APPENDIX 5

GEOTECHNICAL AND PEAT STABILITY ASSESSMENT REPORT

FEHILY TIMONEY

DESIGNING AND DELIVERING
A SUSTAINABLE FUTURE

GEOTECHNICAL & PEAT STABILITY REPORT

GANNOW RENEWABLE ENERGY DEVELOPMENT

Prepared for:

MKO Ltd

Date: **September 2025**

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GEOTECHNICAL & PEAT STABILITY ASSESSMENT REPORT
GANNOW RENEWABLE ENERGY DEVELOPMENT

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Abstract: Fehily Timoney and Company (FT) were engaged by McCarthy Keville O'Sullivan (MKO) to undertake a geotechnical assessment of the proposed Gannow Renewable Energy Development with respect to peat stability. As part of the geotechnical assessment of the Proposed Project, FT completed walkover surveys at the Site. The findings of the geotechnical and peat stability assessment showed that the Site has an acceptable margin of safety and is suitable for the proposed wind farm development.

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1. NON-TECHNICAL SUMMARY

Fehily Timoney and Company (FT) was engaged by MKO, on behalf of Gannow Ltd (the Applicant) to undertake a geotechnical and peat stability assessment of the proposed Gannow Renewable Energy Development (the 'Proposed Project'), located in Co. Galway. In accordance with the '*Wind Energy Development Guidelines for Planning Authorities*' (Department of the Environment, Heritage and Local Government (DoEHLG), 2006) (hereafter referred to as the Guidelines (DoEHLG, 2006), where peat >0.5m thickness is present on a proposed wind farm development, a peat stability assessment is required.

As detailed in Section 1.1.1 in Chapter 1, for the purposes of this EIAR, the various project components are described and assessed using the following references: 'Proposed Project', 'Proposed Wind Farm', 'Proposed Wind Farm site', 'Proposed Grid Connection' and the 'Site'.

A site walkover including intrusive peat depth probing, ground investigation, desk study, stability analysis and risk assessment was carried out to assess the susceptibility of the site to peat failure following the principles in Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (PLHRAG, 2nd edition, Scottish Government, 2017).

The findings, which involved a stability analysis of 202 locations across the Proposed Wind Farm site, show that the Site has an acceptable margin of safety and is suitable for the Proposed Project. Peat probing was also carried out in localised areas along the Proposed Grid Connection (35 no. probes). Due to the limited extent and shallow depth peat along the Proposed Grid Connection (<0.3m) it was deemed unnecessary to undertake a stability analysis of this area. Based on the findings, mitigation measures will be implemented for construction work in peat lands to ensure that all works adhere to an acceptable standard of safety.

The Proposed Wind Farm comprises 8 no. wind turbines and associated infrastructure. A detailed description of the Proposed Project is included in Chapter 4 of the EIAR.

The Proposed Wind Farm site comprises predominantly agricultural land underlain by cut over raised peat and till derived from limestones with a mainly man-made drainage network.

Slope inclinations at the infrastructure locations range from 2 to 4 degrees. The relatively flat topography/nature of the terrain on site reflects the low risk of peat failure. Ground conditions comprised mainly of blanket peat overlying silt and clay.

Between September 2024 and March 2025, 498 no. peat depth readings were taken within the Proposed Wind Farm by FT, Hydro-Environmental Services (HES), and MKO. Peat depth recorded during the site walkovers and from the ground investigation ranged from 0.1 to 7.2m with an average peat depth of 1.1m. 95% of the probes recorded peat depths of less than 3.0m. A number of localised readings recorded peat depths from 3.0 to 7.2m. The Proposed Wind Farm has been designed to avoid areas with deep peat where possible.

The purpose of the stability analysis was to determine the stability i.e. Factor of Safety (FoS), of the peat slopes. The FoS provides a direct measure of the degree of stability of a peat slope. A FoS of less than 1.0 indicates that a slope is unstable; a FoS of greater than 1.0 indicates a stable slope. However, taking a precautionary approach, an acceptable FoS for slopes is generally taken as a minimum of 1.3. The stability analysis for the Proposed Project, which analysed the turbine locations, access roads and substation, resulted in a FoS above the minimum acceptable value of 1.3 and hence the site has a satisfactory margin of safety.

The risk assessment uses the results of the stability analysis in combination with qualitative factors, which cannot be reasonably included in a stability calculation but nevertheless may affect the occurrence of peat instability, to assess the risk of peat failure at the Site. The results of the risk assessment are given in Appendix B. A construction buffer zone plan based on qualitative factors identified during the site walkover is included as Drawing P24-138-0600-0003.

In summary, the Site has an acceptable margin of safety and is considered to be at low risk of peat failure taking into account the proposed mitigation measures and construction controls set out in this report are implemented and is suitable for the Proposed Project.

2. INTRODUCTION

2.1 Fehily Timoney and Company

Fehily Timoney and Company (FT) is an Irish engineering, environmental science and planning consultancy with offices in Cork, Dublin and Carlow. The practice was established in 1990 and currently has about 100 members of staff, including engineers, scientists, planners and technical support staff. FT deliver projects in Ireland and internationally in our core competency areas of Waste Management, Environment and Energy, Civils Infrastructure, Planning and GIS and Data Management.

FT have been involved in over 100 wind farm developments in both Ireland and the UK at various stages of development i.e., preliminary feasibility, planning, design, construction, and operational stage and have established themselves as one of the leading engineering consultancies in peat stability assessment, geohazard mapping in peat land areas, investigation of peat failures and site assessment of peat.

This Report was written by Emily Archer (FT Senior Project Geotechnical Engineer, MSc Applied Environmental Geoscience) and Ian Higgins (FT Principal Geotechnical Engineer, MSc in Geotechnical Engineering). Emily is a Senior Project Engineer with Fehily Timoney and has 6 years' experience in geotechnical engineering. Ian is a Technical Director with Fehily Timoney and has 25 years' experience in geotechnical engineering.

2.2 Project Description

FT was engaged in March 2024 by McCarthy Keville O'Sullivan (MKO) on behalf of Gannow Ltd (the Applicant) to undertake a geotechnical & peat stability assessment of the proposed Gannow Renewable Energy Development (the 'Proposed Project'). As detailed in Section 1.1.1 in Chapter 1, for the purposes of this EIAR, the various project components are described and assessed using the following references: 'Proposed Project', 'Proposed Wind Farm site', 'Proposed Wind Farm', 'Proposed Grid Connection' and the 'Site'.

The Proposed Wind Farm is located approximately 9.7km east of Athenry Co. Galway and 13km north of Loughrea Co. Galway. The Proposed Grid Connection includes for 38kV underground cabling from the proposed onsite 38kV substation, in the townland of Attimonmore South, Co. Galway to the existing Cashla 220kV substation in the townland of Barrettspark, Co. Galway.

The Proposed Wind Farm comprises predominantly agricultural land underlain by cut over raised peat and till derived from limestones with a mainly man-made drainage network. Current land-use along the Proposed Grid Connection comprises of public road corridor, public open space, native woodland, private track, and private land principally used by agriculture.

The Proposed Project will comprise 8 no. wind turbines and associated hardstanding areas, 1 no. 38kV electricity substation, 5 no. peat and spoil management areas, 2 no. temporary construction compounds, upgrade of existing roads, construction of new site access roads, underground cabling connecting to the existing Cashla 220kV substation, 1 no. permanent meteorological mast, site drainage and all associated work as described in Chapter 4 of the EIAR.

2.3 Peat Stability Assessment Methodology

FT undertook the assessment following the principles in Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (PLHRAG, 2nd edition, Scottish Government, 2017). The PLHRAG (2nd Edition, Scottish Government, 2017) is used in this report as it provides best practice methods to identify, mitigate and manage peat slide hazards and associated risks in respect of consent applications for electricity generation projects.

The aforementioned best practice guide was produced following peat failures in the Shetland Islands, Scotland in September 2003, but more pertinently following the peat failure in October 2003, during the construction of a wind farm at Derrybrien, County Galway, Ireland.

This peat stability assessment has been undertaken taking into account peat failures that have occurred on upland peatland sites (such as recent failures at Shass Mountain (2020), Co. Leitrim and Meenbog (2020), Co. Donegal). The lessons learned from both peat slide events have been incorporated into the design of this project and the construction methodologies to be implemented.

The peat present on the Gannow site is an area of raised bog which has been historically used for small-scale peat extraction. The site is flat in nature, and the areas where peat has been extracted have been drained to locally lower the water level within the peat. This has led to an increase in the strength of the in-situ peat when compared to undrained areas. Given the flat site and the higher strength of the peat, the site conditions at Gannow are not considered to be similar to Shass Mountain or Meenbog, nor is it considered likely that a similar failure could occur at Gannow.

It is important that the existing site drainage is maintained during construction to avoid a similar failure to that on Shass Mountain, which occurred following heavy rainfall; this is referenced in the Risk Assessments for the turbines/access roads. However, the topography of the Site is also different to that at Shass Mountain and does not contain any areas where a large catchment area is focussed into a localised area of deep peat.

It is also noted that there have been numerous wind farms successfully constructed on historically worked raised bog sites over the past 15 years without any issues relating to peat failure, such as Derrinlough Wind Farm, Cloncreen Wind Farm and Mount Lucas Wind farm.

A constraints study was initially undertaken by the Environmental, Hydrogeological and Ecological members of the design team to determine the developable area on the Proposed Wind Farm site, prior to the site reconnaissance by engineering geologists/geotechnical engineers from FT. The extent and depth of ground investigation and peat stability analysis by FT have been undertaken in accordance with guidance within Eurocode 7 and PLHRAG (2nd Edition, Scottish Government, 2017) to investigate the ability of the Proposed Wind Farm Site to receive the Proposed Wind Farm infrastructure and to assess the peat slopes that have the potential to impact on the Proposed Wind Farm site, as applicable. Sufficient peat depth data has been recorded during the site walkovers to enable the characterisation of the peat depth across the Proposed Wind Farm, with additional detail at infrastructure locations. The peat stability assessment is undertaken to identify peat slopes at risk from the Proposed Wind Farm, and to identify peat slopes that may pose a risk to the Proposed Wind Farm.

The turbine delivery route and the Proposed Grid Connection are not examined in further detail in this report as the Geological Survey of Ireland (GSI) mapping and the peat probe survey indicate minimal to no presence (0.1 to 0.3m in localised areas only) of peat in these areas. As a result, the risk of peat failure along the Proposed Grid Connection is deemed to be negligible.

The geotechnical and peat stability assessment at the Proposed Project included the following activities:

(1) Desk study involving the review of publicly available soils and geology maps, records of historical peat failures, aerial photography.

(2) Site reconnaissance including shear strength and peat depth measurements undertaken following a multidisciplinary constraints study (by the design team) to determine the proposed construction envelope within the Proposed Wind Farm site i.e. the area within the overall site where development is possible following multidisciplinary review and assessment of constraints (refer to Chapter 3 of the EIAR).

(3) Peat stability assessment of the peat slopes on Proposed Wind Farm site using a deterministic and qualitative approach.

(4) Peat contour depth plan – compiled based on the peat depth probes carried out across the Proposed Wind Farm site and along the Proposed Grid Connection by FT (2024 and 2025), HES (2024 and 2025) and MKO (2024 and 2025).

(5) Factor of safety plan – compiled for the short-term critical condition (undrained) for 202 no. FoS points analysed along the proposed infrastructure envelope on the Proposed Wind Farm site.

(6) Construction buffer zone plan – identifies areas with an elevated or higher construction risk where mitigation/control measures will need to be implemented during construction to minimise the potential risks and ensure they are kept within an acceptable range.

(7) A peat stability risk register was compiled to assess the potential design/construction risks at the infrastructure locations and determine adequate mitigation/control measures for each location to minimise the potential risks and ensure they are kept within an acceptable range, where necessary.

(8) Review of ground investigation carried out at the Proposed Wind Farm site by Irish Drilling Ltd (IDL) 2024.

(9) Commentary of founding details for other infrastructure elements such as access roads, crane hardstands, onsite substation, and temporary construction compound platforms and met mast foundation.

A flow diagram showing the general methodology for the peat stability assessment is shown in Figure 2.1. The methodology illustrates the optimisation of the Proposed Wind Farm layout based on the findings from the site reconnaissance and stability analysis and subsequent feedback.

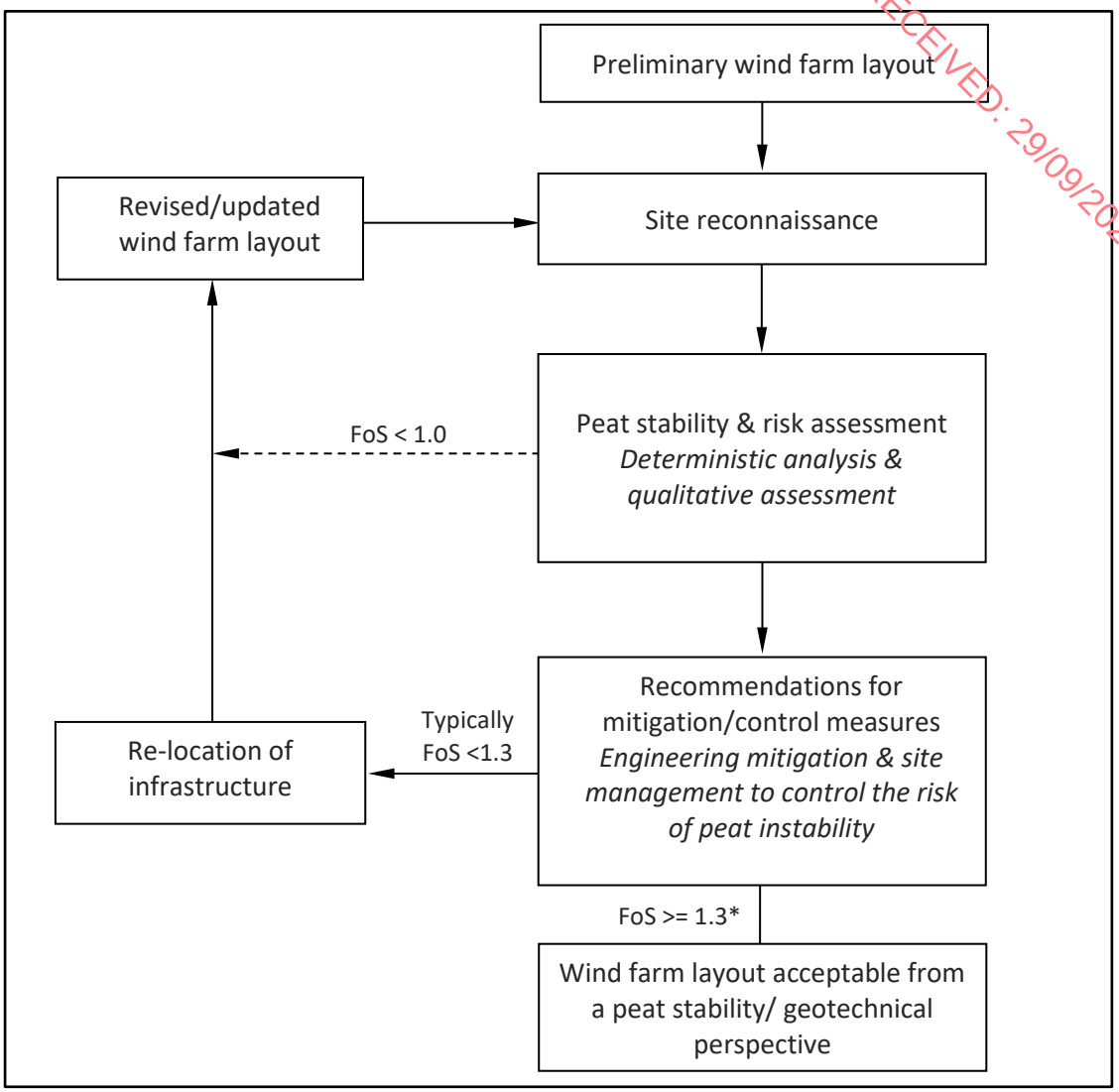

Figure 2.1: Methodology for Peat Stability Assessment

*An FoS of between 1.0 and 1.3 does not mean that a failure will occur, but that the area requires attention. Mitigation measures can be provided for areas with an FoS of between 1.0 and 1.3 to reduce the risk of failure.

As for all construction projects, a detailed engineering construction design must be carried out by the appointed construction stage designer prior to any construction work commencing on site. This must take account of the consented project details and any conditions imposed by that consent. This must include a confirmatory peat stability assessment to account for any changes in the environment which may have occurred in the time leading up to the commencement of construction and a peat and spoil management plan to allow for the most appropriate geotechnical and environmental led solutions to be developed for the management of peat and spoil.

2.4 Peat Failure Definition

Peat failure in this report refers to a significant mass movement of a body of peat that would have an adverse impact on a proposed wind farm development or the surrounding environment. Peat failure excludes localised movement of peat that would occur below an access road, creep movement or erosion type events.

The potential for peat failure at the Proposed Wind Farm site is examined with respect to wind farm construction and associated activity.

2.5 Main Approaches to Assessing Peat Stability

The main approaches for assessing peat stability for wind farm developments include the following:

(1) Geomorphological

(2) Qualitative (judgement)

(3) Index/Probabilistic (probability)

(4) Deterministic (factor of safety)

Approaches (1) to (3) listed above are considered subjective and do not provide a definitive indication of stability; in addition, a high level of judgement/experience is required which makes it difficult to relate the findings to real conditions. FT apply a more objective approach, the deterministic approach (as discussed in Section 2.6).

As part of FT's deterministic approach, a qualitative risk assessment is also carried out taking into account qualitative factors, which cannot necessarily be quantified, such as the presence of mechanically cut peat, quaking peat, bog pools, sub peat water flow, slope characteristics and numerous other factors. The qualitative factors used in the risk assessment are compiled based on FT's experience of assessments and construction in peat land sites and peat failures throughout Ireland and the UK. FT have been involved with in excess of 100 wind farm developments across Ireland and the UK at various stages of development, from preliminary feasibility stage through planning and from scheme development at tender design and detailed design stage, through to the construction and operational stages. This approach follows the guidelines for geotechnical risk management as given in Clayton (2001), as referenced in the best practice for Peat Landslide Hazard and Risk Assessment Guide (PLHRAG, 2nd Edition, Scottish Government, 2017) and takes into account the approach of MacCulloch (2005).

The risk assessment uses the results of the deterministic approach in combination with qualitative factors, which cannot be reasonably included in a stability calculation but nevertheless may affect the occurrence of peat instability to assess the risk of instability on a peat land site.

2.6 Peat Stability Assessment – Deterministic Approach

The peat stability assessment is carried out across a wide area of peatland to determine the stability of peat slopes and to identify areas of peatland that are suitable for development; this allows the layout of infrastructure on a particular wind farm site to be optimised. The assessment provides a numerical value (factor of safety (FoS)) of the stability of individual parcels of peatland. The findings of the assessment differentiate between areas of stable and unstable peat, and areas of marginal stability where restrictions may apply. This allows for the identification of the most suitable locations for turbines, access roads and infrastructure.

A deterministic assessment requires geotechnical information and site characteristics which are obtained from desk study and site walkover, e.g. properties of peat/soil/rock, slope geometry, depth of peat, underlying strata, groundwater, etc. An adverse combination of the factors listed above could potentially result in instability. Using the information above, a factor of safety is calculated for the stability of individual parcels of peatland on a site (as discussed in Section 7).

The FoS is a measure of the stability of a particular slope. For any slope, the degree of stability depends on the balance of forces between the weight of the soil/peat working downslope (destabilising force) and the inherent strength of the peat/soil (shear resistance) to resist the downslope weight, see Figure 2.2.

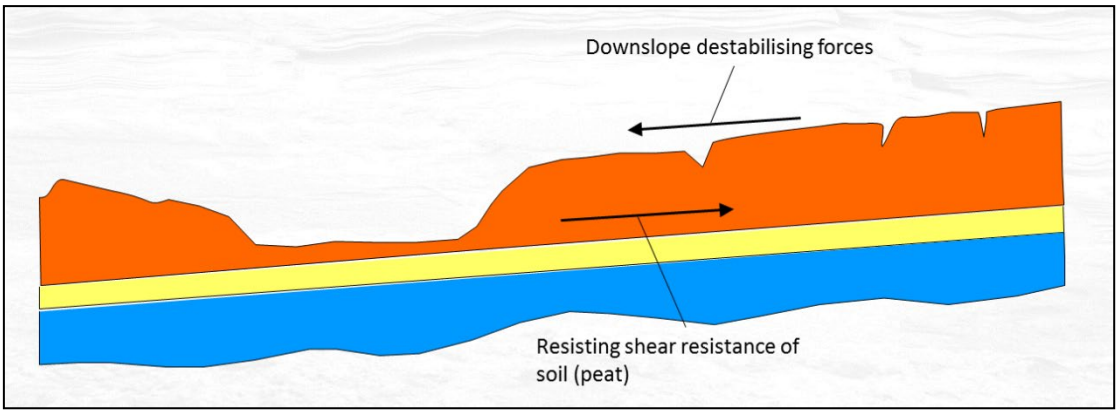

Figure 2.2: Peat Slope Showing Balance of Forces to Maintain Stability

The FoS provides a direct measure of the degree of stability of a slope and is the ratio of the shear resistance over the downslope destabilising force. Provided the available shear resistance is greater than the downslope destabilising force then the FoS will be greater than 1.0 and the slope will remain stable. If the factor of safety is less than 1.0 the slope is unstable and liable to fail. The acceptable FoS for assessment purposes is 1.3 (BS6031, 1981).

2.7 Applicability of the Factor of Safety (Deterministic) Approach for Peat Slopes

The factor of safety approach is a standard engineering approach in assessing slopes which is applied to many engineering materials, such as peat, soil, rock, etc.

The factor of safety approach is included in the PLHRAG (2nd Edition, Scottish Government, 2017); see Section 5.3.1 of the guide. This guide provides best practice methods to identify, mitigate and manage peat slide hazards and associated risks in respect of consent applications for electricity generation projects.

Furthermore, the best practice guide notes that the results from the factor of safety approach 'has provided the most informative results' with respect to analysing peat stability (Section 5.3.1 of the guide).

The factor of safety approach in this report includes undrained (short-term stability) and drained (long-term stability) analyses. The undrained condition is the critical condition for a development. The purpose of the drained analysis is to identify the relative susceptibility of rainfall-induced failures at the Proposed Wind Farm site.

Notwithstanding the above, the stability analysis used by FT in this report also includes qualitative factors to determine the potential for peat stability i.e. the analysis used does not solely rely on the factor of safety approach.

The deterministic analysis is considered an acceptable engineering design approach. This concurs with the best practice guide referenced above.

2.8 Assessment of Intense Rainfall and Extreme Dry Events on the Peat Slope

The deterministic approach carried out by FT examines intense rainfall and extreme dry events. The deterministic approach includes an undrained (short-term stability) and drained (long-term stability) analysis to assess the factor of safety for the peat slopes against a peat failure.

The drained loading condition applies in the long-term. This condition examines the effect of the change in groundwater level as a result of rainfall on the existing stability of the natural peat slopes. For the drained analysis the level of the water table above the failure surface is required to calculate the factor of safety for the peat slope.

In order to represent varying water levels within the peat slopes, a sensitivity analysis is carried out which assesses varying water level in the peat slopes i.e. water levels ranging from 0 to 100% of the peat depth is conducted, where 0% equates to the peat been completely dry and 100% equates to the peat being fully saturated.

By carrying out such a sensitivity analysis with varying water level in the peat slopes, the effects of intense rainfall and extreme dry events are considered and analysed. The results of which are presented in Section 7 of this report.

3. DESK STUDY

3.1 Desk Study

The main relevant sources of interest with respect to the Proposed Wind Farm site include:

- Geological plans and Geological Survey of Ireland database
- Ordnance survey plans
- Literature review of peat failures

The Geological Survey of Ireland online dataset viewer (GSI, 2025) and geological plans (GSI, 1999) for the Proposed Wind Farm site were used to verify the soil and bedrock conditions.

The Ordnance Survey plans were reviewed to determine if any notable features or areas of particular interest (from a geotechnical point of view) are present on the Proposed Wind Farm site.

The desk study also includes a review of both published literature and GSI online dataset viewer (GSI, 2025) on peat failures/landslides in the vicinity of the Proposed Wind Farm site. There are no limitations associated with the desk study information.

3.2 Soils, Subsoil & Bedrock

A review of the Geological Survey of Ireland online database and published documents from GSI was undertaken. A review of the GSI subsoils maps indicate that the Proposed Wind Farm site is mainly overlain by cut over raised peat, with localised areas of Till derived from Limestones and Alluvium also present. The route of the Proposed Grid Connection is predominantly underlain by Till derived from Limestones with localised pockets underlain by cut over raised peat.

In relation to bedrock, the Proposed Wind Farm site is underlain by the Lucan Formation which comprises dark limestone and shale beds.

There are no fault-lines indicated within the bedrock of the Proposed Wind Farm site.

No geological heritage sites are noted within the Site. The closest feature is approximately 10km southeast of T08, outside of the Proposed Wind Farm site. The feature is described as Rahally M6 Road Cut – A 500m long cutting along the M6 motorway with both high and low cliffs of rock.

The landslide susceptibility of the Proposed Wind Farm site (Please see Figure 8-X in Chapter 8 of the EIAR) was classified by the GSI (2025) as "**low**" susceptibility, which is expected given the terrain present.

3.3 Previous Failures

There are no recorded peat failures within the Proposed Wind Farm site recorded on the GSI database (GSI, 2025). The nearest recorded slope failure is located approximately 30km south of T02, outside of the Proposed Wind Farm site. The failure recorded occurred within the Sonnagh Old Wind Farm, Co. Galway, on the edge of an internal site road. The slope failure in this area was a peat flow landslide, the mechanism is undefined.

4. FINDINGS OF SITE RECONNAISSANCE

4.1 Site Reconnaissance

As part of the assessment of potential peat failure at the Proposed Wind Farm site, FT carried out a site reconnaissance in conjunction with the desk study review described in Section 3. This comprised walkover inspections of the Proposed Wind Farm site with recording of salient geomorphological features with respect to a wind farm development which included peat depth measurements and a preliminary assessment of peat strength. General photographs of the Proposed Wind Farm site are included at the end of the main text.

The following salient geomorphological features were considered:

- Active, incipient or relict instability (where present) within the peat deposits
- Presence of shallow valley or drainage line
- Wet areas
- Any change in vegetation
- Peat depth
- Slope inclination and break in slope

The survey covered the proposed locations for the turbine bases and associated infrastructure.

The method adopted for carrying out the site reconnaissance relied on experienced practitioners carrying out a visual assessment of the site supplemented with measurement of slope inclinations.

4.2 Findings of Site Reconnaissance

The site reconnaissance comprised a walkover inspection of the Proposed Wind Farm site by engineers from FT on 4th and 5th September 2024 and 5th and 6th March 2025. Weather conditions for the site visits were wet and overcast in September and dry and overcast in March.

The findings from the site walkover have been used to optimise the layout of the infrastructure on site.

The main findings of the site walkover of the Proposed Wind Farm site are as follows:

(1) The Proposed Wind Farm site is mainly covered in a layer of peat and has generally flat terrain comprising open peat bog, forestry and agricultural fields. Peat depths vary across the Proposed Wind Farm site but are predominantly less than 3m.

(2) A total of 498 no. peat depth probes were carried out on site. Peat depths recorded across the Proposed Wind Farm site ranged from 0.0 to 7.2m with an average depth of 1.1m (Drawing P24-138-0600-0001). Approximately 95 percent of peat depth probes recorded peat depths of less than 3.0m. A number of localised readings were recorded around T01, T02 and T03, where peat depths were between 3.0 and 7.2m.

(3) The peat depths recorded at the turbine locations varied from 0m to 6.2m with an average depth of 1.1m.

(4) Peat depths recorded (by MKO) along the Proposed Grid Connection route ranged from 0.1m to 0.3m in isolated pockets.

(5) The Proposed Wind Farm site will comprise both the upgrade of existing and the construction of new proposed access roads. The construction of new proposed access roads will be carried out predominantly using floated roads. Excavate and replace construction techniques will be used in short sections where the peat is <1m in thickness or is not present, which involves the removal and replacement of peat or soft ground where encountered, and replacement with granular fill.

(6) Slope angles at the turbine locations ranged from 2 to 4 degrees. These slope angle readings were obtained using a combination of readings taken during the site reconnaissance by FT using handheld equipment, such as the Silva Clino Master which has an accuracy of +/- 0.25 degrees and from contour survey plans for the Proposed Wind Farm site.

(7) The slope angle quoted typically reflects the slope within the footprint of each proposed infrastructure location.

(8) No evidence of past failures or any significant signs of peat instability were noted on site at the time of the site walkovers.

(9) A summary of the site walkover findings for the Proposed Wind Farm site are as follows:

(a) The Proposed Wind Farm site is mainly covered in a layer of peat and has generally flat terrain comprising open peat bog, forestry and agricultural fields. Peat depths recorded across the Proposed Wind Farm site ranged from 0.0 to 7.2m with an average depth of 1.1m.

(b) A construction buffer zone plan has been produced for the site (Drawing P24-138-0600-0003). This shows areas on the site with an elevated or higher construction risk. The above identified buffer areas are based on qualitative factors identified during the walkover survey e.g. relatively deep peat, quaking peat, bog pools, mechanically cut peat, historical peat landslide, etc.

(c) The results of the peat depth probing, shear strength testing of the peat and qualitative factors identified on site have been used in the stability and risk assessments, see Sections 6, 7 and 8 of this report for details.

(d) Based on the findings from the walkover survey, the Proposed Wind Farm site and the Proposed Grid Connection is considered to have a **low** risk of peat failure.

5. GROUND INVESTIGATION

Ground investigations were carried out at the Proposed Wind Farm site by Irish Drilling Limited (IDL) under the supervision of FT from 7th to 10th October 2024.

The ground investigation by IDL comprised 12 no. trial pits along with laboratory testing. The trial pits were carried out at various locations across the Proposed Wind Farm site to provide information on the ground conditions. Drawing P24-138-0600-0004 (attached at the end of this report) shows the location of the trial pits.

The laboratory testing included the following:

- Classification testing for overburden material

The trial pits logs, locations, photographs and associated laboratory testing are included within Appendix E of this report.

5.1 Summary of Ground Conditions

The ground conditions at the Proposed Wind Farm site can be typically categorised into the following deposits:

Peat – Typically described as spongy plastic brown pseudo fibrous peat. Peat thicknesses from the trial pits ranged from 0.1 to 4.2m.

