Peat Management Plan for Cummeennabuddoge Wind Farm

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1 Introduction

Gavin and Doherty Geosolutions (GDG) was requested by Atmos Consultants to prepare a Peat Management Plan (PMP) on behalf of FuturEnergy Ireland, as part of an application for planning permission to An Bord Pleanála to construct a wind farm development and grid connection in the townlands of Cummeennabuddoge and Clydaghroe in the Derrynasaggart mountains, Co. Kerry and Co. Cork.

1.1 Statement of Authority

GDG is a specialist engineering consultancy with a foundation in geoscience, environmental services and geotechnical engineering. Founded in 2011, GDG is committed to supporting projects which contribute to the global sustainability agenda, such as enhancing infrastructure, supporting onshore and offshore wind farm developments and general civil infrastructure design.

GDG has been involved in many wind farm developments in both Ireland and the UK at various stages of development i.e. preliminary feasibility, planning, peat stability assessment, design and construction. The GDG team, made up of engineering geologists, geomorphologists, geotechnical engineers and environmental scientists, have developed expertise in the design and construction of developments in areas of peat.

The members of the GDG team involved in this assessment include:

- Stephen Curtis is the primary author of this report. Stephen was involved throughout the development of the proposed design including several visits to the site and has carried out the stability analysis and interpretation of the ground model, reviewed peat stability and influence of peat handling practice at the site relating to the infrastructure design. Stephen is a Senior Engineering Geologist on the onshore renewable team. He has over seven years of experience in both site investigation contracting and geotechnical consultancy environments. He is Chartered with the Institute of Geologist of Ireland (IGI) and the European Association of Geographers. Stephen has worked on multiple renewable energy projects; primarily solar and wind farm projects in Ireland the UK for over four years. He has been involved in the feasibility study, planning, design and construction stages of wind and solar farm developments with a particular focus on geotechnical risk management, and mitigation for construction in upland peat areas and Irish glacial ground conditions.
- Ruadh McIntosh is the project manager and has been involved in the design of the proposed development. Ruadh is Senior Engineering Geologist working in both the GDG Geo-Environmental team and the Onshore Renewables team. She is a Chartered Geologist with the Geological Society of London and has been working in consultancy for over 7 years. Ruadh has worked on a variety of renewables projects in a multidisciplinary capacity, with a focus on project management, geological assessment and borrow pit appraisal;
- Alastair Lewis is the project director. He has been involved in the oversight and review of the engineering design of the Proposed Development. Alastair is a Civil Engineer with over twenty-

five years' experience in civil and ground engineering. He oversees the delivery of multi-disciplinary development infrastructure projects including, brownfield development, ground engineering, earthworks platforming, mining remediation, SUDS, sewerage, flooding, bridges, windfarms, and roads. As head of infrastructure, he developed engineering strategies in the property and energy sectors with particular reference to planning and environmental requirements. He has design experience of major earthworks and mine stabilisation schemes and extensive experience in assessment of abandoned mine workings.

- Chris Engleman has carried out the ground model development, stability analysis, GIS mapping and constaints mapping analysis for the project. Chris is a Geologist with four years of industry experience within the onshore renewables sector and the field of geological mapping; predominantly working on projects for peat stability and management in advance of wind farm construction, ground investigation, rock and soil logging, GIS mapping and geotechnical design. He has strong skills within peat stability, soil logging to BS5930, geological mapping, site investigation and GIS mapping. He has also gained experience in Holebase and SLOPE/W.
- Daniel Murphy carried out several site visits to the site for ground investigations and engineering design. Daniel is a Graduate Engineer working in both the GDG Infrastructure team and the Structures team. He has a Masters' degree in Civil Structural and Environmental Engineering from University College Cork and has been working with GDG since graduating in 2022. Daniel has worked on a variety of Temporary Works and Permanent Works design projects in Ireland and the UK, and is experienced at peat probing.
- Brian McCarthy carried out several site visits to the site for ground investigations and engineering design. Brian is a Civil Engineer within the infrastructure team in GDG with two years of post-graduate experience. Brian holds a Masters degree in Civil, Structural and Environmental Engineering from University College Cork and is a member of the Institution of Engineers of Ireland. Brian has worked on various renewable energy and infrastructural projects in Ireland and the UK and has carried out peat probing on a number of projects throughout Ireland.

1.2 Guidance Documents

This PMP has been prepared with consideration of industry best practice relating to wind farm construction and peatlands. This best practice includes:

- Wind Energy Development Guidelines. Department of Housing, Planning and Local Government (2006);
- Draft Revised Wind Energy Development Guidelines. Department of Housing, Planning and Local Government (2019);
- Good practice during wind farm construction. A joint publication by Scottish Renewables, Scottish Natural Heritage, Scottish Environment Protection Agency, Forestry Commission Scotland (2015);
- Scottish Government, Guidance on Developments on Peatland – Site Surveys (2014);
- Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste, Scottish Renewables and SEPA (2012); and

- Floating Roads on Peat, Scottish Natural Heritage (2011).

Many of the publications listed above have been developed by the Scottish Regulators which are considered to be best practice in Ireland and are therefore appropriate to refer to within this PMP.

This PMP and compliance with it shall not relieve the developer of its obligations to undertake detailed ground investigations or geotechnical design prior to construction or any obligations relating to other aspects of the environment.

