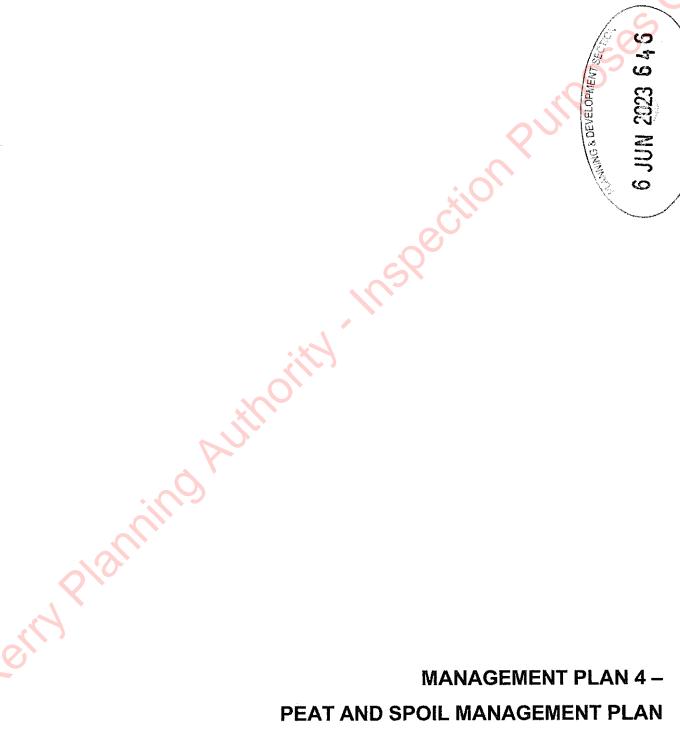
Client: Project Title: Document Title: Inchamore Wind DAC Inchamore Wind Farm

Construction Environmental Management Plan

Date: Project No: Document Issue: May 2023 6226 Final



# **MANAGEMENT PLAN 4 –** PEAT AND SPOIL MANAGEMENT PLAN

# **INCHAMORE WIND DAC**

# INCHAMORE WIND FARM CO. CORK

CONSTUCTION ENVIRONMENTAL

MANAGEMENT PLAN

(CEMP)

# MANAGEMENT PLAN 4 PEAT AND SPOIL MANAGEMENT PLAN

**MAY 2023** 

Inchamore Wind DAC, C/O FuturEnergy Ireland, 27/28 Herbert Place, Dublin 2, D02DC97, Ireland.

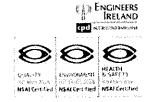


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# **CONTENTS**

1	INT	RODUCTION1
	1.1	General1
	1.2	Site Investigations1
	1.3	General Aims and Principals of the Peat and Spoil Management Plan1
	1.4	Management of Excavated Material2
	1.5	Reinstatement3
2	ES	FIMATED EXCAVATION QUANTITIES4
	2.1	Road Construction4
	2.2	Wind Turbine Foundations6
	2.3	Turbine Hardstands9
	2.5	Electrical Sub-Station and Site Compound
	2.6	Grid Connection11
	2.7	Drainage
	2.8	Total Estimated Excavation Volume Summary
3	RE	-USE OF EXCAVATED MATERIAL17
	3.1	Road Construction17
	3.2	Turbine and Met Mast Foundation Excavations17
	3.3	Storage Areas to the perimeter of Hardstands17
	3.4	Grid Connection17
	3.5	Bedrock
	3.6	Summary of Re-Use of Excavated Material19
4	RE	COMMENDATION
F	Appen	COMMENDATION  dix A – Site Investigations Report  6 JUN 2023 6 4 6

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Topsoil and surface vegetation excavated during the construction of the wind farm infrastructure will be used to finish reinstated surfaces around Turbine Foundations and Turbine Hardstands. Reinstatement and reprofiling of, and around, infrastructure will be carried out during the construction phase.

Landscaping will allow for sympathetic restoration of the ground surface and ground profile to reduce the visual impact of new infrastructure, facilitate vegetation regrowth and reduce scour and erosion of bare surfaces prior to vegetation establishment. Reinstatement will be undertaken as work progresses. This work will be completed only by experienced personnel under guidance from the appointed Ecological Clerk of Works, and they will conduct regular inspections of the work to ensure it is completed in an appropriate manner.

All areas subjected to reinstatement will be fenced with stock-proof fencing to prevent livestock disturbance until vegetation has become established.

Excavated material is used in several ways:

6 JUN 2023 6 4 6

- Excavated rock is used for Site Access Roads and Turbine Hardstands.
- Excavated sub-soil material will be used as fill material where suitable (e.g., back filling around and on top of Turbine Foundations) with any other sub-soil material to be placed in shallow deposition areas around the WTG foundations (always avoiding sensitive habitats).
- Excavated topsoil will be used to vegetate edges of Turbine Hardstands and Turbine Foundations.
- All surplus material will be used to reinstate the proposed borrow pits.

# 1.4 Management of Excavated Material

The excess excavated material will be permanently stored in the borrow pit. Excavated materials during the construction phase required for reinstatement, shall in the first instance be stored on site, in an environmentally safe manner that will not result in the pollution of waters, until it is required for re-use.

A buffer of 25 m from watercourses will be implemented for storage areas of excavated materials to be re-used for reinstatement works.

Excavated material will not be stored adjacent to slopes (>15 degrees gradient). This will be subject to evaluation and approval by the Civil Contractors' geotechnical engineer and will accommodate the Site stockpiling requirements based on earthwork calculations.



# 2 ESTIMATED EXCAVATION QUANTITIES

The environs of the Site are characterised by relatively complex (hilly) topography with associated elevations ranging between c. 350 to 460 metres above datum (m AOD) throughout the Development. Geotechnical drawings prepared by Minerex Environmental Limited were used in conjunction with the peat depth probes and geotechnical trial pit logs as seen in **Appendix I – Site Investigations Report** to calculate the spoil volumes generated by the Development, as can be seen in **Tables 2.1** to **2.6**.

# 2.1 Road Construction

The minimum useful road width required for delivery of turbine components is 4.5 m. **Table**2.1 tabulates the volumes of topsoil and sub-soil to be excavated for the Site access roads.

6 JUN 2023 646

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Trial Pit data is available in the Site Investigation Report (**Appendix A**). Average peat depth from this data was calculated to be 0.6 m. Excavation for roads is required to 0.6 m only. From this, the volume of peat, soil and rock to be extracted was extrapolated and can be seen in **Table 2.1**.

# 2.2 Wind Turbine Foundations

The depth of excavation required for each wind turbine foundation will vary depending on peat depths. The diameter of the gravity Turbine Foundations will range from 22 m to 25.5 m. Each Turbine Foundation excavation will be 2.8 m to 3.2 m deep. **Tables 2.2a (i and ii)** and b (i and ii) provide a breakdown of the estimated total excavation volume for the Turbine Foundations.



y 2023 6226 Final

Date: Project No: Document Issue:

Inchamore Wind DAC Inchamore Wind Farm CEMP – Peat and Spoil Management Plan

Projuut Title: Document Title:

Table 2.2b (i) Estimated Excavation for WTG Foundations (25.5 m Diameter and 2.8 m depth)

							_{	<u>}</u>	UN 29
t suc	Total Rock (m³)	664	919	102	0	919	/6'0	2,605	Eldar con
	Total Soil (m³)	51	357	1,226	1,226	153	0.07	3,083	
	Total Peat (m³)	715	153	102	204	357	30.0	1,562	
	Total Excavation (m³)	1,430	1,430	1,430	1,430	1,430	100.0	7,250	N
	Rock depth (m)	1.30	1.80	0.20	0:00	1.80	0.0		nd 3.2 m de
25£) mdiameter	Depth to suitable formation (m)	1.50	1.00	2.60	2.80	1.00	1.0		ns (25.5 m Diameter and 3.2 m depth)
28	Mineral Soil (m)	0.10	0.70	2.40	2.40	0.30	20		tions (25.5
	Max Peat Depth (m)	1.40	0.30	0.20	0.40	0.70	2::5	Totals	TG Foundat
	Foundation Depth (m)	2.80	280	2.30	2 80	280	25	2.	Table 2.2b (ii) Estimated Excavation for WTG Foundation
	Area of Foundation Excavation (m²)	544	744	) 	7	7	4000	0.001	ii) Estimated E
	Turbine No.	F-	- CT	1.2 T3	2- F	+   +	1001	WELNIAS.	Table 2.2b (

NAMENT SECTION

				23	25.5 m diameter					Ta-
Turbine No.	Area of Foundation Excavation	Foundation Depth (m)	Max Peat Depth (m)	Mineral Soil (m)	Depth to suitable formation (m)	Rock depth (m)	Total Excavation (m³)	Total Peat (m³)	Total Soil (m³)	Total Rock (m³)
Ε	511	3.20	1,40	0.10	1.50	1.70	7,634	715	5	868
To	511	3.20	0:30	0.70	1.00	2.20	1,634	153	357	1,124
T3	511	3.20	0.20	2.40	2.60	09:0	1,634	102	1,226	306
P.1	511	3.20	0.40	2.45	2.85	0.35	1,634	204	1,251	179
1.5	511	3.20	0.70	0:30	1:00	2.20	1,634	357	153	1,124
Met Mast	1000	1.0	0,3	0.7	1.0	0.0	100.0	30.0	70.0	0.0
							0 271	4 582	3 100	3 601

Date: Project No: Document Issue:

Inchamore Wind DAC Inchamore Wind Farm CEMP – Peat and Spoil Management Plan Cli Project Title: Document Title:

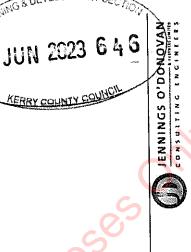
# Electrical Sub-Station and Site Compound 2.5

