grained SANDSTONE. (Weathered Bedrock) Fractures are generally sub-horizontal to 45°, frequently along bedding planes, open, rough, planar and undulating. Occasionally sub-vertical. Frequent iron staining along fracture surfaces. Fractures are more concentrated down to 3.9mbgl. Non intact: 3.0m - 3.15m and 3.8m - 3.9m. Recovered as fine to coarse angular to sub-angular gravel. <i>Fmin = 5mm, Fmax = 140mm</i>	3	
							4.50			Very weak to medium strong extremely closely to closely spaced fractured brown and grey thinly to very thinly bedded moderately weathered medium to coarse grained SANDSTONE. (Weathered Bedrock) Fractures are generally sub-horizontal to 45°, frequently along bedding planes, open, rough, planar and undulating.	4	
												5

Remarks: Dynamic sampled to 3.0mbgl, rotary cored to 15.0mbgl, rotary open hole drilled to 30mbgl. Water strike not recorded.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation					
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT5 Sheet 2 of 6	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283092.00mE 194327.00mN		Hole Type: RC	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:25	
Diameter of Boring:				Depth of Casing: 3.00m				Dates 02/07/2021 - 05/07/2021		Logged By: RAH+APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
		4.50 - 6.00	100	22	0	>20	6.00				Occasionally sub-vertical. Frequent iron staining along fracture surfaces. Fractures are locally broken to gravel/gravel infilled. 4.7m - 4.9m - Very concentrated fracture zone. Locally recovered as non intact. Non intact: 5.7m - 5.9m. Recovered as clayey sandy fine to coarse angular gravel. <u>Fmin = 2mm, Fmax = 90mm</u>	6
		6.00 - 7.50	100	39	15	>20					Very weak to medium strong extremely closely to closely spaced fractured brown and grey thinly to very thinly bedded moderately weathered medium to coarse grained SANDSTONE. (Weathered Bedrock) Fracture set 1: Sub-horizontal to 10-20°, smooth, tight and planar. (Bedding) Fracture set 2: Sub-vertical to 70°, smooth, tight, stepped and rough and open. Locally gravel infilled. Concentrated fracture zones between 6.2m - 6.5m and 7.2m - 7.35m. Intersecting fracture sets. <u>Fmin = 2mm, Fmax = 130mm</u>	
		7.50 - 9.00	100	53	29	>20	7.50				Very weak to strong extremely closely to closely spaced fractured grey thinly bedded fine to medium grained SANDSTONE. (Weathered Bedrock) Fracture set 1: Sub-horizontal to 10-20°, smooth, tight and planar. (Bedding) Fracture set 2: Sub-vertical to 70°, smooth, tight, stepped and rough and open. Locally gravel infilled. Localised iron and manganese staining along fracture surfaces. 7.6m - 7.83m - Concentrated fracture zone. Locally non-intact. Non intact: 8.1m - 8.17m. Recovered as fine to medium sub-angular to angular gravel. 11.56m - 11.67m and 12.83m - 12.9m. Recovered as coarse angular gravel. <u>Fmin = 2mm, Fmax = 200mm</u>	8
		9.00 - 10.50	100	56	26	>20					<u>Fmin = 2mm, Fmax = 240mm</u>	
												10

Remarks: Dynamic sampled to 3.0mbgl, rotary cored to 15.0mbgl, rotary open hole drilled to 30mbgl. Water strike not recorded.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation					
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Intégral Géotechnique		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT5 Sheet 3 of 6	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283092.00mE 194327.00mN		Hole Type: RC	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:25	
Diameter of Boring:				Depth of Casing: 3.00m				Dates 02/07/2021 - 05/07/2021		Logged By: RAH+APEX	
Well	Water Strikes	Rotary Coring				Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD						
		10.50 - 12.00	100	60	45	>20	12.00				10.0m - 10.4m: Localised fine gravel sized sub-rounded ironstone nodules. 10.0m - 11.5m: Locally frequent 1-3mm thick coal traces. Coal is often weathered to coarse sand. <u>Fmin = 5mm, Fmax = 160mm</u> 10.8m: Localised lenticular pyrite mineralisation. Seen as 80mm x 5m lens.
		12.00 - 13.50	100	75	31	20	13.50				Very weak to medium strong very closely to closely spaced fractured grey thinly bedded fine to medium grained SANDSTONE. (Weathered Bedrock) Fracture set 1: Sub-horizontal to 10-20°, smooth, tight and planar. (Bedding) Fracture set 2: Sub-vertical to 70°, smooth, tight, stepped and rough and open. Locally gravel infilled. Localised iron and manganese staining along fracture surfaces. <u>Fmin = 5mm, Fmax = 140mm</u>
		13.50 - 15.00	100	49	10	>20	15.00				Very weak to strong extremely closely to closely spaced fractured grey thinly bedded fine to medium grained SANDSTONE with localised coal traces (1mm - 3mm thick). (Weathered Bedrock) Fracture set 1: Predominantly sub-horizontal to 10-20°, smooth, tight and planar. (Bedding) Fracture set 2: Very occasional sub-vertical to 70°, smooth, tight, stepped and rough and open. Locally gravel infilled. Localised iron and manganese staining along fracture surfaces. Non intact: 14.3m - 14.45m. Recovered as fine to coarse angular gravel. ...Below 14.5m: Occasional sub-vertical quartz veins (2mm - 3mm thick). <u>Fmin = 10mm, Fmax = 150mm</u>
Remarks: Dynamic sampled to 3.0mbgl, rotary cored to 15.0mbgl, rotary open hole drilled to 30mbgl. Water strike not recorded.											
Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone) W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation											
											

 Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT5 Sheet 4 of 6				
		Location: Maesteg				Client: Pennant Walters (FOELT) Ltd		Coordinates: 283092.00mE 194327.00mN				
Equipment: Klemm				Diameter of Casing: 115mm		Level:		Hole Type: RC				
Diameter of Boring:				Depth of Casing: 3.00m		Dates 02/07/2021 - 05/07/2021		Logged By: RAH+APEX				
Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
											SANDSTONE. (Driller's Description)	16
												17
												18
												19
												20

Remarks:
 Dynamic sampled to 3.0mbgl, rotary cored to 15.0mbgl, rotary open hole drilled to 30mbgl.
 Water strike not recorded.

Key:
 D - Small disturbed sample
 B - Bulk disturbed sample
 ES - Environmental soil sample
 SPT - Standard Penetration Test (split spoon)
 CPT - Standard Penetration Test (solid cone)

W - Water sample
 U - Undisturbed sample
 TCR - Total Core Recovery
 SCR - Solid Core Recovery
 RQD - Rock Quality Designation





Intégral Géotechnique		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT6 Sheet 1 of 6							
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 282858.00mE 194597.00mN		Hole Type: RC							
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:25							
Diameter of Boring:				Depth of Casing: 3.00m				Dates 02/07/2021 - 02/07/2021		Logged By: RAH+APEX							
Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description						
		Depth (m)	TCR	SCR	RQD	FI											
											Grass over, soft dark brown to black slightly sandy peaty silty CLAY with abundant roots. (Topsoil)						
											0.20						Firm orange brown slightly gravelly sandy silty CLAY. Gravel comprises fine to coarse sub-rounded to angular sandstone. (Glacial Till)
											0.65						(Medium dense) brown silty sandy GRAVEL with occasional cobbles. Gravel comprises fine to coarse sub-angular to angular sandstone. (Glacial Till)
											2.60						(Medium dense) brown slightly silty very sandy GRAVEL of fine to coarse sub-angular to angular sandstone. (Highly Weathered Bedrock)
											3.00						...Becoming SAND and GRAVEL.
											3.70						Broken SANDSTONE: Recovered as, orange brown and brown slightly silty very sandy GRAVEL of fine to coarse angular sandstone. (Highly Weathered to Moderately Weathered Bedrock) <i>Fmin = 3mm, Fmax = 70mm</i> <i>[2 x 0.8m core runs]</i>
											3.00 - 4.60	94	19	0		N/A	Weak to medium strong extremely closely to closely spaced fractured light grey thinly bedded fine to medium grained SANDSTONE. (Weathered Bedrock)
																	Fracture set 1: Sub-horizontal to 15°, rough, planar and partially open. (Bedding) Fracture set 2: Sub-vertical to 70°, rough, undulating, planar, open. Localised iron staining along fractures.
																	Non intact: 3.8m - 4.0m and 4.3m - 4.4m. Recovered as fine to coarse sub-angular to angular gravel.
											4.60						Weak to medium strong, locally strong, extremely closely to closely spaced fractured light grey thinly bedded medium grained SANDSTONE. (Weathered Bedrock)
							Fracture set 1: Sub-horizontal to 15°, rough, planar and partially open with localised iron staining. (Bedding)										
Remarks: Dynamic sampled to 3.0mbgl, rotary cored to 15.1mbgl, rotary open hole drilled to 30mbgl. Water strike not recorded.																	
Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone) W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation																	
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT6 Sheet 2 of 6	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 282858.00mE 194597.00mN		Hole Type: RC	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:25	
Diameter of Boring:				Depth of Casing: 3.00m				Dates 02/07/2021 - 02/07/2021		Logged By: RAH+APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
		4.60 - 6.10	100	51	7	>20	6.10				Fracture set 2: Less frequent, sub-vertical to 70°, rough, undulating, planar, open. More common down to 5.0mbgl. <i>Fmin = 3mm, Fmax = 110mm</i>	6
		6.10 - 7.60	100	53	21	>20					Weak to medium strong very closely spaced fractured to closely spaced fractured light grey thinly bedded medium grained SANDSTONE. (Weathered Bedrock) Fracture set 1: Sub-horizontal to 15°, rough, planar and partially open with localised iron staining. (Bedding) Fracture set 2: Less frequent, sub-vertical, rough, undulating, planar, open. Non intact: 6.75m - 6.8m. Recovered as fine to medium angular gravel. <i>Fmin = 5mm, Fmax = 160mm</i>	
		7.60 - 9.10	100	47	17	>20	9.10				Weak to medium strong extremely closely to closely spaced fractured light grey thinly bedded medium grained SANDSTONE. (Weathered Bedrock) Fracture set 1: Sub-horizontal to 15°, rough, planar and partially open with localised iron staining. (Bedding) Fracture set 2: Less frequent, sub-vertical, rough, undulating, planar, open. Non intact: 7.6m - 7.8m. Recovered as coarse angular gravel with cobbles. 7.95m - 8.05m - Gravel infilled fractures with localised black manganese staining. <i>Fmin = 5mm, Fmax = 180mm</i>	8
		9.10 - 10.60	100	65	51	>20					Weak to medium strong very closely spaced fractured to closely spaced fractured light grey thinly bedded medium grained SANDSTONE with localised coal traces (1 to 2mm thick). (Weathered Bedrock) Fracture set 1: Sub-horizontal to 15°, rough, planar and partially open with localised iron staining. (Bedding) Fracture set 2 (very limited): Sub-vertical, rough, undulating, planar, open. <i>Fmin = 2mm, Fmax = 210mm</i>	
												10

Remarks:
 Dynamic sampled to 3.0mbgl, rotary cored to 15.1mbgl, rotary open hole drilled to 30mbgl.
 Water strike not recorded.

Key:
 D - Small disturbed sample
 B - Bulk disturbed sample
 ES - Environmental soil sample
 SPT - Standard Penetration Test (split spoon)
 CPT - Standard Penetration Test (solid cone)

W - Water sample
 U - Undisturbed sample
 TCR - Total Core Recovery
 SCR - Solid Core Recovery
 RQD - Rock Quality Designation



		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT6 Sheet 3 of 6	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 282858.00mE 194597.00mN		Hole Type: RC	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:25	
Diameter of Boring:				Depth of Casing: 3.00m				Dates 02/07/2021 - 02/07/2021		Logged By: RAH+APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
							10.60				Extremely closely spaced fractured zone: Recovered as, coarse gravel and cobbles of sandstone. Iron and manganese staining along fractures.	
		10.60 - 12.10	100	80	75	16					Medium strong to very strong closely to medium spaced fractured light grey thinly to very thinly bedded slightly weathered fine to medium grained SANDSTONE with localised coal traces (1mm - 2mm thick). (Weathered Bedrock) Fractures are sub-horizontal, open, rough and planar. (Bedding) Non intact: 12.47m - 12.55m. Recovered as fine to coarse angular gravel with frequent traces of coal. 12.68m - 12.82m - Abundant rusty brown iron staining. <u>Fmin = 5mm, Fmax = 310mm</u>	11
		12.10 - 13.60	100	88	71	12	13.60				<u>Fmin = 40mm, Fmax = 300mm</u>	12
		13.60 - 15.10	100	3	0	>20					Medium strong to strong extremely closely to closely spaced fractured light grey, locally orange brown, thinly bedded medium grained SANDSTONE. Frequent iron staining. (Weathered Bedrock) Fracture set 1: Sub-horizontal, rough, planar and open with localised iron staining. (Bedding) Fracture set 2: Vertical to sub-vertical, rough, undulating, planar, open. Iron stained and with evidence of water movement (scalloped edge). <u>Fmin = 5mm, Fmax = 0.040mm</u> Vertical fracture extends (largely continuously) through core from 14.0m - 15.1m. Evidence of water movement - scalloped weathering along fracture surfaces.	14
												15

Remarks: Dynamic sampled to 3.0mbgl, rotary cored to 15.1mbgl, rotary open hole drilled to 30mbgl. Water strike not recorded.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation					
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT6 Sheet 4 of 6		
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 282858.00mE 194597.00mN		Hole Type: RC		
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:25		
Diameter of Boring:				Depth of Casing: 3.00m				Dates 02/07/2021 - 02/07/2021		Logged By: RAH+APEX		
Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
							15.10				SANDSTONE. (Driller's Description	
												16
												17
												18
												19
												20

Remarks:
 Dynamic sampled to 3.0mbgl, rotary cored to 15.1mbgl, rotary open hole drilled to 30mbgl.
 Water strike not recorded.

Key:
 D - Small disturbed sample
 B - Bulk disturbed sample
 ES - Environmental soil sample
 SPT - Standard Penetration Test (split spoon)
 CPT - Standard Penetration Test (solid cone)

W - Water sample
 U - Undisturbed sample
 TCR - Total Core Recovery
 SCR - Solid Core Recovery
 RQD - Rock Quality Designation



 Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT6 Sheet 6 of 6			
		Location: Maesteg				Client: Pennant Walters (FOELT) Ltd		Coordinates: 282858.00mE 194597.00mN			
Equipment: Klemm		Diameter of Casing: 115mm				Level:		Hole Type: RC			
Diameter of Boring:		Depth of Casing: 3.00m				Dates 02/07/2021 - 02/07/2021		Logged By: RAH+APEX			
Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description
		Depth (m)	TCR	SCR	RQD	FI					
											



		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT8 Sheet 2 of 6	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 284016.00mE 194027.00mN		Hole Type: RC	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:25	
Diameter of Boring:				Depth of Casing: 1.50m				Dates 24/06/2021 - 24/06/2021		Logged By: RAH+APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
		4.50 - 6.00	100	9	9	>20	6.00				Fracture set 2: Highly irregular. Sub-vertical to 70°, rough, open, undulating and frequently broken to gravel along fractures. Non intact: 4.73m - 4.79m and 4.8m - 4.95m. Recovered as fine to coarse angular gravel. <i>Fmin = 2mm, Fmax = 130mm</i>	6
		6.00 - 7.50	100	35	25	>20					Very weak to medium strong extremely closely to closely spaced fractured brown and grey very thinly to thinly bedded moderately weathered fine to medium grained SANDSTONE. (Weathered Bedrock) Occasional coal traces below 6.5m (1mm - 2mm thick). Fracture set 1: Sub-horizontal to 10°, rough, open and planar. Frequently broken to gravel. (Bedding) Fracture set 2: Highly irregular. Sub-vertical to 70°, rough, open, undulating and frequently broken to gravel along fractures. Non intact: 6.43m - 6.48m, 6.55m - 6.6m, 6.76m - 6.79m and 7.2m - 7.27m. Recovered as fine to medium angular gravel. <i>Fmin = 2mm, Fmax = 160mm</i>	
		7.50 - 9.00	100	63	50	>20	7.50				Very weak to medium strong extremely closely to medium spaced fractured brown and grey thinly to medium bedded moderately weathered fine to medium grained SANDSTONE. (Weathered Bedrock) Fracture set 1: Sub-horizontal to 10°, rough, open and planar. (Bedding) Frequently broken to gravel. Fracture set 2: Highly irregular. Sub-vertical to 70°, rough, open, undulating and frequently broken to gravel along fractures. Non intact: 7.78m - 7.88m and 8.3m - 8.33m. Recovered as fine to coarse gravel. <i>Fmin = 2mm, Fmax = 200mm</i> 8.7m - 8.9m: Concentrated fracture zone with large sub-vertical fractures.	8
		9.00 - 10.50	73	1	22	6	9.00				Medium strong to strong closely spaced fractured grey and brown medium bedded slightly weathered medium to coarse grained SANDSTONE. (Weathered Bedrock) Fracture set 1: Sub-horizontal, smooth and planar. (Bedding) Non intact: 9.4m - 9.7m. Recovered as coarse angular gravel of brown sandstone.	
								9.70				Bright black COAL. Recovered as extremely weak fine to medium platy gravel. (Weathered Bedrock)
						10.00						

Remarks: Dynamic sampled to 1.5mbgl, rotary cored to 15.0mbgl, rotary open hole drilled to 30mbgl. Water strike not recorded.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation					
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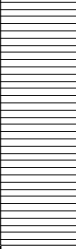
		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT8 Sheet 4 of 6							
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 284016.00mE 194027.00mN		Hole Type: RC							
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:25							
Diameter of Boring:				Depth of Casing: 1.50m				Dates 24/06/2021 - 24/06/2021		Logged By: RAH+APEX							
Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description						
		Depth (m)	TCR	SCR	RQD	FI											
											MUDSTONE. (Driller's Description)						
									19.50						16		
															17		
												18					
												19					
												20					
							20.00										
Remarks: Dynamic sampled to 1.5mbgl, rotary cored to 15.0mbgl, rotary open hole drilled to 30mbgl. Water strike not recorded.								Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation					

		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT8 Sheet 5 of 6	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 284016.00mE 194027.00mN		Hole Type: RC	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:25	
Diameter of Boring:				Depth of Casing: 1.50m				Dates 24/06/2021 - 24/06/2021		Logged By: RAH+APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
							21.00				VOID. (Driller's Description)	
											Very Soft Drill. No recovery. (Driller's Description)	21
							23.00				Normal drill. No recovery. (Driller's Description)	23
											[Sandstone/Mudstone]	
												24
												25

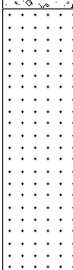
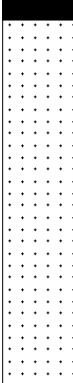
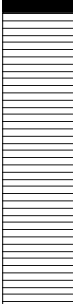
Remarks: Dynamic sampled to 1.5mbgl, rotary cored to 15.0mbgl, rotary open hole drilled to 30mbgl. Water strike not recorded.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation					
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		Integral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT8-A Sheet 1 of 1	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 284023.00mE 194033.00mN		Hole Type: RO	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:200	
Diameter of Boring: 115mm				Depth of Casing: 1.50m				Dates 25/06/2021 - 25/06/2021		Logged By: APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description			
		Depth (m)	TCR	SCR	RQD	FI								
							1.20				BOULDER CLAY. (Driller's Description)	1		
												SANDSTONE. (Driller's Description)	2	
													3	
													4	
													5	
													6	
													7	
													8	
													9	
													10	
													COAL. (Driller's Description)	11
													MUDSTONE with SANDSTONE bands. (Driller's Description)	12
													13	
													14	
													15	
													16	
													17	
													18	
													19	
													20	
													VOID. (Driller's Description)	21
													BROKEN GROUND - BACKFILLED WORKINGS. (Driller's Description)	23
													Normal drill. No recovery. (Driller's Description)	24
												[Sandstone/mudstone]	25	
													26	
													27	
													28	
													29	
													30	
												32		
												33		
												34		
												35		
												36		
												37		
												38		
												39		
												40		

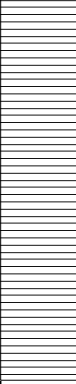
Remarks: Rotary open hole drilled to 30mbgl. Water strike not recorded.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation					
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		Integral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT8-B Sheet 1 of 1	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 284025.00mE 194023.00mN		Hole Type: RO	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale: 1:200	
Diameter of Boring: 115mm				Depth of Casing: 1.50m				Dates: 25/06/2021 - 25/06/2021		Logged By: APEX	

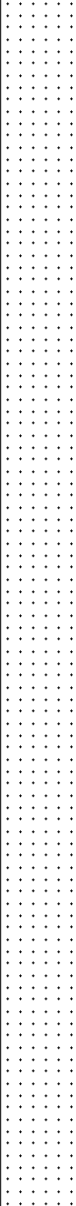
Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description		
		Depth (m)	TCR	SCR	RQD	FI							
							1.00				BOULDER CLAY. (Driller's Description)	1	
												SANDSTONE. (Driller's Description)	2
												3	
												4	
												5	
												6	
												7	
												8	
							8.40					COAL with MUDSTONE. (Driller's Description)	9
							9.60						SANDSTONE. (Driller's Description)
											11		
											12		
											13		
											14		
											15		
											16		
											17		
											18		
											19		
							19.50					COAL. (Driller's Description)	20
							20.00						MUDSTONE. (Driller's Description)
							21.40						COAL. (Driller's Description)
							22.20						MUDSTONE with SANDSTONE bands. (Driller's Description)
											24		
											25		
											26		
											27		
											28		
											29		
											30		
30.00	End of Borehole at 30.00 m										30		
	31												
	32												
	33												
	34												
	35												
	36												
	37												
	38												
	39												
	40												

Remarks: Rotary open hole drilled to 30mbgl. Water strike not recorded.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation					
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT8-C Sheet 1 of 1	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 284019.00mE 194017.00mN		Hole Type: RO	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:200	
Diameter of Boring: 115mm				Depth of Casing: 1.50m				Dates 25/06/2021 - 25/06/2021		Logged By: APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
							1.20				BOULDER CLAY. (Driller's Description)	1
										SANDSTONE - Broken. (Driller's Description)	2	
							3					
							4					
							5					
							6					
							6.50				COAL with MUDSTONE. (Driller's Description)	7
							7.50				MUDSTONE. (Driller's Description)	8
							9					
							10					
							11					
							12					
							13					
							14					
							15					
							16					
							16.70				COAL. (Driller's Description)	17
							17.70				MUDSTONE. (Driller's Description)	18
							19.00				COAL. (Driller's Description)	19
							19.40				MUDSTONE with SANDSTONE bands. (Driller's Description)	20
21												
22												
23												
24												
25												
26												
27												
28												
29												
30.00	End of Borehole at 30.00 m										30	
31												
32												
33												
34												
35												
36												
37												
38												
39												
40												

Remarks: Rotary open hole drilled to 30mbgl. Water strike not recorded.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation					
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT8-D Sheet 1 of 6		
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 284016.00mE 194017.00mN		Hole Type: RO		
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:25		
Diameter of Boring: 115mm				Depth of Casing: 1.50m				Dates 28/06/2021 - 28/06/2021		Logged By: APEX+RAH		
Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
							1.00				BOULDER CLAY. (Driller's Description)	
												SANDSTONE/MUDSTONE. (Driller's Description)
												2
												3
												4
												5

Remarks:
 Rotary open hole drilled to 9.0mbgl, rotary cored to 15.0mbgl, rotary hole hole drilled to 30mbgl.
 Water strike not recorded.

Key:
 D - Small disturbed sample
 B - Bulk disturbed sample
 ES - Environmental soil sample
 SPT - Standard Penetration Test (split spoon)
 CPT - Standard Penetration Test (solid cone)

W - Water sample
 U - Undisturbed sample
 TCR - Total Core Recovery
 SCR - Solid Core Recovery
 RQD - Rock Quality Designation





		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT8-D Sheet 4 of 6		
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 284016.00mE 194017.00mN		Hole Type: RO		
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:25		
Diameter of Boring: 115mm				Depth of Casing: 1.50m				Dates 28/06/2021 - 28/06/2021		Logged By: APEX+RAH		
Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
							19.00				BROKEN GROUND AND VOIDS. No returns. (Driller's Description)	16
											Normal drill. No recovery. (Driller's Description)	19
												20

Remarks:
 Rotary open hole drilled to 9.0mbgl, rotary cored to 15.0mbgl, rotary hole hole drilled to 30mbgl.
 Water strike not recorded.