1.3 Proposed Development

The proposed Cummeennabuddoge Wind Farm is located approximately 8km north of Ballymakeera town, in the Derrynasaggart Mountains, Co. Kerry. It encompasses the townlands of Cummeenabuddoge and Clydaghroe and is approximately 709 ha in size.

The proposed development generally comprises 17 No. turbines, access tracks, a substation and associated works.

A detailed map of the Proposed Development is provided in Figure A-1-1 in Appendix A.

The Proposed Development infrastructure, which shall require associated earthworks, will comprise of the following:

- 17 wind turbines and associated hardstand areas;
- One 110kV permanent electrical substation including a control building with welfare facilities, electrical plant and equipment, security fencing, underground cabling, wastewater holding tank and ancillary structures and associated works;
- Underground electrical and communication cabling connecting the wind turbines to the proposed on site substation and associated ancillary works.
- 110kV Underground cabling between the new permanent substation to the existing 220/110kV Ballyvouskill Substation to facilitate export of electricity to the National Electricity Grid, including service track above the cable;
- One Meteorological Mast of 110m in height and associated hardstand area to be removed at the end of the operational period;
- New permanent access tracks and permanent upgrades to existing tracks, roads and site access;
- Four borrow pits;
- Six peat and spoil repository areas;
- Permanent placement of peat and spoil along sections of site access roads where appropriate;
- Three temporary construction compounds;
- Site drainage;

The Applicant is seeking a ten-year planning permission and a 35-year operational life from the date of commissioning of the Proposed Development.

For full details on the proposals refer to Chapter 4 of the EIAR for the detailed description of the Proposed Development.

The "Proposed Development" or "Site" as referred to in this report is in reference to the access road and main Development Area within the red line boundary as defined in Chapter 4 of the EIAR. This report examines the conditions at the Proposed Development, and does not analyse the transport delivery route as there is minimal ground disturbance required on this route. As very little peat or soft ground has been identified on the grid connection route this has also been excluded in this assessment as the excavated material will be reused in the reinstatement of the cable trench.

1.4 Scope of Report

This report contains the following:

- A summary of proposed construction activities on-site;
- A review of peat conditions on-site;
- Proposed road construction types;
    - Methodologies for the construction of each type of access road and road construction details;
- Proposed methodologies for the excavation of turbine bases, hardstands and compounds,
- Summary of borrow pits on-site and drawings;
- Summary of peat repositories on site and drawings;
- Estimation of the peat volumes to be excavated and placed in association within the Proposed Development;
- Guidelines for handling and storing of excavated peat;
- Recommendations for good construction practice.

As part of the planning stage design work to support this application an assessment has been carried out of earthworks and associated volumes including peat. This assessment has been used to inform this peat management plan and borrow pit design. The assessment indicates that in addition to the volumes of peat being handled and discussed below that rock and mineral soil excavated to create formation levels for the development will be reused wherever possible as engineered fill in the development earthworks. The Construction Stage Peat and Spoil Management Plan will target a balance of cut and fill, and significant surplus soils are not anticipated.

This report outlines the guidance for the safe handling and storage of peat material only. Excavation of some mineral soil material will likely be required as part of the construction of the Proposed Development. The findings of the ground investigations outlined in the EIAR Appendix 10-1 Geotechnical Interpretive Report outline suggest that the peat material is generally underlain by weathered bedrock or relatively thin layers of granular glacial till material (<1m) over bedrock. The preliminary assessment of the suitability of this glacial till and weathered rock material is outlined in Section 3.5 of Appendix 10-1, suggesting it may be suitable for reuse within the construction of the Proposed Development. This is subject to further testing and the findings of the design stage ground investigations. Where required excavated glacial till or weathered bedrock material shall be used within the Proposed Development where appropriate.

1.5 Summary of Construction Activities

For the construction phase, the activities that are considered likely to generate peat are as follows:

1. The construction of new excavated/ founded roads,
2. Excavations for turbine foundations/bases, crane hardstands, met mast foundation and hardstand, substation hardstand and construction compounds,
3. Excavation of existing peat at the proposed borrow pits.

2 Peat Conditions and Stability

GDG visited the site on several occasions between March 2021 and July 2022 to conduct site walkovers, peat probing and to supervise ground investigation (GI) works being carried out by subcontractors.

The ground investigation (GI) works carried out specifically for this development were carried out between March 2021 and October 2022 and consisted of:

1. GDG (March 2021): 33 peat probes.
2. GDG (June 2021): three peat probes at the substation location.
3. GDG (March 2022): 132 peat probes and 17 shear vanes.
4. GII (May 2022): 16 trial pits, 25 Russian core samples and geotechnical & environmental Laboratory testing.
5. GDG (June 2022): 48 peat probes.
6. GDG (October 2022): 48 peat probes.

The findings of these ground investigations are summarised in Appendix 10-1 of the EIAR: GDG Cummeennabuddoge Geotechnical Interpretive Report.

Previous to the GI carried out specifically for this development, there was some existing data from investigation works in 2011 available for the site. This information consisted of 91 nr. gouge samples carried out as part of a previous planning application and classified the peat depths and peat characteristics at locations across the site.