Marl – Soft, creamish white, sandy, organic silt, recorded in TP01 and TP02

Glacial Till – Typically described as slightly gravelly slightly sandy silt/ clay with cobbles and boulders. Cobbles and boulders were typically noted as angular and sub-rounded and rounded.

Groundwater was noted during the excavation of seven of the trial pits. Groundwater was recorded at depth of between 0.2 and 3m bgl, with flow ranging from slow to rapid.

5.2 Summary of Laboratory Tests

Following completion of intrusive site investigations by IDL laboratory testing was scheduled by FT and undertaken by IDL. Soil testing was carried out in accordance with BS1377 (1990) - Methods of Test for Soils for Civil Engineering Purposes in IDL's Materials Laboratory, accredited in accordance with the Irish National Accreditation Board (INAB).

Laboratory testing comprising moisture content, Atterberg limit tests and particle size distribution (PSD) testing was undertaken on samples from the trial pits. Based on the results of the PSD tests, the descriptions on the final trial pit logs have been updated.

Atterberg limit tests carried out on the samples classify the material as Clay of low plasticity, or non-plastic (Silt).

Laboratory results are included in Appendix 2 of the IDL Ground Investigation Factual Report.

5.3 Summary of Geotechnical Parameters

Table 5-1 contains characteristic geotechnical parameters for the main material types likely to be encountered on the Proposed Wind Farm site. Where direct measurement of parameters has not been carried out, established correlations with measured properties have been used to derive values. Characteristic values are defined as a cautious estimate of the value affecting the occurrence of limit state based on clause 2.4.5.2 from Eurocode 7. Values have been derived from both laboratory testing and in-situ (shear vane) measurements.

Table 5-1: Summary of Geotechnical Parameters

Material Type/Strata	Unit Weight	Geotechnical Parameters		
		Undrained Parameters	Drained Parameters	
	γ (kN/m^3)	c_u (kPa)	ϕ' (°)[4]	c' (kPa)
Peat	10.5	6	25	4
Marl	16	10	24	1
Till	19	40	30	0

Notes
Note (1) The above parameters are indicative only and have been derived based on experience and from a review of the ground investigation carried out at the site.
Note (2) Where direct measurement of parameters has not been carried out, established correlations with measured properties have been used to derive values.
Note (4) ϕ' (°) – internal angle of shearing resistance.

6. PEAT DEPTHS, STRENGTH & SLOPE AT PROPOSED INFRASTRUCTURE LOCATIONS

As part of the site walkover, peat depth, in-situ peat strength and slope angles were recorded at various locations across the Proposed Wind Farm site.

6.1 Peat Depth

Peat probes were carried out at proposed turbine locations and along access roads and other main infrastructure elements to determine the peat depth on site. At all proposed turbine locations, a minimum of 5 no. probes were carried out around the turbine location, and an average peat depth was calculated.

6.2 Peat Strength

The strength testing was carried out in-situ using a Geonor H-60 Hand-Field Vane Tester. From FT's experience hand vanes give indicative results for in-situ strength of peat and is considered best practice for the field assessment of peat strength.

6.3 Slope Angle

The slope angles at each of the main infrastructure locations were obtained using a combination of readings taken during the site reconnaissance by FT using handheld equipment, such as the Silva Clino Master and from contour survey plans for Proposed Wind Farm site.

The slope angle quoted typically reflects the slope within the footprint of each proposed infrastructure location. It should be noted that slope angles derived from contour survey plans are approximate, as such surveys are dependent on the density of survey data and do not always reflect local variations in ground topography. Slope angles recorded during the site reconnaissance by FT using handheld equipment are deemed more accurate and representative of local topography.

6.4 Summary of Findings

Based on the peat depths recorded across the Proposed Wind Farm site by FT the peat varied in depth from 0.0 to 7.2m with an average depth of 1.1m. All peat depth probes carried out on site have been utilised to produce a peat depth contour plan for the site (Drawing P24-138-0600-0001 attached at the end of this report).

A summary of the peat depths at the proposed infrastructure locations is given in Table 6.1. The data presented in Table 6.1 is used in the peat stability assessment of the Proposed Wind Farm site.

Table 6-1: Peat Depth & Slope Angle at Proposed Infrastructure Locations

Turbine	Easting	Northing	Peat Depth Range (m) (1)	Average Peat Depth (m)	Slope Angle (°) (2)
T01	560006	729599	2.6 – 4.0	3.4	2
T02	560288	729308	2.6 – 3.5	3	4
T03	560737	729992	1.4 – 6.7	1.8	2
T04	561808	729771	0.1 – 0.3	0.2	4
T05	562167	729573	0.1 – 0.6	0.3	4
T06	562645	729614	0	0	2
T07	563080	729518	0.2 – 0.4	0.3	3
T08	562403	729094	0.3 – 3.0	0.8	4
Substation	559550	729946	0.2 – 0.5	0.3	2
Construction Compound 1	559546	729981	0.4 - 0.8	0.5	2
Construction Compound 2	561644	730048	0.3 – 0.4	0.3	3
Met Mast	561635	730029	0.3 – 0.4	0.3	3

Note (1) Based on probe results from the site walkovers. The range of peat depths for the infrastructure locations are typically based on a 10m grid carried out around the infrastructure element, where accessible.

Note (2) The slope angles at each of the main infrastructure locations were obtained using a combination of readings taken during the site reconnaissance by FT using handheld equipment, such as the Silva Clino Master (which has an accuracy of +/- 0.25 degrees) and from contour survey plans for site. The slope angle quoted typically reflects the slope within the footprint of each infrastructure location.

Note (3) The data presented in the Table above is used in the peat stability assessment of the site.

In addition to probing, in-situ shear vane testing was carried out as part of the ground investigation. Strength testing was carried out at selected locations across the Proposed Wind Farm site to provide representative coverage of indicative peat strengths. The results of the vane testing with depth are presented in Figure 6.1.

The hand vane results indicate undrained shear strengths in the range 6 to 70kPa, with an average value of about 39kPa. The higher strengths recorded are typical of well drained peat as is present on the Proposed Wind Farm site. The lowest peat strength was recorded in an area of relatively undrained deep peat (7.2m) and as such is not considered representative of the peat strength across the entire Proposed Wind Farm site.

Peat strength at sites of known peat failures (assuming undrained loading failure) are generally very low, for example the undrained shear strength at the Derrybrien failure (AGEC, 2004) as derived from back-analysis, was estimated at 2.5kPa. The recorded undrained strength at the Proposed Wind Farm site is significantly greater than the lower bound values for Derrybrien indicating that there is no close correlation to the peat conditions at the Derrybrien site and that there is significantly less likelihood of failure on the Proposed Wind Farm site.

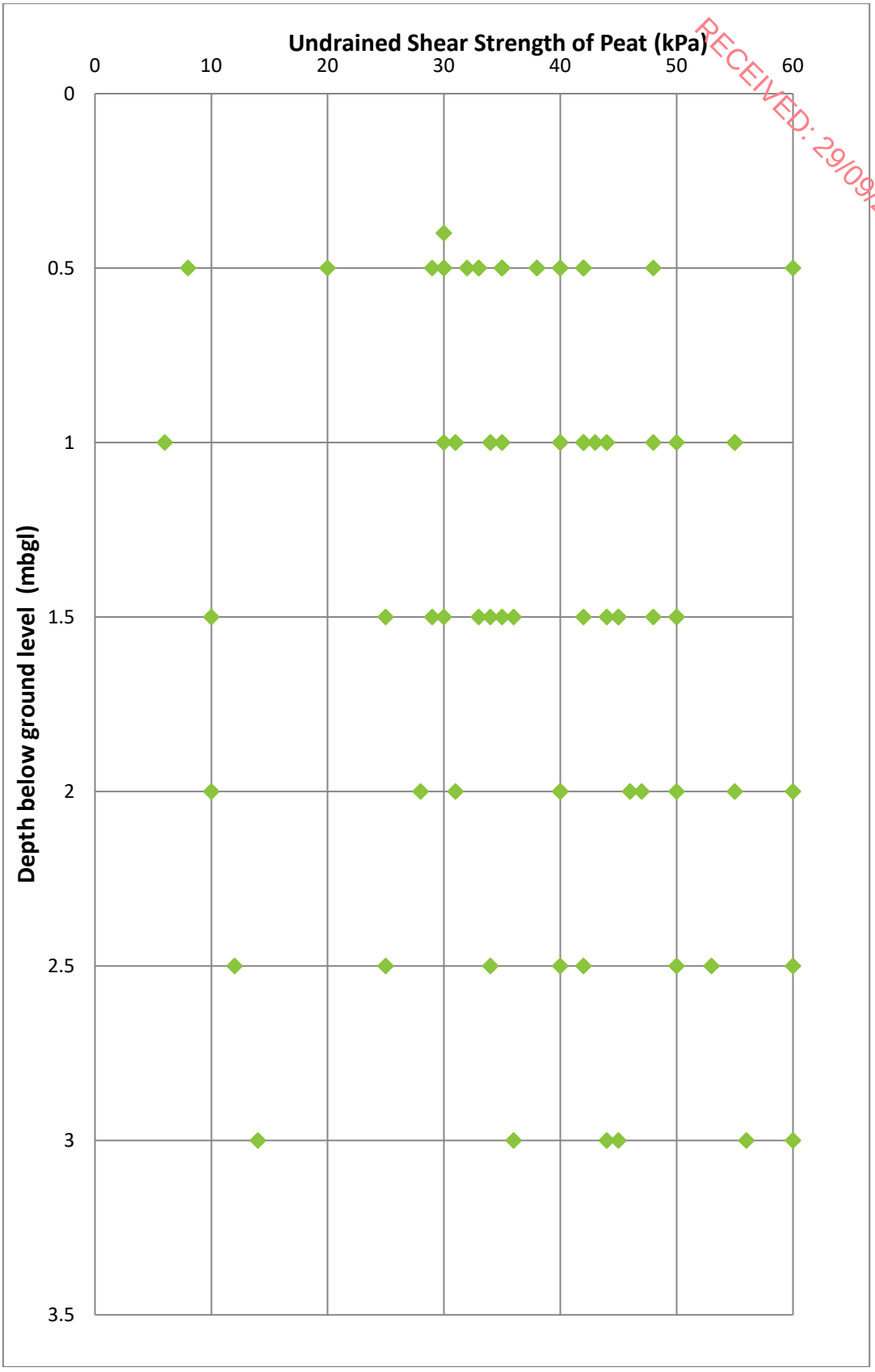

Figure 6.1: Undrained Shear Strength (c_u) Profile for Peat with Depth

7. PEAT STABILITY ASSESSMENTS

The peat stability assessment includes an assessment of the stability of the natural peat slopes for individual parcels across the Proposed Wind Farm site including at the turbine locations and along the proposed access roads. The assessment also analyses the stability of the natural peat slopes with a surcharge loading of 10kPa, equivalent to placing 1m of stockpiled peat on the surface of the peat slope. As peat was only recorded in isolated areas along the Proposed Grid Connection, and did not exceed 0.5m in depth, no peat stability analysis was undertaken along the Proposed Grid Connection.

7.1 Methodology for Peat Stability Assessment

Stability of a peat slope is dependent on several factors working in combination. The main factors that influence peat stability are slope angle, shear strength of peat, depth of peat, pore water pressure and loading conditions.

An adverse combination of factors could potentially result in peat sliding. An adverse condition of one of the above-mentioned factors alone is unlikely to result in peat failure. The infinite slope model (Skempton and DeLory, 1957) is used to combine these factors to determine a factor of safety for peat sliding. This model is based on a translational slide, which is a reasonable representation of the dominant mode of movement for peat failures.

To assess the factor of safety for a peat slide, an undrained (short-term stability) and drained (long-term stability) analysis has been undertaken to determine the stability of the peat slopes on site.

1. The undrained loading condition applies in the short-term during construction and until construction induced pore water pressures dissipate.

2. The drained loading condition applies in the long-term. The condition examines the effect of the change in groundwater level as a result of rainfall on the existing stability of the natural peat slopes.

Undrained shear strength values (c_u) for peat are used for the total stress analysis. Based on the findings of the 2003 Derrybrien failure and other failures in peat, undrained loading during construction was found to be the critical failure mechanism.

A drained analysis requires effective cohesion (c') and effective friction angle (ø') values for the calculations. These values can be difficult to obtain because of disturbance experienced when sampling peat and the difficulties in interpreting test results due to the excessive strain induced within the peat. To determine suitable drained strength values a review of published information on peat was carried out. Table 7.1 shows a summary of the published information on peat together with drained strength values.

From Table 7.1 the values for c' ranged from 1.1 to 8.74kPa and ø' ranged from 21.6 to 43°. The average c' and ø' values are 4.5kPa and 30° respectively. Based on the above, it was considered to adopt a conservative approach and to use design values below the averages. For design the following general drained strength values have been used for the site:

c' = 4kPa
$ø'$ = 25°

Table 7-1: List of Effective Cohesion and Friction Angle Values for Peat

Reference	Cohesion, c' (kPa)	Friction Angle, ø' (degs)	Testing Apparatus/ Comments
Hanrahan et al (1967)	5 to 7	36 to 43	From triaxial apparatus
Rowe and Mylleville (1996)	2.5	28	From simple shear apparatus
Landva (1980)	2 to 4	27.1 to 32.5	Mainly ring shear apparatus for normal stress greater than 13kPa
	5 to 6	-	At zero normal stress
Carling (1986)	6.5	0	-
Farrell and Hebib (1998)	0	38	From ring shear and shear box apparatus. Results are not considered representative.
	0.61	31	From direct simple shear (DSS) apparatus. Result considered too low therefore DSS not considered appropriate
Rowe, Maclean and Soderman (1984)	1.1	26	From simple shear apparatus
	3	27	From DSS apparatus
McGreever and Farrell (1988)	6	38	From triaxial apparatus using soil with 20% organic content
	6	31	From shear box apparatus using soil with 20% organic content
Hungr and Evans (1985)	3.3	-	Back-analysed from failure
Dykes and Kirk (2006)	3.2	30.4	Test within acrotelm
Dykes and Kirk (2006)	4	28.8	Test within catotelm
Warburton et al (2003)	5	23.9	Test in basal peat
Warburton et al (2003)	8.74	21.6	Test using fibrous peat
Hendry et al (2012)	0	31	Remoulded test specimen
Komatsu et al (2011)	8	34	Remoulded test specimen
Zwanenburg et al (2012)	2.3	32.3	From DSS apparatus
Den Haan & Grognet (2014)	-	37.4	From large DSS apparatus
O'Kelly & Zhang (2013)	0	28.9 to 30.3	Tests carried out on reconstituted, undisturbed and blended peat samples

7.2 Analysis to Determine Factor of Safety (Deterministic Approach)

The purpose of the analysis was to determine the Factor of Safety (FoS) of the peat slopes using infinite slope analysis. The analysis was carried out at the proposed turbine locations, along the proposed access roads and at various locations across the Proposed Wind Farm site.

The FoS provides a direct measure of the degree of stability of the slope. A FoS of less than unity indicates that a slope is unstable, a FoS of greater than unity indicates a stable slope.

The previous code of practice for earthworks BS 6031:1981 (BSI, 1981), provided advice on design of earthworks slopes. It stated that for a first-time failure with a good standard of site investigation the design FoS should be greater than 1.3.

As a general guide the FoS limits for peat slopes in this report are summarised in Table 7.2.

Table 7-2: Factor of Safety Limits for Slopes

Factor of Safety (FoS)	Degree of Stability
Less than 1.0	Unstable (red)
Between 1.0 and 1.3	Marginally stable (yellow)
1.3 or greater	Acceptable (green)

Eurocode 7 (EC7) (IS EN 1997-1:2005) now serves as the reference document and the basis for design geotechnical engineering works. The design philosophy used in EC7 applies partial factors to soil parameters, actions and resistances. Unlike the traditional approach, EC7 does not provide a direct measure of stability, since global FoS are not used.

As such, and in order to provide a direct measure of the level of safety on a site, EC7 partial factors have not been used in this stability assessment. The results are given in terms of FoS.

A lower bound undrained shear strength, c_u for the peat of 6kPa was selected for the assessment based on the c_u values recorded across the Proposed Wind Farm site. It should be noted that a c_u of 6kPa for the peat is considered a conservative value for the analysis and is not representative of all peat present across the Proposed Wind Farm site. In reality the peat generally has a higher undrained strength.

The formula used to determine the factor of safety for the undrained condition in the peat (Bromhead, 1986) is as follows:

$$F = \frac{c_u}{\gamma z \sin\alpha \cos\alpha}$$

Where:

F = Factor of Safety
c_u = Undrained strength
γ = Bulk unit weight of material
z = Depth to failure plane assumed as depth of peat
α = Slope angle

The formula used to determine the factor of safety for the drained condition in the peat (Bromhead, 1986) is as follows:

$$F = \frac{c' + (\gamma z - \gamma_w h_w)\cos^2 \alpha \tan \phi'}{\gamma z \sin \alpha \cos \alpha}$$

Where:

F = Factor of Safety
c' = Effective cohesion
γ = Bulk unit weight of material
z = Depth to failure plane assumed as depth of peat
γ_w = Unit weight of water
h_w = Height of water table above failure plane
α = Slope angle
ϕ' = Effective friction angle

For the drained analysis the level of the water table above the failure surface is required to calculate the factor of safety for the slope. Since the water level in blanket peat can be variable and can be recharged by rainfall, it is not feasible to establish its precise location throughout the Proposed Wind Farm site. Therefore, a sensitivity analysis using water level ranging between 0% and 100% of the peat depth was conducted, where 0% equates to the peat being completely dry and 100% equates to the peat been fully saturated.

The following general assumptions were used in the analysis of peat slopes at each location:

(1) Peat depths are based on the maximum peat depth recorded at each location from the walkover surveys.

(2) The slope angles used in the peat stability assessment were obtained using a combination of readings taken during the site reconnaissance by FT using handheld equipment and from contour survey plans for the Proposed Wind Farm site. It should be noted that slope angles derived from contour survey plans are approximate, as such surveys are dependent on the density of survey data and do not always reflect local variations in ground topography.

(3) Slope angle at base of sliding assumed to be parallel to ground surface.

(4) A lower bound undrained shear strength, c_u for the peat along access tracks of 6kPa was selected for the assessment. The lowest recorded value on the Proposed Wind Farm site during the site walkover was 6kPa and this was taken in the open bog area south of the access track between T03 and T04, where no development is proposed. It should be noted that a c_u of 6kPa for the peat is considered a conservative value for the analysis and is not representative of all peat present across the Proposed Wind Farm site. In reality, the peat has a significantly higher undrained strength as a result of the artificial drainage present across the site.

For the stability analysis two load conditions were examined, namely:

Condition (1): no surcharge loading
Condition (2): surcharge of 10 kPa, equivalent to 1m of stockpiled peat assumed as a precautionary scenario.

7.3 Results of Analysis

7.3.1 Undrained Analysis for the Peat

The results of the undrained analysis for the natural peat slopes are presented in Appendix C and the results of the undrained analysis for the most critical load case (load condition 2) are shown on Drawing P24-138-0600-0002 included in the Drawings section at the end of this report. The undrained analysis for load condition 2 is considered the most critical load case as most peat failures occur in the short term upon loading of the peat surface. The results from the main infrastructure locations, including along access roads and in areas of peat and spoil management, are summarised in Table 7.3 and 7.4.

The calculated FoS for load condition 1 is in excess of 1.30 for each of the locations (202 no. locations) analysed with a range of FoS of 2.16 to 172.03, indicating a low risk of peat instability.

The calculated FoS for load condition 2 is in excess of 1.30 for each of the locations (202 no. locations), analysed with a range of FoS of 1.72 to 28.65, indicating a low risk of peat instability.

Table 7-3: Factor of Safety Results (Undrained Condition)

Turbine No./Waypoint	X (ITM)	Y (ITM)	Factor of Safety for Load Condition	
			Condition (1)	Condition (2)
T01	560006	729599	**2.69**	**2.05**
T02	560288	729308	**5.73**	**4.30**
T03	560737	729992	**11.47**	**6.88**
T04	561808	729771	**43.11**	**7.19**
T05	562167	729573	**43.11**	**7.19**
T06	562645	729614	**No peat recorded**	
T07	563080	729518	**21.56**	**6.16**
T08	562403	729094	**11.47**	**6.88**
Substation	559550	729946	**57.34**	**13.23**

Turbine No./Waypoint	X (ITM)	Y (ITM)	Factor of Safety for Load Condition	
			Condition (1)	Condition (2)
Construction Compound 1	559546	729981	**28.70**	**8.20**
Construction Compound 2	561644	730048	**21.56**	**6.16**
Met Mast	561635	730029	**21.56**	**6.16**
Peat and Spoil Management Area 1	560237	729492	**4.30**	**3.44**
Peat and Spoil Management Area 2	560851	730057	**8.39**	**6.74**
Peat and Spoil Management Area 3	561436	730085	**7.48**	**5.21**
Peat and Spoil Management Area 4	561832	729693	**57.40**	**9.57**
Peat and Spoil Management Area 5	562207	729542	**28.70**	**8.20**

7.3.2 Drained Analysis for the Peat

The results of the drained analysis for the peat are presented in Appendix C. The results from the main infrastructure locations, including along access roads and in areas of peat and spoil management are summarised in Table 7.4. As stated previously, the drained loading condition examines the effect of rainfall and water on the existing stability of the natural peat slopes.

The calculated FoS for load condition 1 is in excess of 1.30 for each of the locations (202 no. locations), analysed with a range of FoS of 1.44 to 141.33, indicating a low risk of peat instability.

The calculated FoS for load condition 2 is in excess of 1.30 for each of the locations (202 no. locations) analysed with a range of FoS of 2.48 to 67.12, indicating a low risk of peat instability.

Table 7-4: Factor of Safety Results (Drained Conditions)

Turbine No./Waypoint	X (ITM)	Y (ITM)	Factor of Safety for Load Condition	
			Condition (1)	Condition (2)
T01	560006	729599	**1.80**	**2.96**
T02	560288	729308	**3.82**	**6.21**
T03	560737	729992	**7.65**	**9.93**
T04	561808	729771	**28.74**	**10.35**
T05	562167	729573	**28.74**	**10.35**
T06	562645	729614	No peat recorded	
T07	563080	729518	**14.37**	**8.87**
T08	562403	729094	**21.00**	**17.94**

Turbine No./Waypoint	X (ITM)	Y (ITM)	Factor of Safety for Load Condition	
			Condition (1)	Condition (2)
Substation	559550	729946	38.23	19.09
Construction Compound 1	559546	729981	19.13	11.82
Construction Compound 2	561644	730048	14.37	8.87
Met Mast	561635	730029	14.37	8.87
Peat and Spoil Management Area 1	560237	729492	2.87	4.96
Peat and Spoil Management Area 2	560851	730057	32.31	31.21
Peat and Spoil Management Area 3	561436	730085	18.34	16.83
Peat and Spoil Management Area 4	561832	729693	38.27	13.79
Peat and Spoil Management Area 5	562207	729542	19.13	11.82

8. PEAT STABILITY RISK ASSESSMENT

A peat stability risk assessment was carried out for the infrastructure elements at the Proposed Wind Farm site. This approach adheres to best practice guidance for geotechnical/peat stability risk assessments as given in PLHRA (2017) and MacCulloch (2005).

The risk assessment uses the results of the stability analysis (deterministic approach) in combination with qualitative factors, which cannot be reasonably included in a stability calculation but nevertheless may affect the occurrence of peat instability, to assess the risk for each infrastructure element.

For each of the main infrastructure elements, a risk rating (product of probability and impact) is calculated and rated as shown in Table 8.1. Where a subsection is rated 'Medium' or 'High', control measures are required to reduce the risk to at least a 'Low' risk rating. Where a subsection is rated 'Low' or 'Negligible', only routine control measures are required.

Table 8-1: Risk Rating Legend

17 to 25	High: avoid works in area or significant control measures required
11 to 16	Medium: notable control measures required
5 to 10	Low: only routine control measures required
1 to 4	Negligible: none or only routine control measures required

A full methodology for the peat stability risk assessment is given in Appendix D.

8.1 Summary of Risk Assessment Results

The results of the peat stability risk assessment for potential peat failure at the Proposed Wind Farm site infrastructure is presented as a Geotechnical Risk Register in Appendix B and summarised in Table 8.2.

The risk rating for each infrastructure element at the Proposed Wind Farm is designated Negligible or Low following some mitigation/control measures being implemented. Sections of access roads to the nearest infrastructure element will be subject to the same mitigation/control measures that apply to the nearest infrastructure element.

Details of the required infrastructure specific mitigation/control measures can be found in the Geotechnical Risk Register for each infrastructure element (Appendix B) and the general (not notable) infrastructure specific control measures are summarised below.

- Detailed ground investigation to confirm peat, mineral soil and bedrock condition and properties.
- Use of experienced geotechnical staff for confirmatory site investigation.
- Maintain hydrology of area as far as possible by maintaining the flow of water in existing drains to prevent the build-up of water pressures in the peat, leading to the peat becoming "buoyant".
- Use of contractors with experience in working peat and trained operators to carry out the work.

Table 8-2: Summary of Peat Stability Risk Register

Infrastructure	Pre-Control Measure Implementation Risk Rating	Pre-Control Measure Implementation Risk Rating Category	Notable Control Measures Required	Post-Control Measure Implementation Risk Rating	Post-Control Measure Implementation Risk Rating Category
T01	Negligible	1 to 4	Yes	Negligible	1 to 4
T02	Negligible	1 to 4	Yes	Negligible	1 to 4
T03	Negligible	1 to 4	Yes	Negligible	1 to 4
T04	Negligible	1 to 4	No	Negligible	1 to 4
T05	Negligible	1 to 4	No	Negligible	1 to 4
T06	Negligible	1 to 4	No	Negligible	1 to 4
T07	Negligible	1 to 4	No	Negligible	1 to 4
T08	Low	5 to 10	Yes	Low	5 to 10
Met Mast	Negligible	1 to 4	No	Negligible	1 to 4
Substation	Negligible	1 to 4	No	Negligible	1 to 4
Construction Compound 1	Negligible	1 to 4	No	Negligible	1 to 4
Construction Compound 2	Negligible	1 to 4	No	Negligible	1 to 4
Access Track T01 to T03	Negligible	1 to 4	No	Negligible	1 to 4
Access Track T03 to T04	Negligible	1 to 4	No	Negligible	1 to 4
Access Track T04 to T05	Negligible	1 to 4	No	Negligible	1 to 4
Access Track T06 to T07	Negligible	1 to 4	No	Negligible	1 to 4
Access Track T05 to T08	Negligible	1 to 4	No	Negligible	1 to 4
Peat and Spoil Management Area 1	Negligible	1 to 4	No	Negligible	1 to 4
Peat and Spoil Management Area 2	Negligible	1 to 4	No	Negligible	1 to 4
Peat and Spoil Management Area 3	Negligible	1 to 4	No	Negligible	1 to 4

Infrastructure	Pre-Control Measure Implementation Risk Rating	Pre-Control Measure Implementation Risk Rating Category	Notable Control Measures Required	Post-Control Measure Implementation Risk Rating	Post-Control Measure Implementation Risk Rating Category
Peat and Spoil Management Area 4	Negligible	1 to 4	No	Negligible	1 to 4
Peat and Spoil Management Area 5	Negligible	1 to 4	No	Negligible	1 to 4

9. INDICATIVE FOUNDATION TYPE AND FOUNDATION DEPTH FOR TURBINES

9.1 Summary

Based on a review of the ground investigation information for the Proposed Wind Farm site, an assessment of the likely foundation type and founding depths for each proposed turbine location was carried out. A summary of this assessment is provided in Table 9-1.

Table 9-1: Summary of Proposed Turbine Foundation Type and Founding Depths

Turbine No.	Proposed Turbine Foundation Type	Relevant GI	Proposed founding depth (m bgl)	Ground Conditions
T01	Piled foundation	TP01	-	Peat overlying soft Silt.
T02	Piled foundation	TP02	-	Soft slightly gravelly Silt.
T03	Piled foundation	TP03	-	Peat overlying soft Silt.
T04	Gravity/Piled foundation	TP04	>3.0	Soft gravelly Clay overlying stiff gravelly Silt/ Clay with cobbles. Potentially found on stiff Clay below 3m.
T05	Gravity/Piled foundation	TP05	>3.0	Peat overlying stiff gravelly Silt/ Clay with cobbles. Potentially found on stiff Clay below 3m.
T06	Gravity/Piled foundation	TP06	>3.0	Soft gravelly Clay overlying stiff gravelly Silt/ Clay with cobbles. Potentially found on stiff Clay below 3m.
T07	Piled foundation	TP07	-	Peat overlying sandy gravelly Silt with cobbles.
T08	Piled foundation	TP08	-	Stiff silty gravelly Clay overlying sandy gravelly Clay with cobbles and boulders.

It should be noted that confirmatory ground investigation will be carried out prior to construction at each turbine location in the form of a borehole with in-situ SPT testing in the overburden and follow-on rotary core through bedrock to confirm the foundation types and founding stratums assumed in Table 9-1. Based on professional judgement, it is likely that following the completion of confirmatory ground investigation prior to construction that the turbine bases will require piled foundations. Gravity foundations may be constructed at T04, T05 and T06 subject to confirmatory ground investigation to confirm the depth to bedrock.

For the piled turbine foundations, a typical piling type and configuration could be up to 16 no. 900mm rotary bored piles.

10. FOUNDING DETAILS FOR INFRASTRUCTURE ELEMENTS (EXCEPT TURBINES)

This section provides a summary of the founding details for various elements of the proposed infrastructure across the Site. The detailed methodologies for the construction of these elements of the Proposed Project are included in Chapter 4 of the EIAR.

10.1 Access Roads

Floating access roads are the predominant road construction type proposed for the Proposed Wind Farm site which given the ground conditions and type of terrain present is deemed an appropriate construction approach. Where shallow peat is present (<1m), excavate and replace (founded) type construction is proposed.

The total length of new proposed access road to be constructed on site is approximately 6.6km (see P24-138-0600-0005 attached in the Drawings section at the end of this report). Approximately 1.8km of this is proposed to be floated and approximately 4.8km is proposed to be excavated.

The typical make-up of the floated access roads is a minimum stone thickness of 1000mm with at least one layer of reinforcing geogrid. The necessary stone thickness will be confirmed at detailed design stage.

The typical make-up of the founded access roads is a minimum stone thickness of 500mm. The requirement for a layer of geotextile and geogrid and the necessary stone thickness will be confirmed at detailed design stage.