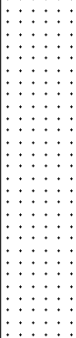
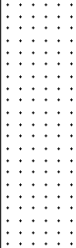
Key:
 D - Small disturbed sample
 B - Bulk disturbed sample
 ES - Environmental soil sample
 SPT - Standard Penetration Test (split spoon)
 CPT - Standard Penetration Test (solid cone)

W - Water sample
 U - Undisturbed sample
 TCR - Total Core Recovery
 SCR - Solid Core Recovery
 RQD - Rock Quality Designation



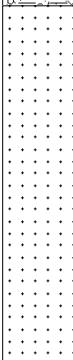
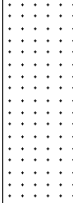
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT8-E Sheet 1 of 1	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 284006.00mE 194027.00mN		Hole Type: RO	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:200	
Diameter of Boring: 115mm				Depth of Casing: 1.50m				Dates 25/06/2021 - 25/06/2021		Logged By: APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description		
		Depth (m)	TCR	SCR	RQD	FI							
							1.20				BOULDER CLAY. (Driller's Description)	1	
											SANDSTONE. (Driller's Description)	2	
										3			
										4			
										5			
										6			
										7			
										8			
										9			
										10			
										11			
								10.50				COAL. (Driller's Description)	11
								11.00				MUDSTONE with SANDSTONE bands. (Driller's Description)	12
											13		
											14		
											15		
											16		
											17		
											18		
											19		
											20		
											21		
								20.90				COAL. (Driller's Description)	21
								21.60				MUDSTONE. (Driller's Description)	22
								22.60					COAL. (Driller's Description)
								23.00			SANDSTONE with MUDSTONE bands. (Driller's Description)		24
											25		
											26		
											27		
											28		
								29					
								30					
								31					
								32					
								33					
								34					
								35					
								36					
								37					
								38					
								39					
								40					

Remarks: Rotary open hole drilled to 30mbgl. Water strike not recorded.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation					
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		Integral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT8-F Sheet 1 of 1	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 284011.00mE 194035.00mN		Hole Type: RO	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:200	
Diameter of Boring: 115mm				Depth of Casing: 1.50m				Dates 25/06/2021 - 25/06/2021		Logged By: APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description		
		Depth (m)	TCR	SCR	RQD	FI							
							1.50				BOULDER CLAY. (Driller's Description)	1	
												SANDSTONE. (Driller's Description)	2
												3	
												4	
												5	
												6	
												7	
												8	
												9	
												10	
												11.10	
							11.60					MUDSTONE with SANDSTONE bands. (Driller's Description)	
							13						
							14						
							15						
							16						
							17						
							18						
							19						
							20.00					SANDSTONE. (Driller's Description)	20
							21						
							22.50					VOID. (Driller's Description)	22
							23						
							23.50					Soft drill. No recovery. (Driller's Description)	23
							24						
							24.40					Normal drill. No recovery. (Driller's Description)	24
							25						
							26						
							27						
							28						
29													
30.00	End of Borehole at 30.00 m										30		
31													
32													
33													
34													
35													
36													
37													
38													
39													
40													

Remarks: Rotary open hole drilled to 30mbgl. Water strike not recorded.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation					
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm			Project No.: 12826		Borehole No.: BHT9 Sheet 2 of 6	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd			Coordinates: 283737.00mE 194202.00mN		Hole Type: RC	
Equipment: Klemm				Diameter of Casing: 115mm			Level:		Scale 1:25	
Diameter of Boring:				Depth of Casing: 3.00m			Dates 01/07/2021 - 01/06/2021		Logged By: RAH+APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
							5.30					
		5.30 - 6.80	100	31	0	>20					Very weak to medium strong extremely closely to closely spaced fractured grey and brown very thinly bedded slightly to moderately weathered fine becoming coarse grained SANDSTONE. (Weathered Bedrock) Fracture set 1: Sub-horizontal to 10/20°, planar, stepped, rough, open and locally gravel infilled/broken down to gravel. (Bedding) Fracture set 2: Sub-vertical to 70° rough, partially open stepped fractures with iron staining. Non intact: 6.6m - 6.8m. Recovered ass coarse gravel and small cobbles of angular blocky sandstone. <i>Fmin = 5mm, Fmax = 100mm</i>	6
		6.80 - 8.30	100	60	45	18					Weak to medium strong extremely closely to very closely spaced fractured grey, locally orange brown, thinly bedded moderately weathered fine to medium grained SANDSTONE. Weathered Bedrock) Fracture set 1: Sub-horizontal, planar, rough, open, with ironstone remineralisation. (Bedding) Fracture set 2: Sub-vertical to 45/60°, irregular, open, rough and stepped with heavy ironstone remineralisation and localised fine to coarse gravel infill. <i>Fmin = 3mm, Fmax = 230mm</i> 7.18m - 7.48m - Non-intact: Recovered as fine to coarse gravel with small cobbles of blocky and angular sandstone with localised lenticular ironstone remineralisation and small 4mm - 10mm pebble beds. 8.0m - 8.3m: Heavily ironstone remineralised with frequent pebble beds.	7
		8.30 - 9.80	100	8	8	>20					Weak to medium strong extremely closely spaced fractured orange brown and grey thinly bedded moderately weathered fine to medium grained SANDSTONE. (Weathered Bedrock) Heavy ironstone remineralisation (re-cemented). Possible evidence of mylonites along fracture surfaces. Fractures are chaotic and variably angled. Rough, planar, stepped open and with frequent ironstone remineralisation. Localised vuggy cavities approximately 10mm - 15mm in diameter. <i>Fmin = 2mm, Fmax = 120mm</i>	9
							9.80					
											Weak to medium strong extremely closely to closely spaced fractured orange brown and grey thinly bedded moderately weathered fine to medium grained SANDSTONE. (Weathered	10

Remarks:
 Dynamic sampled to 2.3mbgl, rotary cored to 15.3mbgl, rotary open hole drilled to 30mbgl.
 Water strike not recorded.

Key:
 D - Small disturbed sample
 B - Bulk disturbed sample
 ES - Environmental soil sample
 SPT - Standard Penetration Test (split spoon)
 CPT - Standard Penetration Test (solid cone)

W - Water sample
 U - Undisturbed sample
 TCR - Total Core Recovery
 SCR - Solid Core Recovery
 RQD - Rock Quality Designation



Intégral Géotechnique		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT9 Sheet 3 of 6	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283737.00mE 194202.00mN		Hole Type: RC	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:25	
Diameter of Boring:				Depth of Casing: 3.00m				Dates 01/07/2021 - 01/06/2021		Logged By: RAH+APEX	
Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description
		Depth (m)	TCR	SCR	RQD	FI					
		9.80 - 11.30	100	11	11	>20	11.30				Bedrock) Heavy ironstone remineralisation (re-cemented). Possible evidence of mylonites along fracture surfaces. Fractures are chaotic and variably angled. Rough, planar, stepped open and with frequent ironstone remineralisation. Localised vuggy cavities approximately 10mm - 15mm in diameter. Non intact: 9.8m - 10.0m and 11.1m - 11.3m. Recovered as fine to coarse angular, blocky gravel of sandstone. <u>Fmin = 2mm, Fmax = 160mm</u>
		11.30 - 12.30	100	11	8	>20					Extremely weak to medium strong extremely closely to closely fractured grey moderately weathered fine to medium grained SANDSTONE. (Weathered Bedrock) Fracture set 1: Sub-horizontal, tight and irregular. (Bedding) Fracture set 2: 45° to 75°, irregular, tight and open and intersecting with evidence of secondary ironstone remineralisation. Non intact: 11.3m - 11.35m and 12.15m - 12.3m. Recovered as coarse sub-rounded to angular and blocky gravel of sandstone with small cobbles. <u>Fmin = 2mm, Fmax = 160mm</u>
		12.30 - 13.80	97	38	30	4	12.30				Non-intact SANDSTONE: Recovered as orange brown slightly clayey fine to coarse gravel and cobbles of angular fine grained sandstone.
							12.70				Medium strong to strong closely spaced fractured to medium spaced fractured grey thinly bedded to medium bedded slightly weathered fine to medium grained SANDSTONE. (Weathered Bedrock) Fractures are generally sub-horizontal to 30°, curved, rough and open. <u>Fmin = 240mm, Fmax = 450mm</u>
		13.80 - 15.30	100	17	17	>20	13.80				Medium strong to strong extremely closely to closely spaced fractured grey thinly bedded to medium bedded slightly weathered fine to medium grained SANDSTONE. (Weathered Bedrock) Fracture set 1: Sub-horizontal, tight, rough and stepped. Fracture set 2: Vertical to sub-vertical, rough, stepped and open. 14.35m - 14.55: Concentrated irregular fracture zone. 14.5m - 14.9m: Sub-vertical fracture extending through centre of core. <u>Fmin = 1mm, Fmax = 160mm</u>
Remarks: Dynamic sampled to 2.3mbgl, rotary cored to 15.3mbgl, rotary open hole drilled to 30mbgl. Water strike not recorded.											
Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone) W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation											
											

		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT9 Sheet 4 of 6		
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283737.00mE 194202.00mN		Hole Type: RC		
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:25		
Diameter of Boring:				Depth of Casing: 3.00m				Dates 01/07/2021 - 01/06/2021		Logged By: RAH+APEX		
Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
							15.30					
											SANDSTONE with MUDSTONE bands. (Driller's Description)	
												16
												17
												18
												19
												20

Remarks:
 Dynamic sampled to 2.3mbgl, rotary cored to 15.3mbgl, rotary open hole drilled to 30mbgl.
 Water strike not recorded.

Key:
 D - Small disturbed sample
 B - Bulk disturbed sample
 ES - Environmental soil sample
 SPT - Standard Penetration Test (split spoon)
 CPT - Standard Penetration Test (solid cone)

W - Water sample
 U - Undisturbed sample
 TCR - Total Core Recovery
 SCR - Solid Core Recovery
 RQD - Rock Quality Designation





		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT9-A Sheet 1 of 1	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283744.00mE 194208.00mN		Hole Type: RO	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:200	
Diameter of Boring: 115mm				Depth of Casing: 3.00m				Dates 30/06/2021 - 30/06/2021		Logged By: APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
							2.60				BOULDER CLAY. (Driller's Description)	1
											2	
											3	
											4	
											5	
											6	
											7	
											8	
											9	
											10	
											11	
											12	
											13	
											14	
											15	
											16	
											17	
											18	
											19	
											20	
											21	
											22	
											23	
											24	
											25	
											26	
											27	
											28	
											29	
31												
32												
33												
34												
35												
36												
37												
38												
39												
40												

Remarks: Rotary open hole drilled to 30mbgl. Water strike not recorded.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation					
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT9-B Sheet 1 of 1	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283743.00mE 194194.00mN		Hole Type: RO	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:200	
Diameter of Boring: 115mm				Depth of Casing: 1.50m				Dates 30/06/2021 - 01/07/2021		Logged By: APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
							1.80				BOULDER CLAY. (Driller's Description)	1
												SANDSTONE with MUDSTONE bands. (Driller's Description)
												3
												4
												5
												6
												7
												8
												9
												10
												11
												12
												13
												14
												15
												16
												17
												18
												19
												20
												21
												22
												23
												24
												25
												26
												27
												28
												29
							30.00				End of Borehole at 30.00 m	30
												31
												32
												33
												34
												35
												36
												37
												38
												39
												40

Remarks: Rotary open hole drilled to 30mbgl. Water strike not recorded.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT9-C Sheet 1 of 1	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283729.00mE 194195.00mN		Hole Type: RO	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:200	
Diameter of Boring: 115mm				Depth of Casing: 1.50m				Dates 30/06/2021 - 30/06/2021		Logged By: APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
							2.20				BOULDER CLAY. (Driller's Description)	1
											SANDSTONE with MUDSTONE bands. (Driller's Description)	2
												3
												4
												5
												6
												7
												8
												9
												10
												11
												12
												13
												14
												15
												16
												17
												18
												19
												20
												21
												22
												23
												24
												25
												26
												27
												28
												29
								30.00				End of Borehole at 30.00 m
												31
												32
												33
												34
												35
												36
												37
												38
												39
												40

Remarks: Rotary open hole drilled to 30mbgl. Water strike not recorded.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT9-D Sheet 1 of 1	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283770.00mE 194209.00mN		Hole Type: RO	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:200	
Diameter of Boring: 115mm				Depth of Casing: 1.50m				Dates 30/06/2012 - 30/06/2021		Logged By: APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description		
		Depth (m)	TCR	SCR	RQD	FI							
							1.50				BOULDER CLAY. (Driller's Description)	1	
												SANDSTONE. (Driller's Description)	2
												3	
											4		
											5		
											6		
											7		
											8		
											9		
											10		
											11		
											12		
											13		
											13.80		
											14.10		
												COAL. (Driller's Description)	14
												SANDSTONE with MUDSTONE bands. (Driller's Description)	15
											16		
											17		
											18		
											19		
											20		
											21		
											22		
											23		
											24		
											25		
											26		
											27		
											28		
29													
30.00													
End of Borehole at 30.00 m											30		
												31	
												32	
												33	
												34	
												35	
												36	
												37	
												38	
												39	
												40	

Remarks: Rotary open hole drilled to 30mbgl. Water strike not recorded.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation				
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Intégral Géotechnique Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT10 Sheet 1 of 6					
Location: Maesteg		Client: Pennant Walters (FOELT) Ltd				Coordinates: 283709.00mE 194446.00mN		Hole Type: RC					
Equipment: Klemm		Diameter of Casing: 115mm				Level:		Scale 1:25					
Diameter of Boring:		Depth of Casing: 4.50m				Dates 29/06/2021 - 30/06/2021		Logged By: RAH+APEX					
Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description		
		Depth (m)	TCR	SCR	RQD	FI							
							0.20				Grass over, soft dark brown to black sandy peaty silty CLAY with frequent roots. (Topsoil)		
							0.60				(Medium dense) brown and orange brown clayey/silty very sandy GRAVEL of fine to coarse sub-rounded to angular sandstone with occasional cobbles. (Glacial Till)		
											(Medium dense) orange brown, brown and dark brown silty/clayey SAND and GRAVEL with occasional cobbles. Gravel and cobbles comprise fine to coarse sub-rounded to sub-angular sandstone. (Glacial Till)		
											(Dense) mottled brown and black sandy GRAVEL of fine to coarse sub-angular sandstone. With frequent black manganese staining and orange brown iron staining. (Highly Weathered to Moderately Weathered Bedrock)		
											Weak to medium strong extremely closely spaced to very closely spaced fractured brown and grey fine grained SANDSTONE. (Weathered Bedrock)		
											Fractures are generally irregular, rough, open, stepped and undulating.		
Remarks: Dynamic sampled to 4.5mbgl, rotary cored to 21.0mbgl, rotary open hole drilled to 30mbgl. Water strike not recorded.													
Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone) W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation													

Intégral Géotechnique Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT10 Sheet 2 of 6						
Location: Maesteg		Client: Pennant Walters (FOELT) Ltd				Coordinates: 283709.00mE 194446.00mN		Hole Type: RC						
Equipment: Klemm		Diameter of Casing: 115mm				Level:		Scale 1:25						
Diameter of Boring:		Depth of Casing: 4.50m				Dates 29/06/2021 - 30/06/2021		Logged By: RAH+APEX						
Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description			
		Depth (m)	TCR	SCR	RQD	FI								
		4.50 - 6.00	73	3	0	>20	6.30				No discernable bedding. Non intact: 5.4m - 6.0m and 6.0m - 6.3m. Recovered as brown clayey sandy fine to medium sub-rounded to angular gravel. <i>Fmin = 1mm, Fmax = 15mm</i>	6		
											<i>Fmin = 2mm, Fmax = 150mm</i>			
		6.00 - 7.50	100	67	33	>20	6.60				Soft to firm, becoming stiff, dark grey, becoming grey brown, silty CLAY with frequent fine to medium sub-angular to angular mudstone lithorelicts. (Weathered Bedrock) ...Grading into extremely weak mudstone. Extremely weak closely fractured grey mottled brown friable MUDSTONE. (Weathered Bedrock) Weak to medium strong extremely closely to very closely spaced fractured brown and grey thinly bedded fine grained SANDSTONE. (Weathered Bedrock) Fracture set 1: Sub-horizontal to 10/20°, rough, tight and planar. (Bedding) Fracture set 2: 45° to 60°, open, rough, stepped and generally irregular. Localised iron staining along fracture surfaces.	7		
							6.75							
							7.50				Weak to medium strong extremely closely to closely spaced fractured brown and grey thinly bedded fine grained SANDSTONE. (Weathered Bedrock) Fracture set 1: Sub-horizontal to 10/20°, rough, tight and planar. (Bedding) Fracture set 2: 45° to sub-vertical, open, rough, stepped with frequent fine gravel along fracture planes. 8.0m - 8.5m: Localised up to fine gravel sized fragments of coal. Non intact: 7.5m - 7.6m. Recovered as brown clayey sandy fine to medium sub-rounded to angular gravel. 8.25m - 8.4m. Extremely closely fractured zone, recovered as fine to coarse angular gravel. <i>Fmin = 1mm, Fmax = 100mm</i>	8		
		7.50 - 9.00	100	27	7	>20	9.00					9		
		9.00 - 10.50	100	31	0	>20					Extremely weak to very weak extremely closely to closely spaced fractured dark grey MUDSTONE. (Weathered Bedrock) Fracture set 1: Sub-horizontal, tight, planar and rough. (Bedding) Fracture set 2: 45° to sub-vertical, tight and open, rough, stepped and undulating. Frequent iron staining along fractures. Non intact: 10.3 - 10.5m. Recovered as fine to coarse angular to sub-angular gravel. <i>Fmin = 1mm, Fmax = 50mm</i>	10		
Remarks: Dynamic sampled to 4.5mbgl, rotary cored to 21.0mbgl, rotary open hole drilled to 30mbgl. Water strike not recorded.												Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone) W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		

		Integral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm			Project No.: 12826		Borehole No.: BHT10 Sheet 3 of 6	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd			Coordinates: 283709.00mE 194446.00mN		Hole Type: RC	
Equipment: Klemm				Diameter of Casing: 115mm			Level:		Scale 1:25	
Diameter of Boring:				Depth of Casing: 4.50m			Dates 29/06/2021 - 30/06/2021		Logged By: RAH+APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
							10.50					
		10.50 - 12.00	100	29	15	>20					Extremely weak to very weak closely spaced fractured dark grey MUDSTONE. (Weathered Bedrock) Fracture set 1: Sub-horizontal, tight, planar and rough. (Bedding) Fracture set 2: 45° to sub-vertical, tight and open, rough, stepped and undulating. Occasional gravel infill along fracture planes. Frequent iron staining along fractures. Non intact: 10.55m - 10.7m and 10.9m - 11.1m. Recovered as fine to coarse angular to sub-angular gravel with some clay matrix. <u>10.5m - 10.55m: Subordinate SANDSTONE bed.</u> <u>Fmin = 1mm, Fmax = 130mm</u> <u>10.7m - 10.9m: Subordinate SANDSTONE bed.</u>	11
		12.00 - 13.50	100	0	0	>20					Non-intact SANDSTONE: Weak light grey extremely closely to very closely spaced fractured light grey to grey fine to medium grained SANDSTONE. Recovered as sub-angular blocky gravel with cobbles. (Weathered Bedrock) Discontinuities are chaotic at variable angles, open, rough, stepped and undulating. 12.65m - 12.9m is intact sandstone core. <u>Fmin = 1mm, Fmax = 60mm</u>	12
		13.50 - 15.00	100	0	0	>20					<u>Fmin = 1mm, Fmax = 50mm</u>	13
							15.00					14
												15

Remarks: Dynamic sampled to 4.5mbgl, rotary cored to 21.0mbgl, rotary open hole drilled to 30mbgl. Water strike not recorded.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation					
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		Integral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT10 Sheet 4 of 6		
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283709.00mE 194446.00mN		Hole Type: RC		
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:25		
Diameter of Boring:				Depth of Casing: 4.50m				Dates 29/06/2021 - 30/06/2021		Logged By: RAH+APEX		
Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
											SANDSTONE with MUDSTONE bands. (Driller's Description)	
												16
												17
												18
												19
												20

Remarks:
 Dynamic sampled to 4.5mbgl, rotary cored to 21.0mbgl, rotary open hole drilled to 30mbgl.
 Water strike not recorded.

Key:
 D - Small disturbed sample
 B - Bulk disturbed sample
 ES - Environmental soil sample
 SPT - Standard Penetration Test (split spoon)
 CPT - Standard Penetration Test (solid cone)

W - Water sample
 U - Undisturbed sample
 TCR - Total Core Recovery
 SCR - Solid Core Recovery
 RQD - Rock Quality Designation





		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm			Project No.: 12826		Borehole No.: BHT11 Sheet 1 of 6	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd			Coordinates: 283503.00mE 194707.00mN		Hole Type: RC	
Equipment: Klemm				Diameter of Casing: 115mm			Level:		Scale 1:25	
Diameter of Boring:				Depth of Casing: 1.50m			Dates 28/06/2021 - 29/06/2021		Logged By: RAH+APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
							0.15				Grass over, dark brown to black slightly sandy peaty silty CLAY with frequent roots. (Topsoil)	
							0.50				Firm orange brown gravelly very sandy silty CLAY. Gravel comprises fine to coarse sub-angular sandstone. (Glacial Till)	
											(Medium dense) brown slightly silty to silty SAND and GRAVEL with occasional cobbles. Gravel and cobble comprises fine to coarse sub-rounded to angular sandstone. (Glacial Till)	
											[Poor recovery - 0.8m of 1.5m]	1
		1.50 - 3.00	50	0	0	N/A	1.50				Non-intact SANDSTONE: Recovered as dark brown slightly sandy fine to coarse sub-angular to angular GRAVEL of sandstone. (Highly Weathered Bedrock)	2
							3.00				Weak to medium strong extremely closely to closely spaced fractured grey, weathered to orange brown, moderately weathered fine grained SANDSTONE with occasional coal traces (1mm - 2mm thick). (Weathered Bedrock)	
		3.00 - 4.50	100	32	15	>20					Fracture set 1: Sub-horizontal to 10/20°, rough, planar, tight and open. Locally gravel infilled. (Bedding) Fracture set 2: Sub-vertical to 45°, irregular, tight and open, undulating and locally gravel infilled. Non intact: 3.0m - 3.1m, 3.5m - 3.57m and 3.7m - 3.75m. Recovered as fine to coarse gravel of angular sandstone. <i>Fmin = 1mm, Fmax = 120mm</i> <i>3.2m - 3.4m: Lenticular lens of coal, fractured along coal.</i>	3
							4.50				Medium strong to strong very closely to closely spaced fractured grey slightly weathered medium to coarse grained SANDSTONE. (Weathered Bedrock)	
											Fracture set 1: Sub-horizontal to 10/20°, rough, planar and open. Frequent iron and manganese staining. (Bedding) Fracture set 2: Less frequent, irregular, sub-vertical and	4
												5

Remarks: Dynamic sampled to 1.5mbgl, rotary cored to 15.0mbgl, rotary open hole drilled to 30mbgl. Water strike not recorded.		Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)		W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		
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		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm				Project No.: 12826		Borehole No.: BHT11 Sheet 2 of 6	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd				Coordinates: 283503.00mE 194707.00mN		Hole Type: RC	
Equipment: Klemm				Diameter of Casing: 115mm				Level:		Scale 1:25	
Diameter of Boring:				Depth of Casing: 1.50m				Dates 28/06/2021 - 29/06/2021		Logged By: RAH+APEX	

Well	Water Strikes	Rotary Coring					Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description	
		Depth (m)	TCR	SCR	RQD	FI						
		4.50 - 6.00	100	53	39	13	6.00				frequently iron stained. Non intact: 4.5m - 4.58m. Recovered as medium to coarse angular gravel. <u>Fmin = 10mm, Fmax = 260mm</u>	6
		6.00 - 7.50	100	35	7	>20					Very weak to medium strong extremely closely fractured to closely spaced fractured grey and orange brown moderately weathered fine to medium grained SANDSTONE. (Weathered Bedrock) Fracture set 1: Sub-horizontal to 10/20°, rough, planar and open. Frequent iron and manganese staining. (Bedding) Fracture set 2: Less frequent, irregular, sub-vertical and frequently iron stained. Non intact: 8.8m - 9.0m. Recovered as coarse angular gravel and cobbles. <u>Fmin = 10mm, Fmax = 110mm</u>	
		7.50 - 9.00	100	63	43	>20	9.00				<u>Fmin = 25mm, Fmax = 190mm</u>	8
		9.00 - 10.50	100	35	19	16					Very weak to medium strong extremely closely to closely spaced fractured orange brown and grey thinly bedded moderately weathered fine to medium grained SANDSTONE. (Weathered Bedrock) Fracture set 1: Sub-horizontal to 10/20°, rough, planar and open. Frequent iron and manganese staining. (Bedding) Fracture set 2: Less frequent, irregular, sub-vertical and frequently iron stained. Non intact: 9.3m - 9.65m. Recovered as black to dark brown fine to coarse angular to sub-angular and blocky sandstone and coal. 9.8m - 9.98m. Recovered as orange brown fine to coarse sub-angular gravel and cobbles of sandstone.	
												10

Remarks: Dynamic sampled to 1.5mbgl, rotary cored to 15.0mbgl, rotary open hole drilled to 30mbgl. Water strike not recorded.				Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone)				W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation					
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Intégral Géotechnique		Intégral House, 7 Beddau Way Castlegate Business Park Caerphilly CF83 2AX Tel. 029 20807991 Fax. 029 20862176 mail@integralgeotec.com		Project Name: Foel Trawsnant Windfarm					Project No.: 12826		Borehole No.: BHT11 Sheet 3 of 6	
Location: Maesteg				Client: Pennant Walters (FOELT) Ltd					Coordinates: 283503.00mE 194707.00mN		Hole Type: RC	
Equipment: Klemm				Diameter of Casing: 115mm					Level:		Scale 1:25	
Diameter of Boring:				Depth of Casing: 1.50m					Dates 28/06/2021 - 29/06/2021		Logged By: RAH+APEX	
Well	Water Strikes	Rotary Coring				Depth (m)	Level (m AOD)	N Value	Legend	Stratum Description		
		Depth (m)	TCR	SCR	RQD							FI
							10.50			<i>Fmin = 2mm, Fmax = 0.160mm</i>		
		10.50 - 12.00	100	47	34	18				Very weak to medium strong extremely closely to closely spaced fractured grey thinly bedded to medium spaced bedded medium to coarse grained SANDSTONE. With locally abundant coal traces (1mm - 2mm thick) and occasional coarse gravel sized lenses. (Weathered Bedrock) Fracture set 1: Sub-horizontal to 20°, rough, planar and open. (Bedding) Fracture set 2: Less frequent, sub-vertical to 45°, rough, planar and open. 11.0m - 11.4m: Long 70° fracture extends through core. <i>Fmin = 5mm, Fmax = 180mm</i>		
							12.00			Weak closely spaced fractured grey very thinly bedded fine grained SANDSTONE with relict thinly laminated cross bedding. Fractures are sub-horizontal to 10/20°, open, rough and planar. (Bedding) <i>Fmin = 30mm, Fmax = 350mm</i>		
											Medium strong to strong closely to medium spaced fractured light grey slightly weathered medium to coarse grained SANDSTONE. (Weathered Bedrock) Fracture set 1: Sub-horizontal, rough, planar and open with localised traces of coal (1mm-3mm) along bedding planes. (Bedding) Fracture set 2: Occasional sub-vertical, rough, planar and open.	
		12.00 - 13.50	100	83	71	11						
							12.42			<i>Fmin = 30mm, Fmax = 350mm</i>		
		13.50 - 15.00	100	82	58	13						
							15.00					
Remarks: Dynamic sampled to 1.5mbgl, rotary cored to 15.0mbgl, rotary open hole drilled to 30mbgl. Water strike not recorded.										Key: D - Small disturbed sample B - Bulk disturbed sample ES - Environmental soil sample SPT - Standard Penetration Test (split spoon) CPT - Standard Penetration Test (solid cone) W - Water sample U - Undisturbed sample TCR - Total Core Recovery SCR - Solid Core Recovery RQD - Rock Quality Designation		