Dimensions of Sub-Station and Site Compound Table 2.4a

Area(m²)	1,314	3,640	4,954
42.2			
No.	-	1	
Width	1	52	
			Total
digiti	Ŧ	70	
) I	ク		
	tion		
ription	Electrical Substation	Site Compound	
<b>DSS(</b>	Electr	Site	pina sepa

Estimated Excavation from Sub-Stations and Site Compounds Table 2.4b

				NING & DE	VELOPME	NT SECTIO
Total Rock (π³)	0	0	e 6	JUN	2023	
Total Soil (m³)	1,970	6,552	8,522			C
Total Peat (m³)	299	728	1,385		PC	300
Total Excavation (m³)	2,627	7,280	9,907	?	•	
Relevant Trial Pits/Bore Holes	TP010	1P006				
Mineral Soil (m)	1.5	1.8				
Average Peat Depth (m)	0.5	0.2				
Depth to Formation (m)	2.0	2.0				
Area (m²)	1,314	3,640				
Infrastructure	Electrical Substation	Site Compound	Total	e enterna e e e contra	50pm.	n is this sense had been



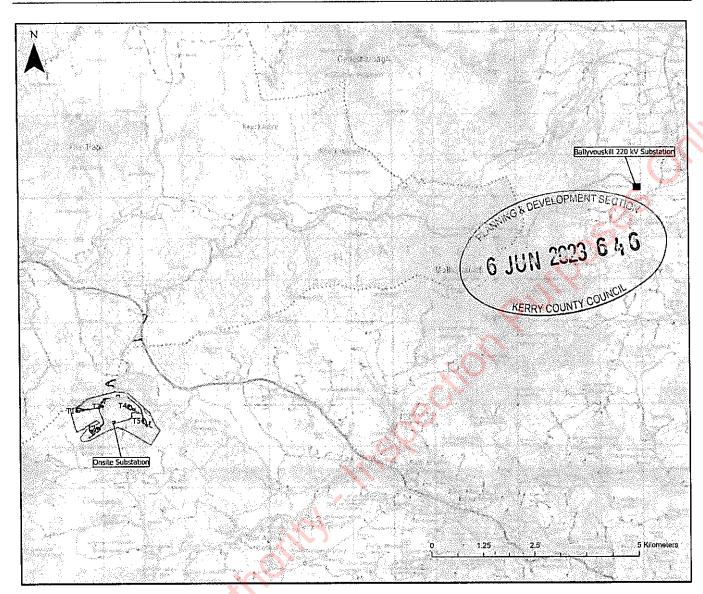


Figure 2.1 Inchamore Wind Farm Grid Connection Route

The cable network will be installed in trenches approximately 0.6 m wide by 1.3 m in depth. There will be 18 No. pre-cast concrete jointing bays measuring 6 m by 2.5 m buried approximately 2 m deep along the grid connection route and at varying intervals from c. 500-820 m intervals (See **EIAR Appendix 2.4**).

Excavated material from the installation of the Grid Connection Route will be used to backfill the trenches once the cable has been laid. Any surplus material will be disposed of at a licensed facility according to **Management Plan 5: Waste Management Plan** due to the presence of bituminous material and hydrocarbons.

In addition, **Table 2.5** provides a breakdown of the estimated total excavation volume for the Grid Connection Route.

Date: Project No: Document Issue: May 2023 6226 Final

# 2.7 Drainage

There are 28 No. stilling ponds at the Site with a combined area of 2,280 m<sup>2</sup> and a combined volume of 2,280 m<sup>3</sup>. Please see **CEMP 3: Surface Water Management Plan** of the CEMP for further details of drainage for the Project.

# 2.8 Total Estimated Excavation Volume Summary

As detailed in Sections 2.1 to 2.5, the total estimated excavation volume is 84,116 m³, of which 31,856 m³ is peat soil and 50,271 m³ is mineral subsoil. These quantities are detailed in **Table 2.6**.



Excavated Material Type	Excavated Material Volume (m³)		ed Re-Use lume	Comments
		8,522	m³ subsoil	Subsoil will be dried and used to reinstate the borrow pits after extraction
	N. W.	j.	l Karagi Kwanasi C	
A deficiency A following		0	m <sup>3</sup> rock	
		0	m³ peat	
Grid Connection*	6,854	6,557	m³ subsoil	To be disposed of at a licensed facility (LoW 17 05 03*, 17 05 04) Please see Waste Managament Plan for more
		297	m³ rock	details
Drainage	2,280	2,280	m³ peat	Peat is to be temporally stored and reciple used to reinstate the Temporary Compound Areas.

As the excavated materials arising from the construction of the Grid Connection Route will be disposed of at a licensed facility, and rock won onsite will be used before using the onsite borrow pit, 77,262 m³ of peat and soil will need to be re-used within the Site as per **Table 2.6**.



## 3.5 Bedrock

Rock encountered in the excavations such as cobbles or boulders will be crushed and used for hardcore in the Site Access Roads and Turbine Hardstands. When this resource has been used up, the onsite borrow pits will be used to provide rock. The onsite borrow pit will provide 50,276 m³ excavated material to provide for the Site Access Roads, Turbine Hardstands, upfill to foundations and temporary compounds. However, a volume of 5,070 m³ of imported stone will be imported as a finish to these elements of infrastructure.

Table 3.1a Rock required from Borrow Pit

Volume of imported rock required (m³)	Rock required for Road Construction / Upgrade (m³)	Rock required for Turbine Hardstand Construction (m³)	Total Rock required for Construction (m³)	Volume of Rock to be Extracted from Excavations (m³)	Rock required from Borrow Pit (m³)
5,070	13,741	39,105	52,846	2,902	49,945

Table 3.1b Volume of Rock to be Extracted from Borrow Pits

Length (m)	Width (m)	Area (m²)	Depth (m)	Volume to be extracted from Borrow Pits (m³)
		38,674	1.30	ELOPMEN 50, 276
Total Vo	lume of Ro <mark>ck to</mark> be	Extracted from Bo	orrow Pits	50,276

Table 3.1c Volume of Excavated Material to be Re-used On-Site

Total Volume (m³) of Excavated Material to be stored	Volume of Borrow Pits (m³)	Volume used to top borrow pits (m3)	Total Volume of material to be stored in Borrow Pits (m³)	Volume to be used in berms (Turbine Foundations and Hardstands)
77,262	50,276	30,939	81,215	504

The borrow pit will provide 50,276 m³ of material to be used on-site. It also has the capacity to be filled to 81,215 m³ and to be topped by up to 0.7 m (30,939 m³). The total volume of fill to reinstate the borrow pit will be 81,215 m³. A volume of 504 m³ will be reused in berms around Turbine Foundations and Turbine Hardstands. See **Table 3.2b** for detailed volumes.

Date: Project No: Document Issue: May 2023 6226 Final

#### Summary of Estimated Excavation Quantities (m³) Table 3.2a

Excavated Material Type	Excavated Material Volume (m³)	Propose Use Vo		Comments
Roads	15,876	13,321 2,556	m <sup>3</sup> peat m <sup>3</sup> subsoil	Peat and subsoil will reinstate the onsite borrow pit.
		1,562	m³ peat	Peat will be used as backfill to foundations. Any surplus will be used to reinstate the borrow pit after extraction.
Turbine Foundations	7,250	3,083	m³ subsoil	Subsoil will be deposited locally adjacent to Turbine Bases. 144 m³ will be used as berms around Turbines. Any surplus will be used to reinstate the borrow pits after extraction.
		2,605	m <sup>3</sup> rock	Rock will be crushe far turbine Hardstands.
Turbine Hardstands	41,949	14,220 27,729	m <sup>3</sup> peat  m <sup>3</sup> subsoil	Peat and subsoil are to be deposited locally at hardstand edges. 360 m³ will be used as berms around Turbine Hardstands. Any outstanding peat will be naturally air dried and used to fill borrow pits.
		1,385	m³ peat	Peat is to be temporally stored and re-used to reinstate the Temporary Compound Areas.
Electrical Sub- Stations & temporary Compounds.	9,907	8,522	m <sup>3</sup> subsoil	Subsoil will be dried naturally with air and used to reinstate the borrow pits after extraction
NA Y		0	m³ rock	Rock will be crushed and used as hardcore in Site Access Tracks and Crane Hardstands.
Grid Connection*	6,854	0 6,557	m <sup>3</sup> peat m <sup>3</sup> subsoil	Subsoil and rock will be used to backfill tranches as part of the Grid Connection Route construction. The remaining material is to be disposed of at a licensed facility (LoW 17 05 03*, 17 05 04)

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CEMP - Peat and Spoil Management Plan

Date: Project No: Document Issue: May 2023 6226 Final

# 4 RECOMMENDATION

Based on the available information, Jennings O'Donovan make the following recommendations:

- The estimated potential total volume of excavated material is 77,262 m<sup>3</sup>.
- Excavated material along the Grid Connection Route will be used to backfill the
  trenches once the cable has been laid. Any surplus material will be disposed of at a
  licensed facility according to Management Plan 5: Waste Management Plan due to
  the presence of bituminous material and hydrocarbons. All other excavated material
  can be re-used on the Site.
- A minimum of 5,070 m³ of imported stone is required for finishing of road construction/upgrade and Turbine Hardstands if the rock onsite is determined to be insufficient quality.