See the Peat and Spoil Management Plan for the Proposed Project for further details on the proposed access roads on site.

10.2 Crane Hardstands

The crane hardstands will be constructed using the founded technique (i.e. not floated) technique.

Crane hardstands are constructed using compacted Class 1/6F material on a suitable sub-formation to achieve the required bearing resistance. The hardstands will be designed for the most critical loading combinations from the crane.

The hardstands will be founded on competent material underlying the peat deposits. The founding levels for the hardstands will be variable across the site and will be confirmed at pre-construction stage.

The make-up of the hardstands will include a minimum of 1000mm of granular stone fill with a layer of geotextile and/or geogrid, if deemed necessary by the Designer.

10.3 Substation Foundations & Platforms

The substation platform will be constructed using the founded technique (i.e. not floated technique). The substation foundations will comprise strip/raft foundations under the main footprint of the building with a basement/pit for cable connections.

Substation platforms are constructed using compacted Class 1/6F material on a suitable sub-formation to achieve the required bearing resistance.

The substation platform will be founded on competent material underlying the peat deposits.

Given the ground conditions present at the proposed onsite 38kV substation, the foundations will be founded on glacial till. The peat will not be a be a suitable founding stratum for the substation foundations. The founding depth for substation platforms is to be 1.0-1.5m.

The make-up of the substation platform will include a minimum of 1000mm of granular stone fill with a layer of geotextile and/or geogrid if deemed necessary by the Designer. At the underside of the substation foundations, a layer of structural up-fill (class 6N) will be required.

10.4 Construction Compound Platforms

The construction compound platforms will be constructed using the founded technique (i.e. not floated technique).

The construction compound platforms are constructed using compacted Class 1/6F material on a suitable sub-formation to achieve the required bearing resistance.

The construction compound platforms will be founded on material underlying the peat deposits.

Founding depth for construction compound platforms will require excavations from 0.5m to 1.0m bgl.

The typical make-up of the construction compound platform will include up to 750mm of granular stone fill with possibly a layer of geotextile and/or geogrid.

10.5 Met Mast Foundations

The met mast foundation constructed using the founded technique (i.e. not floated technique).

The met mast foundation will be constructed using compacted Class 1/6F material on a suitable sub- formation to achieve the required bearing resistance.

The met mast will be founded on material underlying the peat deposits.

The founding depth for the met mast foundation will be 1.5 to 2.0m bgl. At the underside of the met mast foundation, a layer of structural up-fill (class 6N) will be required.

10.6 Peat and Spoil Management Areas

A number of peat and spoil management areas were reviewed as part of the assessment of the Proposed Wind Farm site. These are located within areas of commercial forestry (to be clear felled) around proposed turbine no. 4 (T04) and proposed turbine no. 5 (T05) and in areas of worked peat across the Proposed Wind Farm site. The placement of peat and spoil in these areas will be limited to a maximum of 1.5m in height, and the stability of these areas is covered under load condition 2 as reported in Section 7 of this report.

Additional discussion of the peat and spoil management areas is provided in the Peat and Spoil Management Plan (FT, 2025) for the Proposed Project.

11. SUMMARY AND MEASURES

11.1 Summary

The following summary is given.

FT was engaged by MKO on behalf of the Applicant to undertake a geotechnical and peat stability assessment of the Proposed Wind Farm site and the Proposed Grid Connection.

The findings of the peat assessment showed that the Site has an acceptable margin of safety and is suitable for the Proposed Project. The findings include recommendations and control measures for construction work in peat lands, all of which will be implemented in full to ensure that all works adhere to an acceptable standard of safety.

The Geological Survey of Ireland (GSI) mapping and the peat probe survey indicate minimal to no presence (0.1 to 0.3m in localised areas only) of peat along the Proposed Grid Connection and the turbine delivery route. As a result, the risk of peat failure along the Proposed Grid Connection is deemed to be negligible and a peat stability assessment was deemed unnecessary in these areas.

The Proposed Wind Farm site comprises undulating terrain and consists predominantly of blanket peat, cutover peat and forestry.

Peat thicknesses recorded during the site walkovers from 498 probes ranged from 0.1 to 7.2m with an average depth of 1.1m. 95% of the probes recorded peat depths of less than 3.0m. A number of localised readings were recorded where peat depths from 3.0 to 7.2m around T01, T02 and T03. The Proposed Wind Farm site has been designed to avoid areas with deep peat where possible.

Slope inclinations at the main infrastructure locations range from 2 to 4 degrees.

An analysis of peat sliding was carried out at the main infrastructure locations across the Proposed Wind Farm site for both the undrained and drained conditions. The purpose of the analysis was to determine the FoS of the peat slopes.

An undrained analysis was carried out, which applies in the short-term during construction. For the undrained condition, the calculated FoS for load conditions 1 and 2 for the locations analysed, showed that all locations have an acceptable FoS of greater than 1.3, indicating a low risk of peat failure. The undrained analysis is considered the most critical condition for the peat slopes.

A drained analysis was also carried out, which examined the effect of in particular, rainfall on the existing stability of the natural peat slopes on site. For the drained condition, the calculated FoS for load conditions (1) & (2) for the locations analysed, showed that all locations have an acceptable FoS of greater than 1.3.

The peat stability risk assessment at each proposed infrastructure location, along access roads and in peat and spoil management areas identified a number of mitigation/control measures to reduce the potential risk of peat failure. See Appendix B for details of the required mitigation/control measures for each infrastructure element.

In summary, the findings of the peat stability risk assessment showed that the Proposed Project has an acceptable margin of safety, is suitable for the Proposed Project and is considered to be of a low risk for peat failure provided appropriate control measures, such as implementing and maintaining an appropriate drainage system, are implemented. The findings include mitigation/control measures for construction work in peat lands, all of which will be implemented in full to ensure that all works adhere to an acceptable standard of safety.

11.2 Measures

The following measures are to be implemented in full.

Notwithstanding that the Site has an acceptable margin of safety a number of mitigation/control measures are prescribed to ensure that all works adhere to an acceptable standard of safety for work on peatlands. Mitigation/control measures identified for each of the infrastructure elements in the risk assessment will be implemented throughout design and construction works (Appendix B).

Floating access roads are the predominant road construction type proposed for the Proposed Wind Farm site, which, given the ground conditions and type of terrain present, is deemed an appropriate construction approach. Where shallow peat is present (<1m), excavate and replace (founded) type construction.

The measures prescribed in FT's report 'Peat & Spoil Management Plan – Gannow Wind Farm, County Galway' (FT, 2025) will be implemented in full during the design and construction stage of the Proposed Project.

To minimise the risk of construction activity causing potential peat instability the Construction Method Statements (CMSs) for the Proposed Project will be implemented in full but will not be limited to the measures above. This will ensure that best practice guidance regarding the management of peat stability will be inherent in the construction phase.

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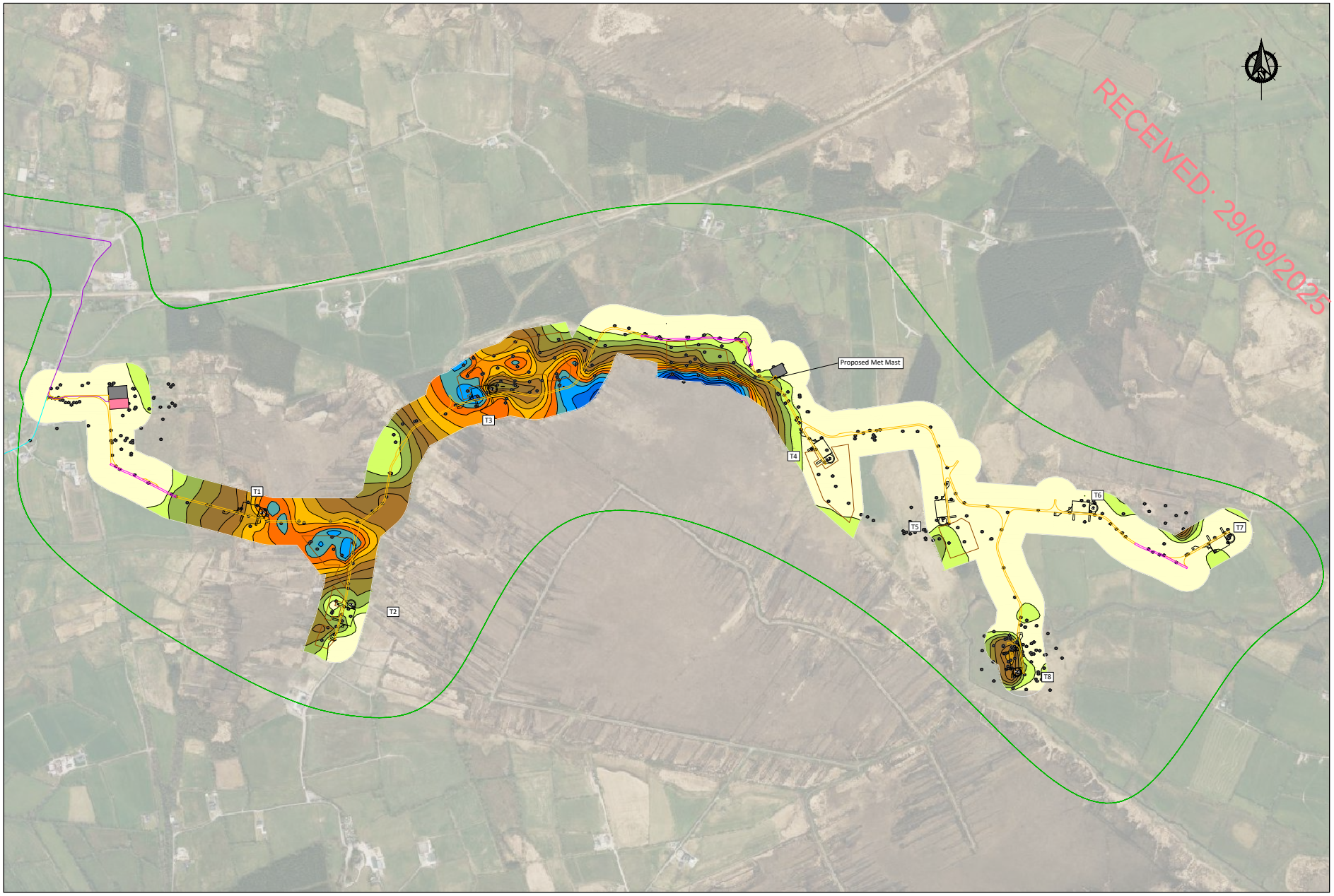
CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

DRAWINGS



Legend:

- EIAR Site Boundary
- Proposed Turbine Location
- Proposed Upgrades to Existing Roads
- Proposed New Roads
- Proposed Temporary Construction Compounds
- Proposed Onsite 38kV Substation
- Proposed Grid Connection
- Proposed Turbine Delivery Route
- Peat & Spoil Management Area
- Peat Depth Point Location

Peat Depth Legend:

- ≥ 0 < 0.5
- ≥ 0.5 < 1
- ≥ 1 < 1.5
- ≥ 1.5 < 2
- ≥ 2 < 2.5
- ≥ 2.5 < 3
- ≥ 3 < 3.5
- ≥ 3.5 < 4
- ≥ 4 < 4.5
- ≥ 4.5 < 5
- ≥ 5 < 5.5
- ≥ 5.5 < 6
- ≥ 6 < 6.5
- ≥ 6.5 < 7
- ≥ 7 < 7.7.5

PLAN

Scale 1:6000

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Rev.	Description	App By	Date
A	FOR INFORMATION	BDH	17.04.25
B	FOR INFORMATION	BDH	25.06.25
C	FOR INFORMATION	BDH	17.09.25

PROJECT: GANNOW RENEWABLE ENERGY DEVELOPMENT

CLIENT: MKO

SHEET: PEAT DEPTH CONTOUR PLAN

Date: 17.09.25

Project number: P24-138

Scale (@ A1): 1:6000

Drawn by: POR

Checked by: EA

Drawing Number: P24-138-0600-0001

Rev: C

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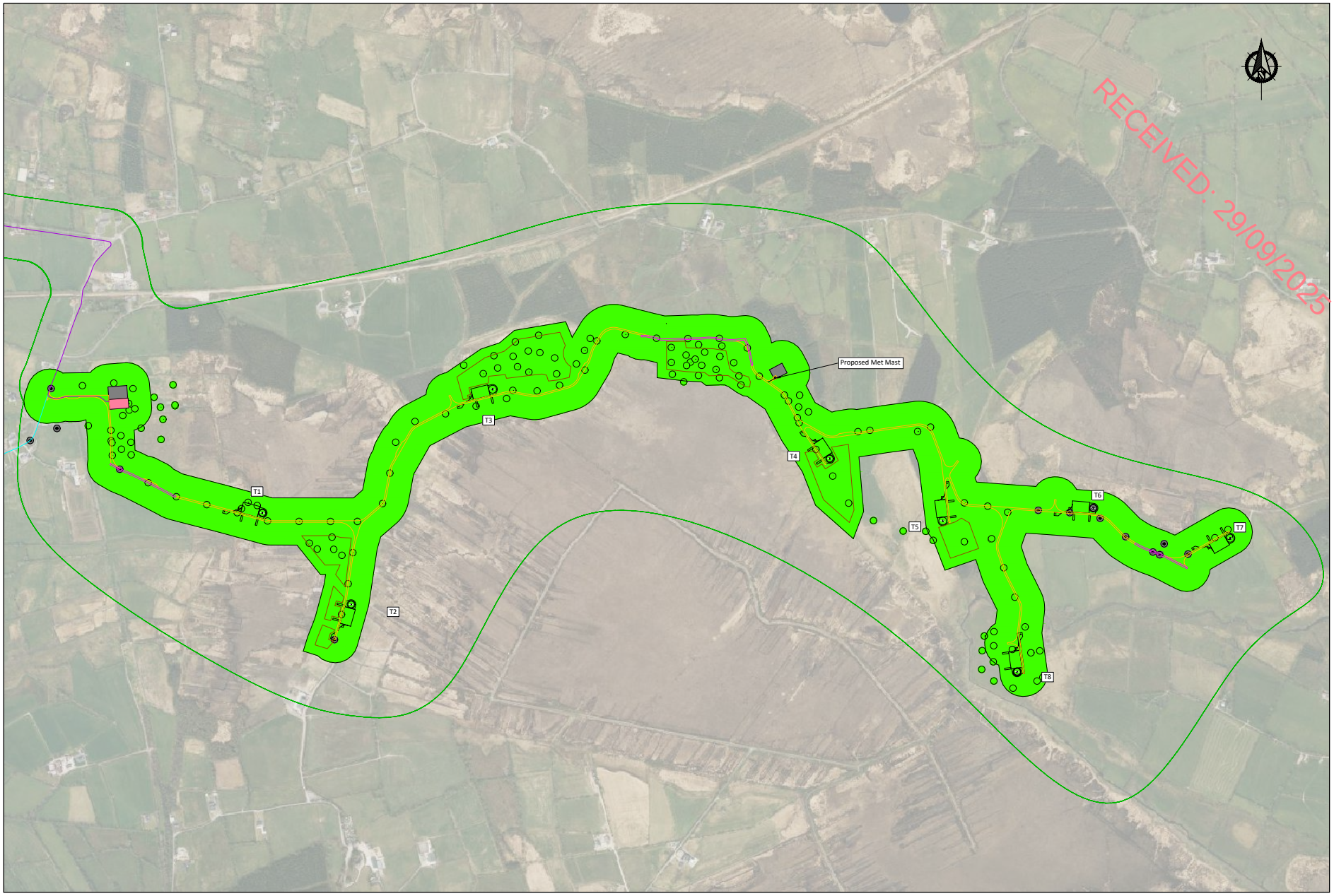
16 September 2025



Legend:

- EIAR Site Boundary
- Proposed Turbine Location
- Proposed Upgrades to Existing Roads
- Proposed New Roads
- Proposed Temporary Construction Compounds
- Proposed Onsite 38kV Substation
- Proposed Grid Connection
- Proposed Turbine Delivery Route
- Peat & Spoil Management Area

Factor of Safety Legend:

- 0 < 1.0
- ≥ 1.0 < 1.3
- ≥ 1.3

Increasing Stability

No Peat Recorded At This Location

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Scale 1:6000

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Rev.	Description	App By	Date
A	FOR INFORMATION	BDH	17.04.25
B	FOR INFORMATION	BDH	25.06.25
C	FOR INFORMATION	BDH	17.09.25

PROJECT: GANNOW RENEWABLE ENERGY DEVELOPMENT

CLIENT: MKO

SHEET: FACTOR OF SAFETY PLAN – SHORT TERM CRITICAL CONDITION (UNDRAINED)

Date: 17.09.25

Project number: P24-138

Scale (@ A1): 1:6000

Drawn by: POR

Checked by: EA

Drawing Number: P24-138-0600-0002

Rev: C

(Sheet set subset 0600)

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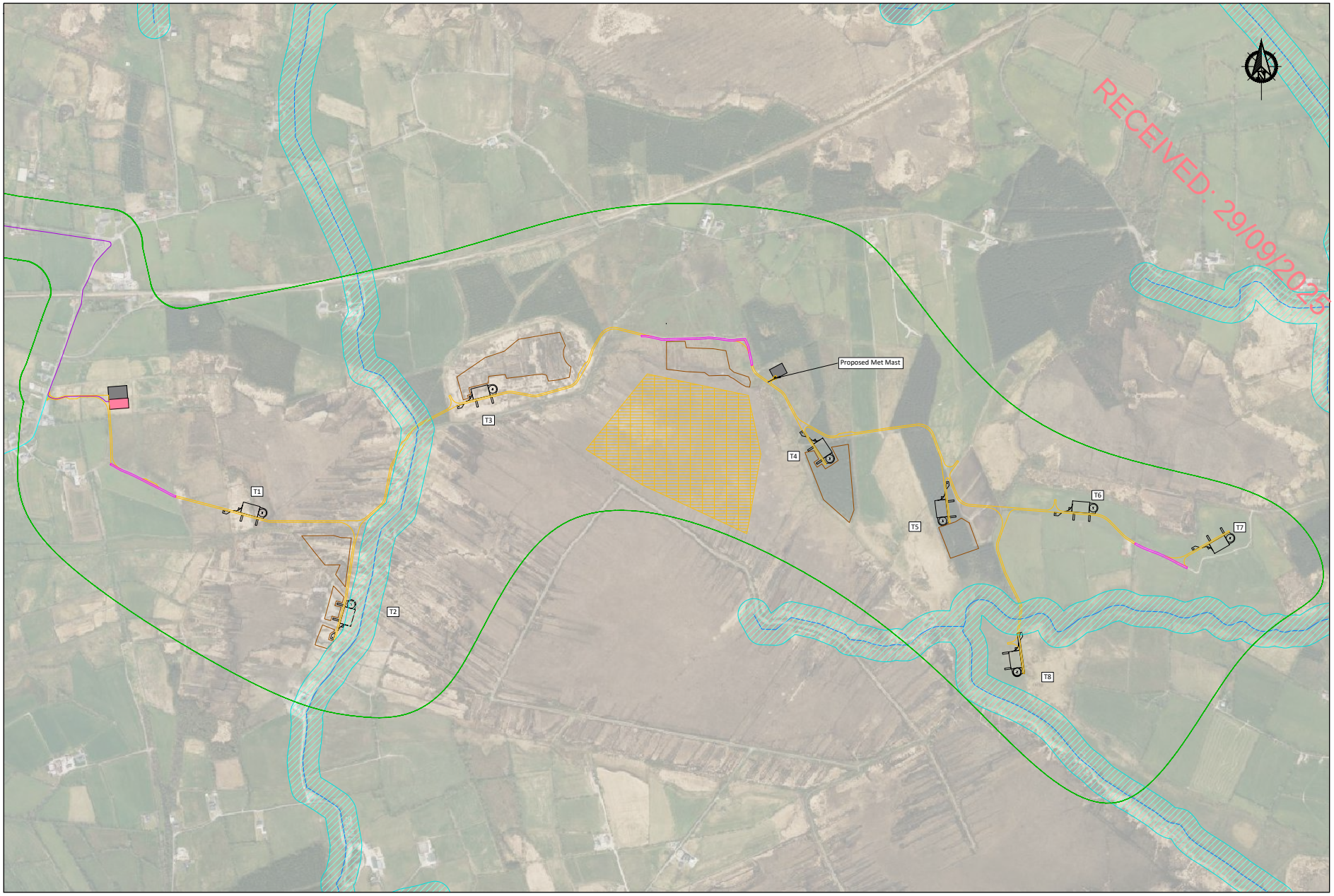
16 September 2025



Legend:

- EIAR Site Boundary
- Proposed Turbine Location
- Proposed Upgrades to Existing Roads
- Proposed New Roads
- Proposed Temporary Construction Compounds
- Proposed Onsite 38kV Substation
- Proposed Grid Connection
- Proposed Turbine Delivery Route
- Peat & Spoil Management Area

Construction Buffer Zone Legend:

- Buffer zone to areas of deep, soft peat where no construction will be undertaken.
- Watercourses / Lakes with 50m buffer

PLAN

Scale 1:6000

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Rev.	Description	App By	Date
A	FOR INFORMATION	BDH	17.04.25
B	FOR INFORMATION	BDH	25.06.25
C	FOR INFORMATION	BDH	17.09.25

PROJECT: GANNOW RENEWABLE ENERGY DEVELOPMENT

CLIENT: MKO

SHEET: CONSTRUCTION BUFFER ZONE PLAN

Date: 17.09.25

Drawn by: POR

Checked by: EA

Project number: P24-138

Scale (@ A1): 1:6000

Drawing Number: P24-138-0600-0003

Rev: C

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16 September 2025

PLAN

Scale 1:6000

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Rev.	Description	App By	Date
A	FOR INFORMATION	BDH	17.04.25
B	FOR INFORMATION	BDH	25.06.25
C	FOR INFORMATION	BDH	17.09.25

PROJECT

GANNOW RENEWABLE ENERGY DEVELOPMENT

CLIENT

MKO

SHEET

GROUND INVESTIGATION LOCATION PLAN

Date 17.09.25

Drawn by POR

Checked by EA

Project number P24-138

Scale (@ A1) 1:6000

Drawing Number **P24-138-0600-0004**

Rev **C**

(Sheet set subset 0600)

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16 September 2025

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DESIGNING AND DELIVERING
A SUSTAINABLE FUTURE

APPENDIX A

Photos from Site Walkover

Figure 1: Area around T01

Figure 2: Area around T03

Figure 3: Location of Construction Compound 2

Figure 4: Area 20m South of T02

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DESIGNING AND DELIVERING
A SUSTAINABLE FUTURE

APPENDIX B

Peat Stability Risk Registers

Turbine	Distance to stream (m)
T1	>150
T2	<50
T3	>150
T4	>150
T5	>150
T6	>150
T7	>150
T8	<50
SS	
TCC	
BP1	
BP2	

Gannow Wind Farm - Peat Stability Risk Register (Rev 0)

Location:	Turbine T01

Grid Reference (Eastings, Northings):	560006	729599
Distance to Watercourse (m)	> 150	
Min & Max Measured Peat Depth (m):	2.6 - 4	
Specific Control Required:	Yes	

		Pre-Control Measure Implementation						Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 2.05 (u), 1.8(d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	1	1	1	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	1	1	1	Negligible	No		1	1	1	Negligible
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	2	1	2	Negligible	No		2	1	2	Negligible
8	Evidence of mechanically cut peat	2	1	2	Negligible	No		2	1	2	Negligible
9	Evidence of quaking or buoyant peat	1	1	1	Negligible	No		1	1	1	Negligible
10	Evidence of bog pools	1	1	1	Negligible	No		1	1	1	Negligible
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for **Turbine T01**
i	Due to relatively deep peat at this turbine location, additional construction measures such as the following may be required: - excavation side walls to be supported (e.g. boulders, sheet piles) or excavation face battered to a shallow angle - temporary works designer may be required to provide excavation support design -daily detailed inspection of excavation faces -potential for greater water inflow into excavation requiring removal of water using pumping -increased exclusion zone around excavation to avoid accidental loading of crest of slope
ii	Maintain hydrology of area as far as possible;
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
v	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
vi	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.
vii	Movement monitoring posts to be installed upslope of the turbine/hardstand excavation and monitored on a regular basis

Note
(1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
(2) Probability assessed as per Table A and B of Appendix D.
(3) Impact based on distance of infrastructure element to nearest watercourse.

Gannow Wind Farm - Peat Stability Risk Register (Rev 0)

Location:	Turbine T02

Grid Reference (Eastings, Northings):	560288	729308
Distance to Watercourse (m)	< 50	
Min & Max Measured Peat Depth (m):	2.6 - 3.5	
Specific Control Required:	Yes	

		Pre-Control Measure Implementation						Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 4.30 (u), 3.82 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	1	1	1	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	1	1	1	Negligible	No		1	1	1	Negligible
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	2	1	2	Negligible	No		2	1	2	Negligible
8	Evidence of mechanically cut peat	2	1	2	Negligible	No		2	1	2	Negligible
9	Evidence of quaking or buoyant peat	1	1	1	Negligible	No		1	1	1	Negligible
10	Evidence of bog pools	1	1	1	Negligible	No		1	1	1	Negligible
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for **Turbine T02**
i	Due to relatively deep peat at this turbine location, additional construction measures such as the following may be required: - excavation side walls to be supported (e.g. boulders, sheet piles) or excavation face battered to a shallow angle - temporary works designer may be required to provide excavation support design -daily detailed inspection of excavation faces -potential for greater water inflow into excavation requiring removal of water using pumping -increased exclusion zone around excavation to avoid accidental loading of crest of slope
ii	Maintain hydrology of area as far as possible;
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
v	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
vi	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.
vii	Movement monitoring posts to be installed upslope of the turbine/hardstand excavation and monitored on a regular basis

Note
(1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
(2) Probability assessed as per Table A and B of Appendix D.
(3) Impact based on distance of infrastructure element to nearest watercourse.

Gannow Wind Farm - Peat Stability Risk Register (Rev 0)

Location:	Turbine T03

Grid Reference (Eastings, Northings):	560737	729992
Distance to Watercourse (m)	> 150	
Min & Max Measured Peat Depth (m):	1.4 - 1.8	
Specific Control Required:	Yes	

		Pre-Control Measure Implementation						Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 6.88 (u), 7.65 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	1	1	1	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	1	1	1	Negligible	No		0	1	0	Not Applicable
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	2	1	2	Negligible	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	2	1	2	Negligible	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	1	1	1	Negligible	No		0	1	0	Not Applicable
10	Evidence of bog pools	1	1	1	Negligible	No		0	1	0	Not Applicable
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for **Turbine T03**
i	Due to relatively deep peat at this turbine location, additional construction measures such as the following may be required: - excavation side walls to be supported (e.g. boulders, sheet piles) or excavation face battered to a shallow angle - temporary works designer may be required to provide excavation support design -daily detailed inspection of excavation faces -potential for greater water inflow into excavation requiring removal of water using pumping -increased exclusion zone around excavation to avoid accidental loading of crest of slope
ii	Maintain hydrology of area as far as possible;
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
v	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
vi	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.
vii	Movement monitoring posts to be installed upslope of the turbine/hardstand excavation and monitored on a regular basis

Note
(1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
(2) Probability assessed as per Table A and B of Appendix D.
(3) Impact based on distance of infrastructure element to nearest watercourse.

Gannow Wind Farm - Peat Stability Risk Register (Rev 0)

Location:	Turbine T04

Grid Reference (Eastings, Northings):	561808	729771
Distance to Watercourse (m)	> 150	
Min & Max Measured Peat Depth (m):	0.1 - 0.3	
Specific Control Required:	No	

		Pre-Control Measure Implementation						Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 7.19 (u), 10.35 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	1	1	1	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	1	1	1	Negligible	No		1	1	1	Negligible
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	2	1	2	Negligible	No		2	1	2	Negligible
8	Evidence of mechanically cut peat	2	1	2	Negligible	No		2	1	2	Negligible
9	Evidence of quaking or buoyant peat	1	1	1	Negligible	No		1	1	1	Negligible
10	Evidence of bog pools	1	1	1	Negligible	No		1	1	1	Negligible
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for **Turbine T04**
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

Note
(1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
(2) Probability assessed as per Table A and B of Appendix D.
(3) Impact based on distance of infrastructure element to nearest watercourse.

Gannow Wind Farm - Peat Stability Risk Register (Rev 0)

Location:	Turbine T05

Grid Reference (Eastings, Northings):	562167	729573
Distance to Watercourse (m)	> 150	
Min & Max Measured Peat Depth (m):	0.1 - 0.6	
Specific Control Required:	No	

		Pre-Control Measure Implementation						Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 7.19 (u), 10.35 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	1	1	1	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	1	1	1	Negligible	No		1	1	1	Negligible
5	Type of vegetation	2	1	2	Negligible	No		2	1	2	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	2	1	2	Negligible	No		2	1	2	Negligible
8	Evidence of mechanically cut peat	2	1	2	Negligible	No		2	1	2	Negligible
9	Evidence of quaking or buoyant peat	1	1	1	Negligible	No		1	1	1	Negligible
10	Evidence of bog pools	1	1	1	Negligible	No		1	1	1	Negligible
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for **Turbine T05**
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

Note
(1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
(2) Probability assessed as per Table A and B of Appendix D.
(3) Impact based on distance of infrastructure element to nearest watercourse.

Gannow Wind Farm - Peat Stability Risk Register (Rev 0)

Location:	Turbine T06

Grid Reference (Eastings, Northings):	562645	729614
Distance to Watercourse (m)	> 150	
Min & Max Measured Peat Depth (m):	0.0	
Specific Control Required:	No	

		Pre-Control Measure Implementation						Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = - (u), - (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	1	1	1	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	1	1	1	Negligible	No		0	1	0	Not Applicable
5	Type of vegetation	1	1	1	Negligible	No		1	1	1	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		2	1	2	Negligible
7	Evidence of very soft/soft clay at base of peat	2	1	2	Negligible	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	2	1	2	Negligible	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	1	1	1	Negligible	No		0	1	0	Not Applicable
10	Evidence of bog pools	1	1	1	Negligible	No		0	1	0	Not Applicable
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for **Turbine T06**
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

Note
(1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
(2) Probability assessed as per Table A and B of Appendix D.
(3) Impact based on distance of infrastructure element to nearest watercourse.