In summary, a total of 415 intrusive ground investigation locations were used in the assessment of the site conditions.

The extent of the ground investigations carried out at the site is in accordance with the Scottish Executive guidelines. Access restrictions to some areas of the site limited the possible ground investigation so a variation in the methodologies used enabled information to be collected at all infrastructure locations at the site. Peat probe locations throughout the site summarise the extent and thickness of peat coverage whereas the trial pitting, gouge sampling and Russian sampling locations give an indication of the nature and engineering characteristics of the peat materials, with shear vane testing also carried out to quantify the peat strength characteristics. Trial pits with

associated lab testing, and geomorphological mapping across the site are used to characterize the underlying glacial till and bedrock.

The ground investigations indicate that the ground conditions at the site comprise predominantly moderate thicknesses of peat material overlying a predominantly granular glacial till and weathered bedrock and sandstone and siltstone bedrock.

The interpolated peat depth within the main site is shown in Figure 2-3 and the whole site depth plan is provided in Appendix A.1.

Figure 2-1 presents the distribution of peat depths with regards the number of probes carried out. Peat thickness encountered by intrusive investigations across the site varies from 0m to a maximum of 5.4m, often displaying sharp variation locally.

The depths encountered are considered to be moderate to deep in places: with approximately 57% of locations indicate a peat thickness of greater than 1m. Approximately 84% of locations were identified peat thickness less than 2m, and the remaining locations, 16%, identified deeper than 2m.

Peat depth was measured at 415 soil survey locations, which was used to create a peat depth map (included in Appendix 10-3), with the following trends were observed regarding the main body of the Development site:

- South-west: Peat generally between 1.5m-2.0m, with localised instances of both thicker and thinner peat deposits. Maximum thickness 3.4m noted in an area of flatter topography.
- North-west: Majority of this area has peat deposits less than 1.5m thick, with peat less than 1m in the north-western-most corner. Localised instances of peat between 1.5m and 2.0m thickness.
- Central: Peat thickness generally less than 1.5m thickness, with a zone of thicker peat encountered moving eastwards. Peat generally remains less than 2.0m thick, with localised instances of thicker peat. Maximum thickness of 4.14m encountered, however no development is proposed in this area.
- North-east: Varied peat thickness, generally between 1.0m to 2.0m. Localised instances of both thinner and thicker peat, with a maximum of 3.6m measured.
- South-west: Peat thins towards the southern boundary from about 1.5m to less than 0.5m.

A photo of exposed peat is provided in Figure 2-2.

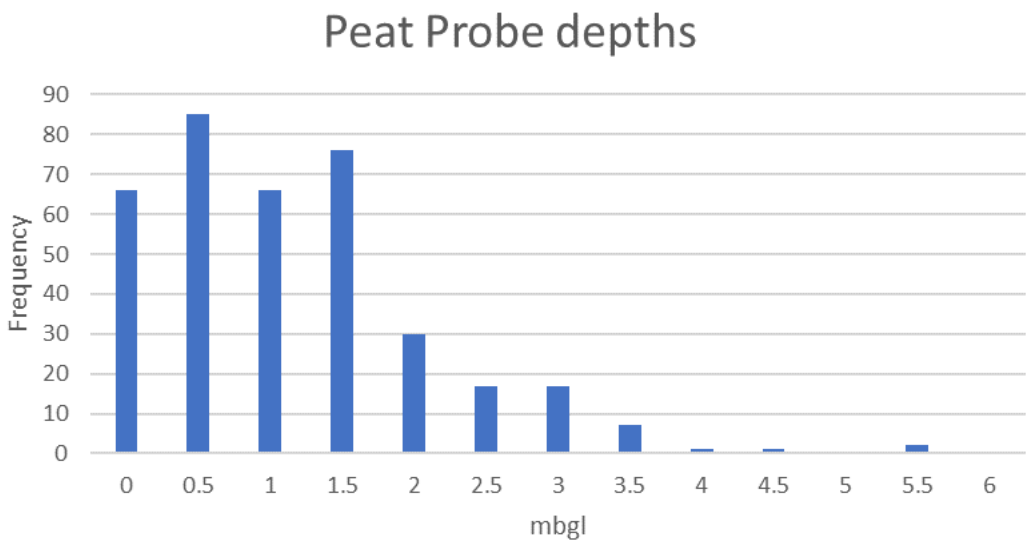


Figure 2-1: Histogram of peat depth results across the site

Figure 2-2: Existing cut through peat material and underlying gravel or weathered bedrock in vicinity of Turbine 10

2.1 Peat Classification

In respect of developments on peatlands, the Scottish Government provides guidance as to the definition of peat in their Peat Survey Guidance document:

"The Joint Nature Conservation Committee (JNCC) Report 445, Towards an Assessment of the State of UK Peatlands, definitions are used:

- Peaty (or organo-mineral) soil: a soil with a surface organic layer less than 0.5m deep;
- Peat: a soil with a surface organic layer greater than 0.5m deep which has an organic matter content of more than 60%;
- Deep peat: a peat soil with a surface organic layer greater than 1.0m deep."