Site Investigations Report





Prepared for;

# Jennings O'Donovan

Inchamore Windfarm (IWF)



Site Investigation Report & Peat & Subsoil Stability Risk Assessment



603679 IWF EIAR App. 8.1 SI & PSSRA (02)







# **Contents**

1.Intr	roduction	5
1.1	Background	5
1.2	Purpose	5
1.3	Scope of Works - Tender	5
1.4	Statement of Authority	5
2.Site	e Investigation Works & Methods	<u></u> 5 6
2.1	Scope of Works – Completed	6
2.2	Peat & Slope Stability Risk Assessment Methodology	6
2.3	Subsoil & Slope Stability Risk Assessment Methodology	12
3.Ba	seline Conditions	15
3.1	Site Description & History	15
3.2	Site Geology	15
3.3	Site Soils & Subsoils	15
3.4	Topography & Substrate Topology	15
3.5	Hydrology & Climate	16
3.6	Receptors	
4. Sit	te Investigation Data & Results	17
4.1	Peat Depth Data	17
4.2		17
4.3		17
4.4		18
4.5	Peat Stability Risk Assessment Interpretation	25
4.6	Subsoil Stability Risk Assessment Results	27
4.7		28
E 0-	- makusiana	30
5.00	onclusions	
6.Ca	aveats & Recommendations	32
7 Re	eferences	33
, , , , ,	SEC.	Too
	(°	. 6
1	6 JUN 2023 6 4	
List	of Figures	
Figure	1. Correlation Between Moisture Content and Shear Strength of Peat (N. Boylan, P. Je	nnings & M.
Long,	2008)	28
Figure	2. Correlation between Factor of Safety, Collesive Strength and Bepar of Sabolis	



#### Introduction 1.

#### Background 1.1

RSK Ireland was commissioned by Jennings O'Donovan & Partners (JOD, the Client) on behalf of Inchamore Wind DAC (the Developer/s) to assess the geological site characteristics in relation to the planning application for the Inchamore Wind Farm (IWF, the Development) in Co. Cork.

#### 1.2 **Purpose**

Site Investigation for the purposes of assessing ground conditions at EIA design phase of a proposed wind farm development, Inchamore Wind Farm, Co. Cork. Assessing ground conditions in terms of peat and slope stability risk, subsoil and geological characterisation and classification.

#### Scope of Works - Tender 1.3

The scope of works was initially specified by the Developer at tender phase. The scope of works for ground investigations at tender included the following works;

- Peat probing (50 m grid), 50 ha
- Trial pits, 35 no.
- Number of groundwater monitoring wells, 4 no.
- SI report with detailed findings, records and interpretation

Provisional works included;

- Gouge auger samples
- Boreholes up to 15 m. 5 no.
- Ground penetrating radar surveys (5 days)

In consultation with the Client and Developer the scope of works was adapted to the site based on observations made by desk study and initial site walk overs and assessments. The actual completed scope of works is detailed in Section 2.

This work has been carried out in unison with the EIAR for the Project. Therefore, this report will be appended to EIAR Chapter 8 - Soils & Geology as part of the planning application for the Project. The EIAR tender scope includes for a stand-alone Peat Stability Report as well as stand alone Site Investigation report, however the two will be merged in this Site Investigation report. This is done with a view streamlining the site geological assessment.

Further to the above, the geological or environmental setting of the site will be described in detail in EIAR Chapter 8 - Soil & Geology with appended maps and graphics for reference. This report will refer and summarise the EIAR chapter/s to avoid duplication of information or graphics. This report will also reference EIAR Chapter 9 -Hydrology & Hydrogeology in relation to groundwater.

#### Statement of Authority 1.4

RSK (Ireland) Ltd. (RSK), part of RSK Group, is a consultancy providing environmental services in the hydrological, hydrogeological and other environmental disciplines. The company and group provide consultancy to clients in both the public & private sectors. More information can be found at www.rskgroup.com. The principal members of the RSK EIA team involved in this assessment include the following persons;

- Sven Klinkenbergh B.Sc. (Environmental Science), P.G.Dip. (Environmental Protection) Associate, Project Manager and EIA Lead Author with c. 10 years industry experience in the preparation of hydrological, hydrogeological and geological reports..
- Project Scientist: Lissa Colleen McClung B.Sc. (Hons.) Environmental Studies, M.Sc. (Hons.) Environmental Science. Current Role: Graduate Project Scientist
- Project Scientist: Mairéad Duffy B.Sc. (Environmental Science), M.Sc. (Climate Change). Current Role: **Graduate Project Scientist**



hazard and risk in peatland areas, particularly in relation to proposed electricity generation developments. The document is published and written in context of Scottish peatlands, however in the absence of jelevant guidance, it is widely accepted as relevant guidance in Ireland.

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The guide emphasizes the need for a comprehensive assessment of landslide hazard and risk in peatland areas, which is particularly important due to the unique characteristics of these environments. Peatlands are often found in areas of high rainfall, and the accumulation of peat can result in unstable ground conditions, which can increase the risk of landslides.

The guide provides a step-by-step approach to landslide hazard and risk assessment, including the identification of potential landslide triggers, the characterization of the peatland environment, the assessment of landslide susceptibility, and the estimation of landslide hazard and risk. The guide also provides guidance on the selection of appropriate methods for landslide hazard and risk assessment, such as field mapping, remote sensing, and numerical modelling. The guide emphasizes the importance of stakeholder engagement and communication in the landslide hazard and risk assessment process, particularly in relation to proposed electricity generation developments, which can potentially have significant impacts on the surrounding environmental receptors and communities. The guide covers the following aspects which should be included in the site risk assessment;

- Sampling Regime: The guide recommends a sampling regime that includes both surface and subsurface surveys, using techniques such as; depth probing, gouge coring, trialpitting, drilling, and geophysical surveys. The aim is to obtain a comprehensive understanding of the geology and hydrogeology of the site, as well as the depth and condition of the peat layer.
- Assessment of Desk Top Data: The guide recommends an assessment of desktop data to identify
  potential sources of instability, such as steep slopes, drainage features, and areas of peat degradation.
  This assessment should be based on available data sources such as geological maps, aerial
  photographs, and LiDAR data.
- Degree of Geomorphological Assessment: The guide recommends a high degree of geomorphological
  assessment, using methods such as aerial photography interpretation and field mapping to identify
  potential instability features such as landslides and erosion channels. Many sources of data can input to
  the interpretation of stability risk at any particular location, and field reconnasance is also a valuable tool
  in this repsect.
- Interpretation of Data: The guide recommends a detailed interpretation of all data collected, including the results of field surveys and laboratory testing. This should involve the identification of key parameters such as peat depth, soil properties, and groundwater levels or saturation, as well as the integration of all available data to develop a comprehensive understanding of the potential for instability. This can result in screening out peat stability risk, for example; in areas of extensive shallow bedrock or bedrock outcrops, or areas with very minor inclines. Conversly, high risk areas can potentially be identified by desk top assessment alone, for example; steep slopes in excess 15 degrees, or areas with historical stability issues or historic landslides.
- The development of numerical models for peat stability risk assessments has been driven by advances in computer technology (e.g. QGIS) and modeling techniques, as well as an increased awareness of the risks associated with peat instability. The use of numerical modeling in peat stability risk assessments typically involves the following steps:
  - Development of a conceptual model: This involves the development of a conceptual model of the site based on the results of field investigations and laboratory testing. The conceptual model should include information on the geometry and properties of the peat layer, as well hydrogeological characteristics such as pore water pressure or but unit weight (saturation).
  - Selection of appropriate modeling techniques: There are a variety of modeling techniques that can be used to simulate peat stability, including finite element and finite difference methods. The selection of an appropriate modeling technique will depend on the specific characteristics of the site and the goals of the assessment.
  - Calibration and validation of the model: The model is calibrated and validated using data collected during field investigations and laboratory testing. This involves adjusting model parameters to improve the match between simulated and observed data.

Overall, the guide emphasizes the importance of a comprehensive and integrated approach to peat landslide hazard and risk assessments, which includes a thorough sampling regime, an assessment of desktop data, a high degree of geomorphological assessment, and a detailed interpretation of all data collected. By following these guidelines potential hazards and risks associated with peat instability can be identified and managed effectively.

$$FoS = \frac{cu}{yz\sin\alpha\cos\alpha}$$



For the purpose of this assessment, the above formula will be referred to as the FoS Formula.

Qualifying peat stability at all peat survey points and trial pit locations was done using the following parameters;

Table 1: Formula Parameters & Symbols

Symbol	Description	Unit
FoS	Factor of Safety	FoS
	Effective cohesion or Undrained Shear Strength	kPa
/	Bulk Unit Weight of Peat	kN/m3
<u> </u>	Depth to failure plain	m
α	Slope Angle	Degrees

The Factor of Safety (FoS) result will range from 0 to infinity, however the following ranges are prescribed ratings as follows;

Table 2: Factor of Safety (FoS) Classifications (Scottish Gov., 2017)

Description	FoS Value Range	Classification
Stable	>1.3	Acceptable
Marginally Stable	1.0 > < 1.3	Acceptable
Unstable	<1.0	Unacceptable

As per the guidance listed in Section 2 of this report, FoS values of 1.0 or greater are considered acceptable in terms of peat stability (Scottish Gov., 2017).

The assessment has been completed on the basis of 2 no. scenarios, which are as follows;

- 1. Scenario A Peat stability in terms of the receiving environment as is, that is using the depth of peat observed and recorded during site surveys.
- 2. Scenario B Peat stability in terms of the in-situ peat with 1m fill (presumed peat) placed on top, that is using the depth of peat observed and recorded during site surveys plus 1 metre fill (depth + 1.0m). This is the assessment worst case scenario, and this will be used to assess stability at proposed infrastructure locations.