Gannow Wind Farm - Peat Stability Risk Register (Rev 0)

Location:	Turbine T07

Grid Reference (Eastings, Northings):	563080	729518
Distance to Watercourse (m)	> 150	
Min & Max Measured Peat Depth (m):	0.2 - 0.4	
Specific Control Required:	No	

		Pre-Control Measure Implementation						Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 6.16 (u), 8.87 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	1	1	1	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	1	1	1	Negligible	No		0	1	0	Not Applicable
5	Type of vegetation	1	1	1	Negligible	No		1	1	1	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	1	2	Negligible	No		1	1	1	Negligible
7	Evidence of very soft/soft clay at base of peat	2	1	2	Negligible	No		0	1	0	Not Applicable
8	Evidence of mechanically cut peat	2	1	2	Negligible	No		0	1	0	Not Applicable
9	Evidence of quaking or buoyant peat	1	1	1	Negligible	No		0	1	0	Not Applicable
10	Evidence of bog pools	1	1	1	Negligible	No		0	1	0	Not Applicable
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for **Turbine T07**
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

Note
(1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
(2) Probability assessed as per Table A and B of Appendix D.
(3) Impact based on distance of infrastructure element to nearest watercourse.

Gannow Wind Farm - Peat Stability Risk Register (Rev 0)

Location:	Turbine T08

Grid Reference (Eastings, Northings):	562403	729094
Distance to Watercourse (m)	< 50	
Min & Max Measured Peat Depth (m):	0.3-3.0	
Specific Control Required:	Yes	

		Pre-Control Measure Implementation						Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 6.88 (u), 17.94 (d)	1	4	4	Negligible	No	See Below	1	4	4	Negligible
2	Evidence of sub peat water flow	1	4	4	Negligible	No		1	4	4	Negligible
3	Evidence of surface water flow	1	4	4	Negligible	No		1	4	4	Negligible
4	Evidence of previous failures/slips	1	4	4	Negligible	No		1	4	4	Negligible
5	Type of vegetation	1	4	4	Negligible	No		1	4	4	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	2	4	8	Low	No		2	4	8	Low
7	Evidence of very soft/soft clay at base of peat	2	4	8	Low	No		2	4	8	Low
8	Evidence of mechanically cut peat	2	4	8	Low	No		2	4	8	Low
9	Evidence of quaking or buoyant peat	1	4	4	Negligible	No		1	4	4	Negligible
10	Evidence of bog pools	1	4	4	Negligible	No		1	4	4	Negligible
11	Other	0	4	0	Not Applicable	No		0	4	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for **Turbine T08**
i	Due to relatively deep peat at this turbine location, additional construction measures such as the following may be required: - excavation side walls to be supported (e.g. boulders, sheet piles) or excavation face battered to a shallow angle - temporary works designer may be required to provide excavation support design -daily detailed inspection of excavation faces -potential for greater water inflow into excavation requiring removal of water using pumping -increased exclusion zone around excavation to avoid accidental loading of crest of slope
ii	Maintain hydrology of area as far as possible;
iii	Use of experienced geotechnical staff for site investigation;
iv	Use of experienced contractors and trained operators to carry out the work;
v	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
vi	Inspection & approval of turbine base sub-formation by a competent person where a gravity type foundation base is constructed.
vii	Movement monitoring posts to be installed upslope of the turbine/hardstand excavation and monitored on a regular basis

Note
(1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
(2) Probability assessed as per Table A and B of Appendix D.
(3) Impact based on distance of infrastructure element to nearest watercourse.

Gannow Wind Farm - Peat Stability Risk Register (Rev 0)

Location:	Substation

Grid Reference (Eastings, Northings):	559550	729946
Distance to Watercourse (m)	**> 150**	
Min & Max Measured Peat Depth (m):	**0.3 - 1.2**	
Specific Control Required:	**No**	

		Pre-Control Measure Implementation						Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 14.34 (u), 9.56 (d)	1	1	1	Negligible	No		1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	1	1	1	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	1	1	1	Negligible	No		1	1	1	Negligible
5	Type of vegetation	1	1	1	Negligible	No		1	1	1	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	1	1	1	Negligible	No	See Below	1	1	1	Negligible
7	Evidence of very soft/soft clay at base of peat	2	1	2	Negligible	No		2	1	2	Negligible
8	Evidence of mechanically cut peat	1	1	1	Negligible	No		1	1	1	Negligible
9	Evidence of quaking or buoyant peat	1	1	1	Negligible	No		1	1	1	Negligible
10	Evidence of bog pools	1	1	1	Negligible	No		1	1	1	Negligible
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for **Substation**
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

Note
(1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
(2) Probability assessed as per Table A and B of Appendix D.
(3) Impact based on distance of infrastructure element to nearest watercourse.

Gannow Wind Farm - Peat Stability Risk Register (Rev 0)

Location:	Const. Comp. 1

Grid Reference (Eastings, Northings):	559546	729981
Distance to Watercourse (m)	**> 150**	
Min & Max Measured Peat Depth (m):	**0.2 - 0.4**	
Specific Control Required:	**No**	

		Pre-Control Measure Implementation						Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 28.70 (u), 19.13 (d)	1	1	1	Negligible	No		1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	1	1	1	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	1	1	1	Negligible	No		1	1	1	Negligible
5	Type of vegetation	1	1	1	Negligible	No		1	1	1	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	1	1	1	Negligible	No	See Below	1	1	1	Negligible
7	Evidence of very soft/soft clay at base of peat	2	1	2	Negligible	No		2	1	2	Negligible
8	Evidence of mechanically cut peat	1	1	1	Negligible	No		1	1	1	Negligible
9	Evidence of quaking or buoyant peat	1	1	1	Negligible	No		1	1	1	Negligible
10	Evidence of bog pools	1	1	1	Negligible	No		1	1	1	Negligible
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for **Construction Compound** 1
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

Note
(1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
(2) Probability assessed as per Table A and B of Appendix D.
(3) Impact based on distance of infrastructure element to nearest watercourse.

Gannow Wind Farm - Peat Stability Risk Register (Rev 0)

Location:	Const. Comp. 2

Grid Reference (Eastings, Northings):	561644	730048
Distance to Watercourse (m)	**> 150**	
Min & Max Measured Peat Depth (m):	**0.3 - 0.4**	
Specific Control Required:	**No**	

		Pre-Control Measure Implementation						Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 21.56 (u), 14.37 (d)	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	1	1	1	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	1	1	1	Negligible	No		1	1	1	Negligible
5	Type of vegetation	1	1	1	Negligible	No		1	1	1	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	1	1	1	Negligible	No		1	1	1	Negligible
7	Evidence of very soft/soft clay at base of peat	2	1	2	Negligible	No		2	1	2	Negligible
8	Evidence of mechanically cut peat	1	1	1	Negligible	No		1	1	1	Negligible
9	Evidence of quaking or buoyant peat	1	1	1	Negligible	No		1	1	1	Negligible
10	Evidence of bog pools	1	1	1	Negligible	No		1	1	1	Negligible
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for **Construction Compound** 2
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

Note
(1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
(2) Probability assessed as per Table A and B of Appendix D.
(3) Impact based on distance of infrastructure element to nearest watercourse.

Gannow Wind Farm - Peat Stability Risk Register (Rev 0)

Location:	Met. Mast

Grid Reference (Eastings, Northings):	561635	730029
Distance to Watercourse (m)	**> 150**	
Min & Max Measured Peat Depth (m):	**0.3**	
Specific Control Required:	**No**	

		Pre-Control Measure Implementation						Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = 21.56 (u), 14.37 (d)	1	1	1	Negligible	No		1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	1	1	1	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	1	1	1	Negligible	No		1	1	1	Negligible
5	Type of vegetation	1	1	1	Negligible	No		1	1	1	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	1	1	1	Negligible	No	See Below	1	1	1	Negligible
7	Evidence of very soft/soft clay at base of peat	2	1	2	Negligible	No		2	1	2	Negligible
8	Evidence of mechanically cut peat	1	1	1	Negligible	No		1	1	1	Negligible
9	Evidence of quaking or buoyant peat	1	1	1	Negligible	No		1	1	1	Negligible
10	Evidence of bog pools	1	1	1	Negligible	No		1	1	1	Negligible
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for **Met. Mast**
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

Note
(1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
(2) Probability assessed as per Table A and B of Appendix D.
(3) Impact based on distance of infrastructure element to nearest watercourse.

Gannow Wind Farm - Peat Stability Risk Register (Rev 0)

Location:	Access Track T01 to T03

Grid Reference (Eastings, Northings):	
Distance to Watercourse (m)	**> 150**
Min & Max Measured Peat Depth (m):	**0.5 - 5.8**
Specific Control Required:	**Yes**

		Pre-Control Measure Implementation						Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = Varied	1	1	1	Negligible	No		1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	1	1	1	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	1	1	1	Negligible	No		1	1	1	Negligible
5	Type of vegetation	1	1	1	Negligible	No		1	1	1	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	1	1	1	Negligible	No	See Below	1	1	1	Negligible
7	Evidence of very soft/soft clay at base of peat	2	1	2	Negligible	No		2	1	2	Negligible
8	Evidence of mechanically cut peat	1	1	1	Negligible	No		1	1	1	Negligible
9	Evidence of quaking or buoyant peat	1	1	1	Negligible	No		1	1	1	Negligible
10	Evidence of bog pools	1	1	1	Negligible	No		1	1	1	Negligible
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for **Access Track T01 to T03**
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
v	Use of floating roads in deeper areas of peat

Note
(1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
(2) Probability assessed as per Table A and B of Appendix D.
(3) Impact based on distance of infrastructure element to nearest watercourse.

Gannow Wind Farm - Peat Stability Risk Register (Rev 0)

Location:	Access Track T03 to T04

Grid Reference (Eastings, Northings):		
Distance to Watercourse (m)	**> 150**	
Min & Max Measured Peat Depth (m):	**0 - 6.1**	
Specific Control Required:	**Yes**	

		Pre-Control Measure Implementation						Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = Varied	1	1	1	Negligible	No		1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	1	1	1	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	1	1	1	Negligible	No		1	1	1	Negligible
5	Type of vegetation	1	1	1	Negligible	No		1	1	1	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	1	1	1	Negligible	No	See Below	1	1	1	Negligible
7	Evidence of very soft/soft clay at base of peat	2	1	2	Negligible	No		2	1	2	Negligible
8	Evidence of mechanically cut peat	1	1	1	Negligible	No		1	1	1	Negligible
9	Evidence of quaking or buoyant peat	1	1	1	Negligible	No		1	1	1	Negligible
10	Evidence of bog pools	1	1	1	Negligible	No		1	1	1	Negligible
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for **Access Track T03 to T04**
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
v	Use of floating roads in deeper areas of peat

Note
(1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
(2) Probability assessed as per Table A and B of Appendix D.
(3) Impact based on distance of infrastructure element to nearest watercourse.

Gannow Wind Farm - Peat Stability Risk Register (Rev 0)

Location:	Access Track T04 to T05

Grid Reference (Eastings, Northings):		
Distance to Watercourse (m)	**> 150**	
Min & Max Measured Peat Depth (m):	**0 - 0.3**	
Specific Control Required:	**No**	

		Pre-Control Measure Implementation						Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = Varied	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	1	1	1	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	1	1	1	Negligible	No		1	1	1	Negligible
5	Type of vegetation	1	1	1	Negligible	No		1	1	1	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	1	1	1	Negligible	No		1	1	1	Negligible
7	Evidence of very soft/soft clay at base of peat	2	1	2	Negligible	No		2	1	2	Negligible
8	Evidence of mechanically cut peat	1	1	1	Negligible	No		1	1	1	Negligible
9	Evidence of quaking or buoyant peat	1	1	1	Negligible	No		1	1	1	Negligible
10	Evidence of bog pools	1	1	1	Negligible	No		1	1	1	Negligible
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for **Access Track T04 to T05**
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

Note
(1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
(2) Probability assessed as per Table A and B of Appendix D.
(3) Impact based on distance of infrastructure element to nearest watercourse.

Gannow Wind Farm - Peat Stability Risk Register (Rev 0)

Location:	Access Track T06 to T07

Grid Reference (Eastings, Northings):		
Distance to Watercourse (m)	**> 150**	
Min & Max Measured Peat Depth (m):	**0 - 0.7**	
Specific Control Required:	**No**	

		Pre-Control Measure Implementation						Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = Varied	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	1	1	1	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	1	1	1	Negligible	No		1	1	1	Negligible
5	Type of vegetation	1	1	1	Negligible	No		1	1	1	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	1	1	1	Negligible	No		1	1	1	Negligible
7	Evidence of very soft/soft clay at base of peat	2	1	2	Negligible	No		2	1	2	Negligible
8	Evidence of mechanically cut peat	1	1	1	Negligible	No		1	1	1	Negligible
9	Evidence of quaking or buoyant peat	1	1	1	Negligible	No		1	1	1	Negligible
10	Evidence of bog pools	1	1	1	Negligible	No		1	1	1	Negligible
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for **Access Track T06 to T07**
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

Note
(1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
(2) Probability assessed as per Table A and B of Appendix D.
(3) Impact based on distance of infrastructure element to nearest watercourse.

Gannow Wind Farm - Peat Stability Risk Register (Rev 0)

Location:	Access Track T05 to T08

Grid Reference (Eastings, Northings):		
Distance to Watercourse (m)	**< 50**	
Min & Max Measured Peat Depth (m):	**0.2 to 0.3**	
Specific Control Required:	**No**	

		Pre-Control Measure Implementation						Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = Varied	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	1	1	1	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	1	1	1	Negligible	No		1	1	1	Negligible
5	Type of vegetation	1	1	1	Negligible	No		1	1	1	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	1	1	1	Negligible	No		1	1	1	Negligible
7	Evidence of very soft/soft clay at base of peat	2	1	2	Negligible	No		2	1	2	Negligible
8	Evidence of mechanically cut peat	1	1	1	Negligible	No		1	1	1	Negligible
9	Evidence of quaking or buoyant peat	1	1	1	Negligible	No		1	1	1	Negligible
10	Evidence of bog pools	1	1	1	Negligible	No		1	1	1	Negligible
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for **Access track T05 to T08**
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

Note
(1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
(2) Probability assessed as per Table A and B of Appendix D.
(3) Impact based on distance of infrastructure element to nearest watercourse.

Gannow Wind Farm - Peat Stability Risk Register (Rev 0)

Location:	Peat and Spoil Management Area 1

Grid Reference (Eastings, Northings):		
Distance to Watercourse (m)	**< 50**	
Min & Max Measured Peat Depth (m):	**0.5 to 5.8**	
Specific Control Required:	**Yes**	

		Pre-Control Measure Implementation						Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = Varied	1	1	1	Negligible	No		1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	1	1	1	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	1	1	1	Negligible	No		1	1	1	Negligible
5	Type of vegetation	1	1	1	Negligible	No		1	1	1	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	1	1	1	Negligible	No	See Below	1	1	1	Negligible
7	Evidence of very soft/soft clay at base of peat	2	1	2	Negligible	No		2	1	2	Negligible
8	Evidence of mechanically cut peat	1	1	1	Negligible	No		1	1	1	Negligible
9	Evidence of quaking or buoyant peat	1	1	1	Negligible	No		1	1	1	Negligible
10	Evidence of bog pools	1	1	1	Negligible	No		1	1	1	Negligible
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for **Peat and Spoil Management Area 1**
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
v	Use of floating roads in deeper areas of peat

Note
(1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
(2) Probability assessed as per Table A and B of Appendix D.
(3) Impact based on distance of infrastructure element to nearest watercourse.

Gannow Wind Farm - Peat Stability Risk Register (Rev 0)

Location:	Peat and Spoil Management Area 2

Grid Reference (Eastings, Northings):		
Distance to Watercourse (m)	**50 - 100**	
Min & Max Measured Peat Depth (m):	**0.2 to 6.2**	
Specific Control Required:	**Yes**	

		Pre-Control Measure Implementation						Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = Varied	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	1	1	1	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	1	1	1	Negligible	No		1	1	1	Negligible
5	Type of vegetation	1	1	1	Negligible	No		1	1	1	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	1	1	1	Negligible	No		1	1	1	Negligible
7	Evidence of very soft/soft clay at base of peat	2	1	2	Negligible	No		2	1	2	Negligible
8	Evidence of mechanically cut peat	1	1	1	Negligible	No		1	1	1	Negligible
9	Evidence of quaking or buoyant peat	1	1	1	Negligible	No		1	1	1	Negligible
10	Evidence of bog pools	1	1	1	Negligible	No		1	1	1	Negligible
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for **Peat and Spoil Management Area 2**
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
v	Use of floating roads in deeper areas of peat

Note
(1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
(2) Probability assessed as per Table A and B of Appendix D.
(3) Impact based on distance of infrastructure element to nearest watercourse.

Gannow Wind Farm - Peat Stability Risk Register (Rev 0)

Location:	Peat and Spoil Management Area 3

Grid Reference (Eastings, Northings):		
Distance to Watercourse (m)	**> 150**	
Min & Max Measured Peat Depth (m):	**0.2 to 7.2**	
Specific Control Required:	**Yes**	

		Pre-Control Measure Implementation						Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = Varied	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	1	1	1	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	1	1	1	Negligible	No		1	1	1	Negligible
5	Type of vegetation	1	1	1	Negligible	No		1	1	1	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	1	1	1	Negligible	No		1	1	1	Negligible
7	Evidence of very soft/soft clay at base of peat	2	1	2	Negligible	No		2	1	2	Negligible
8	Evidence of mechanically cut peat	1	1	1	Negligible	No		1	1	1	Negligible
9	Evidence of quaking or buoyant peat	1	1	1	Negligible	No		1	1	1	Negligible
10	Evidence of bog pools	1	1	1	Negligible	No		1	1	1	Negligible
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for **Peat and Spoil Management Area 3**
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.
v	Use of floating roads in deeper areas of peat

Note
(1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
(2) Probability assessed as per Table A and B of Appendix D.
(3) Impact based on distance of infrastructure element to nearest watercourse.

Gannow Wind Farm - Peat Stability Risk Register (Rev 0)

Location:	Peat and Spoil Management Area 4

Grid Reference (Eastings, Northings):	
Distance to Watercourse (m)	**> 150**
Min & Max Measured Peat Depth (m):	**0.2 - 0.5**
Specific Control Required:	**No**

		Pre-Control Measure Implementation						Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = Varied	1	1	1	Negligible	No	See Below	1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	1	1	1	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	1	1	1	Negligible	No		1	1	1	Negligible
5	Type of vegetation	1	1	1	Negligible	No		1	1	1	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	1	1	1	Negligible	No		1	1	1	Negligible
7	Evidence of very soft/soft clay at base of peat	2	1	2	Negligible	No		2	1	2	Negligible
8	Evidence of mechanically cut peat	1	1	1	Negligible	No		1	1	1	Negligible
9	Evidence of quaking or buoyant peat	1	1	1	Negligible	No		1	1	1	Negligible
10	Evidence of bog pools	1	1	1	Negligible	No		1	1	1	Negligible
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for **Peat and Spoil Management Area 4**
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

Note
(1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
(2) Probability assessed as per Table A and B of Appendix D.
(3) Impact based on distance of infrastructure element to nearest watercourse.

Gannow Wind Farm - Peat Stability Risk Register (Rev 0)

Location:	Peat and Spoil Management Area 5

Grid Reference (Eastings, Northings):	
Distance to Watercourse (m)	**50 - 100**
Min & Max Measured Peat Depth (m):	**0.2 - 0.7**
Specific Control Required:	**No**

		Pre-Control Measure Implementation						Post-Control Measure Implementation			
Ref.	Contributory/Qualitative Factors to Potential Peat Failure	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating	Control Required	Control measures to be implemented during construction	Prob (Note 2)	Impact (Note 3)	Risk	Risk Rating
1	FOS = Varied	1	1	1	Negligible	No		1	1	1	Negligible
2	Evidence of sub peat water flow	1	1	1	Negligible	No		1	1	1	Negligible
3	Evidence of surface water flow	1	1	1	Negligible	No		1	1	1	Negligible
4	Evidence of previous failures/slips	1	1	1	Negligible	No		1	1	1	Negligible
5	Type of vegetation	1	1	1	Negligible	No		1	1	1	Negligible
6	General slope characteristics upslope/downslope from infrastructure location	1	1	1	Negligible	No	See Below	1	1	1	Negligible
7	Evidence of very soft/soft clay at base of peat	2	1	2	Negligible	No		2	1	2	Negligible
8	Evidence of mechanically cut peat	1	1	1	Negligible	No		1	1	1	Negligible
9	Evidence of quaking or buoyant peat	1	1	1	Negligible	No		1	1	1	Negligible
10	Evidence of bog pools	1	1	1	Negligible	No		1	1	1	Negligible
11	Other	0	1	0	Not Applicable	No		0	1	0	Not Applicable

	Control Measures to be Implemented Prior to/and During Construction for **Peat and Spoil Management Area 5**
i	Maintain hydrology of area as far as possible;
ii	Use of experienced geotechnical staff for site investigation;
iii	Use of experienced contractors and trained operators to carry out the work;
iv	Detailed ground investigation to determine peat, mineral soil and bedrock condition and properties.

Note
(1) FOS abbreviations are: u: FOS for undrained analysis, d: FOS for drained analysis.
(2) Probability assessed as per Table A and B of Appendix D.
(3) Impact based on distance of infrastructure element to nearest watercourse.

< 50
50 - 100
100 - 150
> 150

FEHILY TIMONEY

DESIGNING AND DELIVERING
A SUSTAINABLE FUTURE

APPENDIX C

Calculated FOS for Peat Slopes on Site

Infinite Slope Analysis

Assumptions as follows:

(1) Undrained analysis assumed to give worst case, using infinite slope:

Infinite slope analysis (undrained)

$FoS = Cu/[\gamma.z.\sin \beta \cos \beta]$

where,
β = slope angle
Cu = undrained strength
z = depth of sliding layer
γ = bulk unit weight

Calculated FoS of Natural Peat Slopes for Gannow Wind Farm - Drained Analysis

Turbine No./Waypoint	Slope	Design c'	Bulk unit weight of Peat	Unit weight of Water	Depth of In situ Peat	Friction Angle	Surcharge Equivalent Placed Fill	Equivalent Total Depth of Peat (m)	Factor of Safety for Load Condition	
	α (deg)	c' (kPa)	γ (kN/m^3)	γ_w (kN/m^3)	(m)	ø' (deg)	Condition (2)	Condition (2)	Condition (1)	Condition (2)
									100% Water	100% Water
R1	No Peat Recorded									
R2	2	4	10.0	10.0	0.1	25	1.0	1.1	**128.04**	**23.78**
R3	2	4	10.0	10.0	0.2	25	1.0	1.2	**70.70**	**22.91**
R4	2	4	10.0	10.0	0.2	25	1.0	1.2	**70.70**	**22.91**
R5	2	4	10.0	10.0	0.2	25	1.0	1.2	**70.70**	**22.91**
R6	2	4	10.0	10.0	0.2	25	1.0	1.2	**70.70**	**22.91**
R7	3	4	10.0	10.0	1	25	1.0	2.0	**16.55**	**12.72**
R8	3	4	10.0	10.0	0.8	25	1.0	1.8	**18.46**	**13.15**
R9	3	4	10.0	10.0	0.4	25	1.0	1.4	**28.03**	**14.36**
R10	3	4	10.0	10.0	0.2	25	1.0	1.2	**47.16**	**15.28**
R11	3	4	10.0	10.0	0.3	25	1.0	1.3	**34.41**	**14.78**
R12	3	4	10.0	10.0	0.2	25	1.0	1.2	**47.16**	**15.28**
R13	2	4	10.0	10.0	0.1	25	1.0	1.1	**128.04**	**23.78**
R14	No Peat Recorded									
R15	No Peat Recorded									
R16	2	4	10.0	10.0	0.1	25	1.0	1.1	**128.04**	**23.78**
R17	No Peat Recorded									
R18	3	4	10.0	10.0	0.1	25	1.0	1.1	**85.43**	**15.86**
R19	3	4	10.0	10.0	1.6	25	1.0	2.6	**13.68**	**11.84**
R20	2	4	10.0	10.0	1.7	25	1.0	2.7	**20.10**	**17.60**
R21	3	4	10.0	10.0	2.2	25	1.0	3.2	**12.38**	**11.29**
R22	4	4	10.0	10.0	4	25	1.0	5.0	**8.11**	**7.82**
R23	2	4	10.0	10.0	3.5	25	1.0	4.5	**3.28**	**5.52**
R24	2	4	10.0	10.0	3.2	25	1.0	4.2	**3.58**	**5.91**
R25	3	4	10.0	10.0	3.4	25	1.0	4.4	**2.25**	**3.76**
R26	3	4	10.0	10.0	3.4	25	1.0	4.4	**2.25**	**3.76**
R27	2	4	10.0	10.0	4	25	1.0	5.0	**2.87**	**4.96**
R28	2	4	10.0	10.0	1.5	25	1.0	2.5	**7.65**	**9.93**
R29	2	4	10.0	10.0	0.1	25	1.0	1.1	**114.68**	**22.57**
R30	No Peat Recorded									
R31	3	4	10.0	10.0	3.4	25	1.0	4.4	**2.25**	**3.76**
R32	3	4	10.0	10.0	2.8	25	1.0	3.8	**2.73**	**4.36**
R33	4	4	10.0	10.0	0.5	25	1.0	1.5	**18.16**	**10.50**
R34	3	4	10.0	10.0	0.8	25	1.0	1.8	**9.57**	**9.20**
R35	4	4	10.0	10.0	2.6	25	1.0	3.6	**2.21**	**3.45**
R36	2	4	10.0	10.0	4.2	25	1.0	5.2	**2.73**	**4.77**
R37	2	4	10.0	10.0	4.5	25	1.0	5.5	**2.55**	**4.51**
R38	2	4	10.0	10.0	5.2	25	1.0	6.2	**2.21**	**4.00**
R39	2	4	10.0	10.0	2.1	25	1.0	3.1	**5.46**	**8.01**
R40	2	4	10.0	10.0	6.1	25	1.0	7.1	**1.88**	**3.50**
R41	2	4	10.0	10.0	6.1	25	1.0	7.1	**1.88**	**3.50**
R42	3	4	10.0	10.0	4.8	25	1.0	5.8	**1.59**	**2.85**
R43	2	4	10.0	10.0	6.1	25	1.0	7.1	**1.88**	**3.50**
R44	2	4	10.0	10.0	1.2	25	1.0	2.2	**9.56**	**11.28**
R45	2	4	10.0	10.0	1	25	1.0	2.0	**11.47**	**12.41**
R46	2	4	10.0	10.0	0.3	25	1.0	1.3	**38.23**	**19.09**
R47	2	4	10.0	10.0	0.7	25	1.0	1.7	**16.38**	**14.60**
R48	2	4	10.0	10.0	0.5	25	1.0	1.5	**22.94**	**16.55**
R49	3	4	10.0	10.0	1.1	25	1.0	2.1	**6.96**	**7.88**
R50	4	4	10.0	10.0	0.8	25	1.0	1.8	**7.19**	**6.90**
R51	4	4	10.0	10.0	1	25	1.0	2.0	**5.75**	**6.21**
R52	5	4	10.0	10.0	0.5	25	1.0	1.5	**9.21**	**6.62**
R53	4	4	10.0	10.0	0.4	25	1.0	1.4	**14.37**	**8.87**
R54	4	4	10.0	10.0	0.2	25	1.0	1.2	**28.74**	**10.35**
R55	3	4	10.0	10.0	0.2	25	1.0	1.2	**38.27**	**13.79**
R56	3	4	10.0	10.0	0.2	25	1.0	1.2	**38.27**	**13.79**
R57	3	4	10.0	10.0	0.3	25	1.0	1.3	**25.51**	**12.73**
R58	2	4	10.0	10.0	1.2	25	1.0	2.2	**9.56**	**11.28**
R59	4	4	10.0	10.0	0.8	25	1.0	1.8	**7.19**	**6.90**
R60	3	4	10.0	10.0	0.4	25	1.0	1.4	**19.13**	**11.82**
R61	3	4	10.0	10.0	0.3	25	1.0	1.3	**25.51**	**12.73**
R62	3	4	10.0	10.0	0.3	25	1.0	1.3	**25.51**	**12.73**
R63	4	4	10.0	10.0	0.2	25	1.0	1.2	**28.74**	**10.35**
R64	4	4	10.0	10.0	0.2	25	1.0	1.2	**28.74**	**10.35**
R65	4	4	10.0	10.0	0.4	25	1.0	1.4	**14.37**	**8.87**
R66	6	4	10.0	10.0	0.2	25	1.0	1.2	**19.24**	**6.90**
R67	6	4	10.0	10.0	0.2	25	1.0	1.2	**19.24**	**6.90**
R68	6	4	10.0	10.0	0.3	25	1.0	1.3	**12.83**	**6.37**
R69	6	4	10.0	10.0	0.2	25	1.0	1.2	**19.24**	**6.90**
R70	4	4	10.0	10.0	0.4	25	1.0	1.4	**14.37**	**8.87**
R71	4	4	10.0	10.0	0.3	25	1.0	1.3	**19.16**	**9.55**
R72	2	4	10.0	10.0	0.1	25	1.0	1.1	**114.68**	**22.57**
R73	No Peat Recorded									
R74	No Peat Recorded									
R75	No Peat Recorded									
R76	No Peat Recorded									
R77	No Peat Recorded									
R78	No Peat Recorded									
R79	No Peat Recorded									
R80	No Peat Recorded									
R81	No Peat Recorded									
R82	No Peat Recorded									
R83	4	4	10.0	10.0	0.1	25	1.0	1.1	**57.48**	**11.29**
R84	4	4	10.0	10.0	0.2	25	1.0	1.2	**28.74**	**10.35**
T1	4	4	10.0	10.0	3.2	25	1.0	4.2	**1.80**	**2.96**
N	4	4	10.0	10.0	4	25	1.0	5.0	**1.44**	**2.48**
S	4	4	10.0	10.0	3.7	25	1.0	4.7	**1.55**	**2.64**
E	4	4	10.0	10.0	3.4	25	1.0	4.4	**1.69**	**2.82**