APPENDIX I

ROTARY CORE PHOTOGRAPHS



Rotary Core Photographs: BHT1

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Rotary Core Photographs: BHT1

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Rotary Core Photographs: BHT1

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Rotary Core Photographs: BHT1

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Rotary Core Photographs: BHT202

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Rotary Core Photographs: BHT2

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Rotary Core Photographs: BHT2

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Rotary Core Photographs: BHT2

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Rotary Core Photographs: BHT5

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Rotary Core Photographs: BHT5

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Rotary Core Photographs: BHT5

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
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Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Rotary Core Photographs: BHT6

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Rotary Core Photographs: BHT6

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
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Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Rotary Core Photographs: BHT6

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
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Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Rotary Core Photographs: BHT8

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Rotary Core Photographs: BHT8

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Rotary Core Photographs: BHT8

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Rotary Core Photographs: BHT8D

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Rotary Core Photographs: BHT9

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Rotary Core Photographs: BHT9

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Rotary Core Photographs: BHT9

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
7 Beddau Way
Castlegate Business Park
Caerphilly
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Tel: 029 2080 7991



Rotary Core Photographs: BHT10

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

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Castlegate Business Park
Caerphilly
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Tel: 029 2080 7991



Rotary Core Photographs: BHT10

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
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Castlegate Business Park
Caerphilly
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Tel: 029 2080 7991



Rotary Core Photographs: BHT10

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
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Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Rotary Core Photographs: BHT11

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
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Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Rotary Core Photographs: BHT11

12826: Foel Trawsnant Windfarm

Intégral
Géotechnique

Intégral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991



Rotary Core Photographs: BHT11

12826: Foel Trawsnant Windfarm

APPENDIX J

LABORATORY GEOTECHNICAL TEST RESULTS (SOILS)

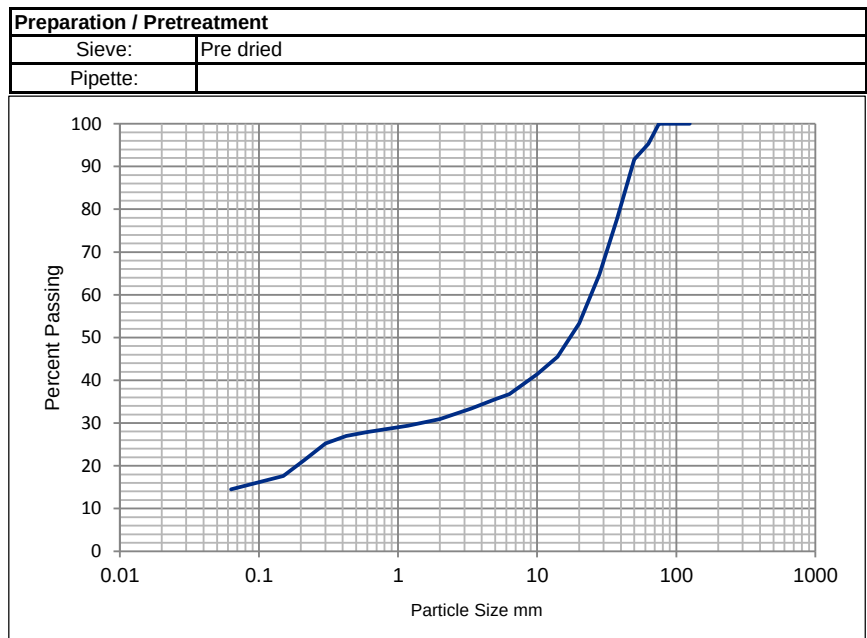
TEST REPORT
PARTICLE SIZE DISTRIBUTION ANALYSIS
BS1377:Part 2:1990

Project No:	D21387	Client:	Integral Geotechnique
Project Name:	Foel Trawsnant Windfarm	Address	Integral House 7 Beddau Way Castlegate Business Park Caerphilly CF83 8PH
ATS Sample No:	25060		

Site Ref / Hole ID:	TP02	Depth (m):	0.80 - 1.20
Sample No:		Sample Type:	Bulk
Sampling Certificate Received:	No	Material Description:	Grey brown clayey sandy GRAVEL with low cobble content
Location in Works:	N/A	Material Source:	Site Generated
Date Sampled:	Unknown	Material Supplier:	Site Generated
Sampled By:	Client	Specification:	BS1377
Date Received:	14 July 2021	Date Tested:	21 July 2021

Test Results

Sieving	
Particle Size mm	% Passing
125	100
90	100
75	100
63	95
50	92
37.5	78
28	65
20	53
14	45
10	41
6.3	37
5.0	36
3.35	33
2.00	31
1.18	29
0.600	28
0.425	27
0.300	25
0.212	21
0.150	18
0.063	14



Sample Portions		Particle Density Mg/m3	Uniformity Coefficient D_{60} / D_{10}
Cobbles / Boulders	5	N/A	
Gravel	64		
Sand	16	Dry mass of sample, kg	
Silt / Clay	14	21.4	N/A

Remarks:

QA Ref.

BS1377 - 4
Rev. 1.0



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Approver

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A Grogan, Laboratory Manager

Date

21/07/2021

Fig

PSD

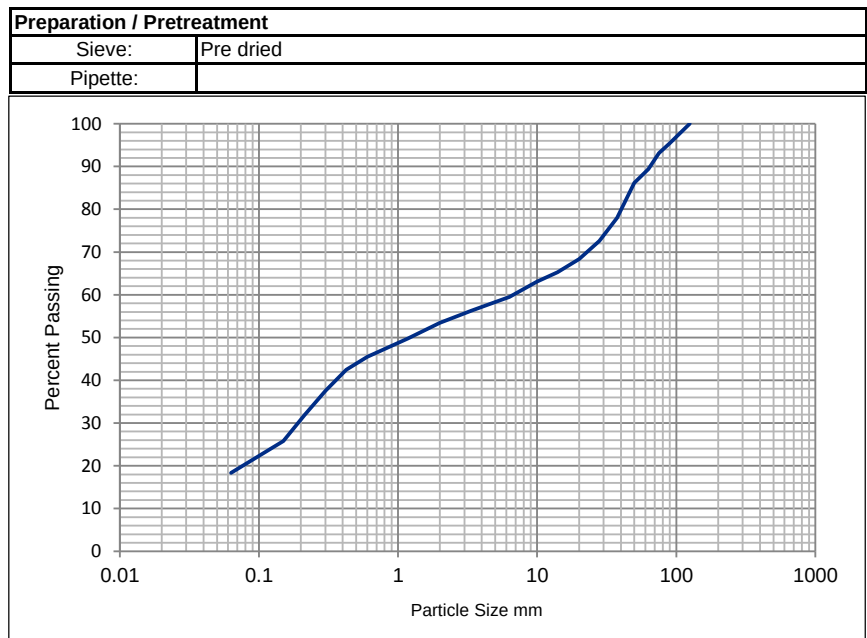
TEST REPORT
PARTICLE SIZE DISTRIBUTION ANALYSIS
BS1377:Part 2:1990

Project No:	D21387	Client:	Integral Geotechnique
Project Name:	Foel Trawsnant Windfarm	Address	Integral House 7 Beddau Way Castlegate Business Park Caerphilly CF83 8PH
ATS Sample No:	25061		

Site Ref / Hole ID:	TP08	Depth (m):	0.40 - 0.65
Sample No:		Sample Type:	Bulk
Sampling Certificate Received:	No	Material Description:	Brown clayey very sandy GRAVEL with medium cobble content
Location in Works:	N/A	Material Source:	Site Generated
Date Sampled:	Unknown	Material Supplier:	Site Generated
Sampled By:	Client	Specification:	BS1377
Date Received:	14 July 2021	Date Tested:	21 July 2021

Test Results

Sieving	
Particle Size mm	% Passing
125	100
90	95
75	93
63	89
50	86
37.5	78
28	73
20	68
14	65
10	63
6.3	59
5.0	58
3.35	56
2.00	53
1.18	50
0.600	46
0.425	42
0.300	38
0.212	32
0.150	26
0.063	18



Sample Portions		Particle Density Mg/m3	Uniformity Coefficient D_{60} / D_{10}
Cobbles / Boulders	11	N/A	
Gravel	36		
Sand	35	Dry mass of sample, kg	
Silt / Clay	18	19.1	N/A

Remarks:

QA Ref.

BS1377 - 4
Rev. 1.0



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Approver

A Grogan

A Grogan, Laboratory Manager

Date

21/07/2021

Fig

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TEST REPORT
Determination Of Water Content
ISO 17892-1: 2014

Project No:	D21387	Client:	Integral Geotechnique
Project Name:	Foel Trawsnant Windfarm	Address:	Integral House 7 Beddau Way Castlegate Business Park Caerphilly CF83 8PH
ATS Sample No:	25062		

Site Ref / Hole ID:	TP10	Depth (m):	0.80 - 0.90
Sample No:		Sample Type:	Bulk
Sampling Certificate Received:	No	Material Description:	Brown silty very sandy GRAVEL
Location in Works:	N/A	Material Source:	Site Generated
Date Sampled:	Unknown	Material Supplier:	Site Generated
Sampled By:	Client	Specification:	BS1377
Date Received:	14 July 2021	Date Tested:	21 July 2021

Test Results

Moisture Content (%)

12.2

Remarks:

QA Ref.

EN ISO 17892-1:2014 E



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Date

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Fig

MC

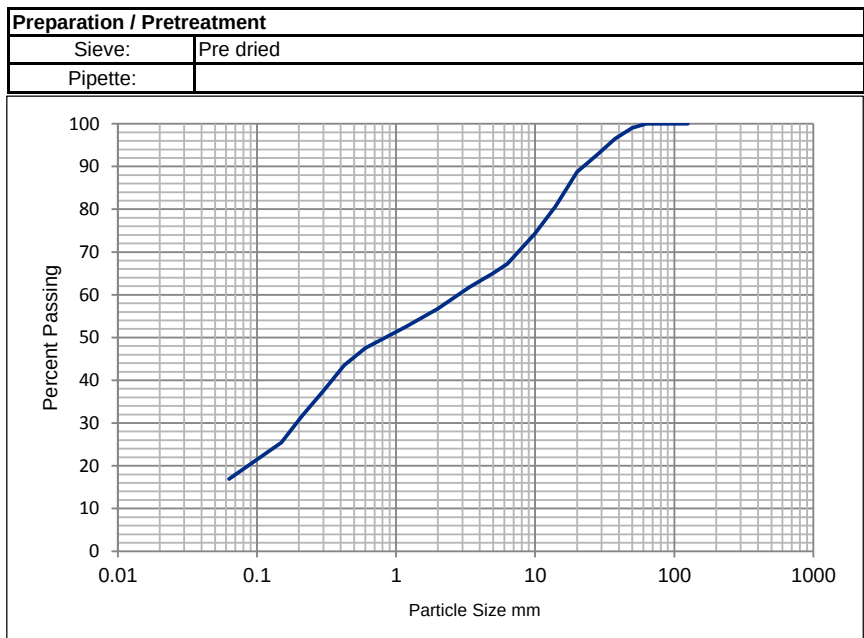
TEST REPORT
PARTICLE SIZE DISTRIBUTION ANALYSIS
BS1377:Part 2:1990

Project No:	D21387	Client:	Integral Geotechnique
Project Name:	Foel Trawsnant Windfarm	Address	Integral House 7 Beddau Way Castlegate Business Park Caerphilly CF83 8PH
ATS Sample No:	25062		

Site Ref / Hole ID:	TP10	Depth (m):	0.80 - 0.90
Sample No:		Sample Type:	Bulk
Sampling Certificate Received:	No	Material Description:	Brown silty very sandy GRAVEL
Location in Works:	N/A	Material Source:	Site Generated
Date Sampled:	Unknown	Material Supplier:	Site Generated
Sampled By:	Client	Specification:	BS1377
Date Received:	14 July 2021	Date Tested:	21 July 2021

Test Results

Sieving	
Particle Size mm	% Passing
125	100
90	100
75	100
63	100
50	99
37.5	97
28	93
20	89
14	81
10	74
6.3	67
5.0	65
3.35	62
2.00	57
1.18	53
0.600	48
0.425	43
0.300	38
0.212	32
0.150	25
0.063	17



Sample Portions		Particle Density Mg/m3	Uniformity Coefficient D ₆₀ / D ₁₀
Cobbles / Boulders	0	N/A	
Gravel	43		
Sand	40	Dry mass of sample, kg	
Silt / Clay	17	21.0	N/A

Remarks:

QA Ref.

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A Grogan, Laboratory Manager

Date

21/07/2021

Fig

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TEST REPORT
Determination Of Water Content
ISO 17892-1: 2014

Project No:	D21387	Client:	Integral Geotechnique
Project Name:	Foel Trawsnant Windfarm	Address:	Integral House 7 Beddau Way Castlegate Business Park Caerphilly CF83 8PH
ATS Sample No:	25063		

Site Ref / Hole ID:	TP13	Depth (m):	0.50 - 0.80
Sample No:		Sample Type:	Bulk
Sampling Certificate Received:	No	Material Description:	Brown very silty very sandy GRAVEL
Location in Works:	N/A	Material Source:	Site Generated
Date Sampled:		Material Supplier:	Site Generated
Sampled By:	Client	Specification:	BS1377
Date Received:	14 July 2021	Date Tested:	21 July 2021

Test Results

Moisture Content (%)

13.2

Remarks:

QA Ref.

EN ISO 17892-1:2014 E



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A Grogan, Laboratory Manager

Date

21/07/2021

Fig

MC

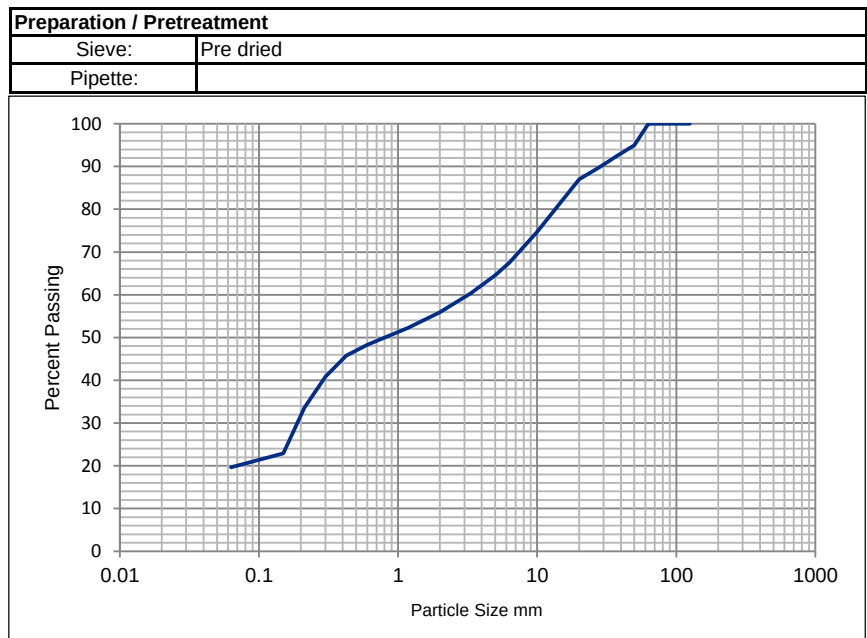
TEST REPORT
PARTICLE SIZE DISTRIBUTION ANALYSIS
BS1377:Part 2:1990

Project No:	D21387	Client:	Integral Geotechnique
Project Name:	Foel Trawsnant Windfarm	Address	Integral House 7 Beddau Way Castlegate Business Park Caerphilly CF83 8PH
ATS Sample No:	25063		

Site Ref / Hole ID:	TP13	Depth (m):	0.50 - 0.80
Sample No:		Sample Type:	Bulk
Sampling Certificate Received:	No	Material Description:	Brown very silty very sandy GRAVEL
Location in Works:	N/A	Material Source:	Site Generated
Date Sampled:		Material Supplier:	Site Generated
Sampled By:	Client	Specification:	BS1377
Date Received:	14 July 2021	Date Tested:	21 July 2021

Test Results

Sieving	
Particle Size mm	% Passing
125	100
90	100
75	100
63	100
50	95
37.5	92
28	90
20	87
14	81
10	75
6.3	68
5.0	65
3.35	60
2.00	56
1.18	52
0.600	48
0.425	46
0.300	41
0.212	34
0.150	23
0.063	20



Sample Portions		Particle Density Mg/m3	Uniformity Coefficient D_{60} / D_{10}
Cobbles / Boulders	0	N/A	
Gravel	44		
Sand	36	Dry mass of sample, kg	
Silt / Clay	20	7.9	N/A

Remarks:

QA Ref.

BS1377 - 4
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Approver

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A Grogan, Laboratory Manager

Date

21/07/2021

Fig

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TEST REPORT
Determination Of Water Content
ISO 17892-1: 2014

Project No: D21387 Project Name: Foel Trawsnant Windfarm ATS Sample No: 25064	Client: Integral Geotechnique Address: Integral House 7 Beddau Way Castlegate Business Park Caerphilly CF83 8PH
--	--

Site Ref / Hole ID: TP17 Sample No: Sampling Certificate Received: No Location in Works: N/A Date Sampled: Unknown Sampled By: Client Date Received: 14 July 2021	Depth (m): 1.00 - 1.40 Sample Type: Bulk Material Description: Grey brown silty very sandy GRAVEL with high cobble content Material Source: Site Generated Material Supplier: Site Generated Specification: BS1377 Date Tested: 21 July 2021
--	---

Test Results

Moisture Content (%)

7.5

Remarks:

QA Ref.

EN ISO 17892-1:2014 E



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A Grogan, Laboratory Manager

Date

21/07/2021

Fig

MC

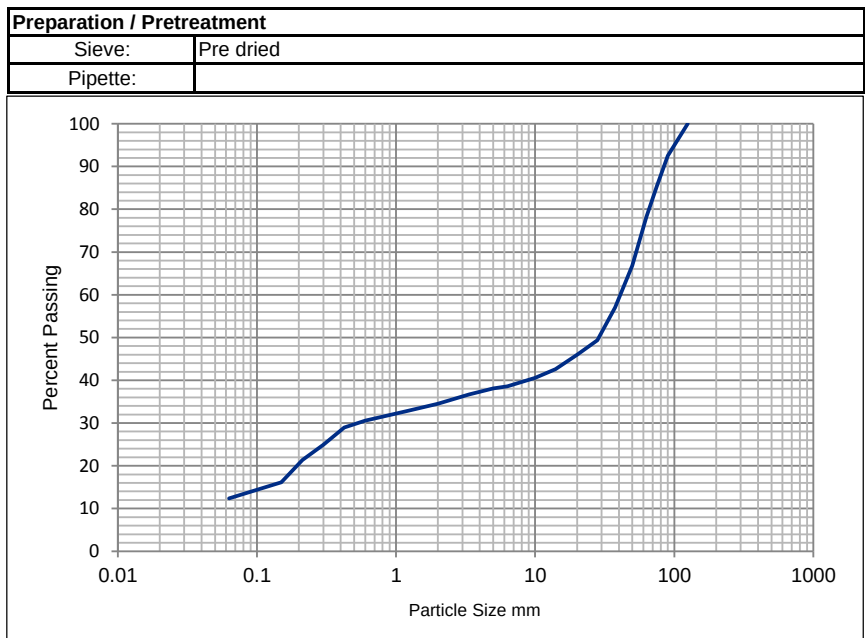
TEST REPORT
PARTICLE SIZE DISTRIBUTION ANALYSIS
BS1377:Part 2:1990

Project No:	D21387	Client:	Integral Geotechnique
Project Name:	Foel Trawsnant Windfarm	Address	Integral House 7 Beddau Way Castlegate Business Park Caerphilly CF83 8PH
ATS Sample No:	25064		

Site Ref / Hole ID:	TP17	Depth (m):	1.00 - 1.40
Sample No:		Sample Type:	Bulk
Sampling Certificate Received:	No	Material Description:	Grey brown silty very sandy GRAVEL with high cobble content
Location in Works:	N/A	Material Source:	Site Generated
Date Sampled:	Unknown	Material Supplier:	Site Generated
Sampled By:	Client	Specification:	BS1377
Date Received:	14 July 2021	Date Tested:	21 July 2021

Test Results

Sieving	
Particle Size mm	% Passing
125	100
90	92
75	85
63	78
50	67
37.5	57
28	49
20	46
14	43
10	41
6.3	39
5.0	38
3.35	37
2.00	34
1.18	33
0.600	31
0.425	29
0.300	25
0.212	21
0.150	16
0.063	12



Sample Portions		Particle Density Mg/m3	Uniformity Coefficient D_{60} / D_{10}
Cobbles / Boulders	22	N/A	
Gravel	44		
Sand	22	Dry mass of sample, kg	
Silt / Clay	12	21.5	N/A

Remarks:

QA Ref.

BS1377 - 4
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Approver

A Grogan

A Grogan, Laboratory Manager

Date

21/07/2021

Fig

PSD

TEST REPORT
Determination Of Water Content
ISO 17892-1: 2014

Project No: D21387 Project Name: Foel Trawsnant Windfarm ATS Sample No: 25065	Client: Integral Geotechnique Address: Integral House 7 Beddau Way Castlegate Business Park Caerphilly CF83 8PH
--	--

Site Ref / Hole ID: TP19 Sample No: Sampling Certificate Received: No Location in Works: N/A Date Sampled: Unknown Sampled By: Client Date Received: 14 July 2021	Depth (m): 0.80 - 1.00 Sample Type: Bulk Material Description: Brown silty sandy GRAVEL with low cobble content Material Source: Site Generated Material Supplier: Site Generated Specification: BS1377 Date Tested: 21 July 2021
--	--

Test Results

Moisture Content (%)

8.7

Remarks:

QA Ref.

EN ISO 17892-1:2014 E



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A Grogan, Laboratory Manager

Date

21/07/2021

Fig

MC

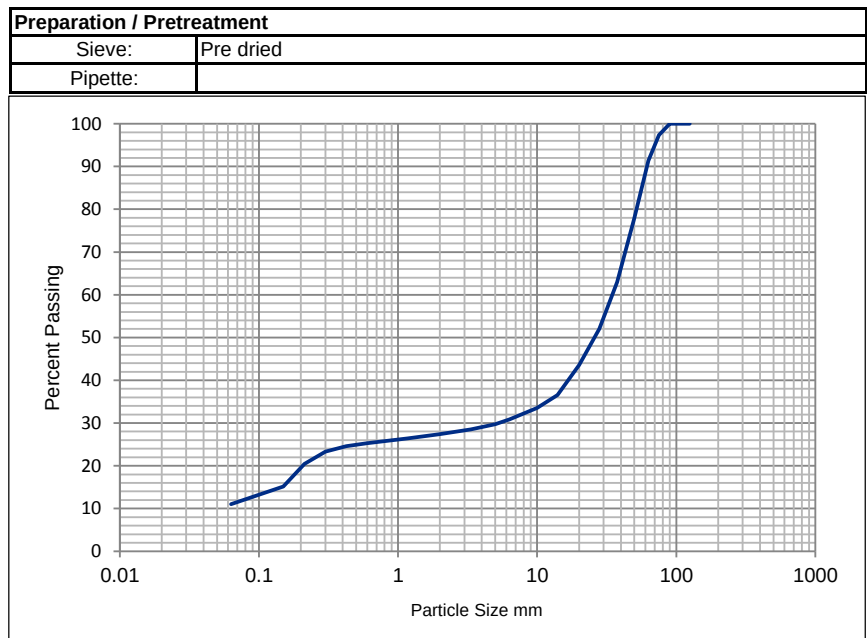
TEST REPORT
PARTICLE SIZE DISTRIBUTION ANALYSIS
BS1377:Part 2:1990

Project No:	D21387	Client:	Integral Geotechnique
Project Name:	Foel Trawsnant Windfarm	Address	Integral House 7 Beddau Way Castlegate Business Park Caerphilly CF83 8PH
ATS Sample No:	25065		

Site Ref / Hole ID:	TP19	Depth (m):	0.80 - 1.00
Sample No:		Sample Type:	Bulk
Sampling Certificate Received:	No	Material Description:	Brown silty sandy GRAVEL with low cobble content
Location in Works:	N/A	Material Source:	Site Generated
Date Sampled:	Unknown	Material Supplier:	Site Generated
Sampled By:	Client	Specification:	BS1377
Date Received:	14 July 2021	Date Tested:	21 July 2021

Test Results

Sieving	
Particle Size mm	% Passing
125	100
90	100
75	97
63	91
50	78
37.5	63
28	52
20	44
14	37
10	33
6.3	31
5.0	30
3.35	29
2.00	27
1.18	26
0.600	25
0.425	25
0.300	23
0.212	20
0.150	15
0.063	11



Sample Portions		Particle Density Mg/m3	Uniformity Coefficient D ₆₀ / D ₁₀
Cobbles / Boulders	9	N/A	
Gravel	64		
Sand	16	Dry mass of sample, kg	
Silt / Clay	11	21.9	N/A

Remarks:

QA Ref.