For the purposes of this report, peat is considered with respect to the two principal types:

1. Acrotelm: This upper layer comprised of poorly decomposed plant material and living vegetation. It is relatively dry with some tensile strength affording it limited structural properties. For peat classification of peat in this report the Acrotelm layer will be considered to be inclusive of 'peaty soil'.
2. Catotelm: This lower layer is formed by highly decomposed humified peat decaying at a rate of several orders of magnitude slower than the acrotelm. The slow peat formation as this catotelm layer grows represents an important sink for atmospheric CO_2. The structural integrity of this layer is particularly vulnerable to excavation and handling as it tends to disrupt completely on excavation. For classification of peat in this report the Catotelm layer will be considered to be inclusive of 'peat' and 'deep peat' soils.

It is noted that data obtained through peat probing cannot be utilised in the classification of the peat material, given that peat probing does not fully distinguish between the different types of peat material and between peat and other soft ground. It is considered that the sampling records from the intrusive investigation provide the most accurate representation of peat depths across the site. However, it is considered that the peat probing data generally compares well with the other intrusive data and so all data types, peat probe, trial pit and Russian core locations, have been used in the peat thickness assessment.

The interpolated peat depth within the main site is shown in Figure 2-3 and the whole site depth plan is provided in Appendix A.1.

The characteristics and interpreted engineering parameters of the peat material across the site are summarised in the Factual Geotechnical Report (GII, 2022) within EIAR Appendix 10-1 Geotechnical Interpretive Report for the site, and EIAR Appendix 10-2 Peat Stability Risk Assessment (PSRA) Report.

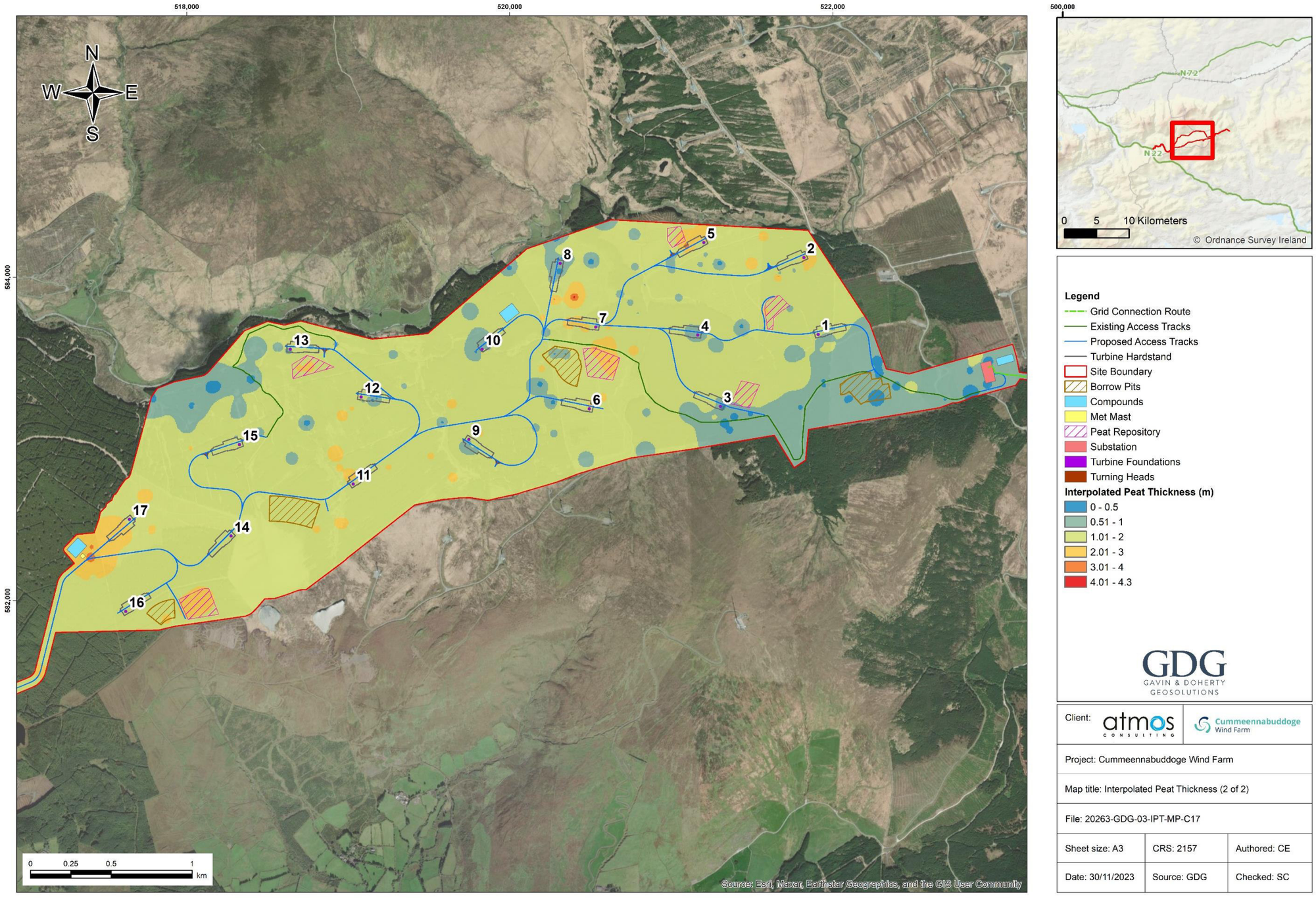


Figure 2-3: Interpolated peat depth plan of the main site area

The composition of the peat is described in the trial pit locations using the Von Post classification system suggesting a large level of variation in the peat body across the site, with no typical trend or succession in the peat layering. The peat is predominantly described as fibrous to pseudo fibrous with varying conditions between firm, spongy and plastic. The degree of humification in the peat was examined in the sampling locations. This is a numerical rating outlining the level of decomposition in the peat ranging from H1 – no compositions to H10 – completed decomposed. The degree of humification identified at the location of the Proposed Development range between H2 and H6, generally increasing with depth.