Calculated FoS of Natural Peat Slopes for Gannow Wind Farm - Drained Analysis

Turbine No./Waypoint	Slope	Design c'	Bulk unit weight of Peat	Unit weight of Water	Depth of In situ Peat	Friction Angle	Surcharge Equivalent Placed Fill	Equivalent Total Depth of Peat (m)	Factor of Safety for Load Condition	
	α (deg)	c' (kPa)	γ (kN/m^3)	γ_w (kN/m^3)	(m)	ø' (deg)	Condition (2)	Condition (2)	Condition (1)	Condition (2)
									100% Water	100% Water
W	4	4	10.0	10.0	2.6	25	1.0	3.6	**2.21**	**3.45**
T2	2	4	10.0	10.0	3	25	1.0	4.0	**3.82**	**6.21**
N	2	4	10.0	10.0	3.5	25	1.0	4.5	**3.28**	**5.52**
S	2	4	10.0	10.0	2.8	25	1.0	3.8	**4.10**	**6.53**
E	2	4	10.0	10.0	3.2	25	1.0	4.2	**3.58**	**5.91**
W	2	4	10.0	10.0	2.6	25	1.0	3.6	**4.41**	**6.89**
T3	2	4	10.0	10.0	1.5	25	1.0	2.5	**7.65**	**9.93**
N	2	4	10.0	10.0	1.6	25	1.0	2.6	**7.17**	**9.55**
S	2	4	10.0	10.0	1.8	25	1.0	2.8	**6.37**	**8.86**
E	2	4	10.0	10.0	1.4	25	1.0	2.4	**8.19**	**10.34**
W	2	4	10.0	10.0	1.6	25	1.0	2.6	**7.17**	**9.55**
T4	4	4	10.0	10.0	0.2	25	1.0	1.2	**28.74**	**10.35**
N	4	4	10.0	10.0	0.3	25	1.0	1.3	**19.16**	**9.55**
S	4	4	10.0	10.0	0.1	25	1.0	1.1	**57.48**	**11.29**
E	4	4	10.0	10.0	0.2	25	1.0	1.2	**28.74**	**10.35**
W	4	4	10.0	10.0	0.2	25	1.0	1.2	**28.74**	**10.35**
T5	4	4	10.0	10.0	0.2	25	1.0	1.2	**28.74**	**10.35**
N	4	4	10.0	10.0	0.1	25	1.0	1.1	**57.48**	**11.29**
S	4	4	10.0	10.0	0.6	25	1.0	1.6	**9.58**	**7.76**
E	4	4	10.0	10.0	0.2	25	1.0	1.2	**28.74**	**10.35**
W	4	4	10.0	10.0	0.2	25	1.0	1.2	**28.74**	**10.35**
T6	No Peat Recorded									
N	No Peat Recorded									
S	No Peat Recorded									
E	No Peat Recorded									
W	No Peat Recorded									
T7	4	4	10.0	10.0	0.4	25	1.0	1.4	**14.37**	**8.87**
N	4	4	10.0	10.0	0.2	25	1.0	1.2	**28.74**	**10.35**
S	4	4	10.0	10.0	0.2	25	1.0	1.2	**28.74**	**10.35**
E	4	4	10.0	10.0	0.3	25	1.0	1.3	**19.16**	**9.55**
W	4	4	10.0	10.0	0.2	25	1.0	1.2	**28.74**	**10.35**
T8	4	4	10.0	10.0	0.5	25	1.0	1.5	**11.50**	**8.28**
N	4	4	10.0	10.0	0.4	25	1.0	1.4	**14.37**	**8.87**
S	4	4	10.0	10.0	0.3	25	1.0	1.3	**19.16**	**9.55**
E	4	4	10.0	10.0	0.4	25	1.0	1.4	**14.37**	**8.87**
W	4	4	10.0	10.0	0.4	25	1.0	1.4	**14.37**	**8.87**
S1-1	2	4	10.0	10.0	0.3	25	1.0	1.3	**38.23**	**19.09**
S1-2	2	4	10.0	10.0	1.2	25	1.0	2.2	**9.56**	**11.28**
S1-3	2	4	10.0	10.0	0.3	25	1.0	1.3	**51.58**	**22.18**
S1-4	2	4	10.0	10.0	1.2	25	1.0	2.2	**22.91**	**18.57**
S1-5	2	4	10.0	10.0	1	25	1.0	2.0	**11.47**	**12.41**
S2-1	3	4	10.0	10.0	0.3	25	1.0	1.3	**25.51**	**12.73**
S2-2	3	4	10.0	10.0	0.2	25	1.0	1.2	**38.27**	**13.79**
S2-3	3	4	10.0	10.0	0.2	25	1.0	1.2	**38.27**	**13.79**
S2-4	3	4	10.0	10.0	0.3	25	1.0	1.3	**25.51**	**12.73**
S2-5	3	4	10.0	10.0	0.2	25	1.0	1.2	**38.27**	**13.79**
CC1-1	2	4	10.0	10.0	0.2	25	1.0	1.2	**57.34**	**20.68**
CC1-2	2	4	10.0	10.0	0.3	25	1.0	1.3	**38.23**	**19.09**
CC1-3	3	4	10.0	10.0	0.4	25	1.0	1.4	**19.13**	**11.82**
CC1-4	3	4	10.0	10.0	0.2	25	1.0	1.2	**38.27**	**13.79**
CC1-5	3	4	10.0	10.0	0.3	25	1.0	1.3	**25.51**	**12.73**
CC2-1	4	4	10.0	10.0	0.4	25	1.0	1.4	**14.37**	**8.87**
CC2-2	4	4	10.0	10.0	0.4	25	1.0	1.4	**14.37**	**8.87**
CC2-3	4	4	10.0	10.0	0.3	25	1.0	1.3	**19.16**	**9.55**
CC2-4	4	4	10.0	10.0	0.3	25	1.0	1.3	**19.16**	**9.55**
CC2-5	4	4	10.0	10.0	0.4	25	1.0	1.4	**14.37**	**8.87**
FTPP01	2	4	10.0	10.0	0.6	25	1.0	1.6	**32.47**	**20.52**
FTPP02	2	4	10.0	10.0	1.5	25	1.0	2.5	**21.00**	**17.94**
FTPP03	2	4	10.0	10.0	1.5	25	1.0	2.5	**21.00**	**17.94**
FTPP04	1	4	10.0	10.0	0.7	25	1.0	1.7	**59.46**	**40.20**
FTPP05	1	4	10.0	10.0	2.1	25	1.0	3.1	**37.63**	**34.11**
FTPP06	1	4	10.0	10.0	2.2	25	1.0	3.2	**37.13**	**33.88**
FTPP07	4	4	10.0	10.0	0.1	25	1.0	1.1	**64.15**	**11.89**
FTPP08	1	4	10.0	10.0	0.7	25	1.0	1.7	**59.46**	**40.20**
FTPP09	1	4	10.0	10.0	0.2	25	1.0	1.2	**141.33**	**45.82**
FTPP10	1	4	10.0	10.0	0.9	25	1.0	1.9	**52.18**	**38.78**
FTPP11	1	4	10.0	10.0	3.2	25	1.0	4.2	**33.88**	**32.17**
FTPP12	1	4	10.0	10.0	4.1	25	1.0	5.1	**32.31**	**31.21**
FTPP13	2	4	10.0	10.0	2.3	25	1.0	3.3	**18.34**	**16.83**
WP002	1	4	10.0	10.0	7.2	25	1.0	8.2	**29.90**	**29.51**
372	2	4	10.0	10.0	0.5	26	1.0	1.5	**36.90**	**21.61**
373	2	4	10.0	10.0	0.3	27	1.0	1.3	**52.82**	**23.41**
142	2	4	10.0	10.0	0.1	28	1.0	1.1	**129.91**	**25.65**
154	2	4	10.0	10.0	0.3	29	1.0	1.3	**54.10**	**24.70**
50	3	4	10.0	10.0	0.2	31	1.0	1.2	**49.73**	**17.84**
52	2	4	10.0	10.0	0.1	33	1.0	1.1	**133.28**	**29.02**
390	2	4	10.0	10.0	6.2	36	1.0	7.2	**22.66**	**22.40**
391	2	4	10.0	10.0	2.4	37	1.0	3.4	**26.36**	**24.95**
392	2	4	10.0	10.0	1.2	38	1.0	2.2	**31.93**	**27.59**
393	2	4	10.0	10.0	1	39	1.0	2.0	**34.66**	**28.92**
394	2	4	10.0	10.0	1.5	40	1.0	2.5	**31.67**	**28.62**
395	3	4	10.0	10.0	1.3	41	1.0	2.3	**22.47**	**19.91**
396	2	4	10.0	10.0	6.7	42	1.0	7.7	**27.50**	**27.27**
397	2	4	10.0	10.0	6.4	43	1.0	7.4	**28.50**	**28.25**
398	3	4	10.0	10.0	1.5	44	1.0	2.5	**23.53**	**21.49**
399	2	4	10.0	10.0	2.7	45	1.0	3.7	**32.88**	**31.74**
400	3	4	10.0	10.0	1.4	46	1.0	2.4	**25.23**	**22.95**
401	2	4	10.0	10.0	1.1	47	1.0	2.1	**41.13**	**36.17**
402	3	4	10.0	10.0	1.9	48	1.0	2.9	**25.22**	**23.83**

Calculated FoS of Natural Peat Slopes for Gannow Wind Farm - Drained Analysis

Turbine No./Waypoint	Slope	Design c'	Bulk unit weight of Peat	Unit weight of Water	Depth of In situ Peat	Friction Angle	Surcharge Equivalent Placed Fill	Equivalent Total Depth of Peat (m)	Factor of Safety for Load Condition	
	α (deg)	c' (kPa)	γ (kN/m^3)	γ_w (kN/m^3)	(m)	ø' (deg)	Condition (2)	Condition (2)	Condition (1)	Condition (2)
									100% Water	100% Water
403	2	4	10.0	10.0	2.8	49	1.0	3.8	**37.04**	**35.96**
404	2	4	10.0	10.0	7	50	1.0	8.0	**35.77**	**35.56**
405	2	4	10.0	10.0	2.5	51	1.0	3.5	**39.95**	**38.64**
406	2	4	10.0	10.0	1.1	52	1.0	2.1	**47.06**	**42.11**
332	2	4	10.0	10.0	5.5	53	1.0	6.5	**40.09**	**39.77**
333	2	4	10.0	10.0	3	54	1.0	4.0	**43.24**	**42.28**
334	2	4	10.0	10.0	0.9	55	1.0	1.9	**53.64**	**46.93**
320	2	4	10.0	10.0	6.5	56	1.0	7.5	**44.22**	**43.98**
321	3	4	10.0	10.0	5.1	57	1.0	6.1	**30.88**	**30.64**
322	2	4	10.0	10.0	5.1	58	1.0	6.1	**48.08**	**47.71**
323	2	4	10.0	10.0	3	59	1.0	4.0	**51.48**	**50.53**
324	3	4	10.0	10.0	3.7	60	1.0	4.7	**35.12**	**34.68**
325	2	4	10.0	10.0	6.5	61	1.0	7.5	**53.43**	**53.19**
326	2	4	10.0	10.0	3.2	62	1.0	4.2	**57.44**	**56.59**
327	2	4	10.0	10.0	3.9	63	1.0	4.9	**59.14**	**58.54**
328	2	4	10.0	10.0	2	64	1.0	3.0	**64.45**	**62.54**
329	2	4	10.0	10.0	1.7	65	1.0	2.7	**68.16**	**65.66**
330	2	4	10.0	10.0	3.1	66	1.0	4.1	**68.02**	**67.12**
407	2	4	10.0	10.0	5	67	1.0	6.0	**69.76**	**69.37**
408	2	4	10.0	10.0	6	68	1.0	7.0	**72.79**	**72.52**
409	2	4	10.0	10.0	7	69	1.0	8.0	**76.24**	**76.03**
410	2	4	10.0	10.0	7	70	1.0	8.0	**80.32**	**80.11**
55	3	4	10.0	10.0	2.9	71	1.0	3.9	**58.05**	**57.38**
56	3	4	10.0	10.0	2.8	72	1.0	3.8	**61.46**	**60.74**
57	3	4	10.0	10.0	4.8	73	1.0	5.8	**64.01**	**63.73**

Minimum =	**1.44**	**2.48**
Maximum =	**141.33**	**67.12**
Average =	**30.90**	**17.63**

Notes:

(1) Assuming a bulk unit weight of peat of 10 (kN/m^3)
(2) Assuming a surcharge equivalent to fill depth of 1.0m.
(3) Slope inclination (β) based on site readings and contour survey plans of site.
(4) FoS is based on slope inclination and shear test results obtained from published data.
(5) Peat depths based on probes carried out by FT and MKO.
(6) For load conditions see Report text.
(7) Minimum acceptable factor of safety required of 1.3 for first-time failures based on BS: 6031:1981 Code of practice for Earthworks.

Calculated FoS of Natural Peat Slopes for Gannow Wind Farm - Undrained Analysis

Turbine No./Waypoint	Easting	Northing	Slope	Undrained shear strength	Bulk unit weight of Peat	Peat Depth	Surcharge Equivalent Placed Fill Depth (m)	Factor of Safety for Load Condition	
			β (deg)	c_u (kPa)	γ (kN/m^3)	(m)	Condition (2)	Condition (1)	Condition (2)
R1	559334.21	729993.52	2	6	10	0	1.0		
R2	559433.72	730002.99	2	6	10	0.1	1.1	**172.03**	**15.64**
R3	559533.4	730010.95	2	6	10	0.2	1.2	**86.01**	**14.34**
R4	559580.69	729946.12	2	6	10	0.2	1.2	**86.01**	**14.34**
R5	559582.14	729925.28	2	6	10	0.2	1.2	**86.01**	**14.34**
R6	559582.13	729925.76	2	6	10	0.2	1.2	**86.01**	**14.34**
R7	559681.73	729934.58	3	6	10	1	2.0	**11.48**	**5.74**
R8	559728.04	729938.94	3	6	10	0.8	1.8	**14.35**	**6.38**
R9	559582.14	729925.28	3	6	10	0.4	1.4	**28.70**	**8.20**
R10	559524.26	729860.91	3	6	10	0.2	1.2	**57.40**	**9.57**
R11	559525.06	729827.54	3	6	10	0.3	1.3	**38.27**	**8.83**
R12	559525.05	729828.22	3	6	10	0.2	1.2	**57.40**	**9.57**
R13	559452.45	729875.44	2	6	10	0.1	1.1	**172.03**	**15.64**
R14	559352.81	729867	2	6	10	0	1.0	**0.00**	**0.00**
R15	559267.87	729828.66	2	6	10	0	1.0	**0.00**	**0.00**
R16	559525.07	729827.47	2	6	10	0.1	1.1	**172.03**	**15.64**
R17	559552.38	729737.23	No Peat Recorded						
R18	559642.66	729694.36	3	6	10	0.1	1.1	**114.80**	**10.44**
R19	559732.11	729649.95	3	6	10	1.6	2.6	**7.18**	**4.42**
R20	559828.88	729624.76	2	6	10	1.7	2.7	**10.12**	**6.37**
R21	559925.52	729599.07	3	6	10	2.2	3.2	**5.22**	**3.59**
R22	560022	729572.77	4	6	10	4	5.0	**2.16**	**1.72**
R23	560121.89	729571.28	2	6	10	3.5	4.5	**4.92**	**3.82**
R24	560221.89	729571.19	2	6	10	3.2	4.2	**5.38**	**4.10**
R25	560307.11	729571.19	3	6	10	3.4	4.4	**3.38**	**2.61**
R26	560306.97	729571.18	3	6	10	3.4	4.4	**3.38**	**2.61**
R27	560292.77	729472.2	2	6	10	4	5.0	**4.30**	**3.44**
R28	560277.87	729373.32	2	6	10	1.5	2.5	**11.47**	**6.88**
R29	560256.93	729275.73	2	6	10	0.1	1.1	**172.03**	**15.64**
R30	560234.53	729195.7	No Peat Recorded						
R31	560307.44	729571.21	3	6	10	3.4	4.4	**3.38**	**2.61**
R32	560387.25	729628.2	3	6	10	2.8	3.8	**4.10**	**3.02**
R33	560410.45	729724.81	4	6	10	0.5	1.5	**17.24**	**5.75**
R34	560428.83	729823.11	3	6	10	0.8	1.8	**14.35**	**6.38**
R35	560490.22	729889.14	4	6	10	2.6	3.6	**3.32**	**2.40**
R36	560587.23	729913.4	2	6	10	4.2	5.2	**4.10**	**3.31**
R37	560684.24	729937.67	2	6	10	4.5	5.5	**3.82**	**3.13**
R38	560781.25	729961.93	2	6	10	5.2	6.2	**3.31**	**2.77**
R39	560878.26	729986.19	2	6	10	2.1	3.1	**8.19**	**5.55**
R40	560949.52	730004.01	2	6	10	6.1	7.1	**2.82**	**2.42**
R41	560949.52	730004.01	2	6	10	6.1	7.1	**2.82**	**2.42**
R42	560940.18	730040.33	3	6	10	4.8	5.8	**2.39**	**1.98**
R43	560949.62	730004.04	2	6	10	6.1	7.1	**2.82**	**2.42**
R44	561030.26	730052.31	2	6	10	1.2	2.2	**14.34**	**7.82**
R45	561068.1	730144.86	2	6	10	1	2.0	**17.20**	**8.60**
R46	561158.17	730165.59	2	6	10	0.3	1.3	**57.34**	**13.23**
R47	561257.45	730153.59	2	6	10	0.7	1.7	**24.58**	**10.12**
R48	561357.21	730152.63	2	6	10	0.5	1.5	**34.41**	**11.47**
R49	561457.13	730153.14	3	6	10	1.1	2.1	**10.44**	**5.47**
R50	561546.05	730122.81	4	6	10	0.8	1.8	**10.78**	**4.79**
R51	561584.11	730032.77	4	6	10	1	2.0	**8.62**	**4.31**
R52	561663.74	729972.93	5	6	10	0.5	1.5	**13.82**	**4.61**
R53	561710.65	729884.62	4	6	10	0.4	1.4	**21.56**	**6.16**
R54	561764.09	729800.19	4	6	10	0.2	1.2	**43.11**	**7.19**
R55	561817.34	729715.59	3	6	10	0.2	1.2	**57.40**	**9.57**
R56	561867.98	729629.36	3	6	10	0.2	1.2	**57.40**	**9.57**
R57	561946.79	729574.05	3	6	10	0.3	1.3	**38.27**	**8.83**
R58	562041.03	729540.84	2	6	10	1.2	2.2	**14.34**	**7.82**
R59	562136.55	729511.24	4	6	10	0.8	1.8	**10.78**	**4.79**
R60	562235.68	729506.88	3	6	10	0.4	1.4	**28.70**	**8.20**
R61	562321.84	729516.18	3	6	10	0.3	1.3	**38.27**	**8.83**
R62	562320.43	729515.32	3	6	10	0.3	1.3	**38.27**	**8.83**
R63	562360.68	729424.02	4	6	10	0.2	1.2	**43.11**	**7.19**
R64	562395.9	729330.44	4	6	10	0.2	1.2	**43.11**	**7.19**
R65	562428.62	729236.01	4	6	10	0.4	1.4	**21.56**	**6.16**
R66	562446.7	729154.04	6	6	10	0.2	1.2	**28.86**	**4.81**
R67	562446.75	729153.84	6	6	10	0.2	1.2	**28.86**	**4.81**
R68	562475.08	729160.19	6	6	10	0.3	1.3	**19.24**	**4.44**
R69	562446.75	729153.84	6	6	10	0.2	1.2	**28.86**	**4.81**
R70	562466.57	729063.98	4	6	10	0.4	1.4	**21.56**	**6.16**
R71	562322.1	729516.34	4	6	10	0.3	1.3	**28.74**	**6.63**
R72	562373.14	729600.3	2	6	10	0.1	1.1	**172.03**	**15.64**
R73	562470.43	729606.81	No Peat Recorded						
R74	562570.15	729599.33	No Peat Recorded						
R75	562666.93	729581.62	No Peat Recorded						
R76	562747.82	729522.82	No Peat Recorded						
R77	562834.51	729474.26	No Peat Recorded						
R78	562855.9	729465.69	No Peat Recorded						
R79	562856.22	729465.55	No Peat Recorded						
R80	562870.37	729500.29	No Peat Recorded						
R81	562856.22	729465.55	No Peat Recorded						
R82	562946.03	729467.71	No Peat Recorded						
R83	563031.5	729519.47	4	6	10	0.1	1.1	**86.22**	**7.84**
R84	563072.8	729545.6	4	6	10	0.2	1.2	**43.11**	**7.19**
T1	560005.5	729598.5	4	6	10	3.2	4.2	**2.69**	**2.05**
N	560005.5	729608.5	4	6	10	4	5.0	**2.16**	**1.72**
S	560005.5	729588.5	4	6	10	3.7	4.7	**2.33**	**1.83**
E	560015.5	729598.5	4	6	10	3.4	4.4	**2.54**	**1.96**
W	559995.5	729598.5	4	6	10	2.6	3.6	**3.32**	**2.40**

Calculated FoS of Natural Peat Slopes for Gannow Wind Farm - Undrained Analysis

Turbine No./Waypoint	Easting	Northing	Slope	Undrained shear strength	Bulk unit weight of Peat	Peat Depth	Surcharge Equivalent Placed Fill Depth (m)	Factor of Safety for Load Condition	
			β (deg)	c_u (kPa)	γ (kN/m^3)	(m)	Condition (2)	Condition (1)	Condition (2)
T2	560287.5	729307.5	2	6	10	3	4.0	**5.73**	**4.30**
N	560287.5	729317.5	2	6	10	3.5	4.5	**4.92**	**3.82**
S	560287.5	729297.5	2	6	10	2.8	3.8	**6.14**	**4.53**
E	560297.5	729307.5	2	6	10	3.2	4.2	**5.38**	**4.10**
W	560277.5	729307.5	2	6	10	2.6	3.6	**6.62**	**4.78**
T3	560801.0	729988.0	2	6	10	1.5	2.5	**11.47**	**6.88**
N	560801.0	729998.0	2	6	10	1.6	2.6	**10.75**	**6.62**
S	560801.0	729978.0	2	6	10	1.8	2.8	**9.56**	**6.14**
E	560811.0	729988.0	2	6	10	1.4	2.4	**12.29**	**7.17**
W	560791.0	729988.0	2	6	10	1.6	2.6	**10.75**	**6.62**
T4	561808.0	729771.0	4	6	10	0.2	1.2	**43.11**	**7.19**
N	561808.0	729781.0	4	6	10	0.3	1.3	**28.74**	**6.63**
S	561808.0	729761.0	4	6	10	0.1	1.1	**86.22**	**7.84**
E	561818.0	729771.0	4	6	10	0.2	1.2	**43.11**	**7.19**
W	561798.0	729771.0	4	6	10	0.2	1.2	**43.11**	**7.19**
T5	562113.0	729540.0	4	6	10	0.2	1.2	**43.11**	**7.19**
N	562113.0	729550.0	4	6	10	0.1	1.1	**86.22**	**7.84**
S	562113.0	729530.0	4	6	10	0.6	1.6	**14.37**	**5.39**
E	562123.0	729540.0	4	6	10	0.2	1.2	**43.11**	**7.19**
W	562103.0	729540.0	4	6	10	0.2	1.2	**43.11**	**7.19**
T6	562645.0	729614.0	No Peat Recorded						
N	562645.0	729624.0	No Peat Recorded						
S	562645.0	729604.0	No Peat Recorded						
E	562655.0	729614.0	No Peat Recorded						
W	562635.0	729614.0	No Peat Recorded						
T7	563077.0	729524.0	4	6	10	0.4	1.4	**21.56**	**6.16**
N	563077.0	729534.0	4	6	10	0.2	1.2	**43.11**	**7.19**
S	563077.0	729514.0	4	6	10	0.2	1.2	**43.11**	**7.19**
E	563087.0	729524.0	4	6	10	0.3	1.3	**28.74**	**6.63**
W	563067.0	729524.0	4	6	10	0.2	1.2	**43.11**	**7.19**
T8	562485.0	729076.0	4	6	10	0.5	1.5	**17.24**	**5.75**
N	562485.0	729086.0	4	6	10	0.4	1.4	**21.56**	**6.16**
S	562485.0	729066.0	4	6	10	0.3	1.3	**28.74**	**6.63**
E	562495.0	729076.0	4	6	10	0.4	1.4	**21.56**	**6.16**
W	562475.0	729076.0	4	6	10	0.4	1.4	**21.56**	**6.16**
S1-1	559594.341	729993.4226	2	6	10	0.3	1.3	**57.34**	**13.23**
S1-2	559721.779	730005.4182	2	6	10	1.2	2.2	**14.34**	**7.82**
S1-3	559600.365	729929.4305	2	6	10	0.3	1.3	**57.34**	**13.23**
S1-4	559727.802	729941.426	2	6	10	1.2	2.2	**14.34**	**7.82**
S1-5	559661.282	729966.1513	2	6	10	1	2.0	**17.20**	**8.60**
S2-1	559562.103	729907.973	3	6	10	0.3	1.3	**38.27**	**8.83**
S2-2	559689.541	729895.9775	3	6	10	0.2	1.2	**57.40**	**9.57**
S2-3	559556.08	729843.9809	3	6	10	0.2	1.2	**57.40**	**9.57**
S2-4	559683.517	729831.9853	3	6	10	0.3	1.3	**38.27**	**8.83**
S2-5	559620.257	729867.8168	3	6	10	0.2	1.2	**57.40**	**9.57**
CC1-1	559527.713	729821.3931	2	6	10	0.2	1.2	**86.01**	**14.34**
CC1-2	559587.696	729822.8459	2	6	10	0.3	1.3	**57.34**	**13.23**
CC1-3	559528.682	729781.4048	3	6	10	0.4	1.4	**28.70**	**8.20**
CC1-4	559588.664	729782.8576	3	6	10	0.2	1.2	**57.40**	**9.57**
CC1-5	559557.614	729800.7372	3	6	10	0.3	1.3	**38.27**	**8.83**
CC2-1	561676.869	729953.9149	4	6	10	0.4	1.4	**21.56**	**6.16**
CC2-2	561712.237	729972.5991	4	6	10	0.4	1.4	**21.56**	**6.16**
CC2-3	561740.264	729919.5471	4	6	10	0.3	1.3	**28.74**	**6.63**
CC2-4	561704.896	729900.8628	4	6	10	0.3	1.3	**28.74**	**6.63**
CC2-5	561708.985	729934.9626	4	6	10	0.4	1.4	**21.56**	**6.16**
FTPP01	562390.188	729041.3602	2	6	10	0.6	1.6	**28.67**	**10.75**
FTPP02	562403.14	729093.7332	2	6	10	1.5	2.5	**11.47**	**6.88**
FTPP03	562387.935	729164.4085	2	6	10	1.5	2.5	**11.47**	**6.88**
FTPP04	562329.367	729064.1678	1	6	10	0.7	1.7	**49.12**	**20.23**
FTPP05	562327.396	729125.2695	1	6	10	2.1	3.1	**16.37**	**11.09**
FTPP06	562328.804	729176.2346	1	6	10	2.2	3.2	**15.63**	**10.75**
FTPP07	562329.649	729221.005	4	6	10	0.1	1.1	**86.22**	**7.84**
FTPP08	562290.51	729101.0541	1	6	10	0.7	1.7	**49.12**	**20.23**
FTPP09	562292.2	729160.4664	1	6	10	0.2	1.2	**171.92**	**28.65**
FTPP10	562298.957	729207.2078	1	6	10	0.9	1.9	**38.20**	**18.10**
FTPP11	560232.049	729482.7594	1	6	10	3.2	4.2	**10.75**	**8.19**
FTPP12	560852	730046	1	6	10	4.1	5.1	**8.39**	**6.74**
FTPP13	561365.148	730077.7537	2	6	10	2.3	3.3	**7.48**	**5.21**
WP002	561344	730015	1	6	10	7.2	8.2	**4.78**	**4.19**
372	562309.604	729619.829	2	6	10	0.5	1.5	**34.41**	**11.47**
373	562235.453	729630.32	2	6	10	0.3	1.3	**57.34**	**13.23**
142	562128	729871	2	6	10	0.1	1.1	**172.03**	**15.64**
154	562087	729857	2	6	10	0.3	1.3	**57.34**	**13.23**
50	561897.611	729856.681	3	6	10	0.2	1.2	**57.40**	**9.57**
52	561935.426	729860.829	2	6	10	0.1	1.1	**172.03**	**15.64**
390	561525.922	730005.11	2	6	10	6.2	7.2	**2.77**	**2.39**
391	561519.293	730034.096	2	6	10	2.4	3.4	**7.17**	**5.06**
392	561502.838	730075.736	2	6	10	1.2	2.2	**14.34**	**7.82**
393	561465.154	730128.787	2	6	10	1	2.0	**17.20**	**8.60**
394	561458.823	730095.677	2	6	10	1.5	2.5	**11.47**	**6.88**
395	561446.627	730054.269	3	6	10	1.3	2.3	**8.83**	**4.99**
396	561457.474	730027.92	2	6	10	6.7	7.7	**2.57**	**2.23**
397	561390.836	730035.359	2	6	10	6.4	7.4	**2.69**	**2.32**
398	561401.158	730067.546	3	6	10	1.5	2.5	**7.65**	**4.59**
399	561380.194	730087.078	2	6	10	2.7	3.7	**6.37**	**4.65**
400	561410.493	730109.422	3	6	10	1.4	2.4	**8.20**	**4.78**
401	561391.095	730133.059	2	6	10	1.1	2.1	**15.64**	**8.19**
402	561351.381	730099.998	3	6	10	1.9	2.9	**6.04**	**3.96**
403	561352.911	730066.825	2	6	10	2.8	3.8	**6.14**	**4.53**
404	561307.775	730039.038	2	6	10	7	8.0	**2.46**	**2.15**

Calculated FoS of Natural Peat Slopes for Gannow Wind Farm - Undrained Analysis

Turbine No./Waypoint	Easting	Northing	Slope	Undrained shear strength	Bulk unit weight of Peat	Peat Depth	Surcharge Equivalent Placed Fill Depth (m)	Factor of Safety for Load Condition	
			β (deg)	c_u (kPa)	γ (kN/m^3)	(m)	Condition (2)	Condition (1)	Condition (2)
405	561304.482	730076.565	2	6	10	2.5	3.5	**6.88**	**4.92**
406	561304.272	730124.528	2	6	10	1.1	2.1	**15.64**	**8.19**
332	561003	730072	2	6	10	5.5	6.5	**3.13**	**2.65**
333	561029	730115	2	6	10	3	4.0	**5.73**	**4.30**
334	561047	730153	2	6	10	0.9	1.9	**19.11**	**9.05**
320	560645	730068	2	6	10	6.5	7.5	**2.65**	**2.29**
321	560707	730041	3	6	10	5.1	6.1	**2.25**	**1.88**
322	560753	730059	2	6	10	5.1	6.1	**3.37**	**2.82**
323	560741	730098	2	6	10	3	4.0	**5.73**	**4.30**
324	560802	730096	3	6	10	3.7	4.7	**3.10**	**2.44**
325	560816	730063	2	6	10	6.5	7.5	**2.65**	**2.29**
326	560809	730142	2	6	10	3.2	4.2	**5.38**	**4.10**
327	560850	730113	2	6	10	3.9	4.9	**4.41**	**3.51**
328	560883	730163	2	6	10	2	3.0	**8.60**	**5.73**
329	560887	730108	2	6	10	1.7	2.7	**10.12**	**6.37**
330	560934	730091	2	6	10	3.1	4.1	**5.55**	**4.20**
407	560154.601	729502.064	2	6	10	5	6.0	**3.44**	**2.87**
408	560179.769	729483.604	2	6	10	6	7.0	**2.87**	**2.46**
409	560226.668	729521.491	2	6	10	7	8.0	**2.46**	**2.15**
410	560258.238	729463.586	2	6	10	7	8.0	**2.46**	**2.15**
55	559939	729612	3	6	10	2.9	3.9	**3.96**	**2.94**
56	559960	729632	3	6	10	2.8	3.8	**4.10**	**3.02**
57	559989	729622	3	6	10	4.8	5.8	**2.39**	**1.98**
							Minimum =	**2.16**	**1.72**
							Maximum =	**172.03**	**28.65**
							Average =	**26.03**	**6.67**

(4) A lower bound undrained shear strength, cu for the peat of 8kPa was selected for the assessment. It should be noted that a cu of 8kPa for the peat is considered a conservative value for the analysis and is not representative of all peat present across the site. In reality the peat has a significantly higher undrained strength.
(5) Peat depths based on probes carried out by FT and MKO.
(6) For load conditions see report text.