BS1377 - 4
Rev. 1.0



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Date

21/07/2021

Fig

PSD

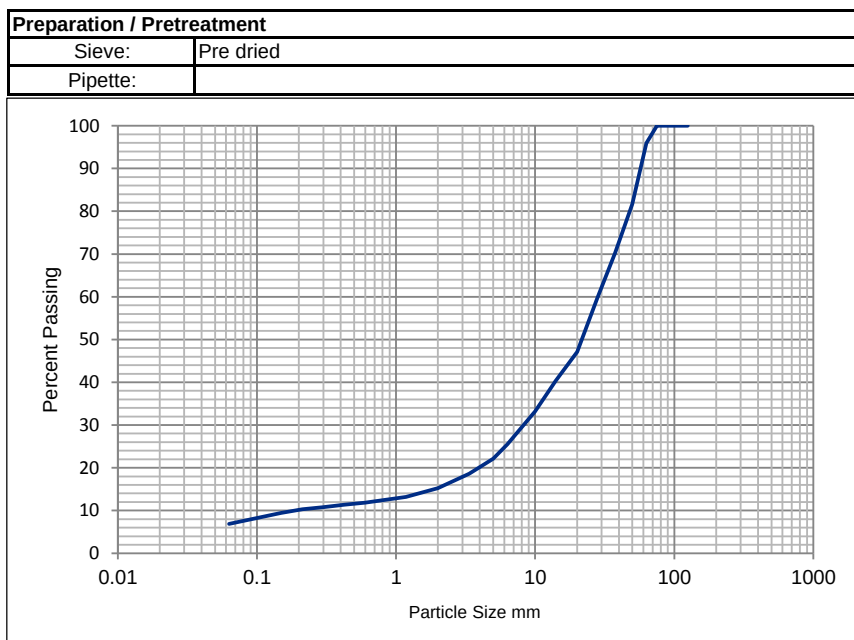
TEST REPORT
PARTICLE SIZE DISTRIBUTION ANALYSIS
BS1377:Part 2:1990

Project No:	D21387	Client:	Integral Geotechnique
Project Name:	Foel Trawsnant Windfarm	Address	Integral House 7 Beddau Way Castlegate Business Park Caerphilly CF83 8PH
ATS Sample No:	25066		

Site Ref / Hole ID:	TP27	Depth (m):	1.60 - 1.80
Sample No:		Sample Type:	Bulk
Sampling Certificate Received:	No	Material Description:	Brown slightly silty slightly sandy GRAVEL with low cobble content
Location in Works:	N/A	Material Source:	Site Generated
Date Sampled:	Unknown	Material Supplier:	Site Generated
Sampled By:	Client	Specification:	BS1377
Date Received:	14 July 2021	Date Tested:	21 July 2021

Test Results

Sieving	
Particle Size mm	% Passing
125	100
90	100
75	100
63	96
50	82
37.5	70
28	60
20	47
14	40
10	33
6.3	25
5.0	22
3.35	19
2.00	15
1.18	13
0.600	12
0.425	11
0.300	11
0.212	10
0.150	9
0.063	7



Sample Portions		Particle Density Mg/m3	Uniformity Coefficient D ₆₀ / D ₁₀
Cobbles / Boulders	4	N/A	
Gravel	81		
Sand	8	Dry mass of sample, kg	
Silt / Clay	7	18.8	N/A

Remarks:

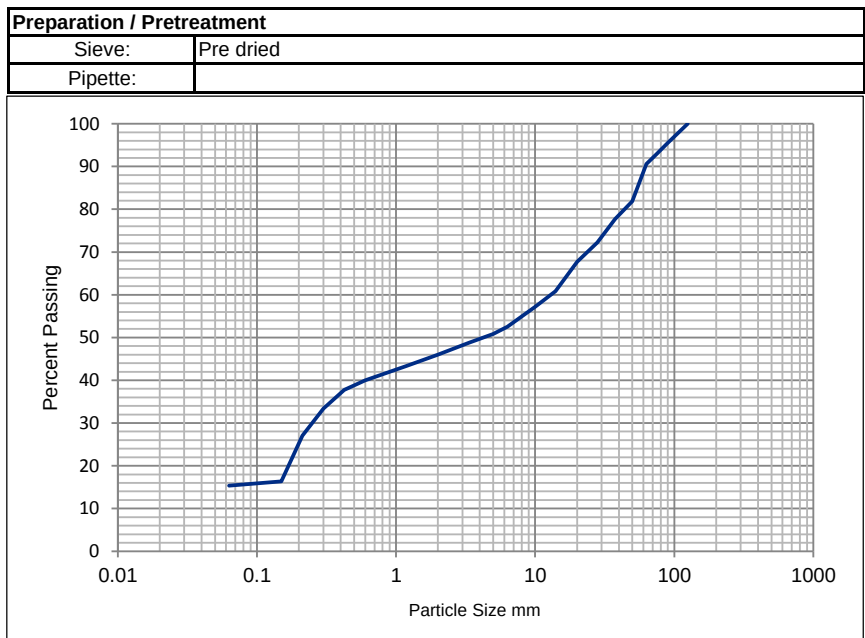
TEST REPORT
PARTICLE SIZE DISTRIBUTION ANALYSIS
BS1377:Part 2:1990

Project No:	D21387	Client:	Integral Geotechnique
Project Name:	Foel Trawsnant Windfarm	Address	Integral House 7 Beddau Way Castlegate Business Park Caerphilly CF83 8PH
ATS Sample No:	25067		

Site Ref / Hole ID:	TT1	Depth (m):	1.20 - 1.50
Sample No:		Sample Type:	Bulk
Sampling Certificate Received:	No	Material Description:	Brown grey silty very sandy GRAVEL with low cobble content
Location in Works:	N/A	Material Source:	Site Generated
Date Sampled:	Unknown	Material Supplier:	Site Generated
Sampled By:	Client	Specification:	BS1377
Date Received:	14 July 2021	Date Tested:	21 July 2021

Test Results

Sieving	
Particle Size mm	% Passing
125	100
90	95
75	93
63	91
50	82
37.5	78
28	72
20	68
14	61
10	57
6.3	53
5.0	51
3.35	49
2.00	46
1.18	43
0.600	40
0.425	38
0.300	33
0.212	27
0.150	16
0.063	15



Sample Portions		Particle Density Mg/m3	Uniformity Coefficient D_{60} / D_{10}
Cobbles / Boulders	9	N/A	
Gravel	45		
Sand	31	Dry mass of sample, kg	
Silt / Clay	15	21.3	N/A

Remarks:

QA Ref.

BS1377 - 4
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Apex Testing Solutions

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Approver

A Grogan

A Grogan, Laboratory Manager

Date

21/07/2021

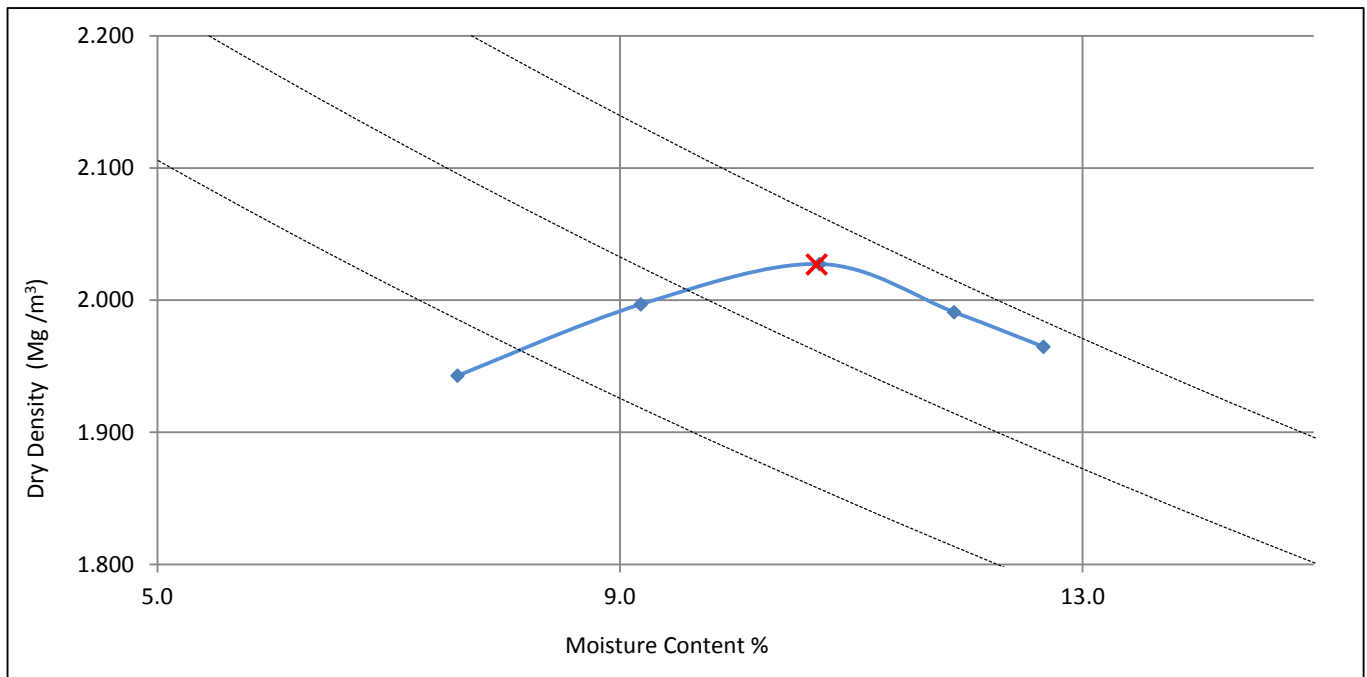
Fig

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TEST REPORT
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377:Part 4:1990: Clause 3.4

Project No:	D21387	Client:	Integral Geotechnique
Project Name:	Foel Trawsnant Windfarm	Address:	Integral House 7 Beddau Way Castlegate Business Park Caerphilly CF83 8PH
ATS Sample No:	25060		

Site Ref / Hole ID:	TP02	Depth (m):	0.80-1.20
Sample No:		Sample Type:	Bulk
Sampling Certificate Received:	No	Material Description:	Grey brown clayey sandy GRAVEL with low cobble content
Location in Works:	N/A	Material Source:	Site Generated
Date Sampled:	Unknown	Material Supplier:	Site
Sampled By:	Client	Specification:	BS1377
Date Received:	14 July 2021	Date Tested:	21 July 2021



Test Method:	BS 1377: part 4: 1990: clause 3.3, 2.5kg rammer in a 1 litre mould
Preparation:	Original sample was oven dried @ 105 oC, single specimen tested

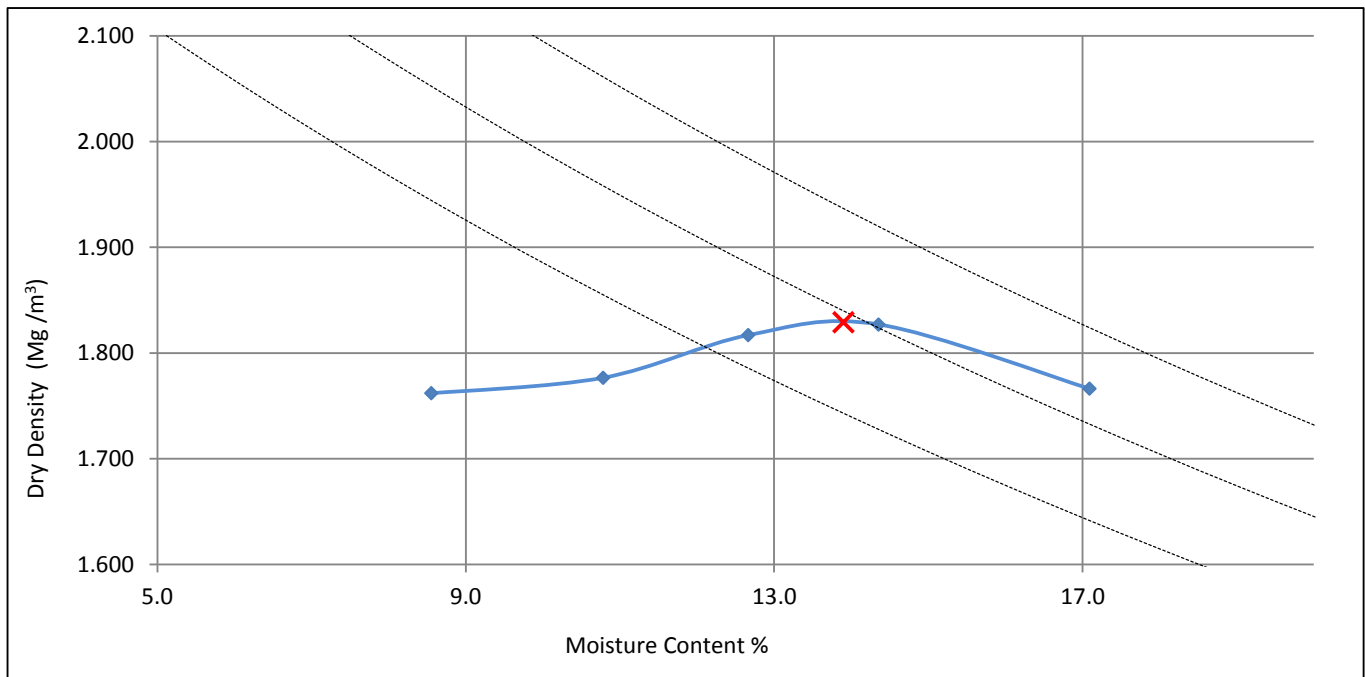
Particle Density, Mg/m ³	2.65	assumed	Derived Parameters ✗
Material > 37.5mm	22	%	Maximum Dry Density, Mg/m ³
Material < 37.5mm > 20mm	24	%	Optimum Moisture Content %
			2.03
			10.7

Remarks:	Natural MC = 10.1%, Tested as an X sample due to oversize material
----------	--

TEST REPORT
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377:Part 4:1990: Clause 3.4

Project No:	D21387	Client:	Integral Geotechnique
Project Name:	Foel Trawsnant Windfarm	Address:	Integral House 7 Beddau Way Castlegate Business Park Caerphilly CF83 8PH
ATS Sample No:	25061		

Site Ref / Hole ID:	TP08	Depth (m):	0.40-0.65
Sample No:		Sample Type:	Bulk
Sampling Certificate Received:	No	Material Description:	Brown clayey very sandy GRAVEL with medium cobble content
Location in Works:	N/A	Material Source:	Site Generated
Date Sampled:	Unknown	Material Supplier:	Site
Sampled By:	Client	Specification:	BS1377
Date Received:	14 July 2021	Date Tested:	21 July 2021



Test Method:	BS 1377: part 4: 1990: clause 3.3, 2.5kg rammer in a 1 litre mould
Preparation:	Original sample was oven dried @ 105 oC, single specimen tested

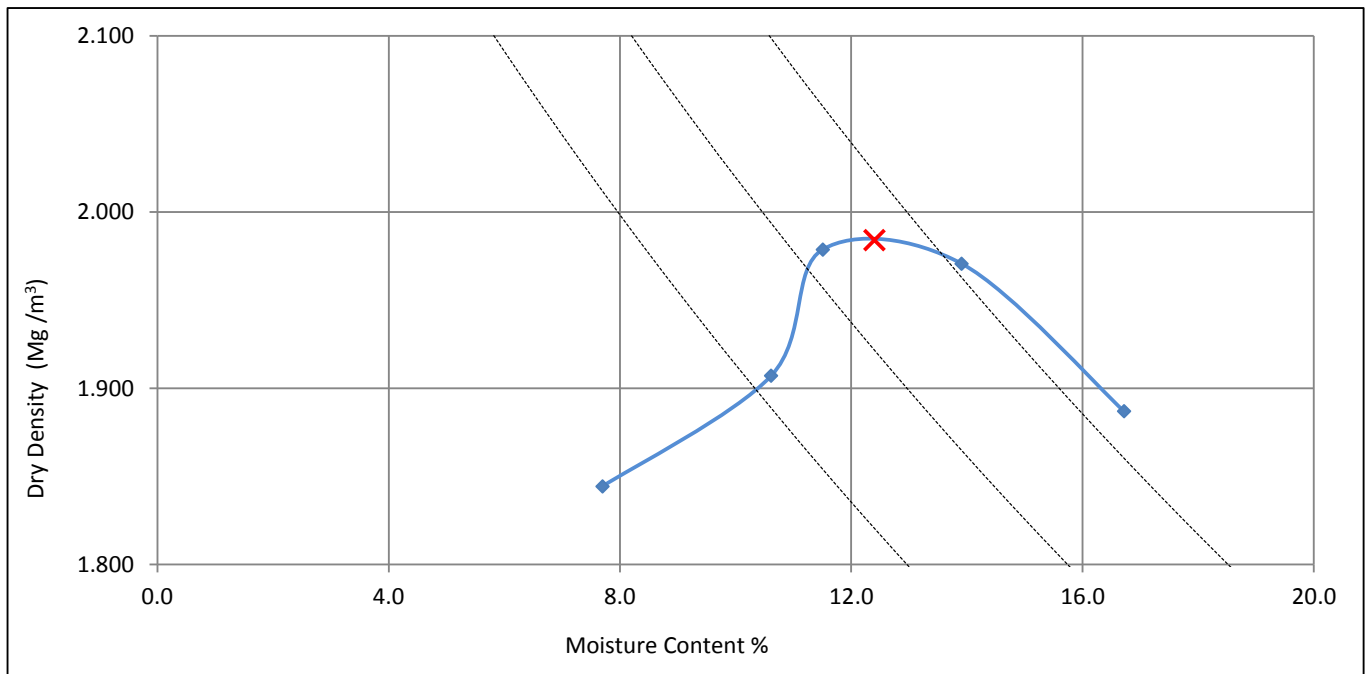
Particle Density, Mg/m ³	2.65	assumed	Derived Parameters ✖
Material > 37.5mm	22	%	Maximum Dry Density, Mg/m ³
Material < 37.5mm > 20mm	10	%	Optimum Moisture Content %

Remarks:	Natural MC = 22.0%, Tested as an X sample due to oversize material
----------	--

TEST REPORT
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377:Part 4:1990: Clause 3.4

Project No:	D21387	Client:	Integral Geotechnique
Project Name:	Foel Trawsnant Windfarm	Address:	Integral House 7 Beddau Way Castlegate Business Park Caerphilly CF83 8PH
ATS Sample No:	25066		

Site Ref / Hole ID:	TP27	Depth (m):	1.60-1.80
Sample No:		Sample Type:	Bulk
Sampling Certificate Received:	No	Material Description:	Brown slightly silty slightly sandy GRAVEL with low cobble content
Location in Works:	N/A	Material Source:	Site Generated
Date Sampled:	Unknown	Material Supplier:	Site
Sampled By:	Client	Specification:	BS1377
Date Received:	14 July 2021	Date Tested:	21 July 2021



Test Method:	BS 1377: part 4: 1990: clause 3.3, 2.5kg rammer in a 1 litre mould
Preparation:	Original sample was oven dried @ 105 oC, single specimen tested

Particle Density, Mg/m ³	2.70	assumed	Derived Parameters ✗
Material > 37.5mm	30	%	Maximum Dry Density, Mg/m ³
Material < 37.5mm > 20mm	23	%	Optimum Moisture Content %
			1.98
			12.4

Remarks: Natural MC = 10.4%, Tested as an X sample due to oversize material

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Apex Testing Solutions

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Approver

L Davis

L Davis, Quality Manager

Date

22/07/2021

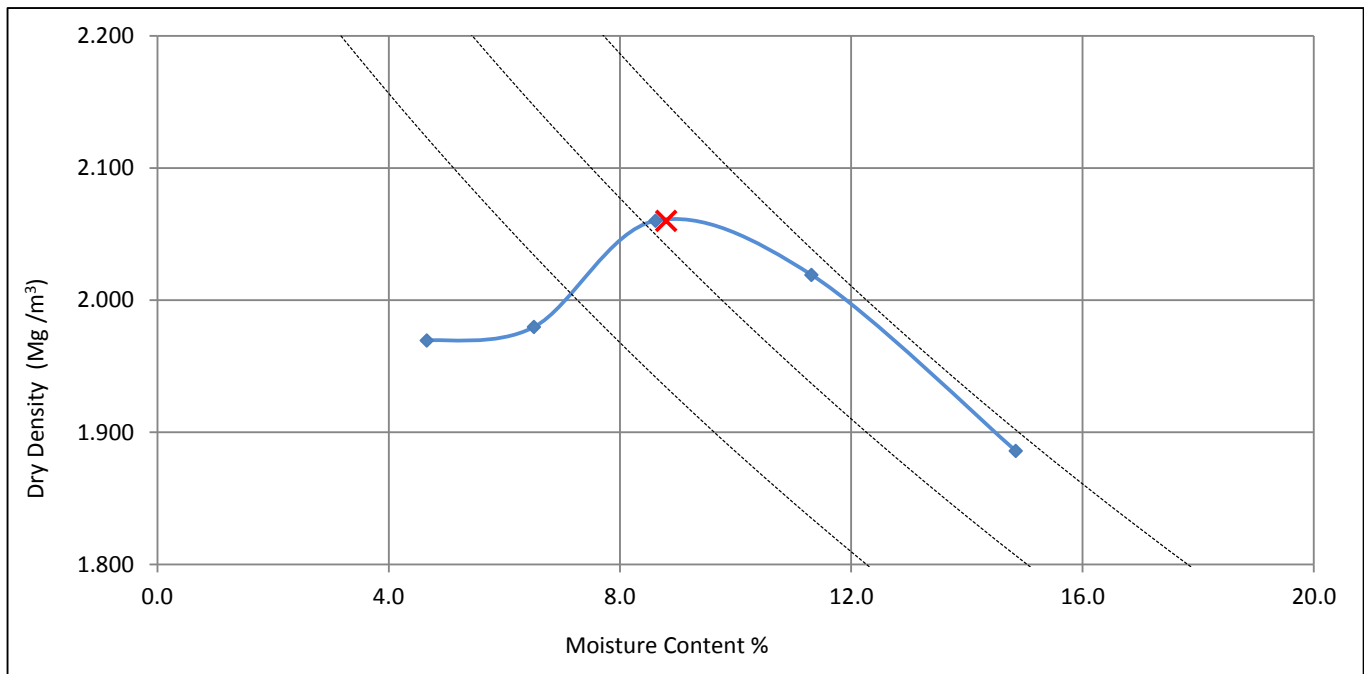
Fig.

COMP

TEST REPORT
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377:Part 4:1990: Clause 3.4

Project No:	D21387	Client:	Integral Geotechnique
Project Name:	Foel Trawsnant Windfarm	Address:	Integral House 7 Beddau Way Castlegate Business Park Caerphilly CF83 8PH
ATS Sample No:	25067		

Site Ref / Hole ID:	TT1	Depth (m):	1.20-1.50
Sample No:		Sample Type:	Bulk
Sampling Certificate Received:	No	Material Description:	Brown grey silty very sandy GRAVEL with low cobble content
Location in Works:	N/A	Material Source:	Site Generated
Date Sampled:	Unknown	Material Supplier:	Site
Sampled By:	Client	Specification:	BS1377
Date Received:	14 July 2021	Date Tested:	22 July 2021



Test Method:	BS 1377: part 4: 1990: clause 3.3, 2.5kg rammer in a 1 litre mould
Preparation:	Original sample was oven dried @ 105 oC, single specimen tested

Particle Density, Mg/m ³	2.65	assumed	Derived Parameters ✖
Material > 37.5mm	22	%	Maximum Dry Density, Mg/m ³
Material < 37.5mm > 20mm	10	%	Optimum Moisture Content %
			2.06
			8.8

Remarks:	Natural MC = 9.8%, Tested as an X sample due to oversize material
----------	---

TEST REPORT
Determination Of Water Content
ISO 17892-1: 2014

Project No:	D21387	Client:	Integral Geotechnique
Project Name:	Foel Trawsnant Windfarm	Address:	Integral House 7 Beddau Way Castlegate Business Park Caerphilly CF83 8PH
ATS Sample No:	25068		

Site Ref / Hole ID:	TP02	Depth (m):	0.50 -
Sample No:		Sample Type:	Bulk
Sampling Certificate Received:	No	Material Description:	Brown very gravelly fine SAND
Location in Works:	N/A	Material Source:	Site Generated
Date Sampled:	Unknown	Material Supplier:	Site Generated
Sampled By:	Client	Specification:	BS1377
Date Received:	14 July 2021	Date Tested:	21 July 2021

Test Results

Moisture Content (%)

11.1

Remarks:

QA Ref.