Considering the variation identified in the peat and the lack of a characteristic trend in the behavioural characteristics in the peat body, it is difficult to quantify the acrotelmic and catotelmic material of the peat body. An assumption of generic characteristics is considered appropriate in anticipating the suitability of the peat for the intended reuse purposes. Based on a review of the ground investigation data, it is considered for that all material at a depth of 0.6m and above is acrotelm (inclusive of 'peaty soils'). Approximately 57% of locations indicate a peat thickness of greater than 1m, these would indicate the best indicator of where the above 'deep peat' classification may be present.

A number of discrete relatively deep pockets of wet and marshy peat were identified during the site walkovers. These areas are generally in topographical lows and flat areas but have been identified close to shoulders or ridges of slopes and in areas with peat depth greater than 2.0m, suggestive of a potential peat instability risk area. These areas have been captured in the exclusion zones and construction buffer areas outlined in Appendix A.2.

Adjacent to almost all of the existing access tracks at the Site, there is evidence that peat has been side-cast during previous construction works. In these areas, the probe was unable to penetrate to full depth which may be due to either the abundance of float (loose rock) and dead fall trees and vegetation within the previously side-cast peat itself.

A large wet, saturated peatland area was identified in an area north of the T4 location, shown in Figure 2-4. This is likely due to the recent clearing of the forestry and drainage issues in the area. The area has a topographic slope of less than 5% and an identified peat thicknesses greater than 1.5m but is located approximately 40m south of a steep eroded bank of a nearby watercourse. The stability risk has been assessed in this area during the peat stability assessment and factor of safety exercise. The resultant safety buffer and peat reinstatement restrictions are outlined in Section 2.2.

A detailed breakdown of the site observations at each turbine location can be found in Appendix 10-2 Peat Stability Risk Assessment (GDG, 2023).

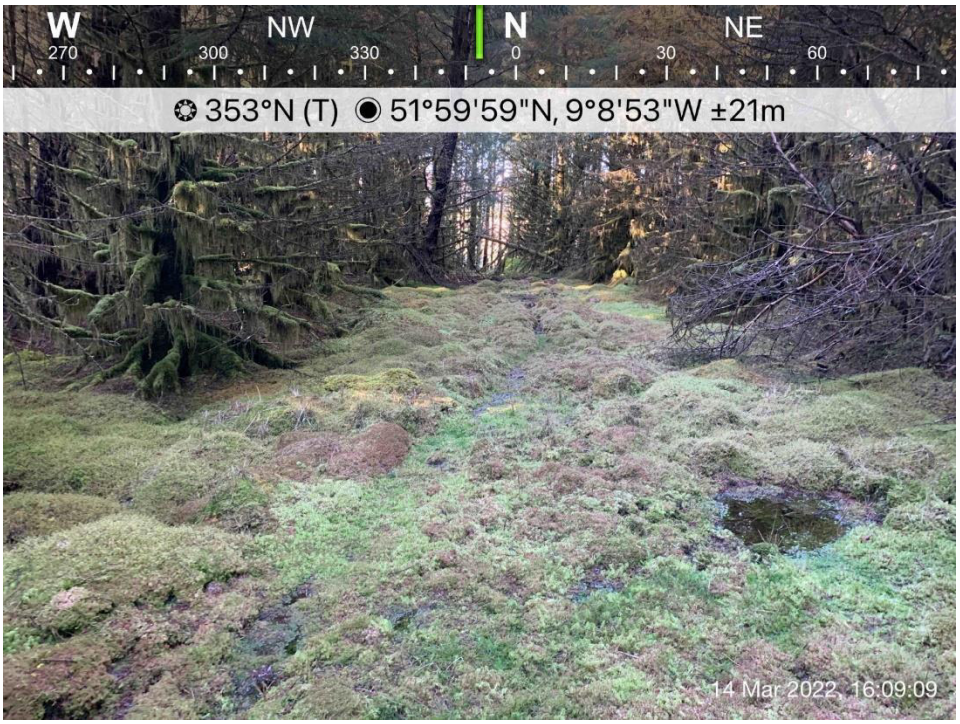


Figure 2-4: Area of wet, saturated peat material in topographical low area adjacent to a steep topographic shoulder north of T4

2.2 Peat Stability Risk Assessment

A Peat Stability Risk Assessment has been undertaken for the site (Appendix 10-2 of the EIAR (GDG, 2023)). Without the Proposed Development on site, i.e. no additional loading on the peat slopes, the site is considered to be stable. Modelling has shown localised zones within the Proposed Site boundary that become less stable with a 10kPa surcharge, akin to a 1m thickness of peat on top of existing ground.