Undrained shear strength (effective cohesion) (cu) has been derived by means of assessing moisture content results, which is; there is a correlation between peat moisture content and shear strength (effective cohesion). Shear vane testing has been carried out on the site however, shear vane test, or in situ barrel shear tests are not considered representative of shear strength characteristics of the peat being assessed in terms of stability assessment given numerous flaws with the test itself, namely; the shear vane test evaluates the shear strength where by the force is exerted in a vertical and cylindrical plane, which is not indicative of forces at play with respect slope stability or mass movement; and fibres and roots within the peat will effect the test itself, potentially exaggerating, or giving misleading data. The following graph presents conceptual shear strength values for peat (Boylan N, Jennings P & Long M., 2008).

The following table lists parameter values, including inferred conservative parameter values use assessments.

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Table 4: Formula Parameters, Symbols & Inferred Conservative Values

Symbo	Description	Value	Unit
Cu	Effective cohesion	3.5	kPa
v	Bulk Unit Weight of Peat	11	kN/m3
z	Depth to failure plain	Depth of Peat	m
α	Slope Angle	Surface Topography	Degrees

# 2.2.8 Risk Matrices & Ranking

In assessing the risk in relation to peat stability on site it is important to rate the risk in terms of the hazard, the likelihood and the consequences if any such issue should arise. Therefore, the slope stability risk assessment considers the following parameters, which are assessed by means of a series of risk matrices (Scottish Gov., 2017).

Table 5: Parameters Included in Risk Matrices and Assessed

Category	Description
Landslide History	Considers the likelihood of landslide events occurring based on the history of the site, including the current site use.
Factor of Safety	As described above, includes the following;
·	Peat depth
	Peat quality / condition
	Moisture content
	Incline (surface topography)
	Shear strength
	Bulk unit weight of peat
Substrate Topology	Identifying and qualifying variance in substrate topology and qualifying variance from theory underlining the stability formula used i.e., Infinite Slope (Parallel and no foot and head forces)
Significance of Receptor	Qualifying potential receptors in terms of significance.
Distance to Receptor	Qualifying localised proposed development areas in terms of distance to nearest receptor.

Considering the above parameters, the stability assessment follows the following steps;

- 1. FoS<sub>RAW</sub> Assess the site in terms of soil stability using the FoS Formula and calculate a Factor of Safety (FoS) using the *raw* data. This step is considered as preparation of the data obtained for the site i.e., translating the data to a value related to stability, and is not considered the final output of the stability assessment.
- FoSadulusted Assess the FoSraw values in terms of suitability of the application of FoS Formula
  by considering the history of landslides in relation to the proposed site, and the topology of the
  substrate compared to the surface topology of the site. This is done by means of a risk matrix
  which qualifies the point, and also applies a coefficient for the next risk assessment step.
- 3. Risk Ranking RRsF The FoSadusted data is assessed in terms of significance of associated receptor. This is done by means of a risk matrix which qualifies the point, and also applies a coefficient for the next risk assessment step.
- Risk Ranking RR<sub>D</sub> The RR<sub>SF</sub> data is assessed in terms of distance to associated receptor. This
  is done by means of a risk matrix which qualifies the point.



For the purpose of assessing subsoil stability for the Site a conservative undrained shear strength (effective cohesion) value will be used in numerical assessments, i.e., 40 kPa.

In situ bulk density (kg/m³), or bulk unit weight (kN/m³) of soils/subsoils (y), namely silty sandy subsoils, is typically within the range of 2500 to 2700 kg/m³, or 24.5 to 26.5 kN/m³. For the purpose of assessing subsoil stability for the Site a conservative bulk unit weight value will be used in numerical assessments i.e., 27 .0 kN/m³.

The depth to failure plane (z) is presumed to be thickness or depth of subsoils at any given sampling point being assessed. However, subsoil depths will be inferred in areas of the site with limited data. It should be noted that the failure plane can potentially be within subsoils (subsoil on subsoil movement), or the substrate i.e., weathered bedrock. In relation to the Site specifically, it is important to note the presence of iron pan. Iron pan is a layer of oxidised iron within the subsoil. The iron pan layer is relatively impermeable which can impede or significantly alter groundwater movement in the subsoils. Under the right circumstances the iron pan layer can therefore become a slip or failure plane. In such instances the failure plane has the potential to parallel to the overlying topography.

Slope angle  $(\alpha)$  is presumed to be topographical incline measured on site / evaluated using high resolution elevation data at any given sampling point being assessed, however it should be noted that the slope angle  $(\alpha)$  relates to the failure plane angle, which is presumed to be the peat and substrate interface, and which is presumed to be parallel to the surface when using FoS Formula (Infinite Slope Formula). In reality the underlying substrate (bedrock) is unlikely to be parallel to the surface topology. However, considering the presence of iron pan in subsoils at the site it is important to consider the potential for parallel failure planes when assessing stability at the site.

It should be noted that FoS Formula does not account for forces related to the toe and head of an area or mass of soil with the potential for mass movement, which is in reality the Infinite Slope formula will likely exaggerate stability conditions negatively.

The following table lists parameter values, including inferred conservative parameter values used in numerical assessments.

Table 6: Formula Parameters, Symbols & Inferred Conservative Values

Symbol	Description	Value	Unit
Cu	Effective cohesion	40	kPa
V	Bulk Unit Weight of Peat	27.0	kN/m3
Z	Depth to failure plain	Depth of subsoil to bedrock	m
α	Slope Angle	Surface Topography	Degrees

# 2.3.2 Risk Matrices & Ranking

In assessing the risk in relation to subsoil stability on site it is important to rate the risk in terms of the hazard, the likelihood and the consequences if any such issue should arise. Therefore, the slope stability risk assessment considers the following parameters, which are assessed by means of a series of risk matrices (Scottish Gov., 2017)

Table 7: Parameters Included in Risk Matrices and Assessed

Category	Description
Landslide History	Considers the likelihood of landslide events occurring based on the history of the site, including the current site use.
Factor of Safety	As described above, includes the following;
	Subsoil depth (to failure plain)



# 3. Baseline Conditions

# 3.1 Site Description & History

There no recorded landslide events in close proximity to the Site (GSI, Accessed 2021).

There were no indications of stability issues or mass movement observed on the Site during site surveys.

The Site is mapped as having areas ranging from Low Risk to High Risk in terms of Landslide Stability, that is; full spectrum of slope stability risk categories (GSI, ND). Larger areas of High-Risk landslide susceptibility are associated with relatively expansive steep slopes.

Refer to EIAR baseline section for further information (Chapter 8: Soils and Geology).

# 3.2 Site Geology

Consultation with Geological Survey Ireland Spatial Resources (GSI) indicates that the bedrock at 1:1,000,000 scale the Site is underlain by;

 Gun Point Formation (GP) – Green-grey to purple medium to fine-grained sandstones, interbedded with green and red to purple siltstones to fine sandstones.

The region contains a multitude of complex geological features however, there are no mapped faults or other significant features underlying the area of the Site.

Rocky outcrops are common within the Site Boundary.

Refer to EIAR baseline section for further information (Chapter 8: Soils and Geology).

# 3.3 Site Soils & Subsoils

Consultation with available maps (GSI) indicate that the soil type across the entire area of the Site, and the general area in the region is mostly Blanket Peat and Till derived from Devonian sandstones with several significant areas mapped as being Bedrock at Surface.

Peat depths observed on the Site are generally 'Rock' to 'shallow' with isolated pockets of moderately deep peat, however depths at most sampling points are within the range of 0.0-0.5 m and areas with deeper, particularly extremely deep peat have been avoided in terms of the Project footprint. Peat depths are mapped and presented in **Appendix A**.

Peat quality assessment (by gouge coring / trial pitting / observations at cut locations) indicate relatively moderate to high Von Post values (generally H5 to H8) across the Site.

Refer to EIAR baseline section for further information (Chapter 8: Soils and Geology).

# 3.4 Topography & Substrate Topology

The topography at and in the immediate area surrounding the Site is highly variable with multiple peaks, ridges with variable elevations and inclines. At lower elevations the topography is relatively flat or comprising of low magnitude inclines, however at mid and high elevation relative to the Site, steep high magnitude inclines are commonplace.



# 4. Site Investigation Data & Results

# 4.1 Peat Depth Data

Approximately 150 no. peat depth probe locations were assessed at the Site. Georeferenced and categorized peat depth locations are presented in **Appendix A**. Peat depth data is presented in **Appendix B**. Number of probe locations by Depth Category are presented in **Table 8**.

Table 8: Peat Depth Probe Points per Depth Category

Peat Depth Category	No.
A - Rock (0.00-0.01 m)	16
B - Very Shallow (0.01-0.5 m)	92
C – Shallow (0.5-2.0 m)	66
D - Moderately Deep (2.0-3.5m)	12
E - Deep (3.5-5.0 m)	1
F – Very Deep (>5.0 m)	0
TOTAL	187 (21 Inferred)

### 4.2 Trial Pit Data

A total of 16 no. Trial Pits were completed, logged and sampled at the Site. Trial Pit and Borehole locations are presented in **Appendix C**. Trial Pit Logs are presented in **Appendix D**. Trial Pit and Site Investigation Photos are presented in **Appendix E**. A total of 3 no. subsoil samples were obtained from the Site and tested for particle size distribution (PSD). Subsoil laboratory certificates are presented in **Appendix G**.

Particle Size Distribution (PSD) Soil Description results for subsoils (BS 1377: Part 2: 1990: Clause 9) at the site are presented in **Table 9**. Note: cobble size particles observed on trial pit log sheets and have likely been screened out to a degree at the time of sampling.