EN ISO 17892-1:2014 E



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Approver

A Grogan

A Grogan, Laboratory Manager

Date

21/07/2021

Fig

MC

TEST REPORT
LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX
BS 1377:Part 2:1990. Clause 4.3/5.3/5.4

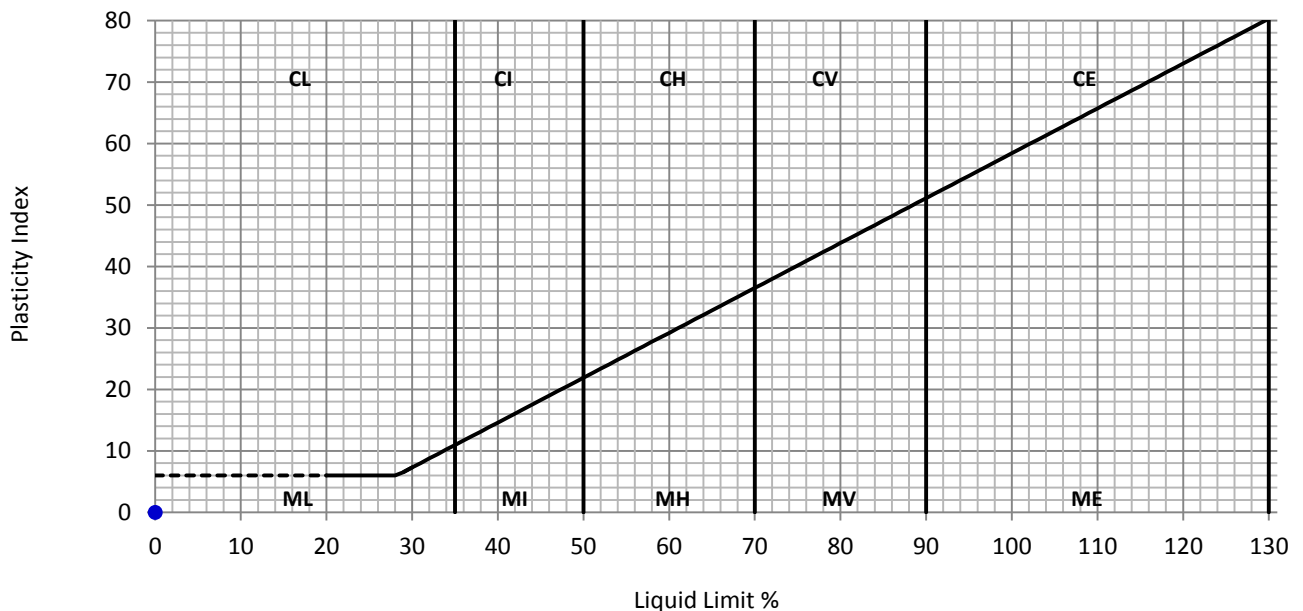
Project No:	D21387	Client:	Integral Geotechnique
Project Name:	Foel Trawsnant Windfarm	Address:	Integral House 7 Beddau Way Castlegate Business Park Caerphilly CF83 8PH
ATS Sample No:	25068		

Site Ref / Hole ID:	TP02	Depth (m):	0.50 -
Sample No:		Sample Type:	Bulk
Sampling Certificate Received:	No	Material Description:	Brown very gravelly fine SAND
Location in Works:	N/A	Material Source:	Site Generated
Date Sampled:	Unknown	Material Supplier:	Site Generated
Sampled By:	Client	Specification:	BS1377
Date Received:	14 July 2021	Date Tested:	21 July 2021

Test Results

Liquid Limit	0	%
Plastic Limit		%
Plasticity Index	NP	%

Preparation:	4.2.4 Sieved Specimen
Proportion retained on 425µm sieve:	58 %



Remarks: Sample is non - plastic

TEST REPORT
Determination Of Water Content
ISO 17892-1: 2014

Project No:	D21387	Client:	Integral Geotechnique
Project Name:	Foel Trawsnant Windfarm	Address:	Integral House 7 Beddau Way Castlegate Business Park Caerphilly CF83 8PH
ATS Sample No:	25069		

Site Ref / Hole ID:	TP04	Depth (m):	0.40 -
Sample No:		Sample Type:	Bulk
Sampling Certificate Received:	No	Material Description:	Orange brown slightly gravelly sandy SILT
Location in Works:	N/A	Material Source:	Site Generated
Date Sampled:	Unknown	Material Supplier:	Site Generated
Sampled By:	Client	Specification:	BS1377
Date Received:	14 July 2021	Date Tested:	21 July 2021

Test Results

Moisture Content (%)

26.7

Remarks:

QA Ref.

EN ISO 17892-
1:2014 E



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Approver

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A Grogan, Laboratory Manager

Date

21/07/2021

Fig

MC

TEST REPORT
LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX
BS 1377:Part 2:1990. Clause 4.3/5.3/5.4

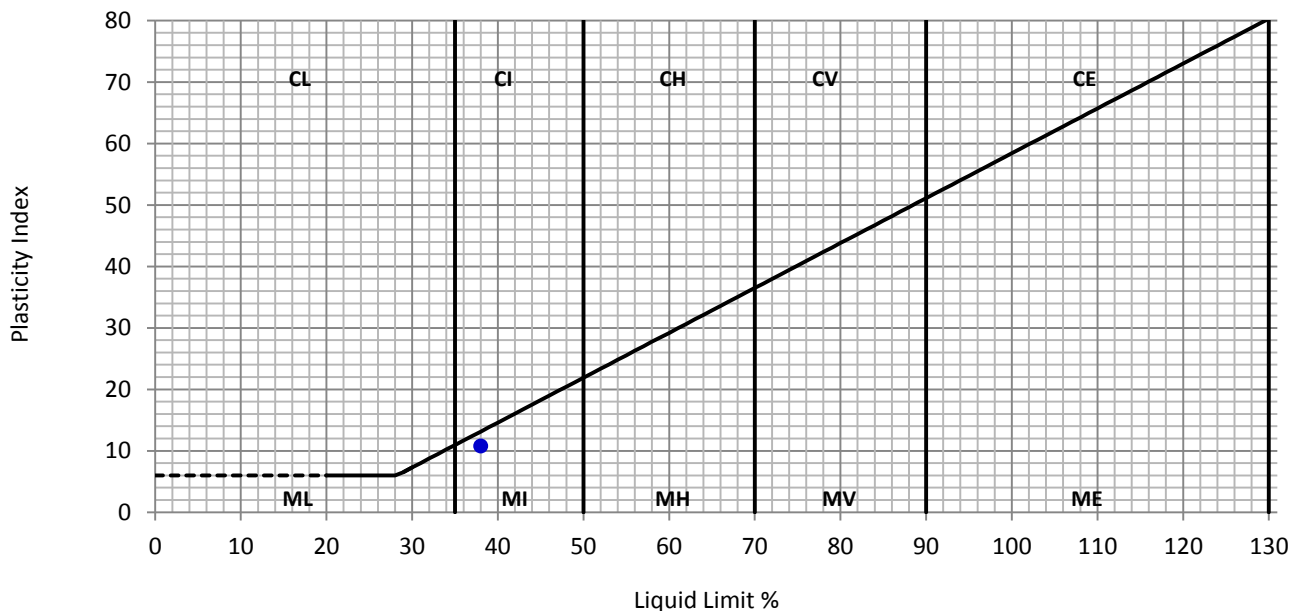
Project No:	D21387	Client:	Integral Geotechnique
Project Name:	Foel Trawsnant Windfarm	Address:	Integral House 7 Beddau Way Castlegate Business Park Caerphilly CF83 8PH
ATS Sample No:	25069		

Site Ref / Hole ID:	TP04	Depth (m):	0.40 -
Sample No:		Sample Type:	Bulk
Sampling Certificate Received:	No	Material Description:	Orange brown slightly gravelly sandy SILT
Location in Works:	N/A	Material Source:	Site Generated
Date Sampled:	Unknown	Material Supplier:	Site Generated
Sampled By:	Client	Specification:	BS1377
Date Received:	14 July 2021	Date Tested:	21 July 2021

Test Results

Liquid Limit	38	%
Plastic Limit	27	%
Plasticity Index	11	%

Preparation:	4.2.4 Sieved Specimen
Proportion retained on 425µm sieve:	29 %



Remarks:

TEST REPORT
Determination Of Water Content
ISO 17892-1: 2014

Project No:	D21387	Client:	Integral Geotechnique
Project Name:	Foel Trawsnant Windfarm	Address:	Integral House 7 Beddau Way Castlegate Business Park Caerphilly CF83 8PH
ATS Sample No:	25070		

Site Ref / Hole ID:	TP14	Depth (m):	0.60 -
Sample No:		Sample Type:	Bulk
Sampling Certificate Received:	No	Material Description:	Brown gravelly fine SAND
Location in Works:	N/A	Material Source:	Site Generated
Date Sampled:	Unknown	Material Supplier:	Site Generated
Sampled By:	Client	Specification:	BS1377
Date Received:	14 July 2021	Date Tested:	21 July 2021

Test Results

Moisture Content (%)

17.5

Remarks:

QA Ref.

EN ISO 17892-1:2014 E



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A Grogan

A Grogan, Laboratory Manager

Date

21/07/2021

Fig

MC

TEST REPORT
LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX
BS 1377:Part 2:1990. Clause 4.3/5.3/5.4

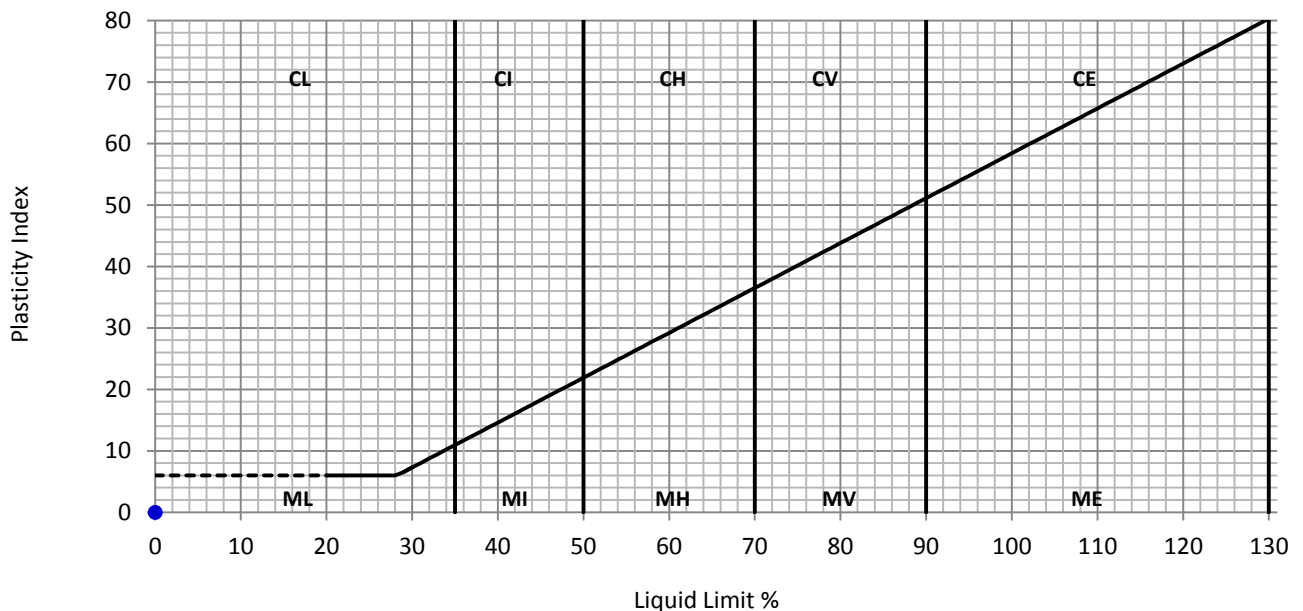
Project No:	D21387	Client:	Integral Geotechnique
Project Name:	Foel Trawsnant Windfarm	Address:	Integral House 7 Beddau Way Castlegate Business Park Caerphilly CF83 8PH
ATS Sample No:	25070		

Site Ref / Hole ID:	TP14	Depth (m):	0.60 -
Sample No:		Sample Type:	Bulk
Sampling Certificate Received:	No	Material Description:	Brown gravelly fine SAND
Location in Works:	N/A	Material Source:	Site Generated
Date Sampled:	Unknown	Material Supplier:	Site Generated
Sampled By:	Client	Specification:	BS1377
Date Received:	14 July 2021	Date Tested:	21 July 2021

Test Results

Liquid Limit	0	%
Plastic Limit		%
Plasticity Index	NP	%

Preparation:	4.2.4 Sieved Specimen
Proportion retained on 425µm sieve:	41 %



Remarks: Sample is non-plastic

TEST REPORT
Determination Of Water Content
ISO 17892-1: 2014

Project No:	D21387	Client:	Integral Geotechnique
Project Name:	Foel Trawsnant Windfarm	Address:	Integral House 7 Beddau Way Castlegate Business Park Caerphilly CF83 8PH
ATS Sample No:	25071		

Site Ref / Hole ID:	TP24	Depth (m):	0.60 -
Sample No:		Sample Type:	Bulk
Sampling Certificate Received:	No	Material Description:	Brown sandy CLAY
Location in Works:	N/A	Material Source:	Site Generated
Date Sampled:	Unknown	Material Supplier:	Site Generated
Sampled By:	Client	Specification:	BS1377
Date Received:	14 July 2021	Date Tested:	21 July 2021

Test Results

Moisture Content (%)

41.7

Remarks:

QA Ref.

EN ISO 17892-1:2014 E



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Approver

A Grogan

A Grogan, Laboratory Manager

Date

21/07/2021

Fig

MC

TEST REPORT
LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX
BS 1377:Part 2:1990. Clause 4.3/5.3/5.4

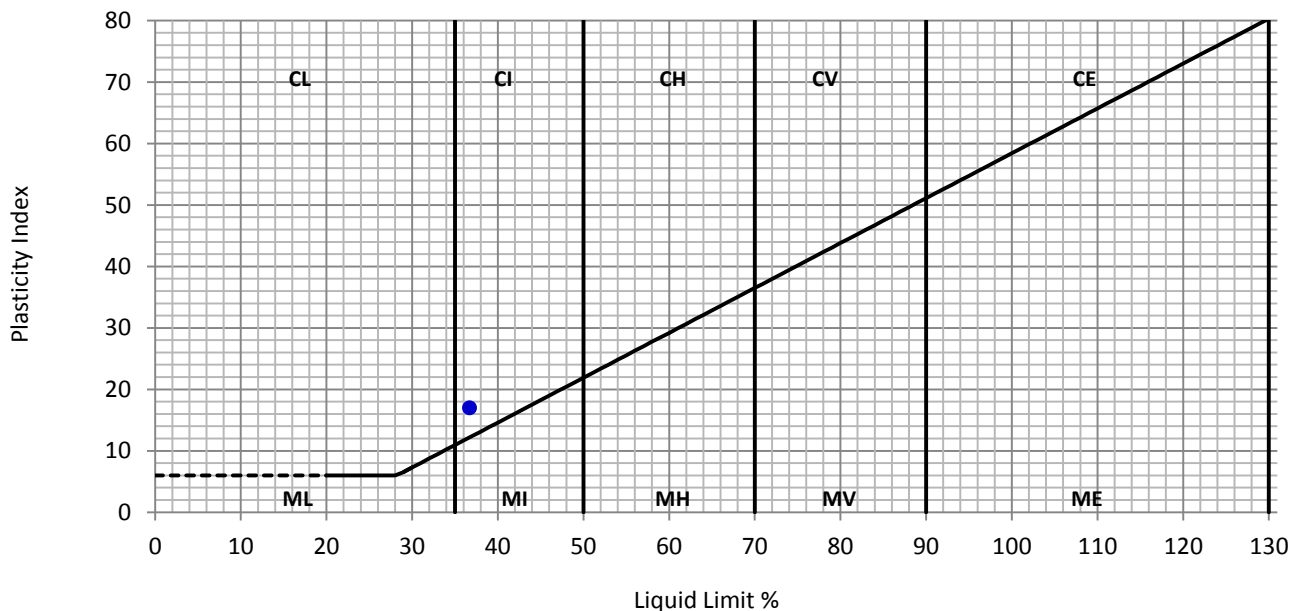
Project No:	D21387	Client:	Integral Geotechnique
Project Name:	Foel Trawsnant Windfarm	Address:	Integral House 7 Beddau Way Castlegate Business Park Caerphilly CF83 8PH
ATS Sample No:	25071		

Site Ref / Hole ID:	TP24	Depth (m):	0.60 -
Sample No:		Sample Type:	Bulk
Sampling Certificate Received:	No	Material Description:	Brown sandy CLAY
Location in Works:	N/A	Material Source:	Site Generated
Date Sampled:	Unknown	Material Supplier:	Site Generated
Sampled By:	Client	Specification:	BS1377
Date Received:	14 July 2021	Date Tested:	21 July 2021

Test Results

Liquid Limit	37	%
Plastic Limit	20	%
Plasticity Index	17	%

Preparation:	4.2.3 Natural Specimen
Proportion retained on 425µm sieve:	0 %



Remarks:

APPENDIX K

LABORATORY GEOTECHNICAL TEST RESULTS (ROCK CORES)

SUMMARY OF RESULTS
UNIAXIAL COMPRESSIVE STRENGTH OF ROCK
ISRM 2007

[illegible]

Notes: Test Specification : International Society for Rock Mechanics, The complete ISRM suggested methods for Rock Characterization Testing and Monitoring, 2007

1 ISRM p87 test 1, water content at $105 \pm 3^{\circ}\text{C}$, specimen as received at the laboratory.

2 ISRM p86 clause (vii), Caliper method used for determination of bulk volume and derivation of bulk density

3 ISRM p153 part 1 determination of Uniaxial Compressive Strength (UCS) of Rock Materials

Mode of failure: S - Single Shear MS - Multiple Shear AC - Axial Cleavage F - Fragmented				
Sl. No.	Specimen	Applied Load (kN)	Displacement (mm)	Failure Mode

QA Ref. ISRM Rev 1.0	 Apex Testing Solutions Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ Tel: 01656 746762 Fax: 01656 749096	Approver <i>A. Grogan,</i>	Date 05/08/2021	Fig. UCS 1
		A. Grogan, Laboratory Manager		

TEST REPORT

POINT LOAD INDEX TEST

ISRM: 1985

Project No: D21418

Client: Integral Geotechnique

Project Name: Foel Trawsnant Windfarm

Address: Integral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 8PH

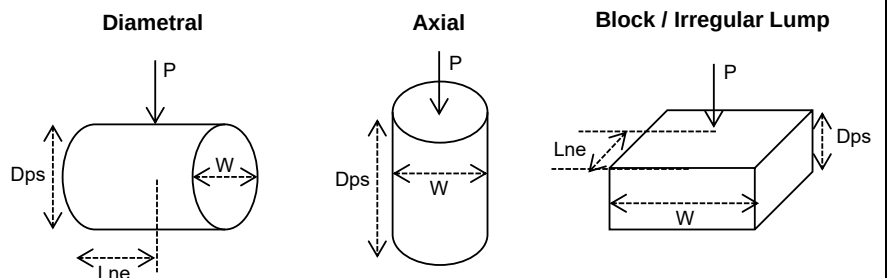
Borehole	Depth m	Sample Ref	Sample Type	Specimen Ref	Specimen Depth	Rock Type	Test Type see ISRM Fig 5 and 8		Failure Valid (Y/N)	Dimensions			LOAD P kN	De equivalent diameter, mm	Point Load Index Mpa $F=(De/50)^{0.45}$		Remarks
							Type (D, A, I, B)	Direction (L, P or U)		Lne mm	Dps' mm	W mm			I _s	I _{s(50)}	
BHT2	13.15		C		12.67	Sandstone	D	L	Y	50	72	72	1.09	72.00	0.21	0.25	
BHT2			C				A	P	Y		56	72	8.99	71.65	1.75	2.06	
BHT1	7.50		C		6.77	Siltstone/Mustone	D	L	Y	75	72	72	0.29	72.00	0.06	0.07	
BHT1			C				A	P	Y		46	72	1.45	64.94	0.34	0.39	
BHT1	16.00		C		16.19	Siltstone/Mustone	D	L	Y	32	72	72	0.22	72.00	0.04	0.05	
BHT1			C				A	P	Y		25	72	3.98	47.87	1.74	1.70	
BHT5	8.70		C		8.80	Sandstone	U	L	Y	43	72	72	14.38	81.24	2.18	2.71	
BHT5			C				U	P	Y		54	72	20.10	70.36	4.06	4.73	
BHT5	9.80		C		9.75	Sandstone	D	L	Y	50	72	72	0.62	72.00	0.12	0.14	
BHT5			C				A	P	Y		42	72	11.32	62.05	2.94	3.24	
BHT5	14.70		C		14.70	Sandstone	D	L	Y	50	72	72	4.15	72.00	0.80	0.94	
BHT5			C				A	P	Y		47	72	12.55	65.64	2.91	3.29	
BHT6	5.15		C		5.60	Sandstone	D	L	Y	40	72	72	1.77	72.00	0.34	0.40	
BHT6			C				A	P	Y		40	72	20.76	60.56	5.66	6.17	
BHT6	12.10		C		12.10	Sandstone	D	U	Y	60	72	72	33.33	72.00	6.43	7.58	
BHT6			C				A	U	Y		60	72	28.91	74.16	5.26	6.28	

All specimens tested as received water content unless shown otherwise

Test Type
D - Diametral, A - Axial, I - Irregular Lump, B - Block

Direction
U - Unknown or Random
L - Parallel to planes of weakness
P - Perpendicular to planes of weakness

Dimensions
Dps' - Distance between platens at failure
Lne - Length from platens to nearest free end
W - Width of shortest dimension perpendicular to load, P



QA Ref.



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Approver

A Grogan

Date

02/08/2021

Fig.

PLT 4

ISRM

Rev 2.0

A Grogan, Laboratory Manager

TEST REPORT

POINT LOAD INDEX TEST

ISRM: 1985

Project No: D21418

Client: Integral Geotechnique

Project Name: Foel Trawsnant Windfarm

Address: Integral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 8PH

Borehole	Depth m	Sample Ref	Sample Type	Specimen Ref	Specimen Depth	Rock Type	Test Type see ISRM Fig 5 and 8		Failure Valid (Y/N)	Dimensions			LOAD P kN	De equivalent diameter, mm	Point Load Index Mpa $F=(De/50)^{0.45}$		Remarks
							Type (D, A, I, B)	Direction (L, P or U)		Lne mm	Dps' mm	W mm			I _s	I _{s(50)}	
BHT8	3.70		C		3.68	Sandstone	D	L	Y	55	72	72	2.69	72.00	0.52	0.61	
BHT8			C				A	P	Y		65	72	6.64	77.19	1.11	1.35	
BHT8	12.50		C		12.76	Mudstone/Siltstone	D	L	Y	62	72	72	1.50	72.00	0.29	0.34	
BHT8			C				A	P	Y		47	72	2.21	65.64	0.51	0.58	
BHT8D	11.10		C		11.12	Mudstone/Siltstone	D	L	Y	60	72	72	0.48	72.00	0.09	0.11	
BHT8D			C				A	P	Y		50	78	0.14	70.47	0.03	0.03	
BHT9	7.60		C		7.54	Sandstone	D	L	Y	50	72	72	1.88	72.00	0.36	0.43	
BHT9			C				A	P	Y		50	72	4.05	67.70	0.88	1.01	
BHT9	8.80		C		9.06	Sandstone	D	L	Y	60	72	72	3.85	72.00	0.74	0.87	
BHT9			C				A	P	Y		78	72	7.41	84.56	1.04	1.31	
BHT11	8.10		C		6.77	Mudstone/Siltstone	D	L	Y	75	72	72	0.29	72.00	0.06	0.07	
BHT11			C				A	P	Y		46	72	1.45	64.94	0.34	0.39	
BHT11	12.00		C		16.19	Mudstone/Siltstone	D	L	Y	32	72	72	0.22	72.00	0.04	0.05	
BHT11			C				A	P	Y		25	72	3.98	47.87	1.74	1.70	

All specimens tested as received water content unless shown otherwise

Test Type

D - Diametral, A - Axial, I - Irregular Lump, B - Block

Direction

U - Unknown or Random

L - Parallel to planes of weakness

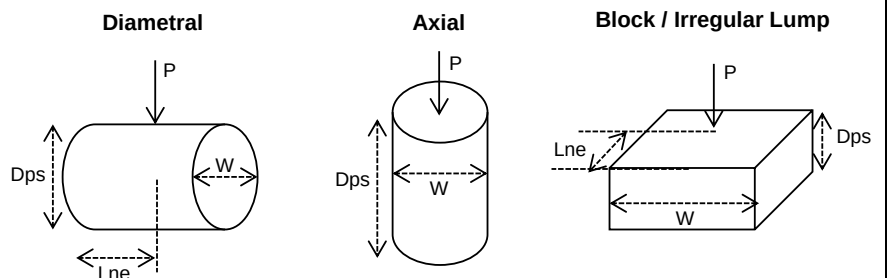
P - Perpendicular to planes of weakness

Dimensions

Dps' - Distance between platens at failure

Lne - Length from platens to nearest free end

W - Width of shortest dimension perpendicular to load, P



QA Ref.



Apex Testing Solutions

Sturmi Way, Village Farm Industrial Est, Pyle, Bridgend, CF33 6BZ

Tel: 01656 746762 Fax: 01656 749096

Approver

A Grogan

Date

02/08/2021

Fig.