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APPENDIX D

Methodology for Peat Stability Risk Assessment

Methodology for Peat Stability Risk Assessment

A peat stability risk assessment was carried out for each of the main infrastructure elements at the proposed wind farm development. This approach takes into account guidelines for geotechnical/peat stability risk assessments as given in PLHRAG (2nd Edition, Scottish Government, 2017) and MacCulloch (2005). The degree of risk is determined as a Risk Rating (R), which is the product of probability (P) and impact (I). How these factors are determined and applied in the analysis is described below.

The main approaches for assessing peat stability include the following:

(a) Geomorphological

(b) Qualitative (judgement)

(c) Index/Probabilistic (probability)

(d) Deterministic (factor of safety)

Approaches (a) to (c) listed above are subjective and do not provide a definitive indication of stability; in addition, a high level of judgement/experience is required which makes it difficult to relate the findings to real conditions. FT apply a more objective approach, the deterministic approach. As part of FT's deterministic approach, a qualitative risk assessment is also carried out taking into account qualitative factors, which cannot necessarily be quantified.

Probability

The likelihood of a peat failure occurring was assessed based on the results of both the quantitative results of stability calculations (deterministic approach using factors of safety) and the assessment of the severity of several qualitative factors which cannot be reasonably included in a stability calculation but nevertheless may affect the occurrence of peat instability.

The qualitative factors used in the risk assessment are outlined in Table A and have been compiled based on FT's experience of assessments and construction in peat land sites and peat failures throughout Ireland and the UK.

Table A: Qualitative Factors used to Assess Potential for Peat Failure

Qualitative Factor	Type of Feature/Indicator for each Qualitative Factor [1]	Explanation/Description of Qualitative Factor
Evidence of sub peat water flow	No	Based on site walkover observations. Sub peat water flow generally occurs in the form of natural piping at the base of peat. Where there is a constriction or blockage in natural pipes a build-up of water can occur at the base of the peat causing a reduction in effective stress at the base of the peat resulting in failure; this is particularly critical during periods of intense rainfall.
	Possibly	
	Probably	
	Yes	

Qualitative Factor	Type of Feature/Indicator for each Qualitative Factor [1]	Explanation/Description of Qualitative Factor
Evidence of surface water flow	Dry	Based on site walkover observations. The presence of surface water flow indicates if peat in an area is well drained or saturated and if any additional loading from the ponding of surface water onto the peat is likely.
	Localised/Flowing in drains	
	Ponded in drains	
	Springs/surface water	
Evidence of previous failures/slips	No	Based on site walkover observations. The presence of clustering of relict failures may indicate that particular pre-existing site conditions predispose a site to failure.
	In general area	
	On site	
	Within 500m of location	
Type of vegetation	Grass/Crops	Based on site walkover observations. The type of vegetation present indicates if peat in an area is well drained, saturated, etc. Vegetation that indicates wetter ground may also indicate softer underlying peat deposits.
	Improved Grass/Dry Heather	
	Wet Grassland/Juncus (Rushes)	
	Wetlands Sphagnum (Peat moss)	
General slope characteristics upslope/downslope from infrastructure location	Concave	Based on site walkover observations. Slope morphology in the area of the infrastructure location is an important factor. A number of recorded peat failures have occurred in close proximity to a convex break in slope.
	Planar to concave	
	Planar to convex	
	Convex	
Evidence of very soft/soft clay at base of peat	No	Based on inspection of exposures in general area from site walkover. Several reported peat failures identify the presence of a weak layer at the base of the peat along which shear failure has occurred.
	Yes	
Evidence of mechanically cut peat	No	Based on site walkover observations. Mechanically cut peat typically cut using a 'sausage' machine to extract

Qualitative Factor	Type of Feature/Indicator for each Qualitative Factor (1)	Explanation/Description of Qualitative Factor
	Yes	peat for harvesting. Areas which have been cut in this manner have been linked to peat instability. The mechanical cuts can notably reduce the intrinsic strength of the peat and also allow ingress of rainfall/surface water.
Evidence of quaking or buoyant peat	No	Based on site walkover observations. Quaking/buoyant peat is indicative of highly saturated peat, which would generally be considered to have a low strength. Quaking peat is a feature on sites that have been previously linked with peat instability.
	Yes	
Evidence of bog pools	No	Based on site walkover observations. Bog pools are generally an indicator of areas of weak, saturated peat. Commonly where there are open areas of water within peat these can be interconnected, with the result that there may be sub-surface bodies of water. The presence of bog pools have been previously linked with peat instability.
	Yes	
Other	Varies	In addition to the above features/ indicators and based on site recordings the following are some of the features which may be identified: Excessively deep peat, weak peat, overly steep slope angles, etc.

Note (1) The list of features/indicators for each qualitative factor are given in increasing order of probability of leading to peat instability/failure.

It should be noted that the presence of one of the qualitative factors alone from Table A is unlikely to lead to peat instability/failure. Peat instability/failure at a site is generally the combination of a number of these factors occurring at the same time at a particular location. The probability rating assigned to the quantitative and qualitative factors is judged on a 5-point scale from 1 (indicating negligible or no probability of failure) to 5 (indicating a very likely failure), as outlined in Table B.

Table B: Probability Scale

Scale	Factor of Safety	Probability
1	1.30 or greater	Negligible/None
2	1.29 to 1.20	Unlikely
3	1.19 to 1.11	Likely
4	1.01 to 1.10	Probable
5	≤1.0	Very Likely

Scale	Likelihood of Qualitative Factor leading to Peat Failure	Probability of Failure
1	Negligible/None	Least
2	Unlikely	
3	Probable	
4	Likely	
5	Very Likely	Greatest

Impact

The severity of the risk is also assessed qualitatively in terms of impact. The impact of a peat failure on the environment within and beyond the immediate wind farm site is assessed based on the potential travel distance of a peat failure. Where a peat failure enters a watercourse, it can travel a considerable distance downstream. Therefore, the proximity of a potential peat failure to a drainage course is a significant indicator of the likely potential impact.

The risk is determined based on the combination of hazard and impact. A qualitative scale has been derived for the impact of the hazard based on distance of infrastructure element to a watercourse (Table C).

The location of watercourses is based on topographic maps and supplemented by site observations from walkover survey. Note that not all watercourses are shown on maps.

Table C: Impact Scale

Scale	Criteria	Impact
1	Proposed infrastructure element greater than 150m of watercourse	Negligible/None
2	Proposed infrastructure element within 150 to 101m of watercourse	Low
3	Proposed infrastructure element within 100 to 51m of watercourse	Medium

Scale	Criteria	Impact
4	Proposed infrastructure element within 50 m of watercourse	High
5	Proposed infrastructure element within 50 m of watercourse, in an environmentally sensitive area	Extremely High

Risk Rating

The degree of risk is determined as the product of probability (P) and impact (I), which gives the Risk Rating (R) as follows:

The Risk Rating is calculated from: R = P x I

Due to the 5-point scales used to assess Probability and Impact, the Risk Rating can range from 1 to 25 as shown in Table D.

Table D: Qualitative Risk Rating

		Probability				
		1	**2**	**3**	**4**	**5**
Impact	**5**	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5

Risk Rating & Control Measures	
17 to 25	High: avoid working in area or significant control measures required
11 to 16	Medium: notable control measures required
5 to 10	Low: only routine control measures required
1 to 4	Negligible: none or only routine control measures required

The risk rating is calculated individually for each contributory factor. Control measures are required to reduce the risk to at least a 'Low' risk rating. The control measures in response to the qualitative risk ratings are included in the peat stability risk registers for each main infrastructure element in Appendix B.

The risk rating is calculated individually for each contributory factor. Control measures are required to reduce the risk to at least a 'Tolerable' risk rating.

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CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

APPENDIX E

Ground Investigation
(IDL, 2024)

IRISH DRILLING LIMITED

LOUGHREA, CO. GALWAY, IRELAND

CONTRACT DRILLING
SITE INVESTIGATION

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GANNOW WIND FARM

GROUND INVESTIGATION CONTRACT FACTUAL REPORT

FINAL

MKO,
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Dublin 11,
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	Prepared by	Approved by	Rev. Issue Date:	Revision No.
	Ronan Killeen	Declan Joyce	3rd December 2024	24 _G_131/01
Signature				

FOREWORD

The trial pit records have been compiled from an examination of the samples by a Geotechnical Engineer and from the Drillers' descriptions.

The report presents an opinion on the configuration of the strata within the site based on the trial pit results. The assumptions, though reasonable, are given for guidance only and no liability can be accepted for changes in conditions not revealed by the trial pits.

The fieldwork was carried out in accordance with IS EN 1997-2 and BS5930:2015+A1:2020 Code of Practice for Ground Investigations with precedence given to IS EN 1997-2 where applicable.

Contents:

1.0 Introduction.

Irish Drilling Ltd. (IDL) was instructed by Fehily Timoney & Co., Consulting Engineers on behalf of MKO to carry out a site investigation at the site of the proposed Gannow Wind Farm.

This site investigation was carried out to provide detailed geotechnical information of the underlying ground conditions at the proposed development.

The fieldwork commenced on October 7th 2024 and was completed on October 10th 2024.

2.0 The Site & Geology

The site is located near Attymon, County Galway.

The site is agricultural in nature and the fieldwork was carried out predominantly on farmlands, boglands and/or forested lands. Weather conditions in general were quite variable with the majority of the fieldwork carried out over a typical autumn period in Ireland.

The following were the main published information sources used:
Geological Map of Ireland: 1:500,000 scale map series.

Overview of Subsoil Geology

Peat: The deposition of peat occurred in post-glacial periods and is generally associated with the start of warmer and wetter climatic conditions. Peat is an unconsolidated usually dark brown to black organic material comprising a mixture of decomposed and undecomposed plant matter that accumulated in an acidic waterlogged environment. Peat has an extremely high-water content generally averaging over 90% by volume.

Glacial Till: Glacial Till is what was often referred to as Boulder Clay. It is a diverse material that is largely deposited sub-glacially and has a wide range of characteristics due to the variety of parent materials and different processes of deposition. Tills are tightly packed, unsorted, heterogeneous, unbedded, and can have a wide range of particle sizes and types, which are often but not exclusively angular or sub-angular.

The type of parent material plays a critical role in providing the particles that create different subsoil permeability with sandstones giving rise to a high proportion of sand sized grains in the till matrix.

Solid Geology
The Geological Map of Ireland: (GSI 1:100,000 scale map series) indicate that the site is predominantly underlain by limestone and shale rock of the Lucan Formation.

3.0 Fieldwork.

3.1 Fieldwork Plant:

The following plant was mobilised to site by IDL to carry out fieldwork operations:
1nr. Hitachi 13T Tracked Excavator.

Fieldwork carried out to date has included the following:

3.2 Fieldwork Operations:

A general summary of fieldwork operations carried out to date includes the following:

- Excavation of 12nr Trial Pits.

3.3 Trial Pits:

Twelve trial pits were excavated on site using a 13T tracked excavator.

The pits were logged and photographed by an Engineer with observations made on ground conditions, pit stability, water ingress and services encountered.

The pits were excavated to depths ranging from 1.50m to 4.20m below ground level.

Small and bulk disturbed soil samples were recovered at each change in strata and returned to the laboratory and presented for testing.

Detailed engineering logs for the trial pits completed are included with this report in Appendix 1.

3.4 General Summary:
The trial pit locations were set out on site using a Trimble CU Bluetooth GPS Surveying Unit and the co-ordinates are included on the logs presented in the appendices.

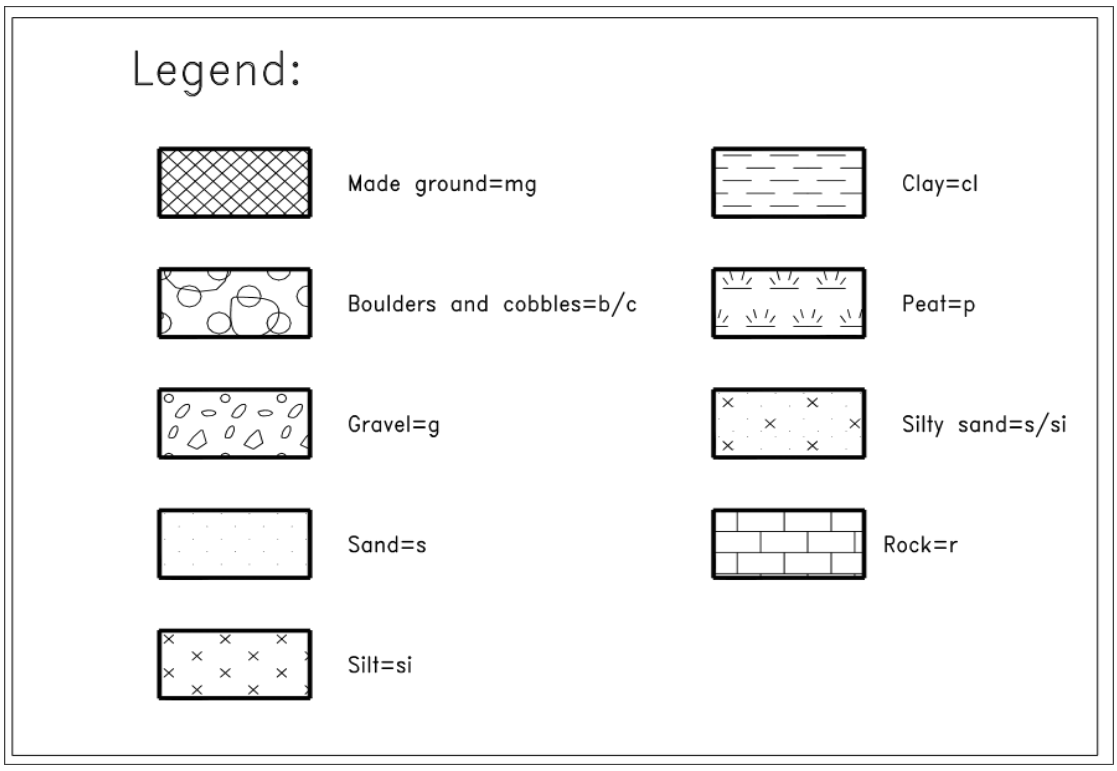
All fieldwork co-ordinates are reported to Irish Transverse Mercator (ITM) with Reduced Levels recorded relative to Malin Head Datum and with an accuracy level of + or – 0.10m.

Ground conditions encountered during the completion of the fieldwork were typical and as expected for this region and predominantly consisted of Peat and/or Glacial Tills.

The Glacial Tills in general consisted of slightly gravelly slightly sandy silt/clay with cobbles and boulders.

Soft brown peat was encountered in the pits to depths of up to 4.20m below ground level and for detailed descriptions of the ground conditions encountered please refer to the engineering logs which are included with this report in the Appendices.

The following Key Legend Table details the symbology used on the engineering logs to describe ground conditions encountered:



The fieldwork was carried out in accordance with IS EN 1997-2 and BS5930:2015+A1:2020 Code of Practice for Site Investigations with precedence given to IS EN 1997-2 where applicable.

4.0 Laboratory Testing

Representative samples recovered from the trial pits were scheduled for testing in the laboratory.

The test schedules were prepared by the client's representatives and included the following tests on bulk disturbed soil samples:

Test Type:	Number
Moisture Content	07
Atterberg Limit	07
Particle Size Distribution	05
Sedimentation	05
Organic Content	03
Chemical (Sulphate Total)	04

The test schedules were carried out predominantly at Structural Soils Laboratory, Bristol, UK.

Laboratory chemical tests were carried out by Envirolab, Hattersley, UK.

Soil samples (disturbed) in general were recovered from the excavation of trial pits.

The records of the laboratory test results are included with this report as Appendix 2.

The soil and rock descriptions as noted on the trial pit logs are in general visual descriptions as observed and logged by our Engineers and are described in accordance with IS EN 1997-2 and BS5930:2015+A1:2020 Code of Practice for Site Investigations.

Soils descriptions (cohesive or otherwise) are also initially assessed based on the texture and 'feel' of the soil materials as witnessed by our Geotechnical Engineers and in accordance with IS EN 1997-2 and BS5930:2015+A1:2020.

Where laboratory classification tests have been carried out on soil and/or rock samples then these visual descriptions have been amended accordingly to take into account the results of these classification tests.

The records of all fieldwork, laboratory test results and photographs are included in the appendices of this Report.

Ronan Killeen
Chartered Engineer
Irish Drilling Limited
December 3rd 2024

Appendix 1
Trial Pit Records

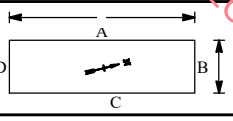
PROJECT: Gannow Wind Farm
LOCATION: Co Galway
TRIALPIT: TP-01
Sheet 1 of 1

CLIENT: MKO
ENGINEER: FTCO
Co-ordinates: E 560,015.9 N 729,604.6
Rig: Hitachi 130 Bogmaster
Rev:

Ground level: 71.47m O.D.
DATE: 7.10.24

GROUNDWATER
Water strikes: **Rose to after:**
1st: 1.40m 1min 1.40m
2nd: 3.00m 20min 2.95m
3rd:

PIT DIRECTION: 14°
PIT DIMENSION: 3.40m * 1.40
LOGGED BY: DK



Shoring/Support: N/A
Stability: Pit unstable. Sidewall collapse from 1.40m bgl.

Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) / In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	Instrument/ Backfill
0							71.37	0.10	TOPSOIL: Firm dark brown fibrous PEAT.	
									Spongy brown pseudo fibrous PEAT. H4 B2 F3 R2 W1 TV1 TH0 A2.	
1		1					70.07	1.40		
									Spongy dark brown pseudo fibrous PEAT. H5 B2 F3 R3 W2 TV0 TH0 A2.	
2										
3		2	B 1 D 2	3.00-3.20 3.00-3.20			68.47	3.00		
							68.07	3.40	Soft creamish white organic peaty SILT with many shell fragments.	
									END	
4										
5										
6										
7										
8										
9										
10										

Remarks: Seepage of water at 1.40m bgl. Ingress of water at 3.00m bgl. TP terminated at 3.00m bgl. Unable to keep TP open - sidewall collapse. TP backfilled with arisings.

Scale: 1:50

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TRIALPIT GANNOW WF FILE 1 OCT 22 2024.GPJ ID GINT AGS 4_0_4.GDT 3/12/24

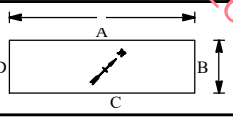
PROJECT: Gannow Wind Farm
LOCATION: Co Galway
TRIALPIT: TP-02
Sheet 1 of 1

CLIENT: MKO
ENGINEER: FTCO
Co-ordinates: E 560,274.1 N 729,328.7
Rig: Hitachi 130 Bogmaster
Rev:

Ground level: 67.99m O.D.
DATE: 7.10.24

GROUNDWATER
Water strikes: **Rose to after:**
1st: 1.50m 20min 1.00m
2nd:
3rd:

PIT DIRECTION: 45°
PIT DIMENSION: 3.60m * 1.50
LOGGED BY: DK



Shoring/Support: N/A
Stability: Pit unstable. Sidewall collapse from g/l.

Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) / In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	Instrument/ Backfill
0							67.79	0.20	MADE GROUND: Firm brown peaty SILT/CLAY with fragments of plastic.	
			B 1 D 2	0.50-1.00 0.50-1.00					Very soft creamish white slightly gravelly sandy organic SILT with many shell fragments.	
1		1					66.49	1.50		
		1							END	
2										
3										
4										
5										
6										
7										
8										
9										
10										

Remarks: Ingress of surface water. Ingress of water at 1.50m bgl. TP terminated at 1.50m bgl. Unable to keep TP open - sidewall collapse. TP backfilled with arisings.

Scale: 1:50

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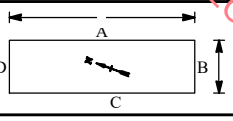
PROJECT: Gannow Wind Farm
LOCATION: Co Galway
TRIALPIT: TP-03
Sheet 1 of 1

CLIENT: MKO
ENGINEER: FTCO
Co-ordinates: E 560,748.3 N 729,940.7
Rig: Hitachi 130 Bogmaster
Rev:

Ground level: 72.10m O.D.
DATE: 7.10.24

GROUNDWATER
Water strikes: **Rose to after:**
1st: 2.50m 20min 2.41m
2nd:
3rd:

PIT DIRECTION: 160°
PIT DIMENSION: 4.10m * 1.50
LOGGED BY: DK



Shoring/Support: N/A
Stability: Pit moderately stable.

Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) / In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	Instrument/ Backfill
0							72.00	0.10	TOPSOIL: Firm brown fibrous PEAT with roots.	
									Spongy brown pseudo fibrous PEAT. H4 B2 F3 R1 W0 TV0 TH1 A0.	
1							70.85	1.25		
									Spongy dark brown pseudo fibrous PEAT. H5 B2 F3 R2 W1 TV1 TH0 A1.	
2		1								
3							68.20	3.90		
4							67.90	4.20	Plastic brown amorphous PEAT. H8 B1 F3 R2 W1 TV1 TH0 A0. 4.20m bgl: soft creamish white organic SILT.	
			B 1 D 2	4.20 4.20		END				
5										
6										
7										
8										
9										
10										

Remarks: Ingress of water at 2.50m bgl. TP terminated at 4.20m bgl. Maximum reach of excavator. TP backfilled with arisings.

Scale: 1:50

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TRIALPIT GANNOW WF FILE 1 OCT 22 2024.GPJ ID GINT AGS 4_0_4.GDT 3/12/24

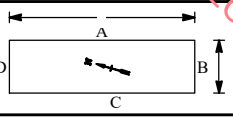
PROJECT: Gannow Wind Farm
LOCATION: Co Galway
TRIALPIT: TP-04
Sheet 1 of 1

CLIENT: MKO
ENGINEER: FTCO
Co-ordinates: E 561,821.1 N 729,852.2
Rig: Hitachi 130 Bogmaster
Rev:

Ground level: 76.20m O.D.
DATE: 9.10.24

GROUNDWATER
Water strikes:
1st: 0.20m **Rose to after:** 1min 0.20m
2nd:
3rd:

PIT DIRECTION: 164°
PIT DIMENSION: 4.20m * 1.50
LOGGED BY: DK



Shoring/Support: N/A
Stability: Pit unstable. Sidewall collapse from g/l.

Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) / In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	Instrument/ Backfill
0							76.10	0.10	TOPSOIL: Soft brown peaty CLAY.	
							76.00	0.20	Firm white silty gravelly CLAY. Gravel is subrounded to subangular fine to coarse of limestone.	
			D 1	0.50-1.00					Soft brown mottled grey slightly gravelly SILT/CLAY with frequent cobbles. Cobbles are rounded to subrounded of limestone.	
1							75.00	1.20		
			B 2	1.50-2.00					Soft light grey slightly gravelly very sandy SILT/CLAY with frequent cobbles and rare boulders. Gravel is subrounded to subangular fine to coarse of limestone. Cobbles are rounded to subrounded of limestone. Boulders are rounded to subrounded of limestone.	
			D 3	1.50-2.00						
2							73.80	2.40		
			B 4	2.50-2.70					Stiff light brown silty gravelly SILT/CLAY with frequent cobbles. Gravel is subrounded to subangular fine to coarse of limestone. Cobbles are rounded to subrounded of limestone.	
			D 5	2.50-2.70			73.50	2.70		
							END			
3										
4										
5										
6										
7										
8										
9										
10										

Remarks: Seepage of water at 0.20m bgl. TP terminated at 2.70m bgl. Unable to keep TP open - sidewall collapse. TP backfilled with arisings.

Scale: 1:50

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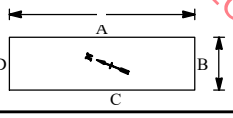
TRIALPIT GANNOW WF FILE 1 OCT 22 2024.GPJ ID GINT AGS 4_0_4.GDT 3/12/24

PROJECT: Gannow Wind Farm	**TRIALPIT:** TP-05
LOCATION: Co Galway	**Sheet** 1 of 1
CLIENT: MKO	**Co-ordinates:** E 562,134.8 N 729,568.0
ENGINEER: FTCO	**Rig:** Hitachi 130 Bogmaster
Ground level: 72.05m O.D.	**Rev:**
GROUNDWATER	**DATE:** 9.10.24
Water strikes: Rose to after:	**PIT DIRECTION:** 158°
1st: 0.70m 1min 0.70m	**PIT DIMENSION:** 3.60m * 1.50
2nd: 1.70m 20min 1.69m	**LOGGED BY:** DK
3rd:	Shoring/Support: N/A
	Stability: Pit unstable. Sidewall collapse from 1.70m bgl.



Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) / In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	Instrument/ Backfill
0							71.85	0.20	TOPSOIL: Soft brown peaty CLAY with rootlets.	
							71.35	0.70	Spongy brown pseudo fibrous PEAT. H5 B2 F3 R1 W0 TV1 TH0 A0.	
1			B 1 D 2	1.00-1.50 1.00-1.50			70.35	1.70	Soft grey silty gravelly CLAY with frequent cobbles. Gravel is subrounded to subangular fine to coarse of limestone. Cobbles are rounded to subrounded of limestone.	
2			B 3 D 4	2.00-2.30 2.00-2.30			69.75	2.30	Soft grey slightly sandy gravelly SILT with frequent cobbles and occasional boulders. Gravel is subrounded to subangular fine to coarse of limestone. Cobbles are rounded to subrounded of limestone. Boulders are rounded to subrounded of limestone.	
			B 5 D 6	2.50-2.80 2.50-2.80			69.25	2.80	Stiff light brown silty gravelly SILT/CLAY with frequent cobbles and frequent boulders. Gravel is subrounded to subangular fine to coarse of limestone. Cobbles are rounded to subrounded of limestone. Boulders are rounded to subrounded of limestone.	
3									END	
4										
5										
6										
7										
8										
9										
10										

Remarks: Seepage of water at 0.70m bgl. Ingress of water at 1.70m bgl. TP terminated at 2.80m bgl. Obstruction as boulders. TP backfilled with arisings.

Scale: 1:50

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TRIALPIT GANNOW WF FILE 1 OCT 22 2024.GPJ ID GINT AGS 4_0_4.GDT 3/12/24

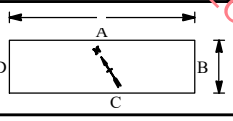
PROJECT: Gannow Wind Farm
LOCATION: Co Galway
TRIALPIT: TP-06
Sheet 1 of 1

CLIENT: MKO
ENGINEER: FTCO
Co-ordinates: E 562,649.5 N 729,606.2
Rig: Hitachi 130 Bogmaster
Rev:

Ground level: 76.12m O.D.
DATE: 9.10.24

GROUNDWATER
Water strikes:
1st: 0.50m **Rose to after:** 1min 0.50m
2nd:
3rd:

PIT DIRECTION: 122°
PIT DIMENSION: 3.60m * 1.50
LOGGED BY: DK



Shoring/Support: N/A
Stability: Pit unstable. Sidewall collapse from 0.50m bgl.

Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) / In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	Instrument/ Backfill
0							75.99	0.13	TOPSOIL: Soft brown peaty CLAY.	
		11	B 1 D 2	0.50-1.00 0.50-1.00					Soft damp light grey silty gravelly SILT/CLAY with frequent cobbles. Gravel is subrounded to subangular fine to coarse of limestone. Cobbles are rounded to subrounded of limestone.	
1										
2			B 3 D 4	2.10-2.40 2.10-2.40			74.02	2.10	Stiff grey silty gravelly CLAY with frequent cobbles and occasional boulders. Gravel is subrounded to subangular fine to coarse of limestone. Cobbles are rounded to subrounded of limestone. Boulders are rounded to subrounded of limestone.	
							73.72	2.40	**END**	
3										
4										
5										
6										
7										
8										
9										
10										

Remarks: Seepage of water at 0.50m bgl. TP terminated at 2.40m bgl. Obstruction as boulders. TP backfilled with arisings.

Scale: 1:50

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TRIALPIT GANNOW WF FILE 1 OCT 22 2024.GPJ ID GINT AGS 4_0_4.GDT 3/12/24

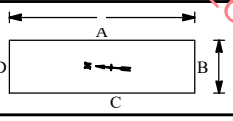
PROJECT: Gannow Wind Farm
LOCATION: Co Galway
TRIALPIT: TP-07
Sheet 1 of 1

CLIENT: MKO
ENGINEER: FTCO
Co-ordinates: E 563,079.3 N 729,522.2
Rig: Hitachi 130 Bogmaster
Rev:

Ground level: 73.54m O.D.
DATE: 9.10.24

GROUNDWATER
Water strikes:
1st: 0.30m **Rose to after:** 1min 0.30m
2nd:
3rd:

PIT DIRECTION: 175°
PIT DIMENSION: 4.30m * 1.50
LOGGED BY: DK



Shoring/Support: N/A
Stability: Pit unstable. Sidewall collapse from g/l.

Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) / In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	Instrument/ Backfill
0							73.44	0.10	TOPSOIL: Soft brown peaty CLAY.	
							73.24	0.30	Spongy brown pseudo fibrous PEAT. H4 B2 F2 R1 W0 TV0 TH1 A0.	
			B 1 D 2	0.50-1.00 0.50-1.00					Soft damp light grey slightly sandy gravelly SILT with frequent cobbles and occasional boulders. Gravel is subrounded to subangular fine to coarse of limestone. Cobbles are rounded to subrounded of limestone. Boulders are rounded to subrounded of limestone.	
1										
			B 3 D 4	1.50-2.00 1.50-2.00						
2							70.94	2.60		
									END	
3										
4										
5										
6										
7										
8										
9										
10										

Remarks: Seepage of water at 0.30m bgl. TP terminated at 2.60m bgl. Unable to keep TP open - sidewall collapse. TP backfilled with arisings. Location re-seeded.

Scale: 1:50

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TRIALPIT GANNOW WF FILE 1 OCT 22 2024.GPJ ID GINT AGS 4_0_4.GDT 3/12/24

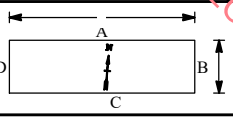
PROJECT: Gannow Wind Farm
LOCATION: Co Galway
TRIALPIT: TP-08
Sheet 1 of 1

CLIENT: MKO
ENGINEER: FTCO
Co-ordinates: E 562,436.9 N 729,057.1
Rig: Hitachi 130 Bogmaster
Rev:

Ground level: 69.18m O.D.
DATE: 10.10.24

GROUNDWATER
Water strikes:
1st: 1.00m **Rose to after:** 20min 0.98m
2nd:
3rd:

PIT DIRECTION: 85°
PIT DIMENSION: 3.80m * 1.50
LOGGED BY: DK



Shoring/Support: N/A
Stability: Pit unstable. Sidewall collapse from 0.50m bgl.

Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) / In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	Instrument/ Backfill
0							68.88	0.30	TOPSOIL: Soft brown peaty CLAY.	
			B 1 D 2	0.50-1.00 0.50-1.00			68.68	0.50	Stiff light grey silty gravelly CLAY. Gravel is subrounded to subangular fine to coarse of limestone.	
1									Soft damp grey slightly gravelly sandy CLAY with frequent cobbles and occasional boulders. Sand is coarse. Gravel is subrounded to subangular fine to coarse of limestone. Cobbles are rounded to subrounded of limestone. Boulders are rounded to subrounded of limestone.	
			B 3 D 4	1.50-2.00 1.50-2.00					1.50m: grey silty very sandy GRAVEL.	
2							66.88	2.30	END	
3										
4										
5										
6										
7										
8										
9										
10										

Remarks: Ingress of water at 1.00m bgl. TP terminated at 2.30m bgl. Obstruction as boulders. TP backfilled with arisings.

Scale: 1:50

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TRIALPIT GANNOW WF FILE 1 OCT 22 2024.GPJ ID GINT AGS 4_0_4.GDT 3/12/24

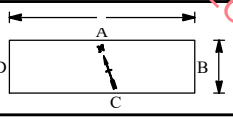
PROJECT: Gannow Wind Farm
LOCATION: Co Galway
TRIALPIT: TP-09
Sheet 1 of 1

CLIENT: MKO
ENGINEER: FTCO
Co-ordinates: E 560,401.5 N 729,781.8
Rig: Hitachi 130 Bogmaster
Rev:

Ground level: 71.69m O.D.
DATE: 7.10.24

GROUNDWATER
Water strikes:
1st: 0.80m **Rose to after:** 1min 0.80m
2nd:
3rd:

PIT DIRECTION: 109°
PIT DIMENSION: 3.80m * 1.50
LOGGED BY: DK



Shoring/Support: N/A
Stability: Pit unstable. Sidewall collapse from 1.00m bgl.

Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) / In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	Instrument/ Backfill
0							71.49	0.20	TOPSOIL: Firm brown fibrous PEAT.	
									Spongy brown pseudo fibrous PEAT. H4 B2 F2 R2 W0 TV1 TH0 A0.	
							70.69	1.00		
1			B 1 D 2	1.00-1.50 1.00-1.50					Soft damp dark grey silty gravelly CLAY with occasional cobbles. Gravel is subrounded to subangular coarse of limestone. Cobbles are rounded to subrounded of limestone.	
2			B 3 D 4	2.00-2.50 2.00-2.50						
							68.89	2.80		
3						END				
4										
5										
6										
7										
8										
9										
10										

Remarks: Seepage of water at 0.80m bgl. TP terminated at 2.80m bgl. Unable to keep TP open - sidewall collapse. TP backfilled with arisings.

Scale: 1:50

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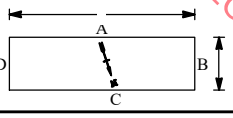
PROJECT: Gannow Wind Farm
LOCATION: Co Galway
TRIALPIT: TP-10
Sheet 1 of 1

CLIENT: MKO
ENGINEER: FTCO
Co-ordinates: E 559,620.7 N 729,956.7
Rig: Hitachi 130 Bogmaster
Rev:

Ground level: 76.10m O.D.
DATE: 10.10.24

GROUNDWATER
Water strikes:
1st: 1.60m Rose to after: 20min 1.50m
2nd:
3rd:

PIT DIRECTION: 288°
PIT DIMENSION: 3.50m * 1.50
LOGGED BY: DK



Shoring/Support: N/A
Stability: Pit moderately stable.

Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) / In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	Instrument/ Backfill
0							75.95	0.15	TOPSOIL: Soft brown peaty CLAY.	
							75.66	0.44	Spongy brown pseudo fibrous PEAT. H4 B2 F3 R1 W0 TV1 TH0 A0.	
			B 1 D 2	0.50-1.00 0.50-1.00					Firm grey silty gravelly CLAY with frequent cobbles. Gravel is subrounded to subangular fine to coarse of limestone. Cobbles are rounded to subrounded of limestone.	
1							74.80	1.30		
		1	B 3 D 4	1.30-1.60 1.30-1.60			74.50	1.60	Soft dark grey slightly sandy gravelly SILT with frequent cobbles. Sand is coarse. Gravel is subangular to subrounded fine to coarse of limestone. Cobbles are angular to subangular of dark grey limestone.	
									END	
2										
3										
4										
5										
6										
7										
8										
9										
10										

Remarks: Ingress of water at 1.60m bgl. TP terminated at 1.60m bgl. Obstruction as possible rock. TP backfilled with arisings.

Scale: 1:50

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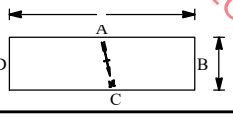
TRIALPIT GANNOW WF FILE 1 OCT 22 2024.GPJ ID GINT AGS 4_0_4.GDT 3/12/24

PROJECT: Gannow Wind Farm	**TRIALPIT:** TP-11
LOCATION: Co Galway	**Sheet** 1 of 1
CLIENT: MKO	**Co-ordinates:** E 559,661.7 N 729,943.4
ENGINEER: FTCO	**Rig:** Hitachi 130 Bogmaster
Ground level: 75.98m O.D.	**Rev:**
GROUNDWATER	**DATE:** 10.10.24
Water strikes: 1st: 1.60m Rose to after: 1min 1.60m 2nd: 3rd:	**PIT DIRECTION:** 282°
	PIT DIMENSION: 3.90m * 1.50
	LOGGED BY: DK



Shoring/Support: N/A
Stability: Pit moderately stable.

Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) / In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	Instrument/ Backfill
0							75.88	0.10	TOPSOIL: Soft brown peaty CLAY.	
							75.78	0.20	MADE GROUND: Firm grey silty gravelly CLAY with occasional cobbles. Gravel is subrounded to rounded of limestone. Cobbles are rounded to subrounded of limestone.	
							75.48	0.50	Spongy brown pseudo fibrous PEAT. H4 B2 F2 R1 W0 TV0 TH1 A0.	
			B 1	0.50-1.00						
1			D 2	0.50-1.00					Firm grey silty gravelly CLAY with frequent cobbles. Gravel is subrounded to subangular fine to coarse of limestone. Cobbles are angular to subangular of dark grey limestone.	
			B 3	1.00-1.50						
			D 4	1.00-1.50						
		11					74.38	1.60		
							END			
2										
3										
4										
5										
6										
7										
8										
9										
10										

Remarks: Seepage of water at 1.60m bgl. TP terminated at 1.60m bgl. Obstruction as possible rock. TP backfilled with arisings.

Scale: 1:50

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TRIALPIT GANNOW WF FILE 1 OCT 22 2024.GPJ ID GINT AGS 4_0_4.GDT 3/12/24

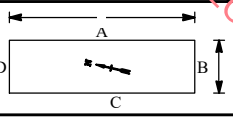
PROJECT: Gannow Wind Farm
LOCATION: Co Galway
TRIALPIT: TP-12
Sheet 1 of 1

CLIENT: MKO
ENGINEER: FTCO
Co-ordinates: E 561,693.6 N 730,021.7
Rig: Hitachi 130 Bogmaster
Rev:

Ground level: 77.48m O.D.
DATE: 8.10.24

GROUNDWATER
Water strikes: **Rose to after:**
1st: dry
2nd:
3rd:

PIT DIRECTION: 167°
PIT DIMENSION: 4.20m * 1.50
LOGGED BY: DK



Shoring/Support: N/A
Stability: Pit unstable. Sidewall collapse from 0.30m to 1.70m bgl.

Depth (m)	Date	Water	Samples	Depth (m)	SPT (N) / In Situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	Instrument/ Backfill
0							77.38	0.10	TOPSOIL: Firm brown silty CLAY.	
							77.18	0.30	Stiff white silty gravelly CLAY. Gravel is subrounded to subangular of limestone.	
			B 1	0.50-1.00					Firm yellow mottled white silty gravelly CLAY with frequent cobbles and occasional boulders. Gravel is subrounded to subangular fine to coarse of limestone. Cobbles are rounded to subrounded of limestone. Boulders are rounded to subrounded of limestone.	
			D 2	0.50-1.00						
1							76.18	1.30		
									Soft light brown slightly sandy gravelly SILT with occasional cobbles. Gravel is subrounded to subangular fine to coarse of limestone. Cobbles are rounded to subrounded of limestone.	
2			B 3	2.00-2.50						
			D 4	2.00-2.50						
							74.58	2.90		
3			B 5	3.00-3.50					Stiff light brown silty gravelly CLAY with occasional cobbles. Gravel is subrounded to subangular fine to coarse of limestone. Cobbles are rounded to subrounded of limestone.	
			D 6	3.00-3.50			73.98	3.50		
							END			
4										
5										
6										
7										
8										
9										
10										

Remarks: TP dry on excavation. TP terminated at 3.50m bgl. Obstruction. TP backfilled with arisings.

Scale: 1:50

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TRIALPIT GANNOW WF FILE 1 OCT 22 2024.GPJ ID GINT AGS 4_0_4.GDT 3/12/24

Appendix 2
Laboratory Test Results

Project ID	2024G131
Project Name	Gannow Wind Farm
Schedule ID	2024G131_1
Client	MKO
Report Date	29/11/2024 09:42
Scheduled Date	23/10/2024 08:49
Remarks	

Sample Details							Classification						Chemical / Concrete								Compaction					Compressibility				Strength (Total)									Stregth (Effective			Rock	
Location	Depth (m)	Base Depth	Sample Type	Sample Ref	Date Sampled	Storage	Moisture Content	Atterberg 4 Point	Particle Density by Gas Jar	Particle Density by Small Pykhometer	Particle Size Distribution	Hydrometer	Organic Content	Loss On Ignition	Sulphate Total	Sulphate Water Gravimetric	Carbonate Titration	ph	Chloride Content	Chloride Content Acid	Compaction Light	Compaction Heavy	Compaction Vibrating Hammer	Moisture Condition Value	Moisture Condition Relationship	CBR	Consolidation	Pressures	Swelling Pressure Test	Laboratory Vane test	Small Direct Shearbox	Ring shear Test	Triaxial Quick Undrained	(Specify Cell Pressure)	Triaxial UU Multi Stage	Triaxial UU Multi Specimen	Consolidated Drained Triaxial Test	Consolidated Undrained Triaxial	Consolidated Undrained Triaxial	Rock Uniaxial compression	Point Load
TP-01	3.00	3.20	B	1	07/10/24																																				
TP-01	3.00	3.20	D	2	07/10/24		1	1																																	
TP-02	0.50	1.00	B	1	07/10/24						1	1																														
TP-02	0.50	1.00	D	2	07/10/24		1	1					1																												
TP-03	4.20		B	1	07/10/24						1	1																														
TP-03	4.20		D	2	07/10/24																																				
TP-04	0.50	1.00	D	1	09/10/24																																				
TP-04	1.50	2.00	B	2	09/10/24																																				
TP-04	1.50	2.00	D	3	09/10/24																																				
TP-04	2.50	2.70	B	4	09/10/24										1																											
TP-04	2.50	2.70	D	5	09/10/24																																				
TP-05	1.00	1.50	B	1	09/10/24																																				
TP-05	1.00	1.50	D	2	09/10/24																																				
TP-05	2.00	2.30	B	3	09/10/24																																				
TP-05	2.00	2.30	D	4	09/10/24		1	1																																	
TP-05	2.50	2.80	B	5	09/10/24																																				
TP-05	2.50	2.80	D	6	09/10/24																																				
TP-06	0.50	1.00	B	1	09/10/24																																				
TP-06	0.50	1.00	D	2	09/10/24																																				
TP-06	2.10	2.40	B	3	09/10/24						1	1																														
TP-06	2.10	2.40	D	4	09/10/24																																				
TP-07	0.50	1.00	B	1	09/10/24																																				
TP-07	0.50	1.00	D	2	09/10/24																																				
TP-07	1.50	2.00	B	3	09/10/24																																				
TP-07	1.50	2.00	D	4	09/10/24		1	1																																	
TP-08	0.50	1.00	B	1	10/10/24																																				
TP-08	0.50	1.00	D	2	10/10/24																																				
TP-08	1.50	2.00	B	3	10/10/24						1	1			1																											
TP-08	1.50	2.00	D	4	10/10/24		1	1					1																												
TP-09	1.00	1.50	B	1	07/10/24																																				
TP-09	1.00	1.50	D	2	07/10/24																																				
TP-09	2.00	2.50	B	3	07/10/24																																				
TP-09	2.00	2.50	D	4	07/10/24																																				
TP-10	0.50	1.00	B	1	10/10/24																																				
TP-10	0.50	1.00	D	2	10/10/24																																				
TP-10	1.30	1.60	B	3	10/10/24								1																													
TP-10	1.30	1.60	D	4	10/10/24		1	1																																	

0 = test scheduled,
1 = test completed as scheduled,
0* = sample not suitable for scheduled test

Project ID	2024G131
Project Name	Gannow Wind Farm
Schedule ID	2024G131_1

Client	MKO
Report Date	29/11/2024 09:42
Scheduled Date	23/10/2024 08:49

Remarks

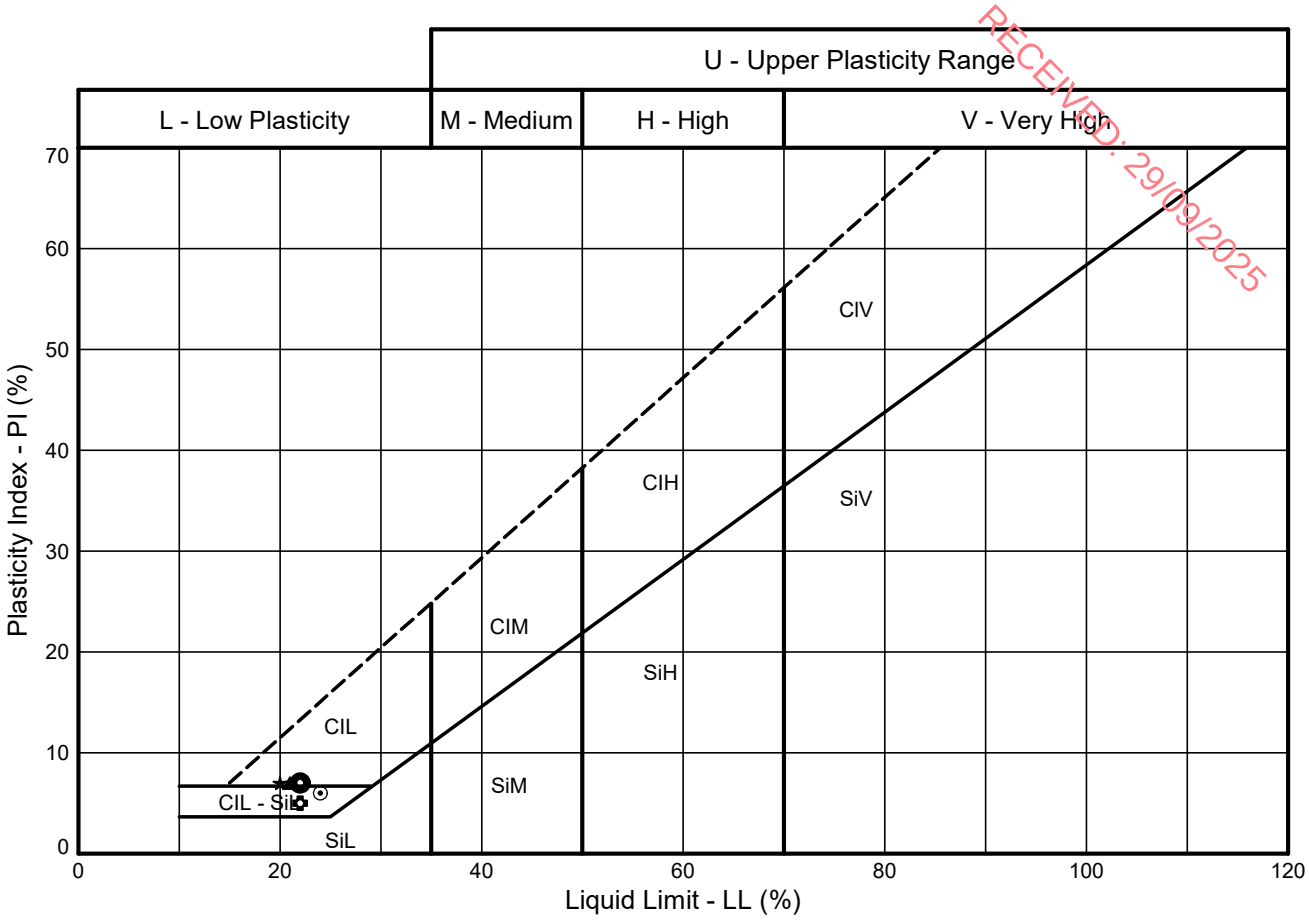
Sample Details							Classification						Chemical / Concrete							Compaction					Compressibility				Strength (Total)									Stregth (Effective			Rock	
Location	Depth (m)	Base Depth	Sample Type	Sample Ref	Date Sampled	Storage	Moisture Content	Atterberg 4 Point	Particle Density by Gas Jar	Particle Density by Small Pykhometer	Particle Size Distribution	Hydrometer	Organic Content	Loss On Ignition	Sulphate Total	Sulphate Water Gravimetric	Carbonate Titration	ph	Chloride Content	Chloride Content Acid	Compaction Light	Compaction Heavy	Compaction Vibrating Hammer	Moisture Condition Value	Moisture Condition Relationship	CBR	Consolidation	Pressures	Swelling Pressure Test	Laboratory Vane test	Small Direct Shearbox	Ring shear Test	Triaxial Quick Undrained	(Specify Cell Pressure)	Triaxial UU Multi Stage	Triaxial UU Multi Specimen	Consolidated Drained Triaxial Test	Consolidated Undrained Triaxial	Consolidated Undrained Triaxial	Rock Uniaxial compression	Point Load
TP-11	0.50	1.00	B	1	10/10/24																																				
TP-11	0.50	1.00	D	2	10/10/24																																				
TP-11	1.00	1.50	B	3	10/10/24						1	1																													
TP-11	1.00	1.50	D	4	10/10/24										1																										
TP-12	0.50	1.00	B	1	08/10/24																																				
TP-12	0.50	1.00	D	2	08/10/24																																				
TP-12	2.00	2.50	B	3	08/10/24																																				
TP-12	2.00	2.50	D	4	08/10/24		1	1																																
TP-12	3.00	3.50	B	5	08/10/24																																				
TP-12	3.00	3.50	D	6	08/10/24										1																										
Tests completed							7	7	0	0	5	5	3	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Tested in Structural Soils under job Ref: 752113 and Envirolab ref 24/11190

0 = test scheduled,
1 = test completed as scheduled,
0* = sample not suitable for scheduled test

PI vs LL CHART

According to BS EN 14688-2:2018
Testing in accordance with BS EN ISO 17892-12:2018+A2:2022



Sample Identification				Test Method #	Preparation Method +	WC %	LL %	PL %	PI %	<425µm %	Lab location	Notes
	Exploratory Position ID	Sample	Depth (m)									
	TP-01	2D	3.00	5.3/5.5/6.5	5.2.1	286	237	115	122	88	B	D
	TP-02	2D	0.50	5.3/5.5/6.5	5.2.1	169	137	77	60	93	B	I
▲	TP-05	4D	2.00	5.3/5.5/6.5	5.2.7	12.4	21	14	7	62	B	I
★	TP-07	4D	1.50	5.3/5.5/6.5	5.2.7	10.4	20	13	7	59	B	I
⊙	TP-08	4D	1.50	5.3/5.5/6.5	5.2.7	18.8	24	18	6	36	B	I
✿	TP-10	4D	1.30	5.3/5.5/6.5	5.2.7	12.1	22	17	5	58	B	I
●	TP-12	4D	2.00	5.3/5.5/6.5	5.2.7	14.2	22	15	7	56	B	I

Tested in accordance with the following clauses of BS EN ISO 17892-12:2018+A2:2022
5.3 - Cone Penetrometer Method; 5.3.14 - One-Point Cone Penetrometer Method (factors are from Table 1, BS 1377-2:2022);
5.4 - Casagrande Method; 5.5 - Plastic Limit Method; 6.5 - Plasticity Index
Water Content (WC) tested in accordance with BS EN ISO 17892-1:2014+A1:2022
+ Tested in accordance with the following clauses of BS EN ISO 17892-12:2018+A2:2022
5.2.1 - Natural State and 5.2.7 - Wet Sieved

Key: * = Non-standard test, NP = Non plastic, I = Increasing WC, D = Decreasing WC.

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tunbridge (TN2 3DR)

STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By		Date
Francesca Bennett	FRANCESCA BENNETT	28/11/24

Contract	Contract Ref:
Gannow Wind Farm	**752113**

SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with Part 1,Part 12 of BS EN ISO 17892

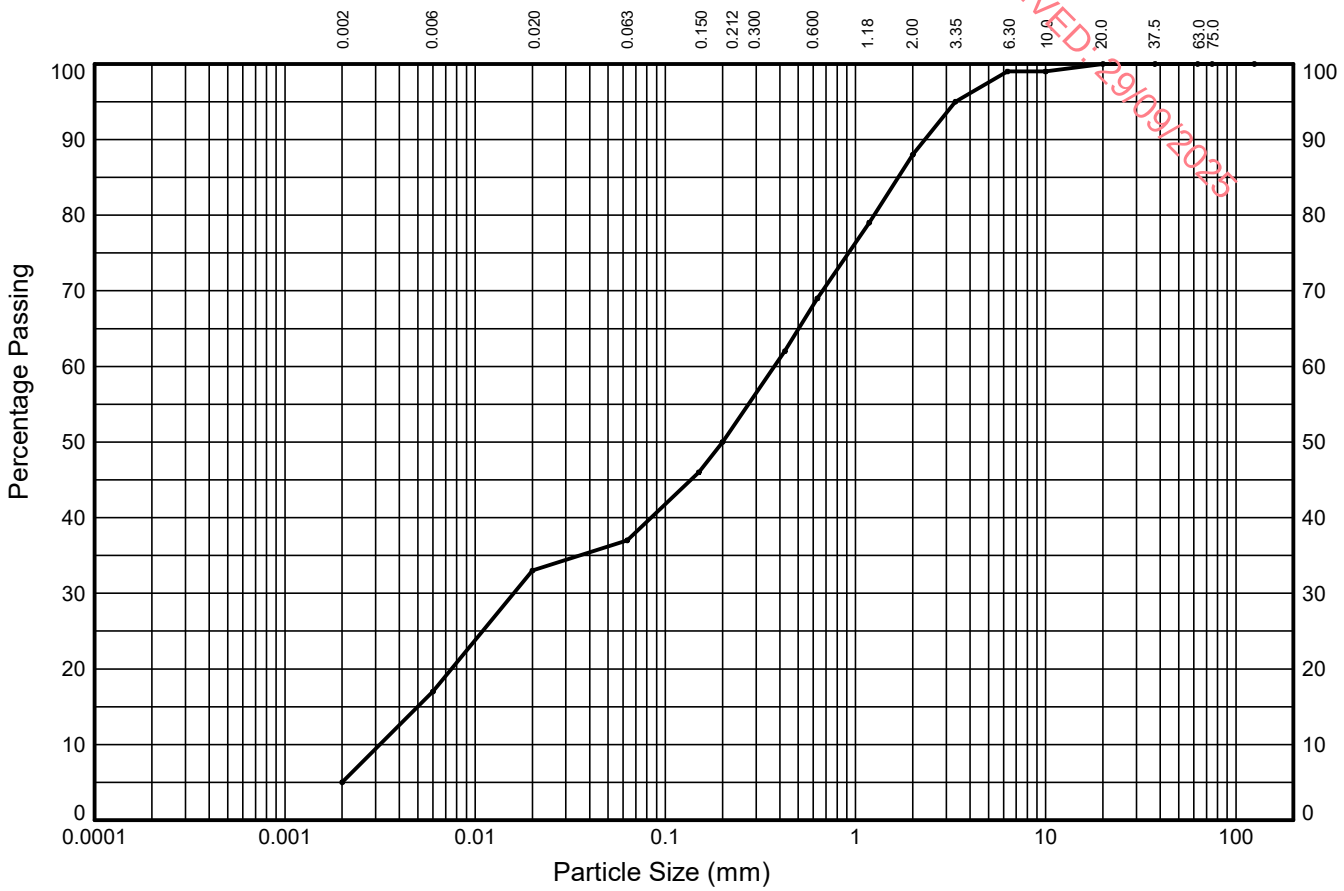
Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Water Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425um	Description of Sample
TP-01	2	D	3.00	286	237	115	122	88	Black and grey silty PEAT
TP-02	2	D	0.50	169	137	77	60	93	Creamish brown slightly gravelly sandy organic SILT
TP-05	4	D	2.00	12.4	21	14	7	62	Grey slightly sandy gravelly SILT
TP-07	4	D	1.50	10.4	20	13	7	59	Grey slightly sandy gravelly SILT
TP-08	4	D	1.50	18.8	24	18	6	36	Grey very sandy silty GRAVEL
TP-10	4	D	1.30	12.1	22	17	5	58	Grey slightly sandy gravelly SILT
TP-12	4	D	2.00	14.2	22	15	7	56	Grey slightly sandy gravelly SILT

SYMBOLS: * denotes BS 1377

PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 5.2, 5.3 of BS EN ISO 17892:Part 4:2016

Trial Pit: **TP-02** Sample Ref: **1** Sample Type: **B** Depth (m): **0.50**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	12%	16%	4%	13%	19%	19%	11%	1%	0%	
	SILT			SAND			GRAVEL			
5%	32%			51%			12%			0%

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**100**
20.0	**100**
10.0	**99**
6.30	**99**
3.35	**95**
2.00	**88**
1.18	**79**
0.630	**69**
0.425	**62**
0.200	**50**
0.150	**46**
0.063	**37**

Particle Diameter (mm)	Percent Passing (%)
0.02	**33**
0.006	**17**
0.002	**5**

Sedimentation sample was not pre-treated

Coefficients	
D_{10} (mm)	**0.003**
D_{15} (mm)	**0.005**
D_{30} (mm)	**0.016**
D_{50} (mm)	**0.200**
D_{60} (mm)	**0.375**
D_{85} (mm)	**1.677**
D_{90} (mm)	**2.318**
C_U	**119**
C_C	**0.21**

Soil Description:

Creamish brown slightly gravelly sandy organic SILT

Key: C_U = Uniformity coefficient. C_C = Coefficient of curvature as defined in BS EN ISO 14688-2:2018

STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By		Date
Francesca Bennett	FRANCESCA BENNETT	28/11/24

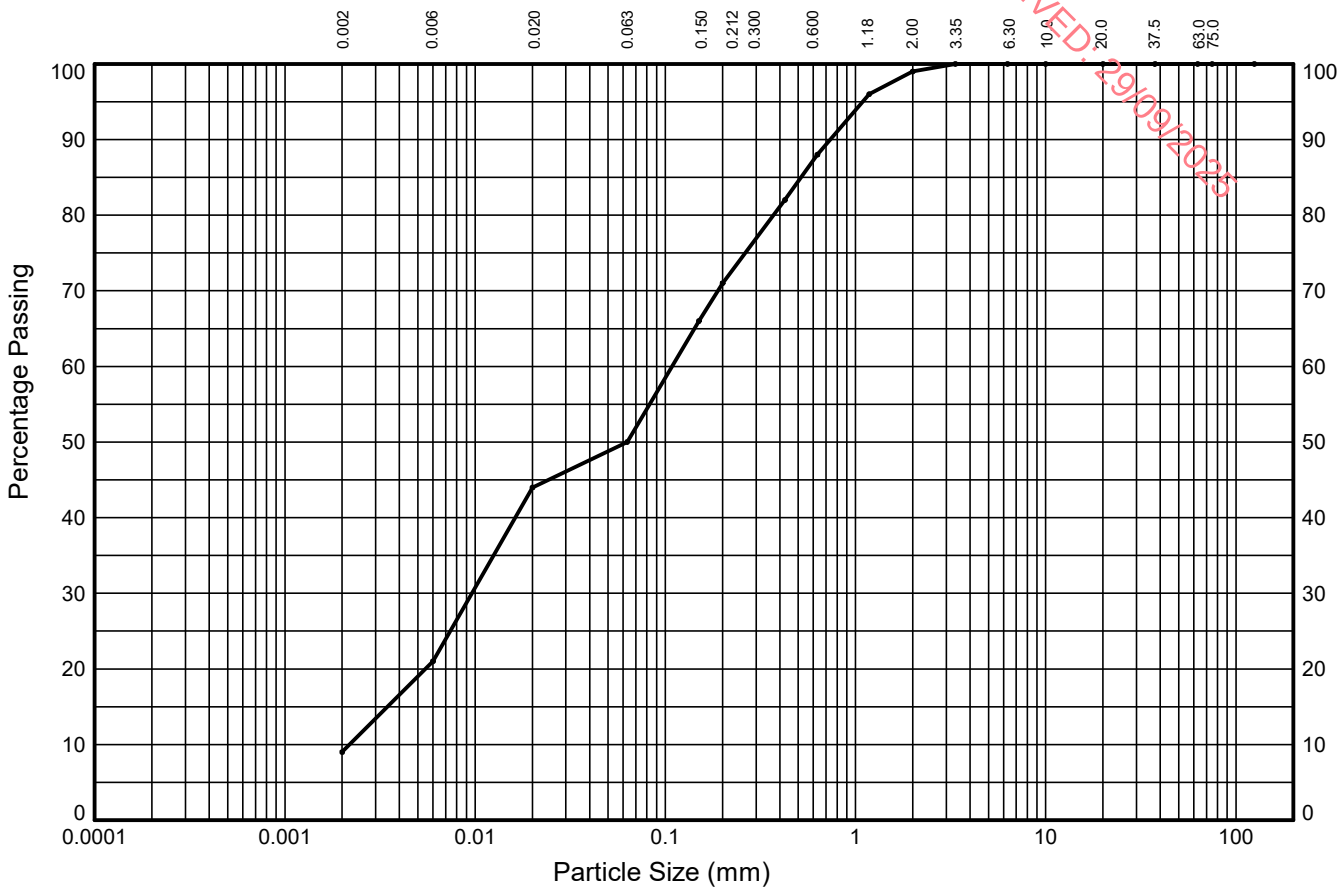
Contract	Contract Ref:
Gannow Wind Farm	**752113**