Table 9: Reported Subsoil Description (PSD)

Sample ID	Cobbles (%)	Gravel (%)	Sand (%)	Silt & Clay (%)	Description
TP03-A2 (SS1)	0.0	43.0	32.0	25.0	Very clayey very sandy GRAVEL
TP08-A2 (SS1)	0.0	50.0	19.0	31.0	Slightly sandy gravelly CLAY
TP11-A2 (SS1)	0.0	51.0	26.0	22.0	Very clayey very sandy GRAVEL

Cobbles were observed on site and were likely screened out at the time of sampling. Further details are presented in **Appendix D**. Iron pan was observed in several trial pits as listed in **Appendix H**, and presented in **Appendix C**, **Appendix D** and **Appendix E**.

## 4.3 Borehole Data

A total of 1 no. rotary core borehole was completed, logged, and sampled at the Site. Borehole logs are presented in **Appendix F**. Drill logs indicate that;

- Bedrock underlying the site is described as SILTSTONE (BH01I)
- Bedrock shows minor signs of weathering.
- Driller notes water strike at BH01I at ~2.50m bGL likley perched groundwater on top of unweathered bedrock.



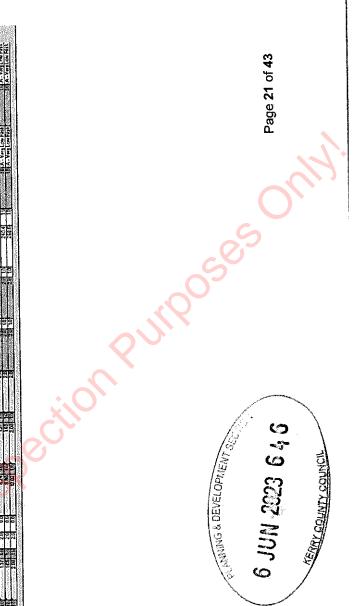
The following plates present the available peat data per proposed turbine locations, including the results of numerical model stability risk assessment.

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Plate 1: Peat Data & Risk Assessment Results - T1

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Plate 3: Peat Data & Risk Assessment Results - T3



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Plate 5: Peat Data & Risk Assessment Results - T5



# 4.5 Peat Stability Risk Assessment Interpretation

Table 13: Peat Stability Risk Assessment – Factor of Safety (Adjusted) (Scenario B) at Main Infrastructure Units presents the interpretation of stability risk assessment data in the context of stability, or factor of safety (FoS) (Adjusted, Scenario B) at each significant development infrastructure unit.

Table 13: Peat Stability Risk Assessment – Factor of Safety (Adjusted) (Scenario B) at Main Infrastructure Units

Turbine No. / Unit	FoS <sub>ADJ</sub> (Factor of Safety adjusted according considering site specific conditions)	Geo-Hazard / Comment (Important to consid <mark>er whe</mark> n carrying out detailed design and preconstruction pla <mark>nning</mark> )					
T1	Generally acceptable.  Data indicates peat stability is primarily acceptable, with the exception of * pockets of moderately deeper peat (marginally acceptable / unstable at localised scale north of proposed turbine locality).	Localised steep inclines and potential for pockets of deep peat. Residual risk = localised stability issues.  Relatively extensive area of deep peat to north / northwest of development footprint at T1. Development footprint avoids this area however vehicular movements must be managed, and this area avoided completely.					
Т2	Generally acceptable with localised areas of marginally stable FoS, localised areas of unstable peat.  Data indicates that peat depth in the area is generally shallow with relatively extensive rock outcrops. Steep inclines in the area are a key driver of unfavourable results.	for pockets of deep peat. Residual risk = localised stability issues.  Proximity to receptor (river).					
T3	Data indicates peat stability is primarily acceptable, marginally acceptable.  Some locations on approach (access tracks possess locally unstable data due to relatively higher localized slope angles and/or deeper peat however peat depths are shallow.	for pockets of deep peat. Residual risk = localised stability issues.					
T4	Generally acceptable.  Data indicates peat stability is primaril acceptable, with isolated pockets Marginall acceptable.	Localised steep inclines and potential for pockets of deep peat. Residual rise = localised stability issues.					
T5	Generally acceptable.  Data indicates peat stability is primaril acceptable, with isolated pockets Marginall acceptable.	Localised steep inclines and pote for pockets of deep peat. Residual = localised stability issues.					



Turbine No. / Unit	(Ranked Risk considering Distance to Sensitive Receptors)	Geo-Hazard/Comment (Important to consider when carrying out detailed design and preconstruction planning)		
Borrow Pit	Very Low to Moderate Risk	Localised stability and drainage network.		
Substation	Very Low to Low Risk	Localised stability and drainage network.		

# 4.6 Subsoil Stability Risk Assessment Results

Review of subsoil stability assessment result data and maps as presented in **Appendix I** indicate that the factor of safety is generally acceptable and very low to low stability risk across the site (areas assessed / trial pit locations\*) with the exception of minor isolated areas of steeper inclines and deeper till deposits (inferred\*).

Summary of risk at the site under varying conditions and scenarios is presented in the following tables.

Table 15: Factor of Safety (Adjusted) at Trial Pit Locations

	Acceptable	Marginally Stable	Unstable
FoS (Adj.) Scenario A	16	0	0
FoS (Adj.) Scenario B	14	2	0

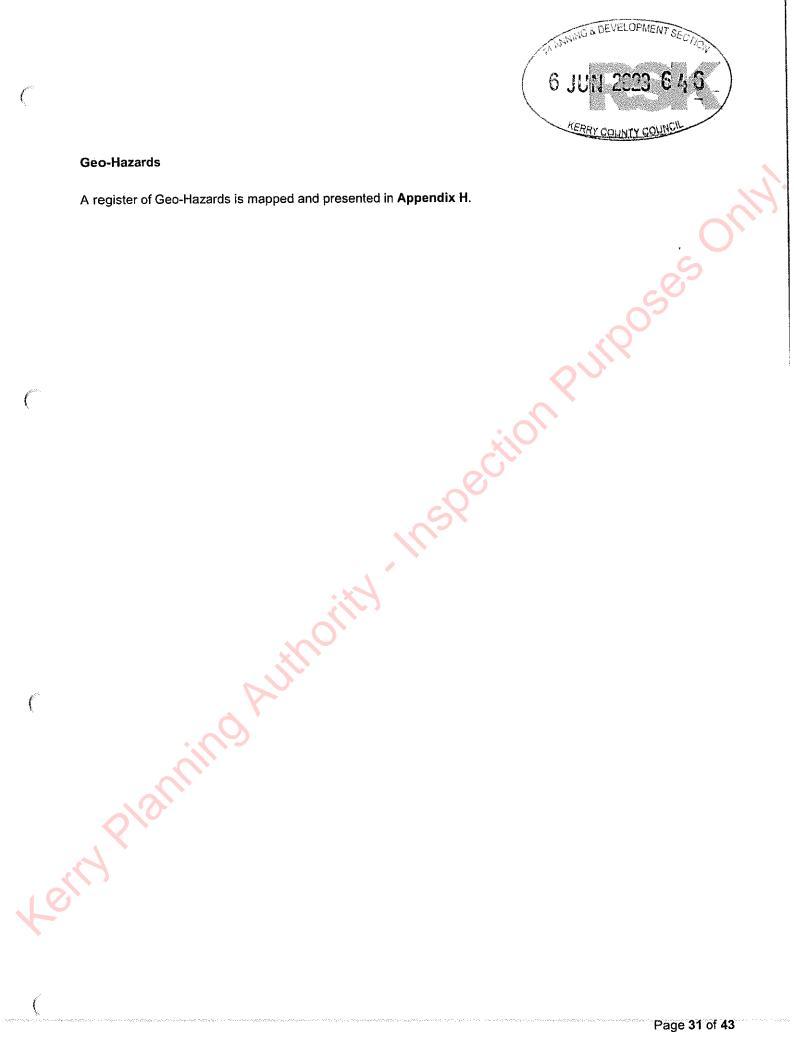
Table 16: Risk Ranking (Distance) at Trial Pit Locations

Tuble to this training	Very Low	Low	Moderate	High
RR (Dist.) Scenario A	14	1	1	0
RR (Dist.) Scenario B	13	1	2	0

Based on the inferred conservative values applied to the above stability risk assessment, the factor of safety is highly dependent on cohesive strength, which in turn is highly dependent on hydrogeological characteristics including pore water pressure. Figure 2 presents potential varying Factors of Safety for subsoils at the Site depending on varying cohesive strength and depths to failure plane.