Areas of restricted stockpiling and construction have been identified as part of Appendix 10-2 Peat Stability Risk Assessment (GDG, 2024) and are shown presented in Appendix A.2.

The restriction areas consist of:

- Safety buffer areas – areas which were used during the development phase of the layout design and **shall be restricted for construction.** No development or construction activities shall be carried out in these areas including plant movements, peat or overburden excavation or reinstatement or placement of peat or any overburden materials. These areas are outside of the development footprint and as a result no construction or plant movement will be required within these areas.
- Peat stockpile restriction areas– areas that are **not restricted for construction** but shall not be used for stockpiling, sidecasting or reinstatement of any peat oor overburden materials. The development footprint may occur within these areas but peat placement and reinstatement is not permitted within these desgnated areas. Any material excavated from within the peat

restriction areas is required to be removed immediately and safely reinstatement within a designated area elsewhere.

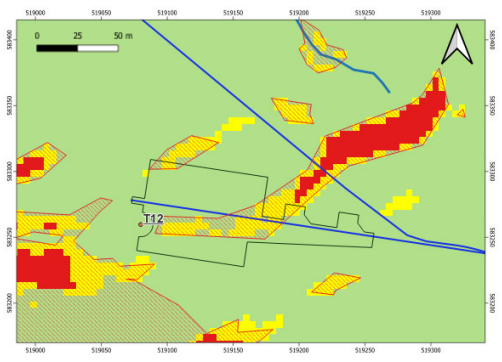
Stability modelling has shown that the remainder of the site has a Factor of Safety (>1.3) when loaded with an additional 1m of peat. Limited peat side casting and stockpiling is therefore considered safe adjacent to the Proposed Development footprint and outside of the 'Peat Stockpile Restriction Areas'.

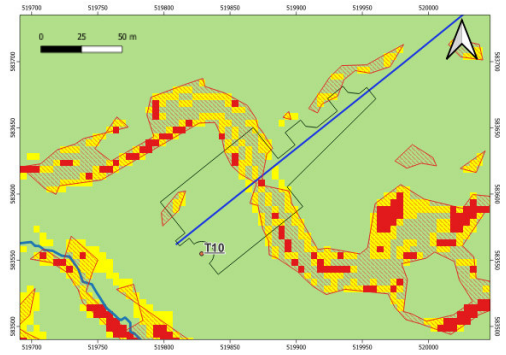
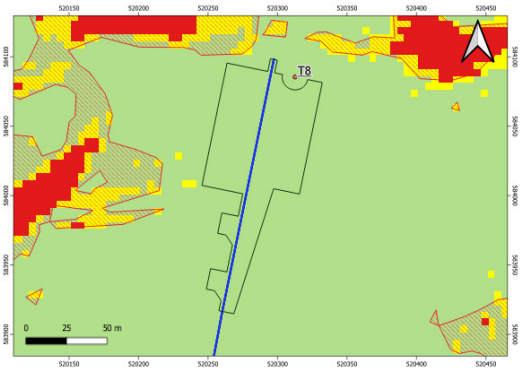
Stockpile restriction areas are outlined in Appendix A.2. Areas in the stockpile restriction areas include:

- Areas within or adjacent to the Proposed Development footprint encounters a stability factor of safety of less than 1.3 with the addition of a 10kPa (1m of peat) surcharge only and is otherwise considered stable in its natural state. as outlined in Appendix 10-2 Peat Stability Risk Assessment,
- Linear areas adjacent to watercourses, caused by the steep eroded stream banks. No development is planned within these areas due to the proximity to the water course and the existing design development 60m watercourse buffer,
- Areas of deep peat adjacent to steep slopes where there is a risk of propagated peat slide,
- An area of deep saturated peat north of T4, adjacent to a steep drop in elevation and a watercourse identified during the walkover.

An assessment of risk at Peat stockpile restriction areas was examined by looking at the geometry of the local slope and the proposed construction methodology. The hazards will be mitigated by no permitting peat and spoil storage and the limiting of plant operations within the area. The peat stockpile restriction areas are outlined in Appendix A.2 and some of the locations where key infrastructure encounters these areas are outlined in Table 2-1.

Table 2-1: Peat Stockpile restriction areas at key infrastructure locations

Risk and mitigation	Undrained surcharged FoS analysis
The area at the hardstand for T12 suggests a FoS <1.3 with the application of a surcharge. Without the application of the surcharge it indicates a FoS>1.3, indicating the natural, undisturbed slope is stable. This instability is caused by local variation in the slope angle. All the intersection area is proposed for excavate and replace, and so will be stabilised by excavating to a bearing strata. **We recommend that peat the placement of peat material shall not be carried out at the northern, downslope side of the T12 turbine and hardstand area.**	

Risk and mitigation	Undrained surcharged FoS analysis
The area at the hardstand for T10 suggests a FoS <1.3 with the application of a surcharge. Without the application of the surcharge indicate a FoS>1.3, indicating the natural, undisturbed slope is stable Much of the low FoS results here are caused by existing the existing cut and side cast material at the existing forestry road currently at the hardstand area. Having inspected the site during a site walkover, this is not all considered to be a true risk area. **However, we recommend that the placement of peat material shall not be carried out at the northern, downslope side of the T10 turbine and hardstand area.**	
The area to the north of T08 is highly sensitive, indicating instability with and without the surcharge. The area of instability is indicated by a relatively thick peat coverage and steep northernly slopes. This area is located directly upslope of the River Clydagh and is considered to be of a particularly high sensitivity. Although the proposed construction zone and earthworks footprint is not directly within these safety buffer zones, **the Contractor will ensure complete avoidance of plant movements and peat storage to the areas north of the T08 location.**	

3 Handling and Storing Excavated Peat

Inappropriate storage of excavated peat and overburden, as well as uncontrolled loading of peat material is considered one of the main causes of peat instability and landslide event triggers during the wind farm construction process. The management and control of these activities is key to de-risking peat stability at the windfarm site.