AGS

PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 5.2, 5.3 of BS EN ISO 17892:Part 4:2016

Trial Pit: **TP-03** Sample Ref: **1** Sample Type: **B** Depth (m): **4.20**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	12%	23%	6%	21%	17%	11%	1%	0%	0%	
	SILT			SAND			GRAVEL			
9%	41%			49%			1%			0%

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**100**
20.0	**100**
10.0	**100**
6.30	**100**
3.35	**100**
2.00	**99**
1.18	**96**
0.630	**88**
0.425	**82**
0.200	**71**
0.150	**66**
0.063	**50**

Particle Diameter (mm)	Percent Passing (%)
0.02	**44**
0.006	**21**
0.002	**9**

Sedimentation sample was not pre-treated

Coefficients	
D_{10} (mm)	**0.002**
D_{15} (mm)	**0.003**
D_{30} (mm)	**0.010**
D_{50} (mm)	**0.063**
D_{60} (mm)	**0.108**
D_{85} (mm)	**0.517**
D_{90} (mm)	**0.737**
C_U	**49**
C_C	**0.39**

Soil Description:

Grey slightly gravelly sandy organic SILT

Key: C_U = Uniformity coefficient. C_C = Coefficient of curvature as defined in BS EN ISO 14688-2:2018

STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By		Date
Francesca Bennett	FRANCESCA BENNETT	28/11/24

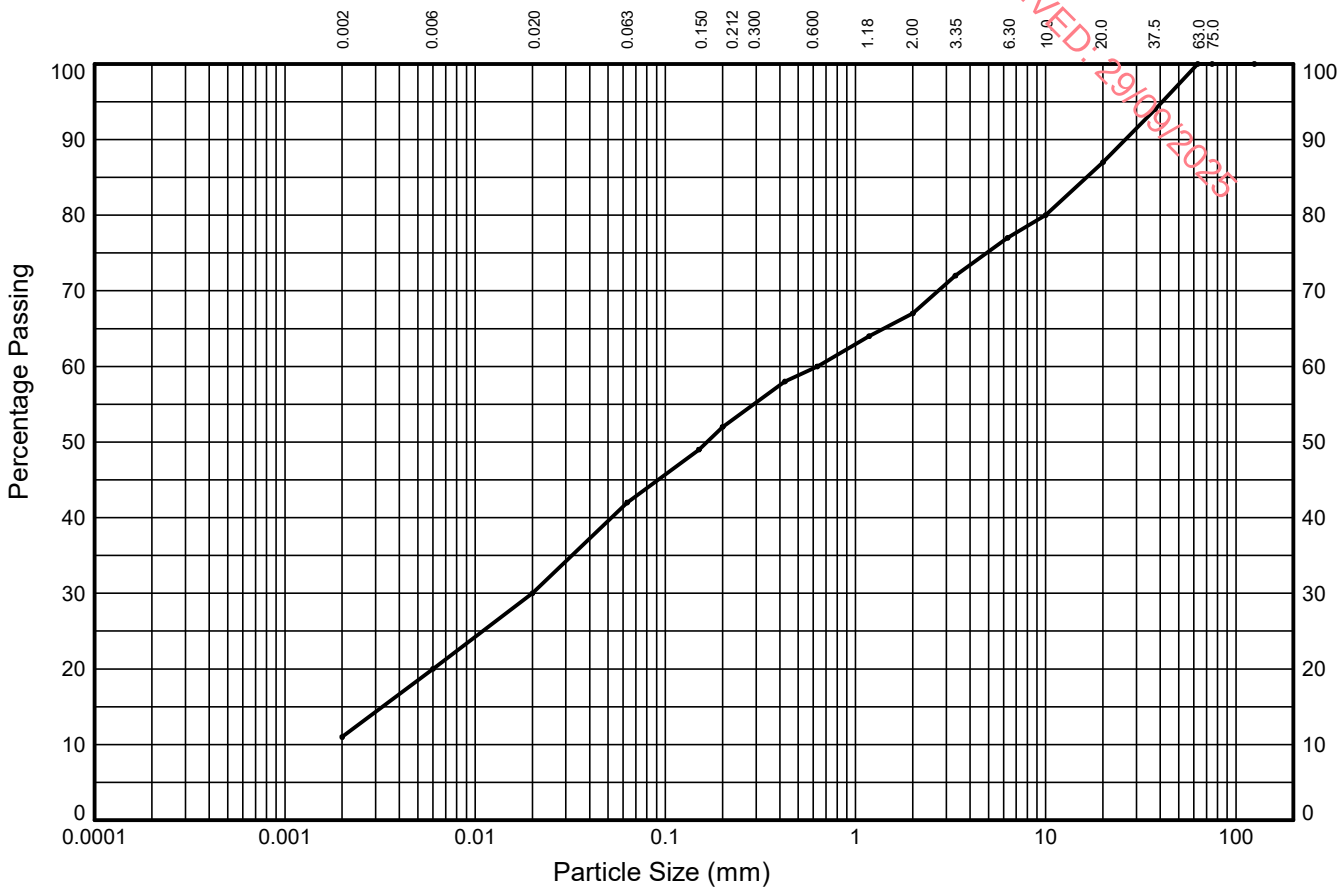
Contract	Contract Ref:
Gannow Wind Farm	**752113**

AGS

PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 5.2, 5.3 of BS EN ISO 17892:Part 4:2016

Trial Pit: **TP-06** Sample Ref: **3** Sample Type: **B** Depth (m): **2.10**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	9%	10%	12%	10%	8%	7%	10%	10%	13%	
	SILT			SAND			GRAVEL			
11%	31%			25%			33%			0%

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**94**
20.0	**87**
10.0	**80**
6.30	**77**
3.35	**72**
2.00	**67**
1.18	**64**
0.630	**60**
0.425	**58**
0.200	**52**
0.150	**49**
0.063	**42**

Particle Diameter (mm)	Percent Passing (%)
0.02	**30**
0.006	**20**
0.002	**11**

Sedimentation sample was not pre-treated

Coefficients	
D_{10} (mm)	**NA**
D_{15} (mm)	**0.003**
D_{30} (mm)	**0.020**
D_{50} (mm)	**0.165**
D_{60} (mm)	**0.630**
D_{85} (mm)	**16.407**
D_{90} (mm)	**26.184**
C_U	**NA**
C_C	**NA**

Soil Description:

Grey slightly sandy slightly gravelly SILT

Key: C_U = Uniformity coefficient. C_C = Coefficient of curvature as defined in BS EN ISO 14688-2:2018

STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By		Date
Francesca Bennett	FRANCESCA BENNETT	28/11/24

Contract	Contract Ref:
Gannow Wind Farm	**752113**

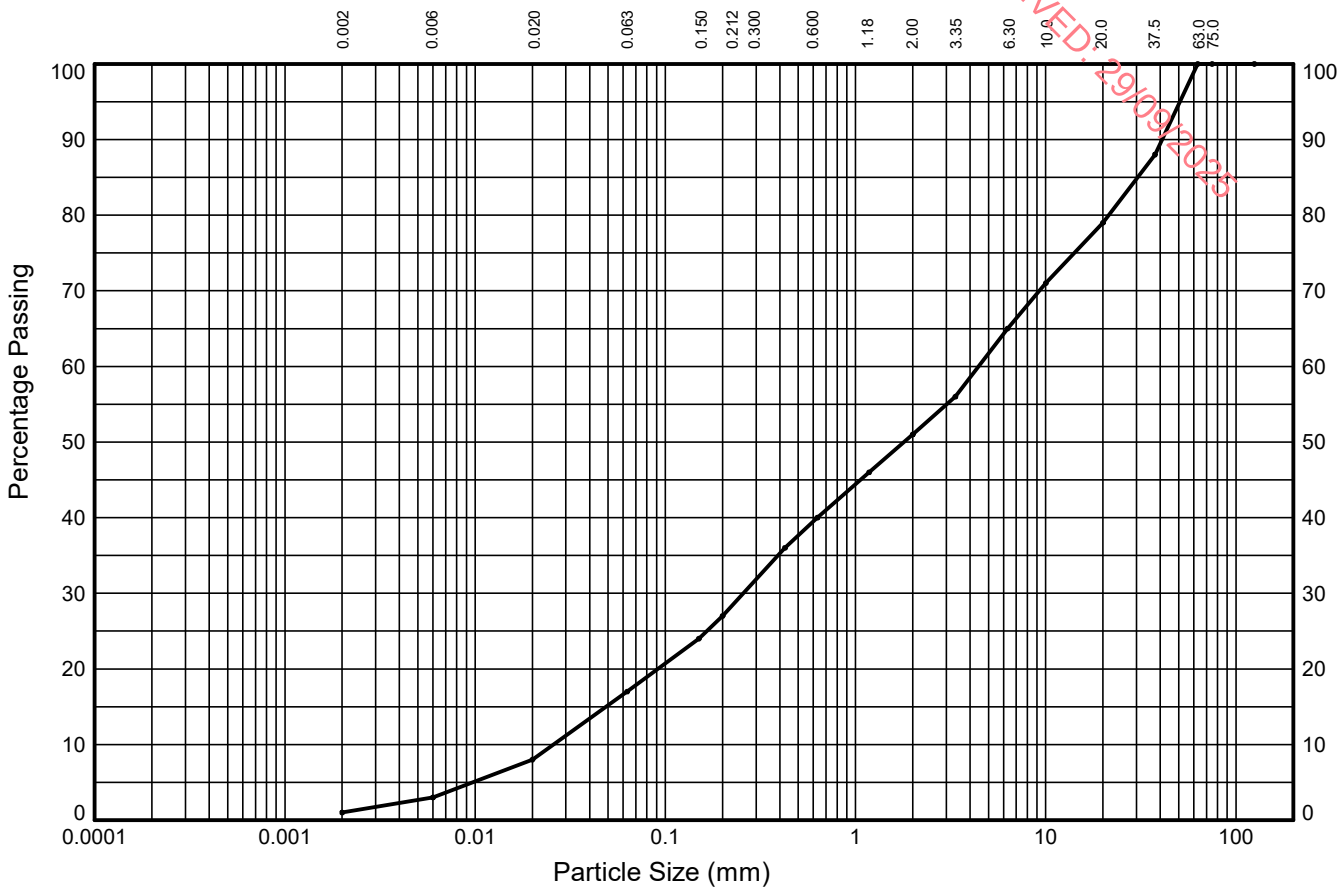
AGS

PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 5.2, 5.3 of BS EN ISO 17892:Part 4:2016

NON-STANDARD TEST

Trial Pit: **TP-08** Sample Ref: **3** Sample Type: **B** Depth (m): **1.50**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	2%	5%	9%	10%	13%	11%	14%	14%	21%	
	SILT			SAND			GRAVEL			
1%	16%			34%			49%			0%

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**88**
20.0	**79**
10.0	**71**
6.30	**65**
3.35	**56**
2.00	**51**
1.18	**46**
0.630	**40**
0.425	**36**
0.200	**27**
0.150	**24**
0.063	**17**

Particle Diameter (mm)	Percent Passing (%)
0.02	**8**
0.006	**3**
0.002	**1**

Sedimentation sample was not pre-treated

Coefficients	
D_{10} (mm)	**0.026**
D_{15} (mm)	**0.049**
D_{30} (mm)	**0.257**
D_{50} (mm)	**1.800**
D_{60} (mm)	**4.436**
D_{85} (mm)	**30.411**
D_{90} (mm)	**40.887**
C_U	**172**
C_C	**0.58**

Soil Description:

Grey very sandy silty GRAVEL

Key: C_U = Uniformity coefficient. C_C = Coefficient of curvature as defined in BS EN ISO 14688-2:2018

STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By		Date
Francesca Bennett	FRANCESCA BENNETT	28/11/24

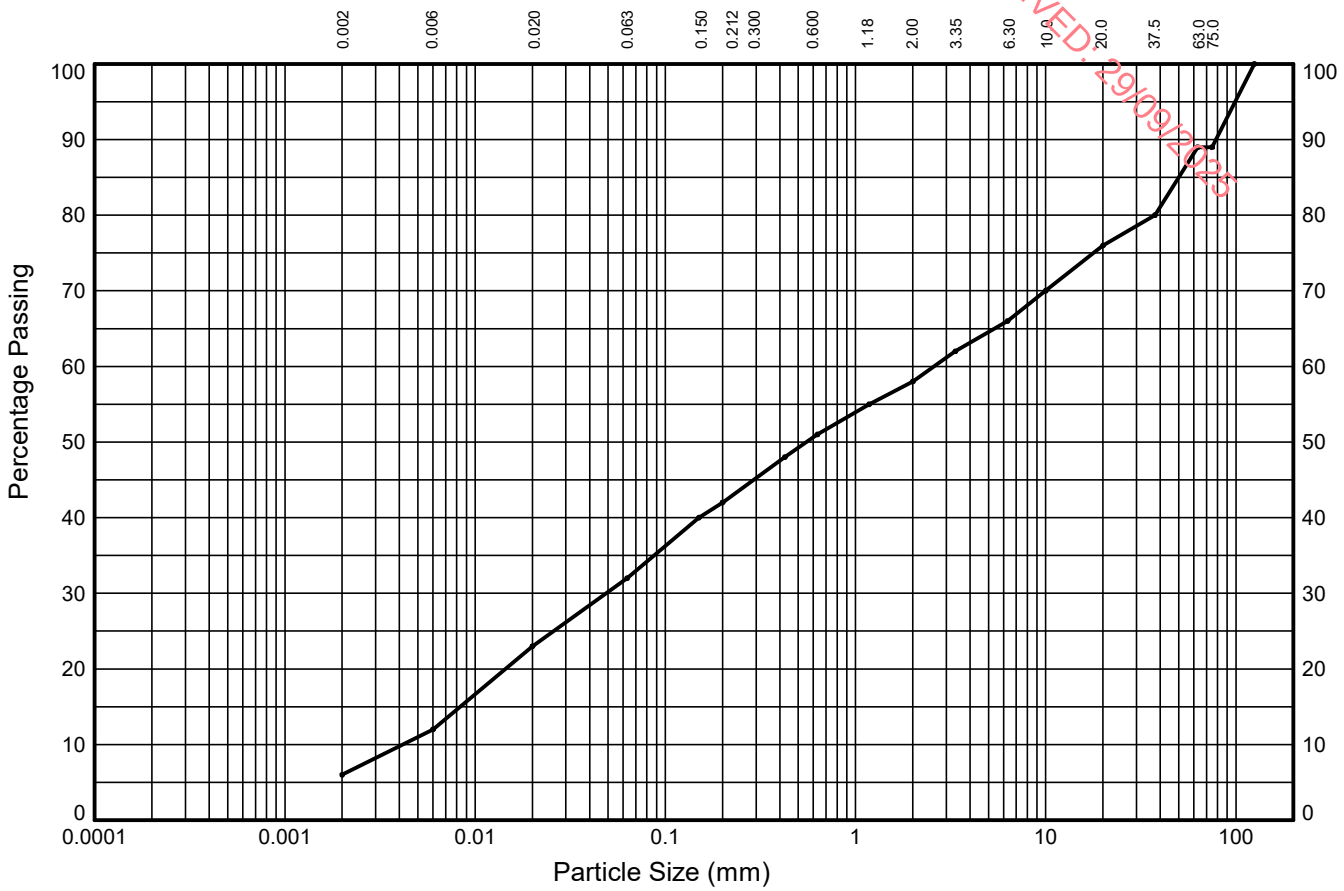
Contract	Contract Ref:
Gannow Wind Farm	**752113**

AGS

PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 5.2, 5.3 of BS EN ISO 17892:Part 4:2016
NON-STANDARD TEST

Trial Pit: **TP-11** Sample Ref: **3** Sample Type: **B** Depth (m): **1.00**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	6%	11%	9%	10%	9%	7%	8%	10%	13%	
	SILT			SAND			GRAVEL			
6%	26%			26%			31%			11%

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**89**
63.0	**89**
37.5	**80**
20.0	**76**
10.0	**70**
6.30	**66**
3.35	**62**
2.00	**58**
1.18	**55**
0.630	**51**
0.425	**48**
0.200	**42**
0.150	**40**
0.063	**32**

Particle Diameter (mm)	Percent Passing (%)
0.02	**23**
0.006	**12**
0.002	**6**

Sedimentation sample was not pre-treated

Coefficients	
D_{10} (mm)	**0.004**
D_{15} (mm)	**0.008**
D_{30} (mm)	**0.049**
D_{50} (mm)	**0.553**
D_{60} (mm)	**2.588**
D_{85} (mm)	**50.027**
D_{90} (mm)	**78.565**
C_U	**622**
C_C	**0.22**

Soil Description:

Grey very sandy very silty GRAVEL with medium cobble content

Key: C_U = Uniformity coefficient. C_C = Coefficient of curvature as defined in BS EN ISO 14688-2:2018

STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By		Date
Francesca Bennett	FRANCESCA BENNETT	28/11/24

Contract	Contract Ref:
Gannow Wind Farm	**752113**

envirolab
Hattersley Science & Technology Park
Stockport Road, Hattersley, SK14 3QU

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 24/11190
Issue Number: 1 **Date:** 20 November, 2024

Client:
Structural Soils Limited (Bristol Lab)
Unit 1a
Princess Street
Bedminster
Bristol
UK
BS3 4AG

Project Manager: Bristolchem/Elizabeth Hort/Valeria Chacinmijova
Project Name: Gannow Wind Farm
Project Ref: 752113
Order No: N/A
Date Samples Received: 18/11/24
Date Instructions Received: 18/11/24
Date Analysis Completed: 20/11/24

Approved by:

Danielle Brierley
Client Services Supervisor

Envirolab Job Number: 24/11190

Client Project Name: Gannow Wind Farm

Client Project Ref: 752113

Lab Sample ID	24/11190/1	24/11190/2	24/11190/3	24/11190/4	24/11190/5	24/11190/6	24/11190/7	Units	Limit of Detection	Method ref
Client Sample No	2	4	3	4	3	4	6			
Client Sample ID	TP-02	TP-08	TP-10	TP-04	TP-08	TP-11	TP-12			
Depth to Top	0.50	1.50	1.30	2.50	1.50	1.00	3.00			
Depth To Bottom	1.00	2.00	1.60	2.70	2.00	1.50	3.50			
Date Sampled										
Sample Type	SOIL - D	SOIL - D	SOIL - B	SOIL - B	SOLID	SOIL - D	SOIL - D			
Sample Matrix Code	6AE	4A	4A	4A	7	6A	6A			
% Stones >10mm$_{A}$	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	% w/w	0.1	A-T-044
Sulphate (acid soluble)$_{D}^{M\#}$	-	-	-	<200	270^{U}	260	<200	mg/kg	200	A-T-028s
Organic Matter$_{D}^{M\#}$	6.1	1.2	1.4	-	-	-	-	% w/w	0.1	A-T-032s

Report Notes

General

•This report shall not be reproduced, except in full, without written approval from Envirolab.
•The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
•The results reported herein relate only to the material supplied to the laboratory.
•The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
•Analytical results reflect the quality of the sample at the time of analysis only.
•Opinions and Interpretations expressed are outside our scope of accreditation.
•A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
•If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
•Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

Key

Superscript "#"	Accredited to ISO 17025
Superscript "M"	Accredited to MCertS
Superscript "U"	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript "A"	Analysis performed on as-received Sample
Subscript "D"	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript "D" on Asbestos	Analysis performed on a dried aliquot of sample provided.
Subscript "^"	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
Trace	Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh.
N/A	Not applicable

Asbestos

Identification: Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis
"Trace Asbestos Identified" will be reported if there is not enough present to verify the type.
Quantification: Generally a 2 stage process including visual identification, hand picking and weighing, and fibre counting. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres). "TRACE" will be reported as a quantification result.
PLEASE INFORM THE LABORATORY IF YOU WOULD LIKE THE STAGE 3 SEDIMENTATION PROCESS CARRIED OUT. Note this will be subcontracted.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs
Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.					

Soil Chemical Analysis:
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH by method A-T-007:
For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only.
Results "with Clean up" indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:
EPH CWG results have humics mathematically subtracted through instrument calculation.
Where these humic substances have been identified in any IDs from "TPH CWG with clean up" please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:
Results greater than 12900µS/cm @ 25^0C / 11550µS/cm @ 20^0C fall outside the calibration range and as such are unaccredited.

Please contact your client manager if you require any further information.

Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Structural Soils Limited (Bristol Lab), Unit 1a, Princess Street, Bedminster, Bristol, UK, BS3 4AG

Project: Gannow Wind Farm

Clients Project No: 752113

Project No: 24/11190

Date Received: 18/11/2024 (am)

Cool Box Temperatures (°C): 8.7

Lab Sample ID	24/11190/1	24/11190/2	24/11190/3	24/11190/4	24/11190/5	24/11190/6	24/11190/7
Client Sample No	2	4	3	4	3	4	6
Client Sample ID/Depth	TP-02 0.50-1.00m	TP-08 1.50-2.00m	TP-10 1.30-1.60m	TP-04 2.50-2.70m	TP-08 1.50-2.00m	TP-11 1.00-1.50m	TP-12 3.00-3.50m
Date Sampled							
Deviation Code							
E (no date)	✓	✓	✓	✓	✓	✓	✓

Key
E (no date) *No sampling date provided (all results affected if not provided)*

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	24/11190/1	24/11190/2	24/11190/3	24/11190/4	24/11190/5	24/11190/6	24/11190/7
Client Sample No	2	4	3	4	3	4	6
Client Sample ID/Depth	TP-02 0.50-1.00m	TP-08 1.50-2.00m	TP-10 1.30-1.60m	TP-04 2.50-2.70m	TP-08 1.50-2.00m	TP-11 1.00-1.50m	TP-12 3.00-3.50m
Date Sampled							
A-T-028s				19/11/2024	19/11/2024	19/11/2024	19/11/2024
A-T-032s	19/11/2024	20/11/2024	19/11/2024				
A-T-044	19/11/2024	19/11/2024	19/11/2024	19/11/2024	19/11/2024	19/11/2024	19/11/2024

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

Appendix 3
Trial Pit Photographs

Figure 1 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP01(1).jpg

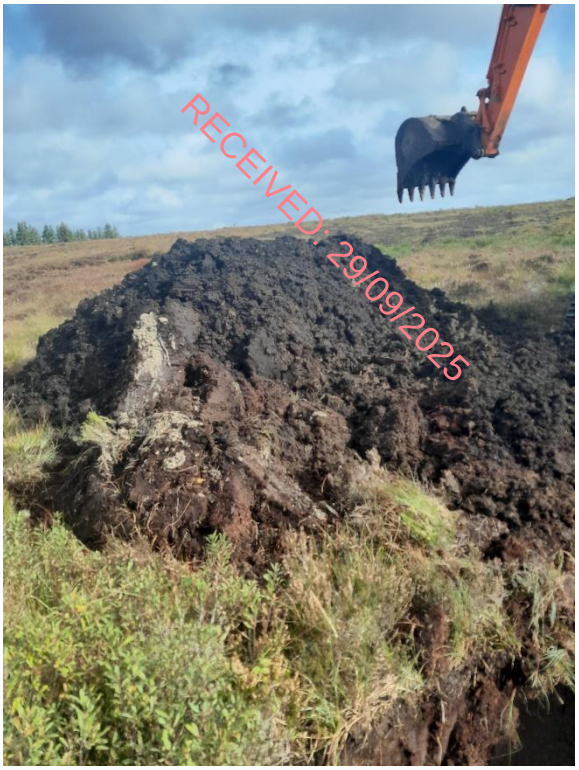


Figure 3 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP01(3).jpg

Figure 2 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP01(2).jpg

Figure 4 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP02(1).jpg

Figure 5 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP02(2).jpg

Figure 7 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP03(1).jpg

Figure 6 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP02(3).jpg

Figure 8 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP03(2).jpg

Figure 9 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP03(3).jpg

Figure 11 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP04(2).jpg

Figure 10 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP04(1).jpg

Figure 12 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP04(3).jpg

Figure 13 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP05(1).jpg

Figure 14 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP05(2).jpg

Figure 15 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP05(3).jpg

Figure 16 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP06(1).jpg

Figure 17 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP06(2).jpg

Figure 19 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP07(1).jpg

Figure 18 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP06(3).jpg

Figure 20 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP07(2).jpg

Figure 21 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP07(3).jpg

Figure 23 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP08(2).jpg

Figure 22 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP08(1).jpg

Figure 24 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP08(3).jpg

Figure 25 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP09(1).jpg

Figure 26 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP09(2).jpg

Figure 27 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP09(3).jpg

Figure 28 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP10(1).jpg

Figure 29 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP10(2).jpg

Figure 31 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP11(1).jpg

Figure 30 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP10(3).jpg

Figure 32 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP11(2).jpg

Figure 33 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP11(3).jpg

Figure 35 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP12(2).jpg

Figure 34 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP12(1).jpg

Figure 36 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP12(3).jpg

Figure 37 H:\2024\24G131_Gannow Wind Farm Trail Pits Photos\TP12(4).jpg

Appendix 4
‘As-Built’ Site Plan

Figure 1: Site Layout Overview

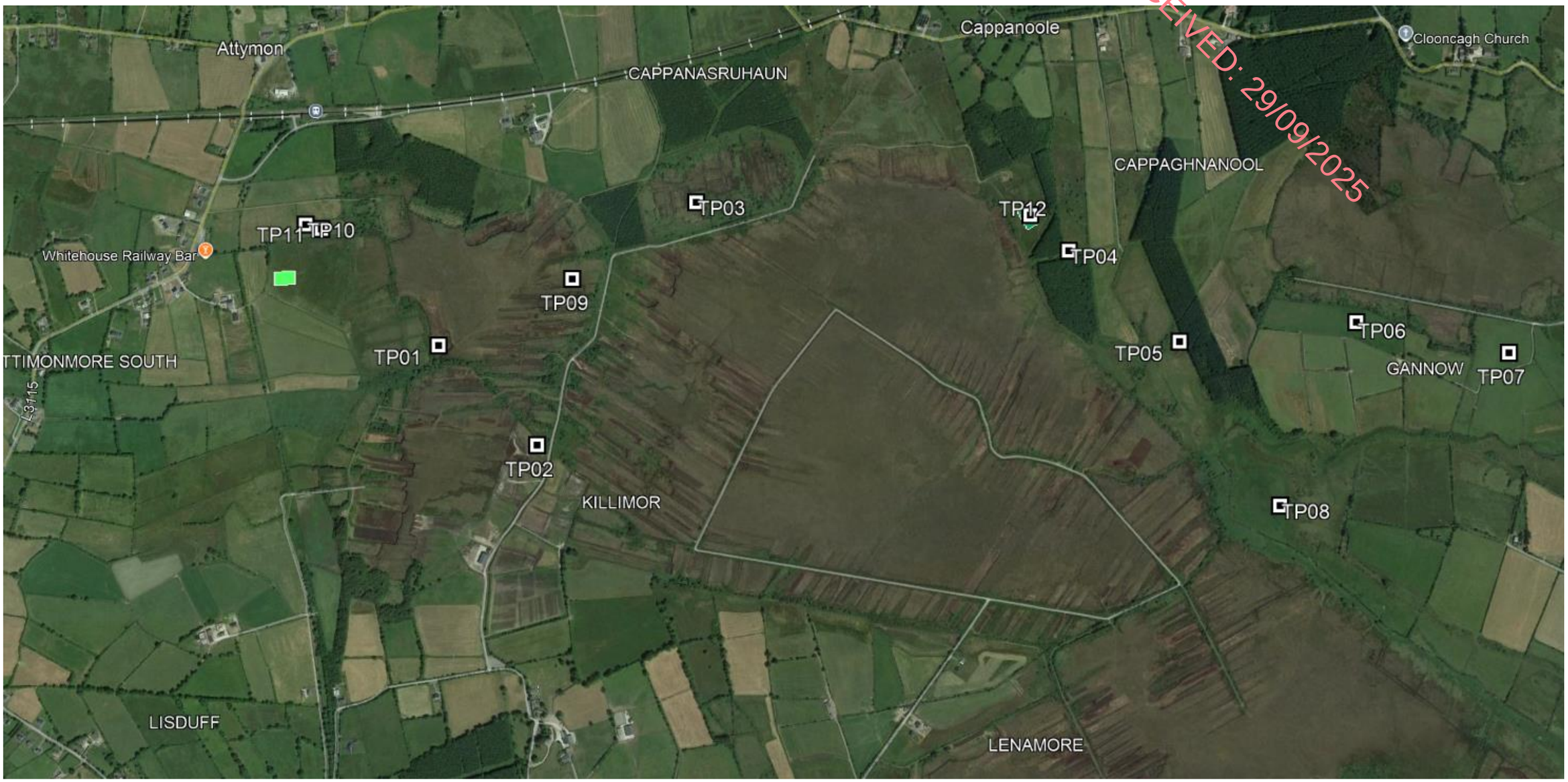


Figure 2: Western Portion of Site

Figure 3: Eastern Portion of Site

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