PLT 4

ISRM

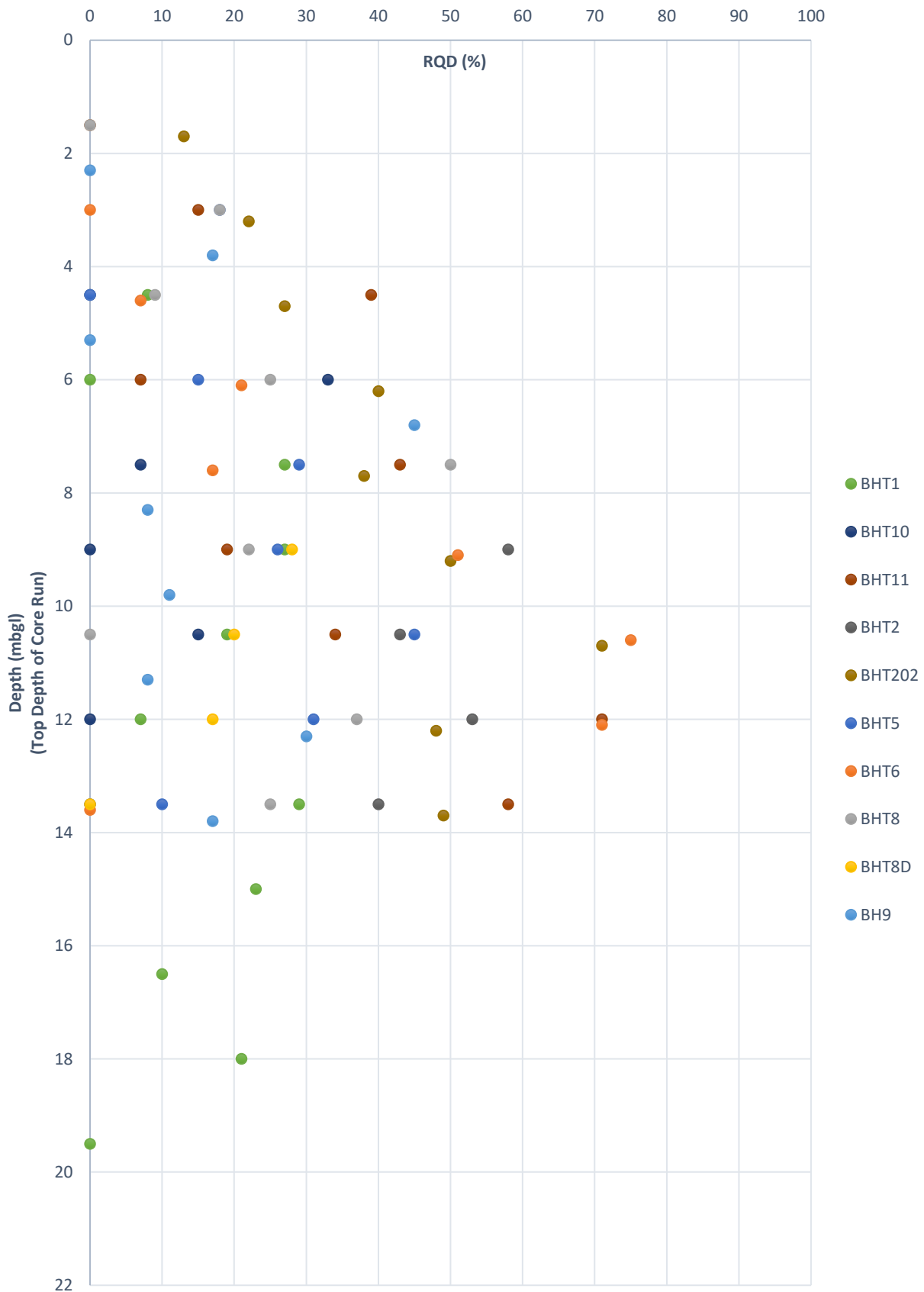
Rev 2.0

A Grogan, Laboratory Manager

APPENDIX L

RQD AND FRACTURE INDEX PROFILES

12826 FTWF RQD Profiles



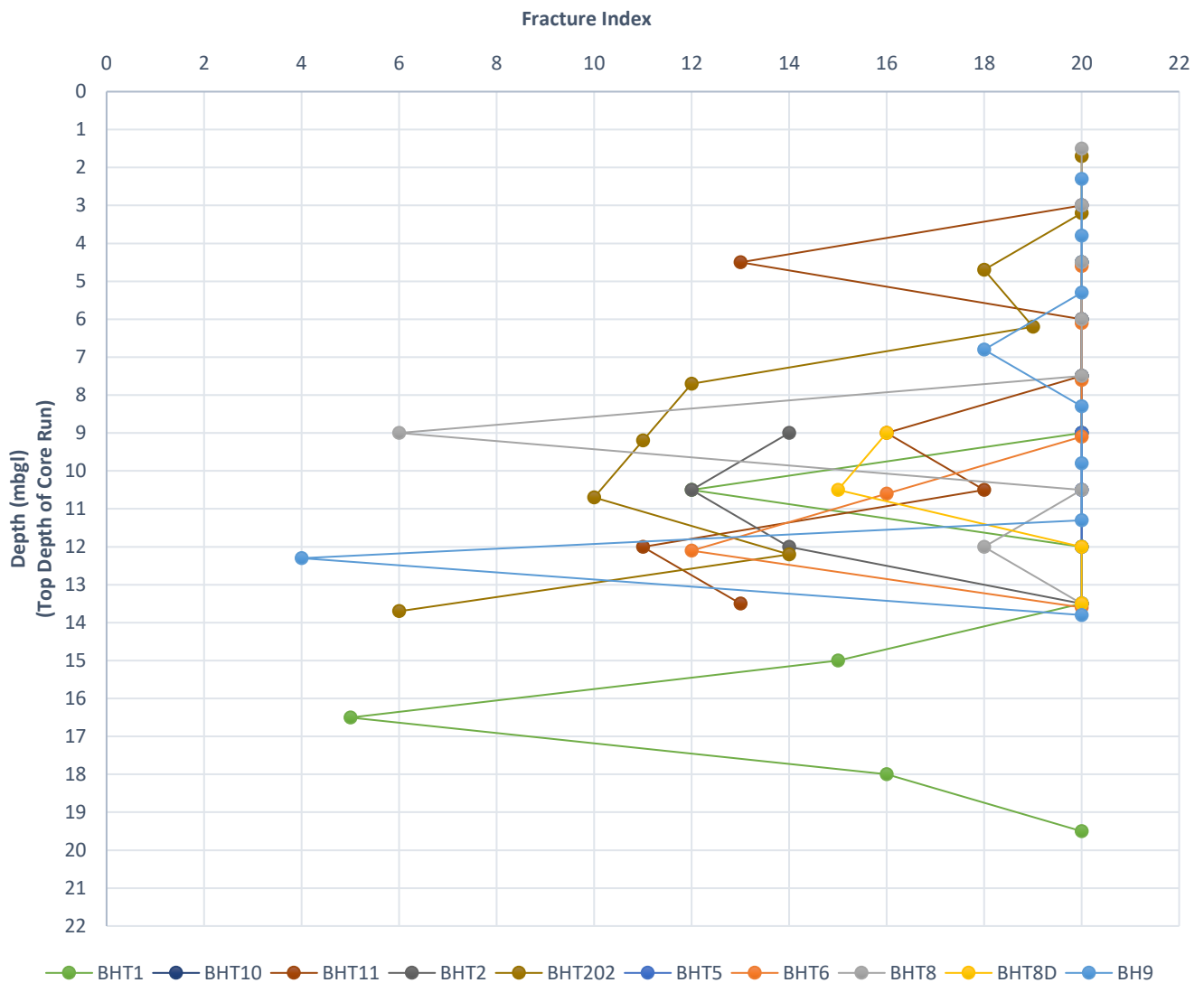
Appendix L - RQD Profiles in Rock Cores

12826: Foel Trawsant Windfarm

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12826 FTWF FI Profiles:



NB: Maximum fracture index recorded as >20. FI values of 20 indicate highly fractured sections of core

Appendix L - FI Profiles in Rock Cores

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FIGURES

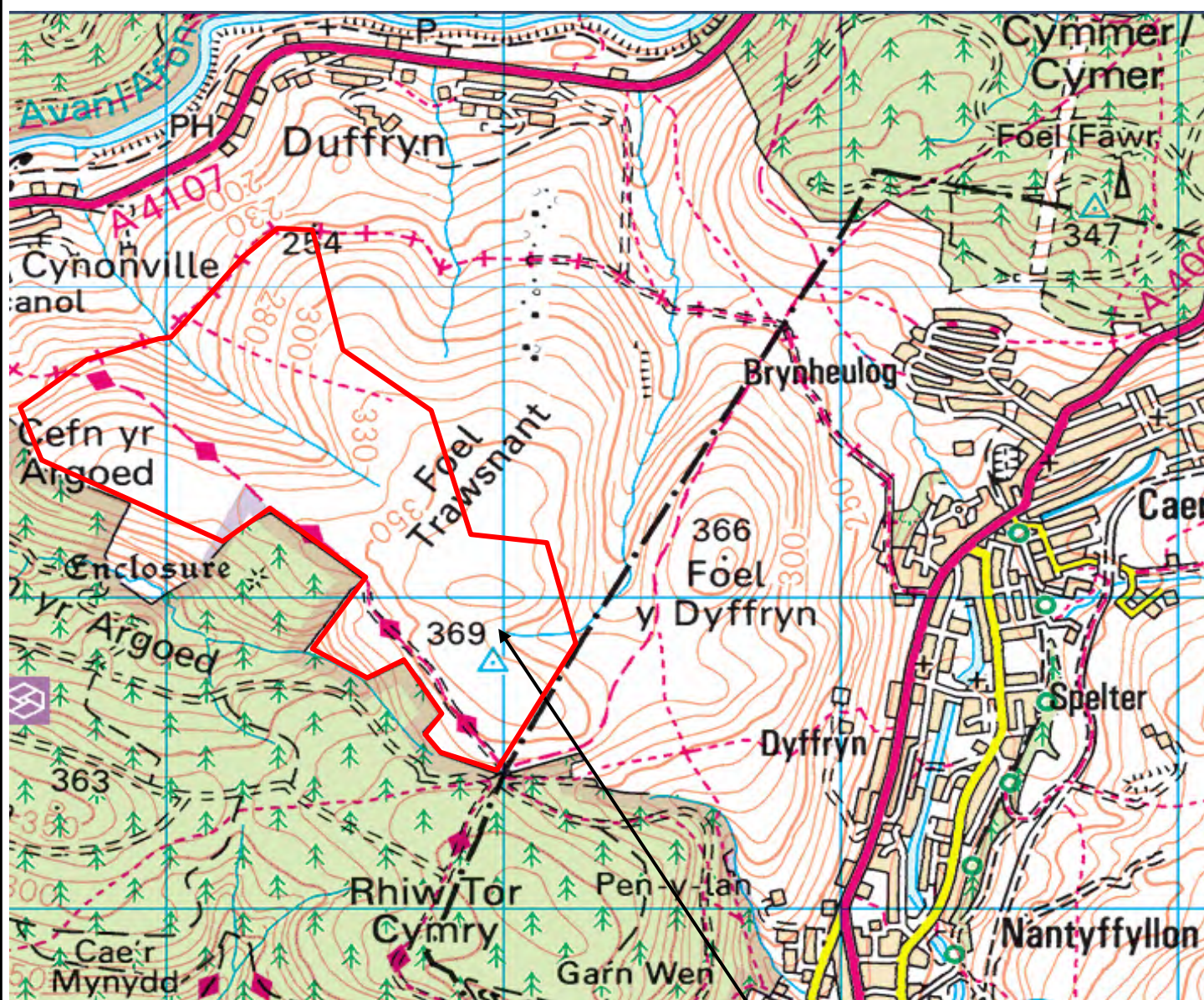


Figure 1: Site Location Plan

12826: Foel Trawsnant Wind Farm

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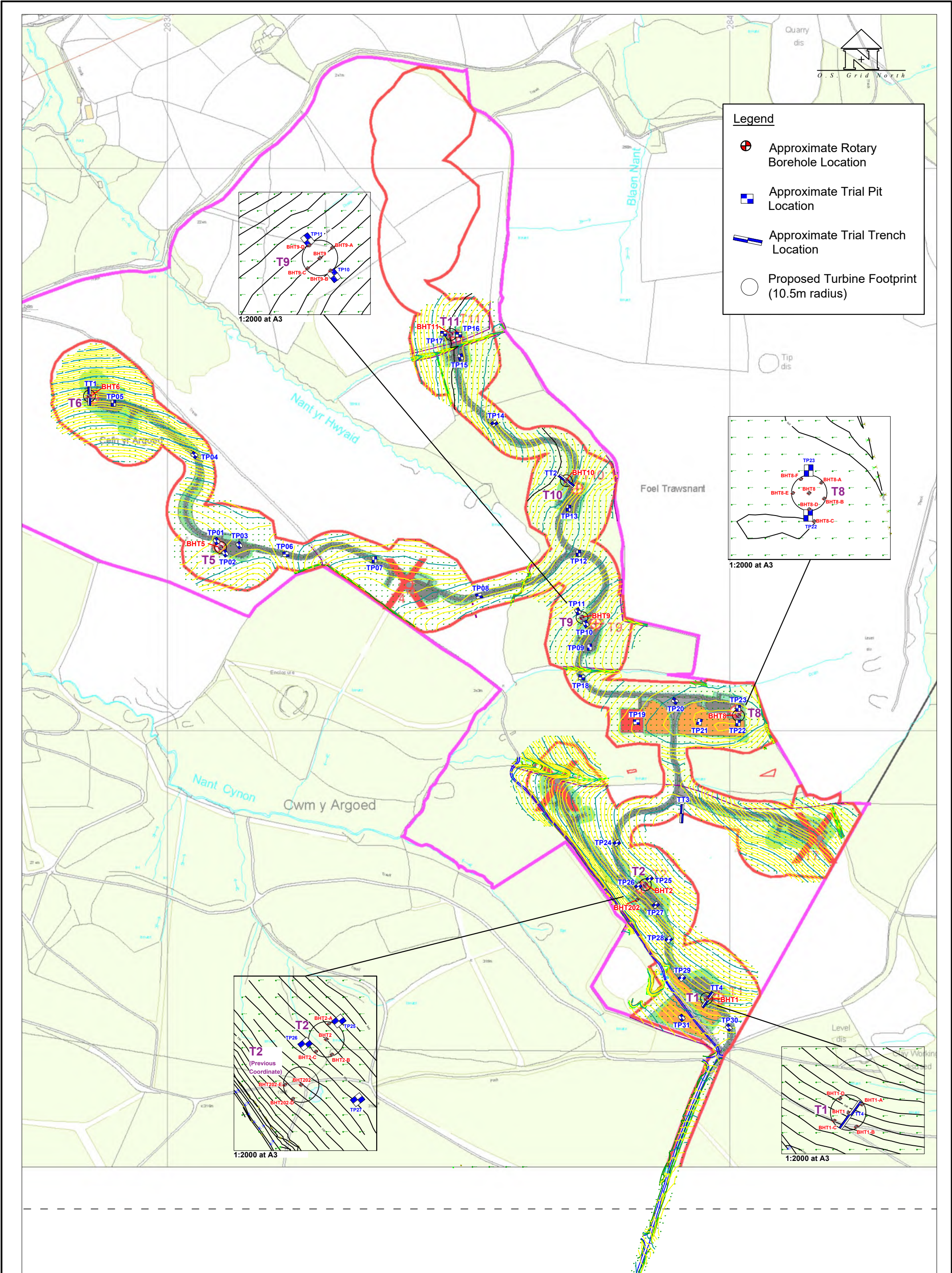


Figure 2: Site Plan (Full Site)

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Client: Pennant Walters (FOELT) Ltd	Scale: 1:6000 at A3		

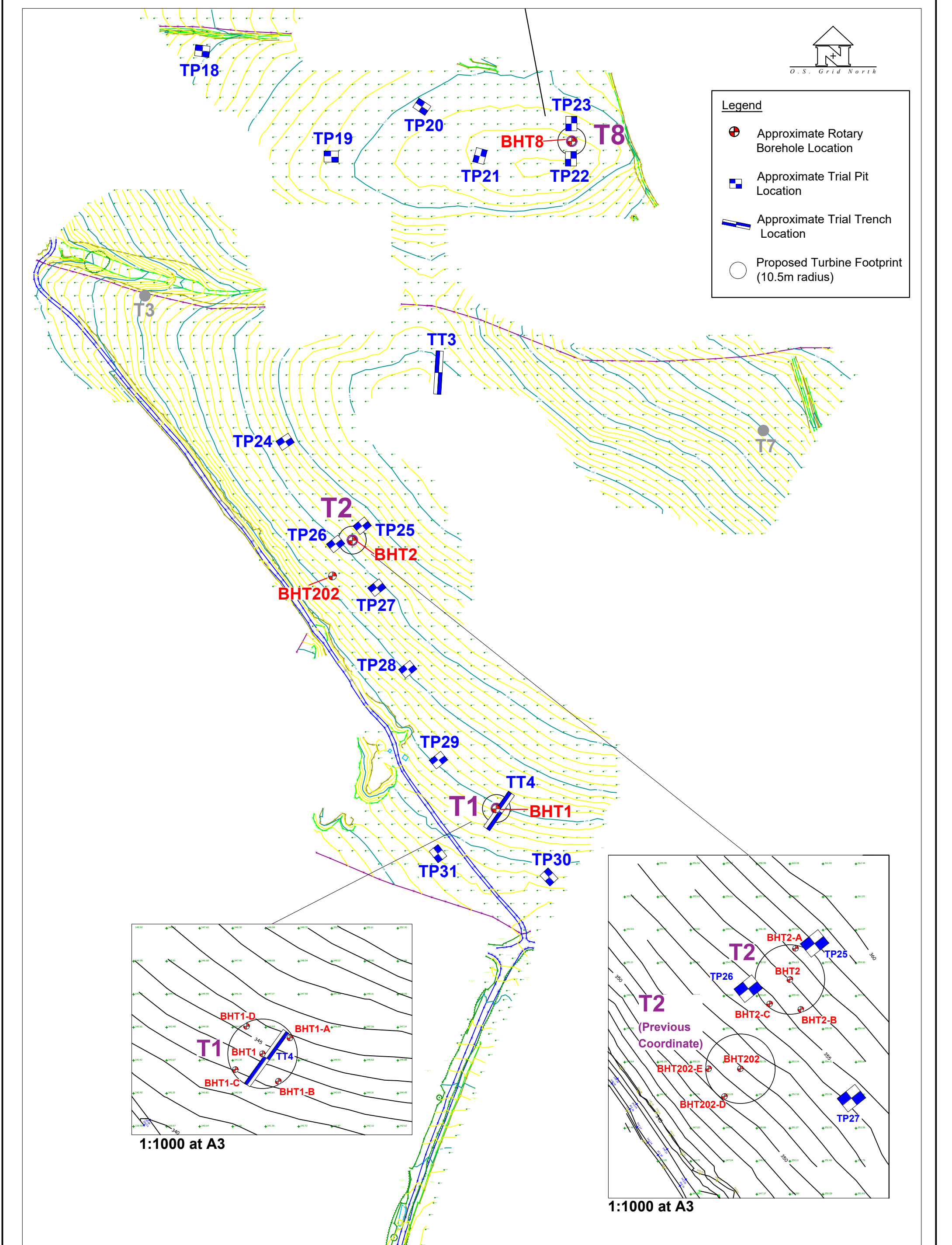


Figure 3A: Site Plan (South)

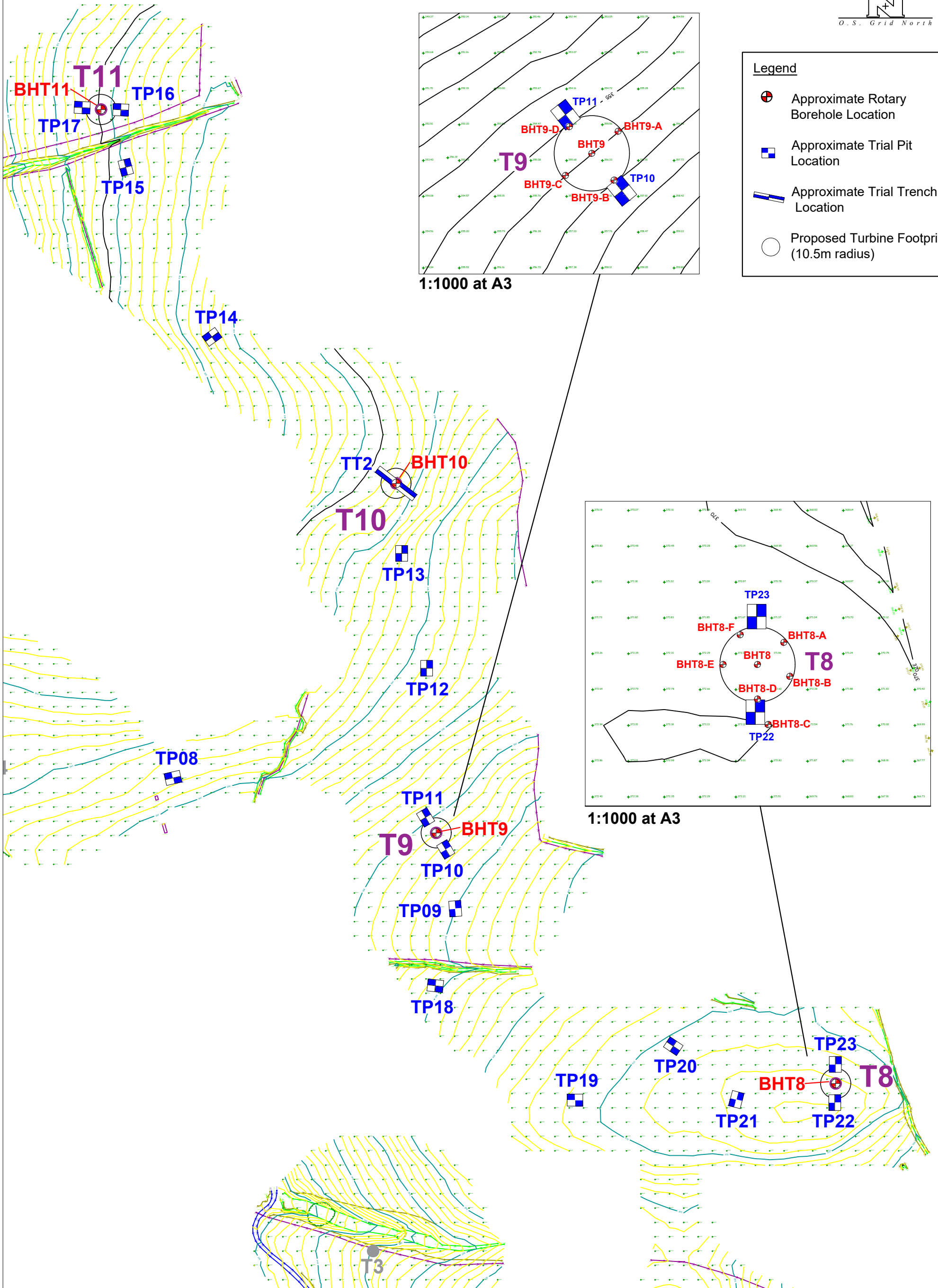
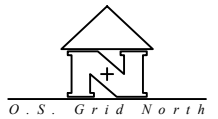


Figure 3B: Site Plan (North-east)

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Client: Pennant Walters (FOELT) Ltd	Scale: 1:2500 at A3		

Legend

Approximate Rotary Borehole Location

Approximate Trial Pit Location

Approximate Trial Trench Location

Proposed Turbine Footprint (10.5m radius)

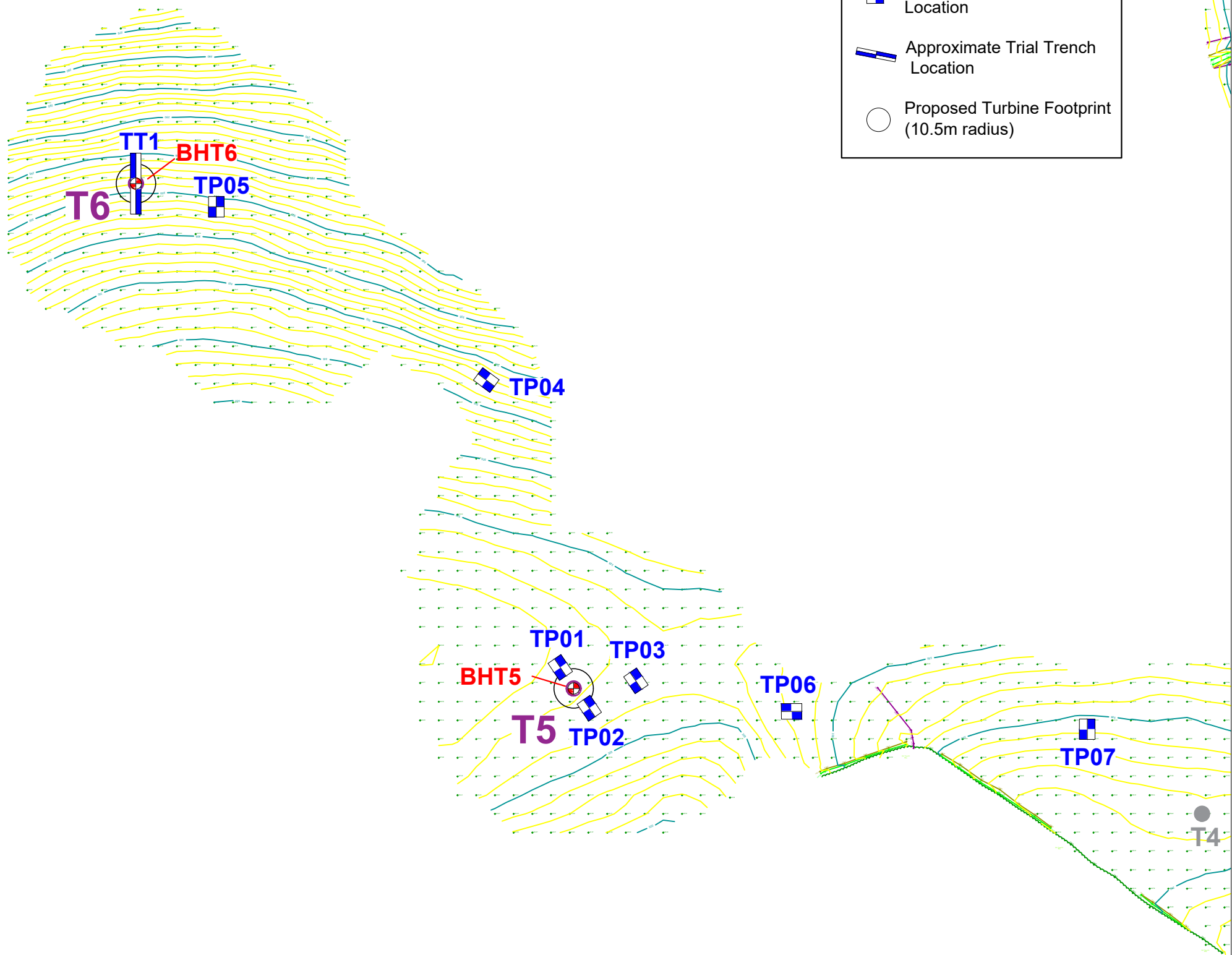


Figure 3C: Site Plan (North-west)