		( 6 JUN 2023 6 4 S
Turbine No. / Unit	RR <sub>D</sub> (Ranked Risk considering Distance to Sensitive Receptors)	Geo-Hazard / Comment GENEY COUNTY COUNTY
Met Mast	Low	Localised stability and drainage network.
Borrow Pit	Low	Localised stability and drainage network.
Substation	Low	Localised stability and drainage network.
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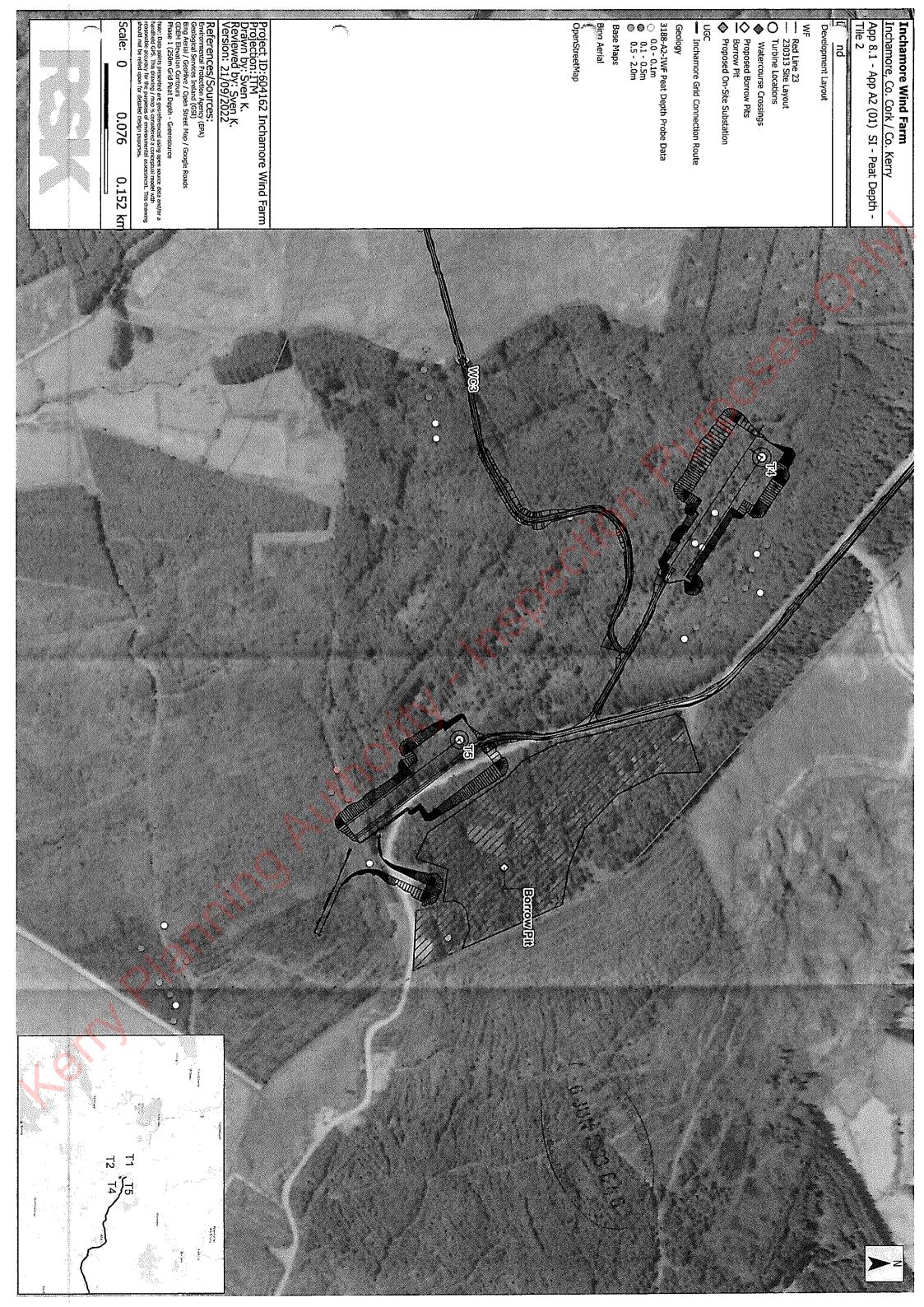
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Remy Flanning Authority - Inspection Purposes Only









#### Appendix B



Lety Praming Authority

SI Appendix B - Peat & Subsoil Survey Database Inchamore WF, Co. Cork Sample / Test Point ID No. Thickness Depth of peat Slope (Extracted / from GDEM) 8.5443 Rock 6.01069 Rocky 9.62354 Rocky 8.50034 6.07249 8.59533 10.03816 9.1398 Rock 9.60924 4.902-10.09572 3.35734 Rock 3.7559 Rocky adjacent 8.8280)
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15.7012 Rocky adjacent 7.12121 6.88087 Rocky adjacent 5.14745 Rocky adjacent 689 Rocky adjacent photo 802 Rocky 89 Rocky adjacent photo 2 INFERRED, VISIBLE 9 INFERRED, DRAIN Slope Angle (For Exert Adjusted Factor of Safety (FoS) for Poat Stability COEFFICIENT Scenario B
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Peat & Slope Stability Risk Assessment



### Appendix C

6 JUN 2023 6 46

KERRY COUNTY COUNCIL

Leny Planning Authority - Inspection Pulls

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### Appendix D

Herry Planning Authority. Inspection Planning Authority.



(File Ref. 3188-A2-024; 603679 App D)

Inchamore WF, Co. Cork

SI Trial Pit Logs

Borehole/ Trial	Soil (S) / Wat	ter (W) / Van	our (V) S	amni	ina			INVESTIGATION TP002
Pit Design &	Sample number	, , ,		- F.				POINT LOG NUMBER  Client, Project, Location JOD (Coilite), Inchamore WF, Cork
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	interval		E.;	tion	8 8	a a	_	Page No. 1 of 1
	(mbGL) (Sample 10 kg		(BS); Triel Pit Wall (TPW); , BH Arisings (BHA); ; (TPC)	strength & description	Groundwater occurrence (See legend for symbols used for dry, damp and wet)	rres below also (maODM)	Geology (graphical log)	Date & time drilled / formed: 02/06/2021
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	sample (imer leet) Blue Sne = Composte	Non-Natural	#8.5 B	treng	and the	Set, and	(978	Doc. Ref. (File Ref. 3188-A2-024; 603679 App D)
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	or lab) Green into a Konto Academ	Percentage (see below)	PID (ppm) Bagged sampla (BS); Ti Soil Core (SC), BH Ar Trial Pit Clumps (TPC)	Odour stu	See 7	Depth in metres b ground level, also 8 [Thickness]	) eo	Geological description Natural
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piping), 6 = Blue	Bangor slate.						bble, Bauld	Clay - Silt - Sand (LG, MG, DG) F = Firm %>10mm stone
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* Unreliable data.	Indication only							A /B	(C /D	/E /F
1						DOMIN	IANT GEO	LOGICAL / NON- IPONENT / DOMINANT	COLOUR STIFFNESS	AYER ID, NN
** From hand hel	d GPS					Cla	ay, Silt, Sai	d, Gravel, GEOLOGICAL	ILB, MB, DB) VST . V. Soft E	STONE N
						Ćc	obble, Boul	207 0000001	(LG, MG, DG) ST = Soft	% recovery %>10mm stone
								Clay - Silt - Sand Gravel - Cobble -	- Mustard S = Stiff	\
								Bouldet	-Olive	
								relp notes	- Mottled - Orange	F Interpretation
						on mac	cropores, i space allo	mottling /	NN + Non-natural ground (fill / made	up ground / disturbed natura
1						1 45	-page and			N × Natural ground



#### Appendix E

Entrance Control Purposes Control Purpose Con

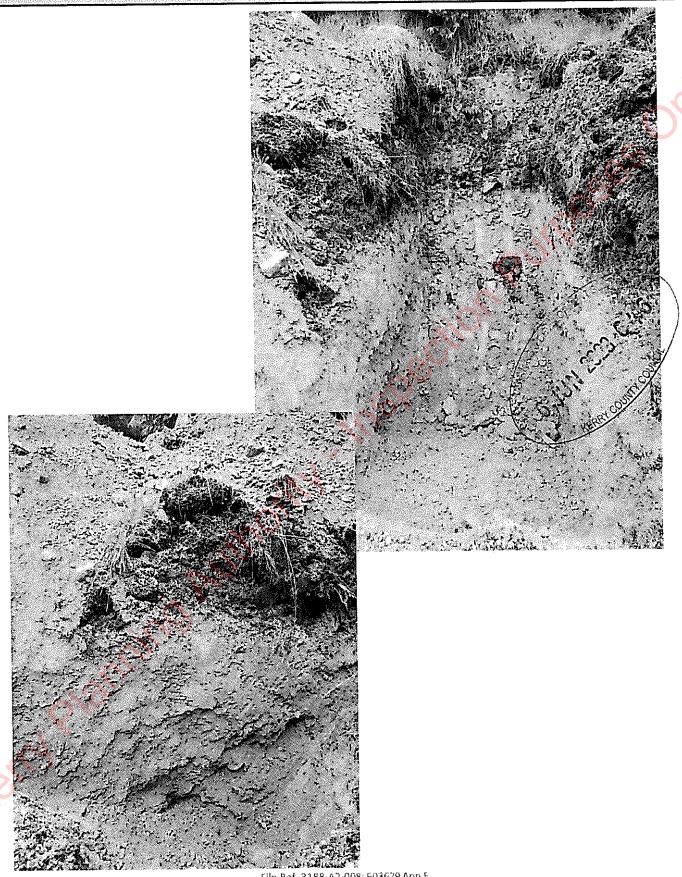


(File Ref. 3188-A2-008; 603679 App E)

Inchamore WF, Co. Cork
SI Trial Pit Photos

Collin Co

# Appendix E – IWF Trial Pit and Site Photos TP002 (File Ref. 3188-A2-008; 603679 App E)



File Ref. 3188-A2-008; 603679 App E

## Appendix E – IWF Trial Pit and Site Photos TP004 (File Ref. 3188-A2-008, 603679 App E)



### Appendix E – IWF Trial Pit and Site Photos TP005



File Ref. 3188-A2-008; 603679 App E

## Appendix E – IWF Trial Pit and Site Photos TP007 (File Ref. 3188-A2-008; 603679 App E)



File Ref. 3188-A2-008; 603679 App E

### Appendix E – IWF Trial Pit and Site Photos TP008







#### Appendix E – IWF Trial Pit and Site Photos **TP010**



File Ref. 3188-A2-008; 603679 App E

### Appendix E – IWF Trial Pit and Site Photos TP012



### Appendix E – IWF Trial Pit and Site Photos TP014

(File Ref. 3188-A2-008; 603679 App E)