The following guidelines outline the proposed handling and storage of peat at the site;

- Care shall be taken during peat excavation to ensure it is segregated from other soil types, therefore, particular care should be taken to review recorded peat depths.
- Peat shall be separated and stored by type, namely the acrotelmic and catotelmic layers.
    - Acrotelm (interpreted as the upper 0.6m of peat) is generally required for landscaping and shall be stripped and temporarily stockpiled for re-use as required. Acrotelm stripping shall be undertaken before the main excavations.
    - Where possible, the acrotelm shall be placed with the vegetation part of the sod facing the right way up to encourage the growth of plants and vegetation.
    - All catotelm peat (peat below about 0.6 depth) shall be transported on excavation to the designated peat repository areas or into available borrow pit space,
    - The careful handling and segregation of peat types will help to optimise the reuse of peat, aiding in the retention of structure and integrity of the excavated peat material.

- Depending on what vegetation is found on site, more fibrous material may be placed on steeper angles. Unconsolidated peat, generally comprising of catotelmic material is often not suitable for general dressing and any unconsolidated peat excavated must only be used for reinstatement where such reuse poses no risk of polluting watercourses and evidence can be provided that the required water table at the chosen location can be maintained. Review of the ground investigation logs shows that the peat was predominantly fibrous and pseudo-fibrous material, therefore it is considered that the peat excavated will be generally suitable to facilitate placement in restricted thicknesses only on track shoulders where topography permits, and for borrow pit reinstatement.
- Construction sequencing shall minimise the temporary stockpiling of peat wherever possible, and where necessary, stockpiled for a minimal amount of time prior to placement/reuse. Placement may be as landscaping, side casting, within the peat repositories, or placement in the excavated borrow pit cells.
- Temporary storage must be safe in so far as it protects the structure and integrity of the excavated peat subject to prevailing local conditions. Reinstatement of peat and peat turves will be completed during the Construction Phase at the earliest practicable opportunity to avoid prolonged storage.
- Peat stockpiles shall not be allowed to substantially erode or become dry.
    - Any temporary storage locations must be in suitably wet conditions or be irrigated in order to prevent the peat from desiccating and precautions shall be taken to ensure that turves are not allowed to dry out prior to reinstatement. The condition of turves shall be monitored throughout the duration of storage. Irrigation of peat turves will be agreed in advance with the Ecological Clerk of Works (ECoW) and Geotechnical Engineer. Should wetting of turves be required in order to prevent desiccation, mitigation will be adopted to prevent run-off or discharge to any adjacent watercourses.
- Plant movements and haul distances related to earthworks activity and peat excavation shall be kept to a minimum.
- Access road shall be constructed ahead of plant and machinery. Offroad plant and machinery movement is not permitted without the use of bog mats and will be kept to a minimum.
- All construction activities shall be kept to areas adjacent to the proposed development and plant and machinery movements outside of these areas is not permitted.
- The area of the proposed development shall be fenced off and isolated from areas away from the proposed footprint to ensure no construction activities are conducted outside of the proposed earthworks areas.
- Material stockpiles and peat reinstatement shall be located at least 60m away from watercourses, including site ditches, to reduce the potential for sediment to be transferred into the wider hydrological system.
- If possible, excavation will be timed so as to avoid very wet weather.
- Peat stockpile locations will be selected to limit re-handling as far as reasonably possible.
- Excavated peat shall be stored and reused as close as possible to the immediate area
- The Contractor shall consult the ECoW to agree on locations for material stockpiles and consider minimising impacting sensitive ecological receptors.

- The Contractor shall consult the site Geotechnical Engineer and review and take into account Appendix 10-2 Peat Stability Risk Assessment (GDG, 2022), to avoid the risk of peat instability in; peat excavations, peat stockpiles and all material stockpiling in areas underlain by peat.
- Run-off from stockpiles shall be directed through the Proposed Development drainage system that shall include silt fences, settlement ponds and other drainage measures as appropriate. Information on drainage further detailed in the Surface Water Management Plan (Appendix to Chapter 11 of the EIAR) Construction and Environmental Management Plan (Appendix 4-1 of the EIAR).

The following particular recommendations/best practice guidelines for the placement of peat & spoil with respected to specific aspects of the windfarm will be considered and taken into account during construction.