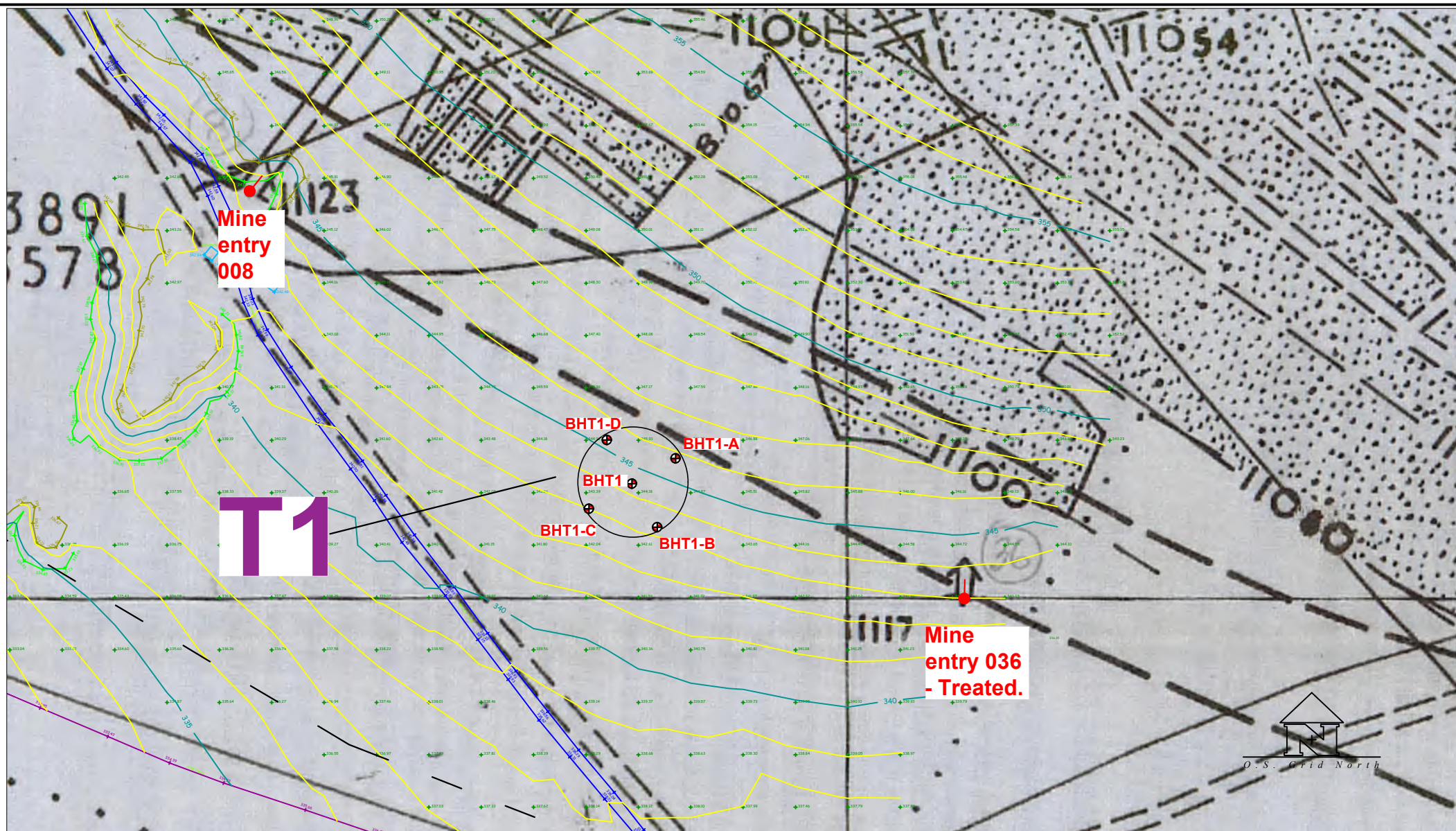


Figure 4A: Abandonment Plan Overlay - Turbine 1

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Client: Walters UK Ltd

Job No.: 12826

Scale: 1:1000 at A4

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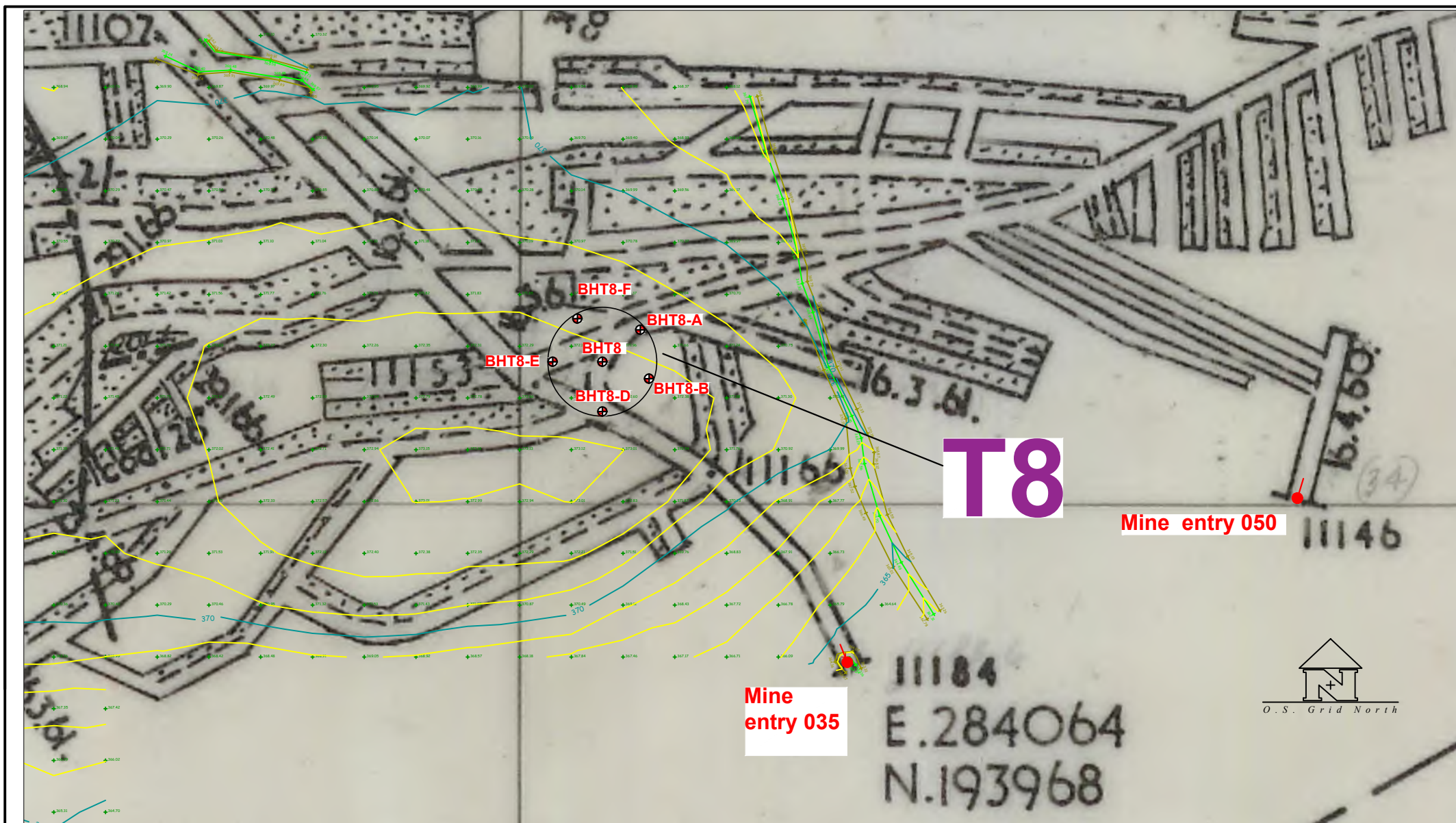


Figure 4C: Abandonment Plan Overlay - Turbine 8

Project: Foel Trawsnant Windfarm

Client: Walters UK Ltd

Job No.: 12826

Scale: 1:1000 at A4

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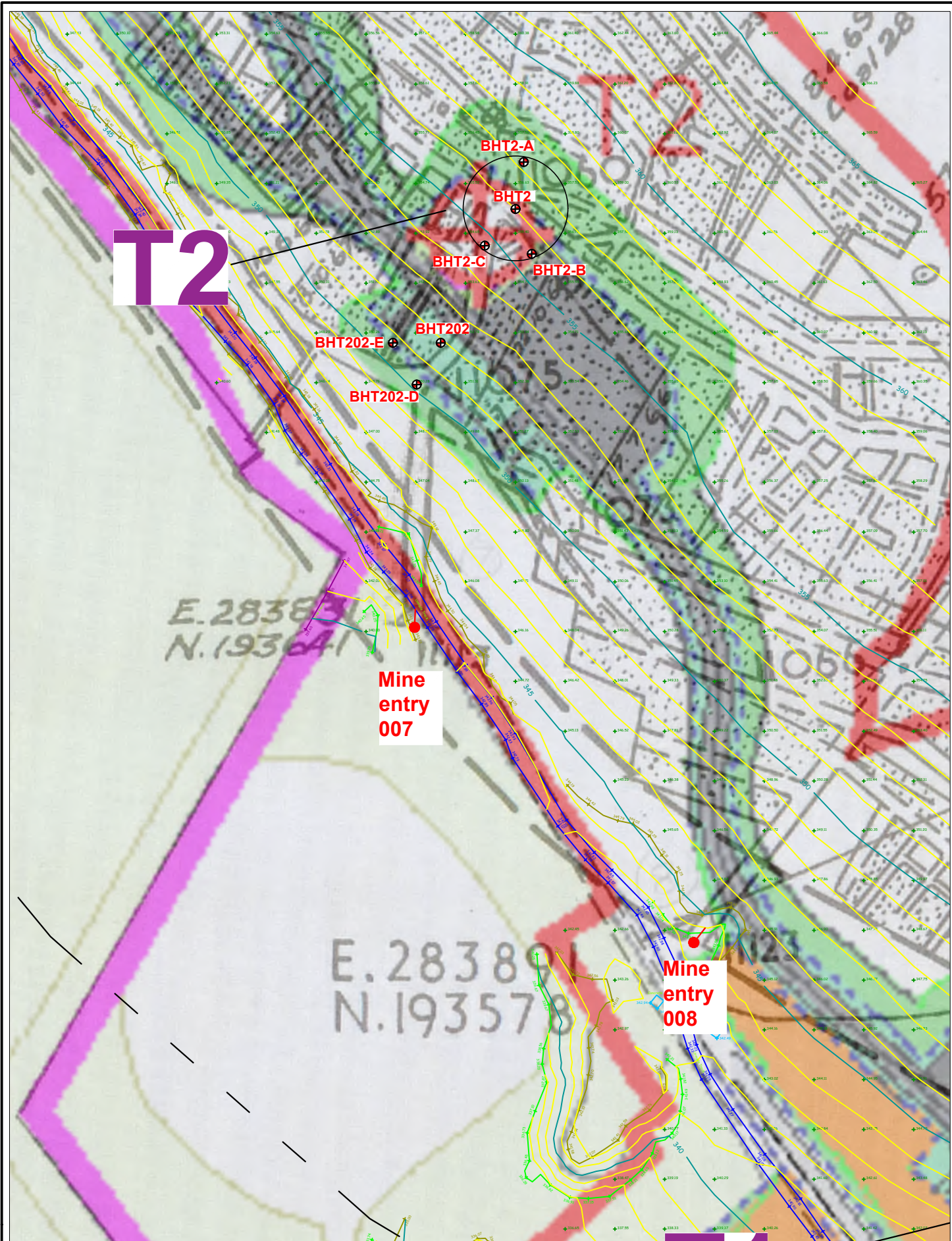


Figure 4D: Abandonment Plan and Proposed Layout Overlay - Access Road

Project: Foel Trawsant Windfarm

Job No.: 12826

Client: Walters UK Ltd

Scale: 1:1000 at A4

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Pennant Walters (FOELT) Ltd

Foel Trawsnant Windfarm

Factual Site Investigation Report

12826/RAH/21/FSI/RevA

CLIENT: Pennant Walters (FOELT) Ltd

PROJECT: Foel Trawsnant Windfarm

TITLE: Factual Site Investigation Report

JOB NO: 12826

DOCUMENT REF: 12826/RAH/21/FSI/RevA

Revision	Purpose Description	Originated	Reviewed	Authorised	Date
0	Final	RAH	RB	HP	August 2021
A	Final	RAH	RB	HP	September 2021

Geotechnical Engineers:

Intégral Géotechnique (Wales) Limited
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1.0 INTRODUCTION

1.1 GENERAL

Pennant Walters (FOELT) Ltd are proposing to develop a site at Foel Trawsnant, near Maesteg for commercial end use, comprising a windfarm.

Intégral Géotechnique (Wales) Limited have been appointed as the Geotechnical Engineers to undertake a site investigation to enable a geotechnical and geoenvironmental appraisal of the site and provide a basis for design.

This factual report presents the findings of the site investigation works completed to date.

This report (including all appendices to it and any subsequent addendums or correspondence) has been prepared for the sole benefit, use and information of Pennant Walters (FOELT) Ltd and no third party is entitled or permitted to rely on it. This report may not be used, reproduced or circulated (in whole or part) for any purpose without the written consent of Intégral Géotechnique (Wales) Limited. Intégral Géotechnique (Wales) Limited shall not be liable to any third party who does not have such express written permission to rely on the report for any losses they may suffer.

1.2 PROPOSED DEVELOPMENT

The new development is proposed to comprise 8No. wind turbines spread across the site area. Reference has been made to Figure 5.2 of the Environmental Statement by Wood Environment and Infrastructure Solutions UK, which also details the typical specification of the turbines, understood to be a maximum height of 120m (top of blade). The figure indicates access tracks through the site, with turbines and associated crane pads along the tracks and a large contractors compound and electrical substation located in the south of the site.

Initially, eleven turbines were proposed, but more recently, turbines T3, T4 and T7 have been removed from the project.

The following outlines the GPS coordinates of the proposed turbines. As the design phase progresses, these positions may be micrositied, but it is understood that they will remain largely in the vicinity of the locations below.

1.2 PROPOSED DEVELOPMENT (CONTINUED)

Table 1: GPS Coordinates		
Turbine No.	Easting, Northing	Grid Reference
1	283959, 193522	SS 83959 93522
2	283850, 193725	SS 83850 93725
3 (removed)	283693, 193910	SS 83693 93910
4 (removed)	283428, 194260	SS 83428 94260
5	283092, 194327	SS 83092 94327
6	282858, 194597	SS 82858 94597
7 (removed)	284161, 193808	SS 84161 93808
8	284016, 194027	SS 84016 94027
9	283737, 194202	SS 83737 94202
10	283709, 194446	SS 83709 94446
11	283503, 194707	SS 83503 94707

The position of Turbine T2 was amended during the site investigation, previously located at national grid reference 283835,193698.

1.3 SCOPE OF WORKS

The site investigation was completed in two phases as follows:

Initially a non-intrusive geophysical survey was undertaken in March 2021. Five of the eight proposed turbine locations (Turbines T1, T2, T8, T9 and T10) were surveyed along a single profile line to record P-wave Seismic Refraction and S-wave Seismic Refraction.

Following this an intrusive investigation comprising the following was undertaken in June through to July 2021 comprising:

- 31No. Trial Pit Excavations
- 4No. Trial Trench Excavations
- 28No. Rotary Open Hole/Rotary Cored Boreholes
- Sampling of soils and rock cores for laboratory geotechnical testing

1.4 LIMITATIONS

This document is intended to be a working document for further development in discussion with all concerned including the Local Planning Authority and Natural Resources Wales as appropriate.

1.4 LIMITATIONS (CONTINUED)

“Contamination” is taken throughout the report to mean the “presence of one or more potentially harmful substances as a result of human activity”. The use of the term in this way does not imply that harm is being or might be caused by the contamination. It should be noted that “contamination” can have different meanings under different regulatory regimes, for example, planning, building control and Part IIA of the Environmental Protection Act 1990. Naturally elevated concentrations of potentially harmful substances may also be of concern and the significance of any that have been found is also evaluated in this report.

It is important to recognise that there may be areas of contamination that have not been found, or that contaminants are present at concentrations above those that have been found. It is also important to recognise that contamination may be localised and that no investigation, however comprehensive, is capable of finding such occurrences other than by chance.

It should also be noted that vertical and lateral changes in ground conditions may be present between exploratory hole locations.

2.0 THE SITE

2.1 SITE LOCATION AND DESCRIPTION

The site is located at Foel Trawsnant to the south of Duffryn, comprising the land between Cynonville and Nantyffyllon, approximately 2.3km north-west of Maesteg. The national grid reference of the approximate centre of the site is at 283732, 194170. See Figure 1, Site Location Plan.

The site is irregular in shape and the full site boundary, hereby referred to as the planning site boundary, occupies an area of approximately 111 hectares. A smaller site boundary, hereby referred to as the development site boundary, refers to a smaller area, also irregular in shape, comprising the proposed development area. The boundaries of the site are generally defined by vacant land to the north, east, south and west with areas of woodland present to the south-west. A site plan is presented in Figure 2.

The site is situated on sloping ground with a maximum elevation of 371mAOD in the south of the site falling to approximately 215m along the north-west boundary. The site rises from the southern boundary to the maximum height (Trig point - Foel Trawsnant) in the southern portion of the site. A steep valley is present trending south-east to north-west through the north-west of the site along the alignment of the Nant yr Hywaid.

The site generally comprises vacant land, with various fence lines present as well as drains and minor watercourses. Localised areas of reeds and rushes are present and the grass/vegetation varies across the fields, but is generally short. Towards the north-east the ground surface is hummocky and comprises grassland. Areas of woodland are present adjacent to the site, but not located within the site boundary.

Several public footpaths are known to cross the site.

The site is accessed from the south via a gravel track from Neath Road, approximately 1.6km long.

Site photographs are included in Appendix A.

2.2 SITE OPERATIONS

The site is currently vacant. Several informal tracks cross through the site with two public footpaths including the St Lltyd's Walk along the western boundary and a walkway in the north-west.

2.3 SURROUNDING LAND USE

The surrounding land is generally vacant land with localised areas of woodland. Further afield, Cynonville, Duffryn and Nantyllyon are located to the north-west, north and south-east respectively.

2.4 AVAILABLE SITE INVESTIGATION DATA

Chapter 12 of an Environmental Statement completed by Wood Environment and Infrastructure Solutions UK dated December 2018 has been reviewed as part of this report. We have also been provided with Appendix 12B, A Coal Authority Report and Ground Stability Report and Appendix 12C, A Peat Study

There is no other investigation data for the site to our knowledge.

3.0 THE SITE INVESTIGATION

3.1 FIELDWORKS

Geophysical Investigation

A geophysical survey was undertaken in March 2021 which comprised surveys at five of the eight proposed turbine locations (Turbines T1, T2, T8, T9 and T10). The work was designed to provide initial information on estimated depth to bedrock and characteristics of the underlying strata using P-wave (V_p) and S-wave (V_s) seismic velocities. Seismic data was acquired along single profile lines to check for lateral homogeneity.

- P-wave Seismic Refraction – to provide seismic velocity (P-wave) sections along the selected profile lines.
- S-wave Seismic Refraction – to provide seismic velocity (S-wave) sections along the selected profile lines.

The work is described in Terradat's Geophysical Survey Report ref: 7299, dated April 2021 and is presented in Appendix B.

Intrusive Investigation

An intrusive site investigation was designed in accordance with BS5930:2015+A1:2020, the Code of Practice for Site Investigations, BS10175:2011+A2:2017, the Code of Practice for Investigation of Potentially Contaminated Sites, and 'Development of Land Affected by Contamination: A Guide for Developers' prepared by Welsh Local Government Association (WLGA)/Natural Resources Wales (NRW) Land Contamination Working Group, 2017.

An intrusive site investigation comprising 31No. trial pits, 4No. trial trenches and 28No. rotary drilled boreholes, was carried out during June and July 2021.

The trial pits were excavated across the proposed development areas, including at the proposed turbine locations, associated compounds and crane pads as well as along the proposed access roads.

The trial trenches were undertaken across proposed turbine footprints where there was the potential for a disparity in ground conditions beneath the turbine area as a result of either sloping ground (with a notable change in ground level), or the potential for shallow coal seams. A trial trench (TT3) was also undertaken near to the centre of the site in the vicinity of the geological Jubilee Slide Faultline in order to note any change in ground conditions in this area associated with the fault displacement.

3.1 FIELDWORKS (CONTINUED)

The trial pits were excavated using a 14 tonne tracked excavator to a maximum depth of 4.0m below existing ground level. The purpose of the trial pits was to confirm the nature of the shallow ground conditions and obtain representative samples for laboratory geotechnical testing. A photographic record of each trial pit was taken.

The trial trenches were also excavated using a 14 tonne tracked excavator to a maximum depth of 3.6mbgl. Trenches TT1, TT2 and TT4 were 19 to 20m long, completed along the diameter of proposed turbines T6, T10 and T1 respectively. Trench TT3 was undertaken near to the centre of the site, perpendicular to the alignment of the Jubilee Slide, to a total length of 15m.

The rotary drilled boreholes were located at the proposed turbine locations, drilled to a maximum depth of 35m below existing ground level, generally drilled to 30mbgl. The purpose of the boreholes was to prove the deeper ground conditions, with particular interest in the presence of any coal seams and/or any associated shallow mineworkings.

A rotary borehole was undertaken at the centre point of the eight proposed turbines. In these locations, the drilling was commenced by dynamic sampling from ground level to rockhead (between 1.5m and 4.5mbgl), continued by rotary coring to depths of between 15mbgl and 21mbgl, followed on by rotary open hole drilling to 30/35mbgl.

At turbine locations T1, T2, T8 and T9, four to six additional boreholes were undertaken around the perimeter of the proposed turbines, with sections of rotary coring undertaken in BHT8-D and BHT2 only (between 9m to 15mbgl).

It should be noted that in the location of Turbine 2, the proposed turbine coordinate was amended during the intrusive works. As such, three boreholes were undertaken in the vicinity of the former coordinate (BHT202, BHT202-D and BHT202-E) and four boreholes were undertaken in the location of the amended coordinate (BHT2, BHT2-A, BHT2-B and BHT2-C).

Representative soil samples were taken from the trial pits and boreholes for laboratory geotechnical testing and placed in the appropriate sample containers deemed suitable for the analysis required. Strict protocols were adopted during this process to limit the cross contamination of samples.

3.1 FIELDWORKS (CONTINUED)

The fieldworks were supervised by a qualified Geotechnical Engineer from Intégral Géotechnique (Wales) Limited who also logged the trial pits and prepared their detailed engineering logs in accordance with the requirements of BS5930:2015+A1:2020. The engineering logs provide descriptions of the materials encountered in accordance with BSEN ISO 14688-1 (2002) and 14689-1 (2003) for soils and rocks respectively.

The approximate locations of the trial pits, trial trenches and rotary open hole boreholes are shown on Figure 2. Figures 3A, 3B and 3C depict the locations on the topographical survey in more detail. The trial pit logs are presented in Appendix C. The trial trench sections are shown in Appendix D. The trial pit and trial trench photographs are presented in Appendix E. The rotary borehole logs are presented in Appendix F. Rotary core photographs are included in Appendix G.

3.2 LABORATORY GEOTECHNICAL TESTING

Representative soil samples obtained from the trial pits and rotary boreholes were sent to the UKAS accredited laboratories of Apex Testing Solutions.

The following testing was undertaken on soil samples collected from depths of between 0.4m and 1.8mbgl:

- 12No. Moisture Content
- 4No. Atterberg Limits
- 8No. Particle Size Distribution,
- 4No. Optimum Moisture Content and Maximum Dry Density relationship,
- 6No. pH and water soluble sulphate

A copy of the soil geotechnical test results is presented in Appendix H.

The following testing was undertaken on rock samples collected from depths of between 3.7m and 16.5mbgl:

- 15No. Point Load Tests (with axial and diametral tests on each sample)
- 2No. Uniaxial Compressive Strength (UCS) Tests

A copy of the rock geotechnical test results is presented in Appendix I.

APPENDIX A

SITE PHOTOGRAPHS

Turbine 1 and Turbine 2



West of T1, looking north towards Trig point (Foel Trawsnant).



Looking south towards T1 with access track beyond.



T2 area looking south-west.



T2 area, looking south-east.

Site Photographs

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Features south of Turbines 1 and 2.



Mound of stockpiled material south of track between T1 and T2.

Site Photographs

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Turbines 5 and 6



Looking north-west from south-eastern corner of T5 and T6 field.



T5 area, looking north-west.



Pond north-west of T5.



T6 area, looking east.

Site Photographs

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Turbine 8



T8 area looking north-east.



T8 area looking west.



Gate in the approximate centre of the site, south of T8 and compound. Looking north.

Site Photographs

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Features south of Turbine 8



Depression with abundant rushes and timber - Suspected mine shaft.



Site Photographs

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Suspected Jubilee Shaft Alignment



Looking west.



Looking east.

Site

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Turbine 9



Looking north.



Pond in south-west corner of field.



Looking north-east.



Looking west.

Site Photographs

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Turbine 10



Looking north-west.



Looking north.

Site Photographs

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Turbine 11



South of fenceline, looking west.



South of fenceline, looking east.



South of fence, looking north towards T11 location.
Ravine located immediately beyond fenceline.

Site Photographs

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Nant yr Hwyaidd



Looking south-east.



Looking north-west.