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KERRY COUNTY COUNCIL



## Appendix E – IWF Trial Pit and Site Photos







## Appendix F

6 JUN 2023 646\_

Lety Pranting Authority. Inspection Purposes

#### KEY TO SYMBOLS ON EXPLORATORY HOLE RECORDS

All linear dimensions are in metres or millimetres

DESCRIPTIONS

\*\* Drillers Description
Friable Easily crumbled

SAMPLES

U() Undisturbed 102mm diameter sample, ( ) denotes number of blows to drive sampler

U( )F, U( )P F- not recovered, P-partially recovered
U38 Undisturbed 38mm diameter sample

P(F), (P) Piston sample - disturbed
B Bulk sample - disturbed
D Jar Sample - disturbed

W Water Sample

CBR California Bearing Ratio mould sample
ES Chemical Sample for Contamination Analysis

SPTLS Standard Penetration Test S lump sample from split sampler

**CORE RECOVERY AND ROCK QUALITY** 

TCR Total Core Recovery (% of Core Run)

SCR Solid Core Recovery (length of core having at least one full diameter as % of core run)

RQD Rock Quality Designation (length of solid core greater than 100mm as % of core run)

Where there is insufficient space for the TCR, SCR and RQD, the results may be found in the remarks column

If Fracture Spacing in mm (Minimum/Average/Maximum) NI - non intact, NR - no recovery

AZCL Assumed Zone of Core Loss

NI Non intact

**GROUNDWATER** 

∇ Groundwater strike

■ Groundwater level after standing period

Date/Water Date of shift (day/month)/Depth to water at end of previous shift shown above the date

and depth to water at beginning of shift given below the date

INSITU TESTING

S Standard Penetration Test - split barrel sampler
C Standard Penetration Test - solid 60° cone

SW Self Weight Penetration

Ivp, HVp (R) In Situ Vane Test, Hand Vane Test (R) demonstrates remoulded strength

K(F), (C), (R), (P) Permeability Test

HP Hand Penetrometer Test

MEASURED PROPERTIES

N Standard Penetration Test - blows required to drive 300mm after seating drive

x/y Denotes x blows for y mm within the Standard Penetration Test

x\*/y Denotes x blows for y mm within the seating drive

C<sub>ii</sub> Undrained Shear Strength (kN/m²)

CBR California Bearing Ratio

ROTARY DRILLING SIZES

Index Letter	Nominal Diameter (mm)					
	Borehole	Core				
N	75	54				
H	99	76				
Р	120	92				
s	146	113				



**Key Sheet** 

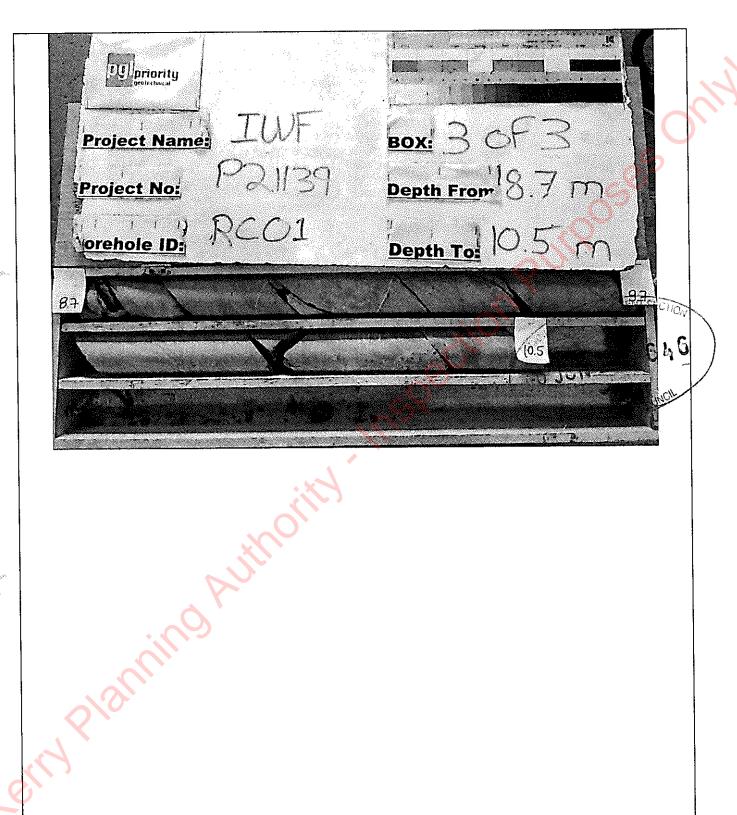
ANG & DEVELOPMENT SE

Drilled By: Borehole No. Priority Geotechnical Ltd. GW Tel: 021 4631600 priority **BH01I** Fax: 021 4638690 Logged By: www.prioritygeotechnical.ie Sheet 2 of 2 Hole Type Gortyrahily and Inchamore Wind Project No. Co-ords: Project Name: RC P21139 Scale Gortyrahily, Co.Cork. Inchamore, Co.Cork Level: m QD Location: 1:50 04/06/2021 Client: Minerex Environmental Dates: 04/06/2021 Type /Fs (min, max, avg) Coring (%) Depth (m) Level Depth Water Strike (m **Stratum Description** Well Legend / FI (/m) (mOD) (m) TCR SCR ROD Lithology: Red moderately weak 8/m 10mm SILTSTONE. 76 180mm 150mm 100 24 8.70 - 9.70 Weathering: Core is showing minor signs of weathering. Sections 2.8m-3.5m and 5.7m-6.4m are highly fragmented. 10 81 54 3/m 9,70 - 10,50 60mm Fractures: One set identified. Set one has 290mm 160mm a dip of 60-70 degrees, an undulating rough fracture surface and close to OPMENT medium spacing. 10.50 Details: No obvious oxidation discolouration marks. Clay smearing present. Quartz veins present measuring between 2mm-20mm in thickness increase between 3.5m-5.5m

End of Borehole at 10.500m  $\langle x \rangle$ KERRY COUNTY COU 13 14 15 16 17 18 Equipment: Soilmec PSM Hole Information: Groundwater: Hole Depth (m bgl) Hole Dia (mm) Casing Dia (mm) Struck (m bgl) Level (m bgl) After (min) Comment Compressed air mist Method: See shift data for detai 10,50 76 2.50 Shift Data: 04/06/2021 08:00 04/06/2021 18:00 Start of shift. Remarks: End of borehole, 1.85 Borehole terminated at 10.5m bgl.

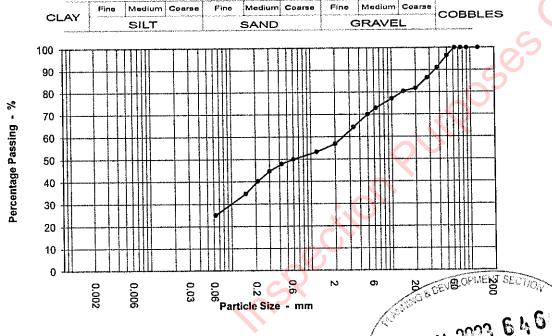
#### Photographic Record





Number: RC01 Project Inchamore Wind Farm
Project No P21139
Engineer Minerex

	PARTICLE SIZE DISTRIBUTION	Job Ref	P21139
Depriority protectation	BS 1377 : Part 2 : 1990 : Clause 9	Borehole / Pit No	TP03A2
Location	Gortyrahilly and Inchamore W.F	Sample No	
Location		Depth	0.00 m
Soil Description	Very clayey very sandy GRAVEL	Sample type	В



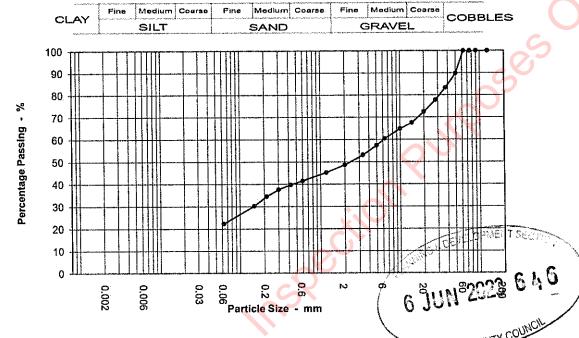
Ī	Sievi	ng	Sedimentation
	Particle Size mm	% Passing	Particle Size % Passing mm
l	125	100	
١	90	100	
ı	75	100	
	63	100	
Ì	50	97	
	37.5	91	
	28	87	
	20	82	
	14	80	
1	10	77	
	6.3	73	
	5	70	
	3.35	64	
	2	57	
	1.18	53	
	0.6	50	
	0.425	48	
	0.3	45	
	0.212	40	
	0.15	35	! !
	0.063	25	

TesO	Method 11 2023 U
	Part 2 · 1990
Sieving	KERRIPUSE AT TO COU
Sedimentation	N/A

Sample Prop	ortions
Cobbles	0.0
Gravel	43.0
Sand	32.0
Silt & Clay	25.0

Grading Anal	lysis
D100	63.00
D60	2.49
D10	
Uniformity Coefficient	

PARTICI E SIZE DISTRIBUTI	PARTICLE SIZE DISTRIBUTION	Job Ref	P21139	
priority gesternical	BS 1377 : Part 2 : 1990 : Clause 9	Borehole / Pit No	TP11A2	
Location	Gortyrahilly and Inchamore W.F	Sample No		
		— Depth	0.00 n	
Soil Description	Very clayey very sandy GRAVEL	Sample type	В	



	Sievir	ng	Sediment	ation
	Particle Size mm	% Passing	Particle Size mm	% Passing
Ì	125	100		
l	90	100		
١	75	100		
1	63	100	<b>)</b>	
	50	90		
	37.5	83	į	
	28	78		
	20	72		
I	14	67		
1	10	65		
	6.3	60		
	5	57		
	3,35	53		
	2	49		
	1.18	45		
	0.6	41	ļ	
	0.425	40	i	
	0.3	38		
	0.212	34	ļ	
	0.15	30	1	
	0.063	22		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.3
Sedimentation	N/A

Sample Proportions		
Cobbles	0.0	
Gravel	51.0	
Sand	26.0	
Silt & Clay	22.0	

Grading Analy	sis
D100	63.00
D60	6.08
D10	
Uniformity Coefficient	

#### **Unconfined Compressive Strength, UCS**

Job Name
Job Number

Inchamore W.F
P21139

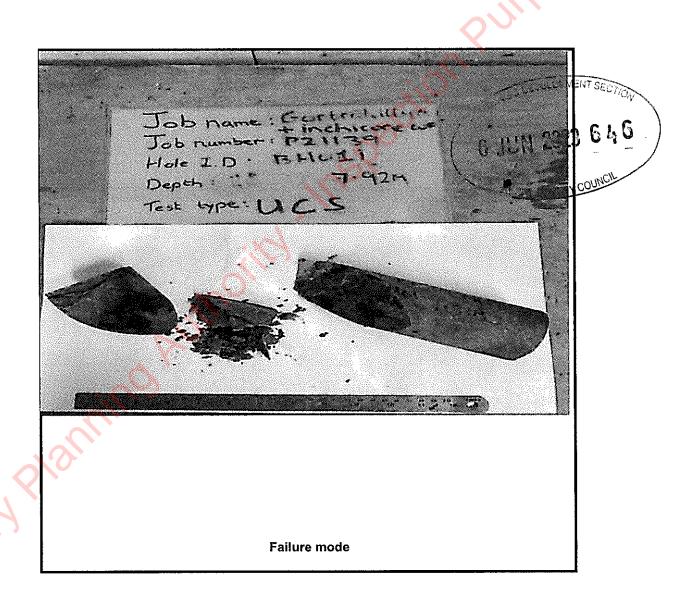
Borehole: BH01I 7.92 m

Rock Type PURPLE SILTSTONE

Bulk Density
Load at Failure, P

2.73 Mg/m³
23.3 kN

Stress at Failure 5.17 MPa





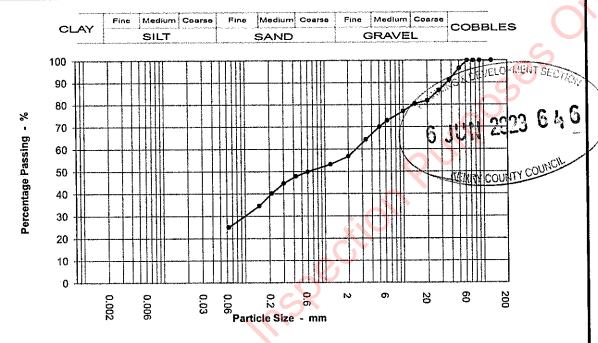
#### Appendix G

6 JUN 2023 646

KERRY COUNTY COUNCIL

Remy Plaining Authority, Inspectif

	PARTICLE SIZE DISTRIBUTION	Job Ref	P21139
LU priority	BS 1377 : Part 2 : 1990 : Clause 9	Borehole / Pit No	TP03A2
Location	Gortyrahilly and Inchamore W.F	Sample No	
		- Depth	0.00 m
Soil Description	Very clayey very sandy GRAVEL	Sample type	В



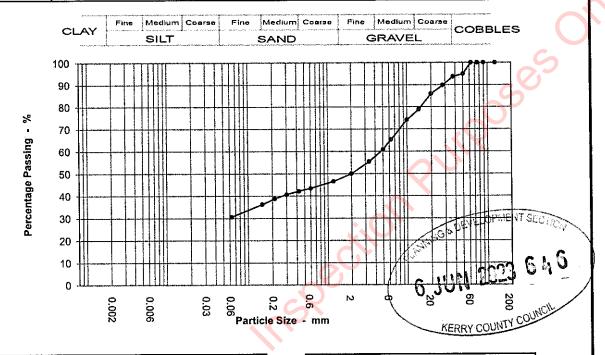
	Sievir	ng ]	Sedimentation
	Particle Size mm	% Passing	Particle Size % Passing
ı	125	100	
	90	100	
١	75	100	
1	63	100	<b>)</b>
ı	50	97	
١	37.5	91	
	28	87	
	20	82	
ļ	14	80	
1	10	77	
	6.3	73	
	-5	70	
	3.35	64	
	2	57	
	1.18	53	
	0,6	50	
	0.425	48	
	0.3	45	
	0.212	40	
	0.15	35	
	0.063	25	

Test Method	
BS 1377 : F	Part 2 : 1990
Sieving	Clause 9.3
Sedimentation	N/A

Sample Proportions		
Cobbles	0.0	
Gravel	43.0	
Sand	32.0	
Silt & Clay	25.0	
	<u> </u>	

Grading Analy	sis
D100	63.00
D60	2.49
D10	
Uniformity Coefficient	

priority protections	PARTICLE SIZE DISTRIBUTION	Job Ref	P21139	1
	BS 1377 : Part 2 : 1990 : Clause 9	Borehole / Pit No	TP08A2	
Location	Gortyrahilly and Inchamore W.F	Sample No		
		Depth	0.00	m
Soil Description	Slightly sandy gravelly CLAY	Sample type	В	



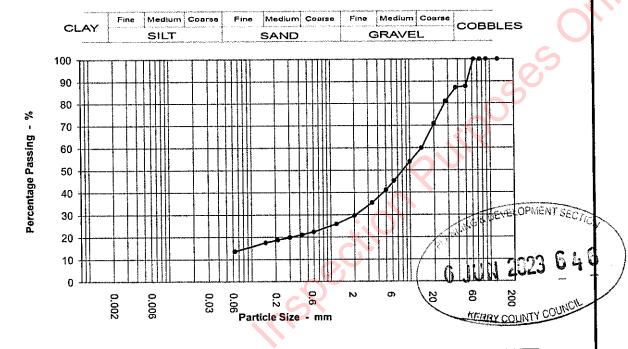
Ī	Sievi	ng	Sediment	tation
	Particle Size mm	% Passing	Particle Size mm	% Passing
1	125	100		
ı	90	100		
	75	100	X	
	63	100	<b>)</b>	
1	50	95		
	37.5	94		
	28	90		
1	20	86		
	14	79		
	10	74		
	6.3	65		
	5	61		
	3.35	55		
	2	50		
	1.18	47		
	0.6	43		
	0.425	42		
	0.3	41		
	0.212	39		
	0.15	36		
	0.063	31		

Test Method		
BS 1377 : Part 2 : 1990		
Sieving	Clause 9.3	
Sedimentation	N/A	

Sample Proportions			
Cobbles	0.0		
Gravel	50.0		
Sand	19.0		
Silt & Clay	31.0		

Grading Analysis	
D100	63.00
D60	4.68
D10	
1	
Uniformity Coefficient	

PS priority	PARTICLE SIZE DISTRIBUTION	Job Ref	P21139	)
	BS 1377 : Part 2 : 1990 : Clause 9	Borehole / Pit No	TP13Ä1	
Location	Gortyrahilly and Inchamore W.F	Sample No		
		Depth	0.00	m
Soil Description	Clayey sandy GRAVEL	Sample type	В	



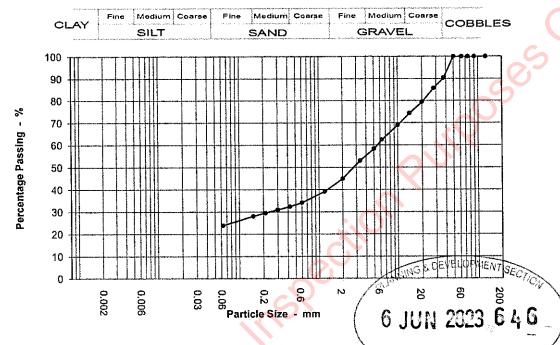
Sievi	1g	Sedimentation
Particle Size mm	% Passing	Particle Size % Passing mm
125	100	
90	100	
75	100	
63	100	<b>)</b>
50	88	
37.5	87	
28	81	
20	71	
14	60	
10	54	
6.3	45	
5	41	
3.35	35	
2	30	
1.18	26	ļ
0.6	22	
0.425	21	
0.3	20	
0.212	19	
0.15	18	
0.063	14	]

Test Method BS 1377 : Part 2 : 1990		
Sedimentation N/A		

Sample Proportions			
Cobbles	0.0		
Gravel	70.0		
Sand	16.0		
Silt & Clay	14.0		

Grading Analy	rsis
D100	63.00
D60	14.00
D10	
Uniformity Coefficient	

PUI priority	PARTICLE SIZE DISTRIBUTION	Job Ref	<b>P21139</b> TP30A1	
	BS 1377 : Part 2 : 1990 : Clause 9	Borehole / Pit No		
Location	Gortyrahilly and Inchamore W.F	Sample No		
		Depth	0.00	m
Soil Description	Very clayey very sandy GRAVEL	Sample type	В	



Sievii	ng	Sedimentation
Particle Size mm	% Passing	Particle Size % Passing
125	100	
90	100	
75	100	
63	100	
50	100	
37.5	90	
28	86	
20	79	
14	74	
10	69	
6.3	62	
5	58	
3.35	53	
2	45	
1.18	39	
0.6	34	
0.425	32	
0.3	31	
0.212	30	
0.15	28	
0.063	24	

Test	lethod	
BS 1377 : Part 2 : 1991		
Sieving	Clause 9.3	
Sedimentation	N/A	

Sample Proportions	
0.0	
55,0	
21.0	
24.0	

Grading Analysis	
D100	50.00
D60	5.51
D10	
Uniformity Coefficient	



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