Site Photographs

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APPENDIX B

GEOPHYSICAL SURVEY

GEOPHYSICAL SURVEY REPORT

Project

Seismic refraction survey at a proposed windfarm

Location

Foel Trawsnant, Maesteg, County of Neath Port Talbot

Client

Intégral Géotechnique

**Head Office
Unit 1
Link Trade Park
Penarth Road
Cardiff CF11 8TQ
United Kingdom**

**Telephone: +44 (0)2920 700127
www.terradat.co.uk**

**Job reference: 7299
Date: April 2021
Version: 1**

GEOPHYSICAL SURVEY REPORT

Project

Seismic refraction survey at a proposed windfarm

Location

Foel Trawsnant, Maesteg, County of Neath Port Talbot

Client

Intégral Géotechnique

Project Geophysicists: Andrew Thomas BSc MSc FGS

Reviewer: Rob McDonald BSc PhD
S Hughes PhD BSc FGS

Job Reference: 7299

Date: 9th April 2021

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Appendices

1 EXECUTIVE SUMMARY

A geophysical report was carried out as part of the ground investigation for five proposed wind turbines at Foel Trawsnant, Maesteg, County of Neath Port Talbot. The survey work was commissioned by Intégral Géotechnique (The Client) and took place on the 24th and 25th of March 2021. The key aims of the geophysical survey were to determine the depth to rock and characterise ground conditions.

The main geophysical element comprised Seismic refraction (P and S-wave) and Multichannel Analysis of Surface Waves (MASW) at the five proposed locations.

Analysis of the compressional (P) wave and shear (S) wave seismic data has provided low-error layer models of the surface sediments, weathered overburden and bedrock. There is generally a very good correlation between the corresponding P and S wave velocity boundaries, and the seismic sections provide detailed information about the rockhead geometry and the distinct velocity layers to help gain an understanding of the bulk engineering properties of the shallow sub-surface.

2 INTRODUCTION

This report describes a geophysical survey carried out as part of the ground investigation for the proposed wind farm at Foel Trawsnant. The geophysical survey work was commissioned by Intégral Géotechnique (The Client) and took place on the 24th and 25th of March 2021. The key aims of the geophysical survey were to determine the depth to rock and characterise ground conditions.

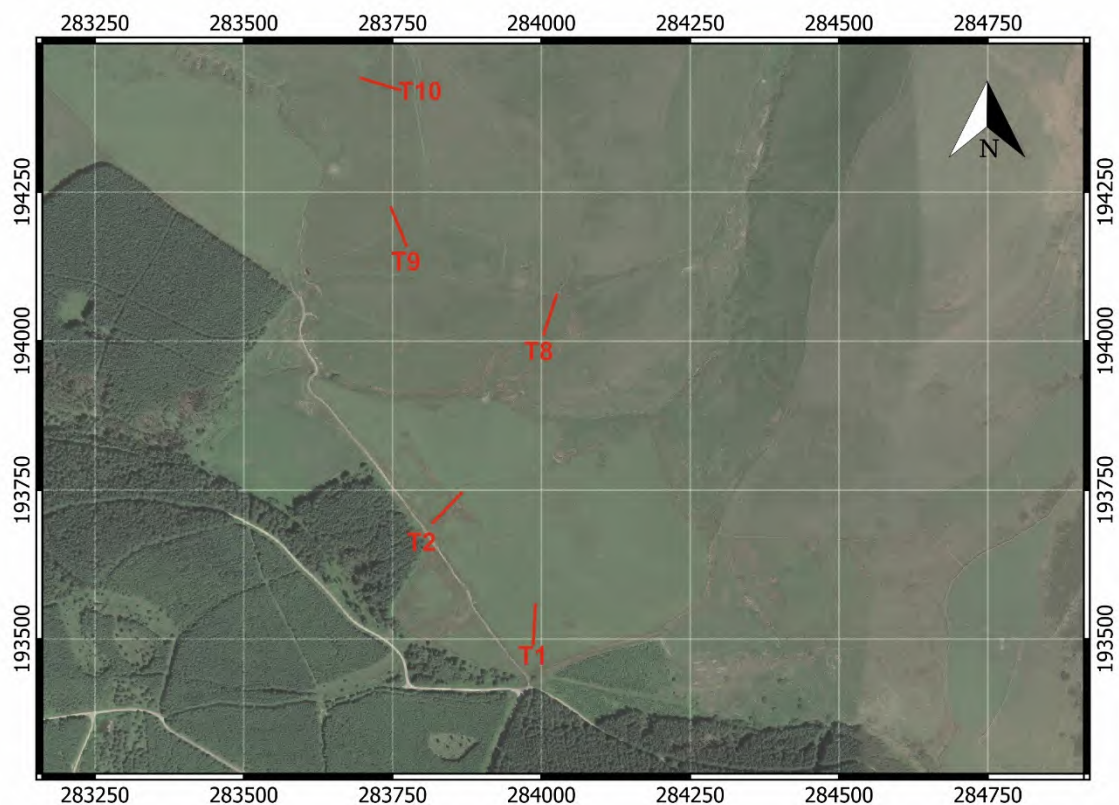


Plate 1: Map showing the location of the proposed wind turbines T1, T2, T8, T9 and T10.

2.1 Site description

The Foel Trawsnant Wind Farm site is located approximately 2.3km to the northwest of Maesteg, Bridgend, and lies entirely within the Neath Port Talbot local authority area. The proposed wind farm comprises open moorland used primarily for grazing of livestock.



Plate 2: Left – Location T1 looking south. **Right** – Location T8 looking north.

2.2 Geological setting

British Geological Survey (BGS) records (NERC,2019) indicates the Foel Trawsnant survey area is underlain by Rhondda Member and Llynfi Member Sandstone. The overlying superficial geology has not been mapped, nor is any intrusive data available at this time.

2.3 Survey objectives

The primary objectives of the survey are as follows:

- Provide information on the thickness of superficial deposits.
- Provide information on the depth to bedrock.
- Characterise the material velocities to help gain an understanding of the bulk engineering properties of the sub-surface.

2.4 Survey design

Given the scope of the survey objectives, it was decided, under client direction, to adopt an integrated survey approach utilising the following techniques:

- **P-wave Seismic Refraction** – to provide seismic velocity (P-wave) sections along the selected profile lines.
- **S-wave Seismic Refraction** – to provide seismic velocity (S-wave) sections along the selected profile lines.
- **MASW** (Multichannel Analysis of Surface Waves) – to determine the S-wave velocity structure where favourable conditions are encountered (considered optional depending on the suitability of the preferred S-wave refraction method).

A single seismic profile was acquired at each of the five turbine locations. Due to the anticipated shallow bedrock and soft surface sediments, it was thought likely that the MASW technique would be limited, but to ensure survey integrity, MASW data were still acquired.

Background information for the survey method is provided in the appendices, and descriptions of the actual survey work carried out on site are provided in the sections below.

2.5 Quality control

The geophysical data are collected in line with normal operating procedures as outlined by the instrument manufacturer and TerraDat Ltd. company policy. On completion of the survey, the data are downloaded from the survey instrument on to a computer and backed up appropriately. The acquired data set is initially checked for errors that may be caused by instrument noise, low batteries, positional discrepancies etc. and any field notes are either written up or incorporated in the initial data processing stage. The data set is processed using the standard processing routines, and once completed, the resulting plots are subject to peer review to ensure the integrity of the interpretation. Our quality control standards are BS EN ISO 9001: 2015 certified.

3 SURVEY DESCRIPTION

The survey was carried out using the following geophysical methods:

- P-wave seismic refraction (employs compressional waves)
- S-wave seismic refraction (employs shear waves)
- MASW (Multichannel Analysis of Surface Waves)

Background information for the survey method is provided in the appendices, and descriptions of the actual survey work carried out on site are provided in the sections below.

3.1 Survey layout

Seismic data were acquired along the specified profile lines, and the results are presented as interpreted cross-sections indicating the location and physical characteristics of identified features together with a text description. The Client provided the coordinates of the turbines, and the orientation of each seismic profile was determined by the Client based on appropriate ground conditions and terrain for each location, respectively. The proposed wind turbine positions and extents of seismic sections are shown in Table 1.

Turbine ID	Start	End	Proposed wind turbine location
T10	283761.988 E 194421.583 N	283658.548 E 194451.848 N	283728 E 194431 N
T9	283773.575 E 194160.183 N	283747.778 E 194223.336 N	283761 E 194191 N
T8	284004.391 E 194011.402 N	284025.633 E 194077.073 N	284015 E 194045 N
T2	283818.341 E 193695.327 N	283865.695 E 193744.653 N	283842 E 193719 N
T1	283968.583 E 193492.174 N	283990.228 E 193557.123 N	283979 E 193524 N

Table 1: Proposed locations of wind turbines and start and end positions of the corresponding seismic refraction profiles.

All geophone and off-end shot locations were surveyed using a *Trimble R8s GNSS* instrument, with an accuracy of +/- 25mm, and referenced to British National Grid (OSTN15) using the Trimble RTK VRS system.

3.2 Seismic survey - P and S-wave refraction

A seismic survey involves generating a shock wave signal at the surface to investigate the geological structure beneath a chosen profile line. A series of vibration sensors (geophones) are deployed along the line and are used to record the travel times of incident seismic signal as it returns from below ground. Features such as rock-head, the water table, soft sediments, and dense till all have distinct velocity ranges and can be imaged in cross-section using a seismic refraction survey. A description of the field activity is provided below, and some further background information on the survey method is found in the Appendix.

3.2.1 Seismic survey field activity - P-wave refraction

P-wave seismic refraction data were acquired along a series of profile lines using a high precision 48-channel *GEODE* (Plate 3) seismic system. In order to target the anticipated shallow depth range, the low frequency (10Hz) geophones were deployed at 1.5 m intervals, providing individual geophone spread lengths of up to 70.5 m. For many of the profile lines,

the seismic wave generated by a sledgehammer striking a plate was sufficient. However, for the others, a Buffalo Gun firing blank shotgun cartridges (10-gauge) were required to overcome the signal attenuation caused by the near-surface peat/organic layers. In order to build up a refraction section, seismic shots were taken at several positions along the geophone spread and at set distances beyond each end.

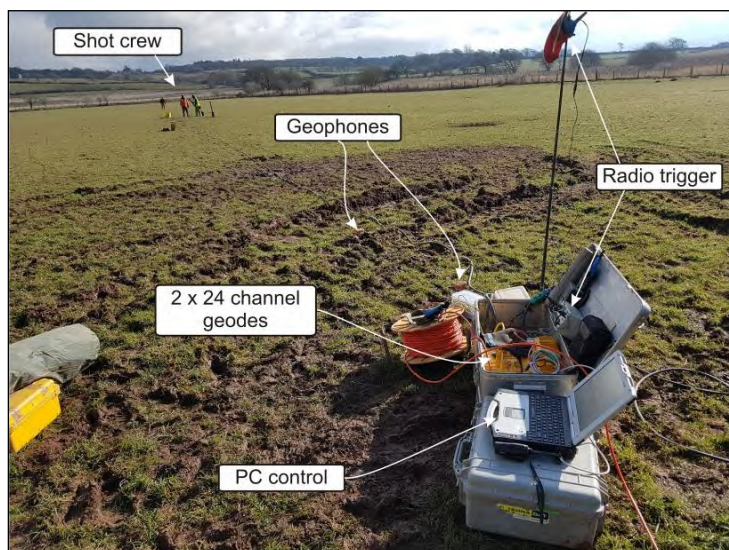


Plate 3: seismic field setup (library picture)

3.2.2 Seismic survey field activity - S-wave Refraction (Shear)

S-wave seismic refraction data were also acquired using a 48-channel *GEODE* seismic system. To target possible weathered rock within a shallow depth range, horizontally mounted geophones were once again deployed at 1.5 m intervals producing individual geophone spread lengths of up to 70.5 m. A weighted S-wave plate struck sideways with a sledgehammer was used as the source (Plate 4). At each shot location, the S-wave plate was aligned perpendicularly to the profile line and subsequently struck on both ends to generate two sets of shear wave recordings that have opposite polarity. Shots were deployed at several positions along the geophone spread and beyond both ends.



Plate 4: S-wave source plate (library picture)

3.2.3 Seismic survey data processing – P and S-wave refraction

The data processing was carried out using PICKWIN and PLOTREFA software. The first stage involved accurate determination of the first-arrival times of the seismic signal (time from the shot going off to each recording geophone) for every shot record using PICKWIN. Time-distance graphs showing the first-arrival times were then generated for each seismic line and analysed using PLOTREFA software to determine the number of seismic velocity layers. Modelled depth profiles for the observed seismic velocity layers were produced by a tomographic inversion procedure that was revised iteratively to develop a best-fit model.

The final output of a seismic refraction survey is a velocity model section of the subsurface. The section is based on an observed layer sequence with measured velocities that correspond to physical properties such as levels of compaction/saturation in the case of sediments and strength/rippability in the case of bedrock. A transitional velocity model may be considered if distinct layers are not expected, or velocity contrasts between layers are marginal. However, a layered model appears most appropriate at this site. The final sections were exported to CorelDraw for annotation and presentation.

3.3 Seismic survey - MASW

MASW (Multichannel Analysis of Surface Waves) is a seismic technique that can provide a characterisation of shear-wave velocity (V_s) for the near-surface (<30 m). It utilises Rayleigh-type surface waves that are normally considered noise in seismic refraction/reflection surveys and called “ground roll”. The waves are generated by a seismic source and recorded via

multiple geophones deployed on an even spacing and connected to a common recording device (seismograph).

3.3.1 Seismic survey field activity - MASW

The field setup for the MASW seismic survey is similar to the refraction setup, however instead of a discrete number of shot points, shots are acquired at each geophone position along the profile. For this particular survey, the geophones were set at 1.5 m intervals, and the data were acquired using a 10lb sledgehammer source.

3.3.2 Seismic survey data processing - MASW

Analysis of surface waves recorded on multichannel shot records was carried out using *SurfSeis* software, which considers the dispersion properties of all types of waves (both body and surface waves) through a wave field-transformation method. This directly converts the multichannel record into an image, where a dispersion pattern is recognised, and the necessary dispersion properties are extracted. These dispersion properties are used to generate modal dispersion curves that are subsequently inverted and used to produce the resultant shear-wave velocity (V_s) profile. The final sections were exported to CorelDraw for annotation and presentation.

4 RESULTS AND DISCUSSION

The results of the seismic refraction cross-sections are presented in Figures 2 to 6 as a series of modelled velocity sections. A general description of the interpretation process and summary findings for each technique is given below.

4.1 Seismic Refraction – compressional (P) and shear (S) wave

The interpretation of the refraction sections is based on the widely understood and published velocities of typical sub-surface materials. The quality of the seismic data was very good for both P and S wave producing low error layer models of the subsurface sediments, weathered overburden and bedrock; however, due to unfavourable ground conditions, the MASW data were deemed unreliable and has not been used in the interpretation.

4.1.1 Compressional (P) wave

Analysis of the P-wave refraction data suggests up to five distinct layers of contrasting velocity (V_p). A typical soil/rock description of each layer is given in Table 2 below. The seismic refraction section represents the measured bulk characteristics of the subsurface, and in some cases, it can prove difficult to correlate with point source data (borehole/trial pits) where the underlying material is variable.

COMPRESSION (P) WAVE KEY:	
	Layer P1 (150 - 230 m/s) Unsaturated surface material comprising weak soils and fibrous peat.
	Layer P2a (480 - 670 m/s) Comprising moderately compacted, unsaturated sediments
	Layer P2b (1010 - 1530 m/s) Comprising stiff, compacted, partially saturated sediments
	Layer P3 (1430 - 1450 m/s) - Transition layer comprising stiff soils / weak (soft) rock**
	Layer P4 (2900 - 3030 m/s) - Bedrock
** Applicable to T1 4-layer model only.	

Table 2: A guide to P-wave velocities related to superficial/rock description for the Foel Trawsnant site; Interpreted by correlation with standard tables and the S-wave dataset.

Given the highly variable velocities of Layer P2, the layer has been subdivided into P2a and P2b to distinguish dryer moderately compacted sediments from stiffer, partially saturated sediments (Table 3). Further, layer P3 is unique to the 4-layer P-wave model for T1.

When comparing the resulting S-wave and P-wave velocity sections, there is a rough 'rule of thumb' with regards to the ratio of the velocities. For unconsolidated sediment, the V_p/V_s ratio is usually between 4.0 and 8.0, while for consolidated rocks, the V_p/V_s ratio can vary between 1.5 and 2.0. Even though these are accepted values, they can vary between sites depending on the geology and ground conditions.

When correlating between the respective S-wave and P-wave refraction boundaries, in some instances, there can be differences in the observed depths of those boundaries. The degree of deviation between layers identified by P and S-wave surveys depends primarily on the prevailing geology, most notably the weathering profile, lithology, bedding structure, presence of groundwater, and to a lesser degree, the survey parameters (horizontal/vertical polarised S-waves, spacing, etc.). It has been noted on some sites that an S-wave or P-wave refractor can correlate with a particularly hard internal bedding unit as opposed to a weaker rockhead immediately above.

4.1.2 Shear (S) wave

Analysis of the S-wave refraction data has identified up to four distinct layers of contrasting velocity (V_s), and a typical description of each layer is given below (Table 3). The quality of the S-wave refraction data was good, and shot examples are provided in the Appendix.

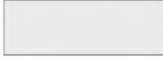
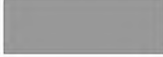
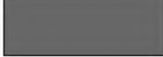
Rock / Soil Description (top 30m)	S-wave velocity (m/s)	SHEAR (S) WAVE KEY:	
Hard rock (<i>strong*</i>)	> 1,500		Layer (S1) 54 - 100 m/s - Very soft soils*.
Rock (<i>moderately strong*</i>)	760 - 1,500		Layer (S2) 280 - 320 m/s - Stiff soils*.
Very dense soil / soft (<i>weak*</i>) rock	360 - 760		Layer (S3) 410 - 790 m/s - Very dense soil / soft (<i>weak*</i>) rock
Stiff soil	180 - 360		Layer (S4) 910 - 1360 m/s - Moderately strong bedrock*.
Soft soil	<180		
The NEHRP Recommended Provisions for seismic regulation for new buildings, (FEMA-222A and FEMA-223A, 1994) * UK equivalent classification (Waltham, 1994)			

Table 3: A guide to the shear (S) wave velocity structure for the Foel Trawsnant site, based on the correlation between standard tables and the observed velocity layers identified by the survey.

As a guide, the resolution of a given refraction boundary is typically considered to be approximately 10% of its depth below ground level, which for a boundary at 10m depth would be +/- 1m. However, at very shallow depths, the resolution may vary/decrease as a function of geophone spacing and ground consistency. It is worth noting that seismic refraction sections represent the measured bulk characteristics of the subsurface. In certain rare cases, it can prove difficult to correlate a seismic section with point source data (boreholes/trial pits) where the underlying material is variable in character and samples obtained by invasive means are not broadly representative of the geology along a particular survey line. However, information from online boreholes and trial pits is always very valuable for calibrating seismic sections and gaining an understanding of the lithologies and how they relate to seismic layering in more detail.

A further consideration is the potential presence of a 'hidden layer', which can occur either when a buried slow layer is overlain by a faster layer, i.e., 'velocity inversion', or alternatively when a very 'thin layer' overlies a significantly faster layer, and the refracted rays of the deeper faster layer arrive first. Depending on the significance of the hidden layer, this can cause a slight over-estimation of the modelled depth to bedrock in a 'velocity inversion' scenario or a slight underestimation of the depth in a 'thin layer' scenario.

In general, the shear-wave velocity (V_s) is much more sensitive than the P-wave velocity (V_p), where the ground becomes abruptly stiffer due to increases in strength. For this reason, it is possible to use the V_s to distinguish between sediments and ‘rock’ (i.e. cemented) material, which is particularly useful for refining the P-wave interpretation. A further advantage of shear waves is that they are unaffected by the groundwater table.

4.2 Seismic Refraction – Detailed Discussion

Turbine T10 (Figure 2)

The results from the seismic refraction survey at location T10 can be seen in Figure 2. The layer boundaries for the P and S waves correlate very well, providing confidence in the modelled sections. The subsurface layers dip roughly parallel to the surface topography. The P and S wave velocities for Layer P4 and S4, 2900 to 3030 m/s and 990 to 1290 m/s, respectively, reveal an undulating boundary of moderately strong bedrock at a depth ranging between 4 to 6 meters below ground level (bgl). Subtle variations in the calculated S-wave velocities (Layer S4) suggest a slight increase in rock strength towards the southeast of the section.

Overlying this is layer P2a and S2, where calculated P-wave and S-Wave velocities of 460 to 670 m/s and 300 - 320 m/s suggests a ‘stiff soils’ layer and forms a roughly uniform thickness along the section.

The near-surface Layers P1 and S1 are interpreted to comprise a thin layer of weak soils and fibrous peat exhibiting velocities of 150 m/s and 70 m/s and range in depth of ~0.5 and 1 m.

Turbine T9

The results from the seismic refraction survey at location T9 can be seen in Figure 3. Similar to T10, the P and S wave velocities (2420 – 2480 m/s and 1150 – 1270 m/s) reveal moderately strong bedrock at a depth ranging from 4 to 6 meters bgl. The modelled sections reveal a slight divergence between the deepest P-wave and S-wave boundary, with the S-wave (layer S4) boundary revealing bedrock at shallower horizons. A deviation between the P and S wave boundaries can be relatively common on sites where there are local variations in

the lithology/groundwater and/or weathering processes. Given the S-wave velocities of the layer, S4 are indicative of moderately strong rock; this overlap may indicate a zone transitioning from weathered/weaker to relatively stronger rock.

Overlying this is layer P2b and S3, where calculated P-wave and S-Wave velocities of 1010 to 1100 m/s and 410 - 500 m/s suggests a layer comprising very dense soil and/or soft, weathered rock. The over-deepening of Layer P2b between 5 and 30 meters chainage may suggest some differential weathering and/or a subtle change in lithology/groundwater.

Turbine T8

The three-layered seismic refraction profiles for T8 are presented in Figure 4. The P and S wave velocities for Layer P4 and S4, 1960 to 2030 m/s and 920 to 1120 m/s, respectively, reveal an undulating boundary of moderately strong bedrock at a depth ranging between 2 to 6 meters bgl. The deepest P-wave and S-wave boundaries correlate well, with subtle divergences being interpreted to represent local variations in the weathering/consolidation of the superficial deposits.

Overlying this is Layers P2b and S3, where calculated P-wave and S-wave velocities of 1010 – 1040 m/s and 540 – 560 m/s suggest a layer of very dense soil / soft (weak) rock.

From 0m and 40m chainage, the bedrock boundary between P4/S4 and P2b/S3 dips northeast where a subtle decrease in S-wave velocities (Layer S4) and an increase in thickness of the overlying layers P2b and S3 are evident, indicative of either a subtle change in the lithology and/or localised zones of differential weathering.

Turbine T2

The results from the seismic refraction survey at location T2 are presented in Figure 5. The resulting sections are very consistent with T10 and T9 and reveal moderately strong bedrock overlain by very dense soils/soft (weak) rock; however, the P and S wave boundaries at chainage 35m to 70m diverge considerably, reducing the confidence in the modelling and its reliability in this area. At chainage 0 - 35m, the P-wave and S-wave velocities reveal a moderately strong bedrock layer (Layer P4 (V_p 1820 – 2050 m/s) and S4 (V_s 920 – 1120 m/s))

at a depth of around 1 to 4 m bg and overlain by a 2 to 3 m thick layer of very dense soils/weak rock.

Beneath the NE part of the section (chainage 30m to 50m), an increase in depth to bedrock and a corresponding increase in the thickness of layer P2b may indicate a localised increase in weathering. Given the apparent variability of the model sections and the poor quality of the S-wave signal in this area, it is anticipated that better ground conditions are likely to be encountered beneath the SW half of the survey line.

Turbine T1

The results from the seismic refraction survey at the southernmost location T1 is presented in Figure 6. The P and S wave models correlate very well; however, the P-wave model reveals four distinct layers of contrasting velocity, whereas the S-wave model is unable to define the deepest refraction boundary, either due to reduced ground penetration or limited contrast in the S-wave velocity with the overlying material. The interpreted, moderately strong bedrock layer (Layer P4 (V_p 2520 – 2880 m/s)) can be seen at a depth of around 12 to 13 m bgl.

Overlying this is Layer P3 and S3, where calculated P-wave and S-wave velocities of 1430 – 1450 m/s and 720 – 790 m/s reveal a relatively thick (9 – 10m), uniform layer of soft (weak) rock. Layer P3, not seen at the other four locations, may indicate a change in lithology associated with the Llynfi Beds.

5 CONCLUSIONS

- Analysis of the compressional (P) wave and shear (S) wave seismic data has provided low-error layer models of the surface sediments, weathered overburden and bedrock. The seismic sections provide detailed information about the rockhead geometry and the material velocities to help gain an understanding of the bulk engineering properties of the sub-surface in the proposed wind farm area.
- There is generally a very good correlation between the corresponding P and S wave velocity boundaries, and any small disparities most likely reflect local differential weathering and/or subtle changes in the lithology.
- At turbine location T2, the S-wave survey results were adversely affected by shallow ground conditions along the NW half of the survey line. Based on the seismic survey results, it is anticipated that the ground conditions along the SW half of the survey line at T2 are more consistent with those encountered at the other turbine locations.
- If any additional geophysical data / intrusive information becomes available, it may be possible to extend/refine the interpretations and calibrate the acquired dataset.

Disclaimer

This report represents an opinionated interpretation of the geophysical data. It is intended for guidance with follow-up invasive investigation. Features that do not produce measurable geophysical anomalies or are hidden by other features may remain undetected. Geophysical surveys complement invasive/destructive methods and provide a tool for investigating the subsurface; they do not produce data that can be taken to represent all of the ground conditions found within the surveyed area. Areas that have not been surveyed due to obstructed access or any other reason are excluded from the interpretation.

FIGURES