Access roads, hardstands and other infrastructure:

- Controlled quantities of peat and spoil shall be side-cast, to form permanent landscaping, adjacent to access road and other infrastructure only where it can be placed in a stable formation i.e. where the topography and ground conditions allow, and out with areas identified in Section 2.2.
- Side cast peat material shall consist of the acrotelm (upper peat layer) only and it shall be landscaped and shaped to aid in the reinstatement of the site.
- Peat and spoil shall only be cast to safe heights and slope angles, considering the topography and the ground conditions. This height shall be no more than 1m, and the slopes shall be not greater than 1 (V): 3 or 4 (H) unless a site-specific assessment during detailed design indicates a greater height and angle is safe.
- The effect of drainage or water run off shall be considered when placing landscaping rising adjacent to access roads. Landscaping material shall be placed in such a way so as to not interfere with drainage, risk blocking of drainage systems or run-off into drainage systems.

Peat storage areas:

- Peat storage areas have been identified at locations where the topography, peat depth, resulting stability assessment and other environmental constraints have allowed. These areas are designated for the permanent storage of up to 1m of peat material.
- A stability assessment of the peat respository areas has been outlined in associated technical note within the Peat Stability Risk Assessment (Appendix 10-2 of this EIAR).
- A stone buttress will be constructed as outlined in the peat repository drawings in Appendix C, and subsequent detailed design. This stone berm will help to prevent the flow of saturated peat material. The stone berm will be constructed with a sufficiently coarse granular material or rock to enable the drainage of the stored peat material and prevent any occurrence of instabilities within the repository area.
- The height of the rock berm constructed will be greater than the height of the placed peat to prevent any surface peat run-off. Berms will be required to be at least 250mm higher than the placed peat material, as a result rock berms of 1.25m in height are proposed.

- The stone berm is subject to the detail designer's specification however some peat excavation or installation of shear key may be required to prevent global instabilities within the stored material.
- Any peat material generated during the construction of the first peat repository area berm will be safely temporarily stored locally before being placed in the peat repository area once constructed or used in the reinstatement of the Proposed Development. Peat generated during the construction of subsequent peat repository areas will be stored in other repository areas. As outlined in Section 8, the contraction stage contractor will be required to develop their own peat management plan and method statements for the construction stage activities and it will be in line with all the principles in this document.
- Where possible, the surface of the placed peat will be shaped to allow efficient run-off of surface water from the peat storage areas into the Proposed Development drainage system.
- Silting ponds will be required at the lower side/outfall location of the repository areas.
- Intermediate berms or buttresses of spoil material may be installed within the peat storage area to aid in the placement and stability of the peat material. These berms will be shaped to align with the contours of the storage area.
- The contractor shall make every reasonable effort to promote growth on the peat storage areas following placement of peat and completion of construction stage activities. Upper acrotelm layers shall be placed on the surface right way up to promote vegetation growth. This growth will aid in stabilising the stored peat material and help in preventing it from becoming saturated following heavy period of rain.

Borrow pits:

- The surface of the placed peat and spoil shall be shaped to allow efficient run-off of surface water from borrow pit areas.
- Silting ponds will be required at the lower side/outfall location of the borrow pits.
- A layer of geogrid to strengthen the surface of the placed peat & spoil within the borrow pits can be used where required.
- Infilling of the peat & spoil shall commence at the back edge of the borrow pit and progress towards the borrow pit entrance/rock buttress. The contractor excavating the rock will be required to develop the borrow pits in a way which will allow the excavated peat and spoil to be placed safely.
- The height of any required rock buttresses constructed will be greater than the height of the placed peat and spoil to prevent any surface peat and spoil run-off.

4 Road Construction Types

Some of the existing forestry tracks are to be upgraded and new access roads are proposed. The following factors are considered in the proposed road construction types:

- Constructability;
- Serviceability requirements for construction and wind turbine delivery and maintenance vehicles;
- Peat depth;
- Horizontal longitudinal and cross fall gradient of the roads;
- Minimisation of excavation arisings; and
- The requirement to minimise disruption to peat hydrology.

The above key principles are used to determine the road type and will be finalised with regard to the prevailing ground conditions encountered during the detailed site investigation stages.

The proposed road construction details for the development are summarised below in Table 4-1. The details of the road construction types are included in Figure 4-4 of Chapter 4 for the EIA report.

Table 4-1 Road construction types

Construction method	Appendix B Detail reference	Construction type
Construction of new roads	A	Founded
Upgrade of existing access roads	B	Founded

No floated roads are proposed for the Proposed Development.

It is proposed that all new access roads will be of a founded construction methodology (Detail A in Figure 4-4 of Chapter 4 for the EIA report). A methodology and a detail is provided for upgrading of the existing founded access roads (Detail B in Figure 4-4 of Chapter 4 for the EIA report). There is no known existing floated access track at the site, so the upgrade of existing floated road is not proposed.

General construction methodologies are presented in the following sections. This methodology aims to minimise impacts on the stability of the peat. These proposed methodologies will be informed by detailed design following site investigation. The methodology is not intended to cover all aspects of construction such as drainage and environmental considerations. Inspection and monitoring plans will be implemented during construction for each methodology to monitor peat stability.

4.1 Construction of New Roads

The general methodology to construct new founded roads is presented in Section 4.3.7 in Chapter 4: Project Description of the EIAR. All peat will be removed from the earthworks footprint.

Peat material can be side cast along the access road section to aid with restoration of the peatland areas and embed the access roads into the surrounding environment where slope and ground conditions allow, limiting their ecological and environmental impact. Areas of potential instability have been identified in the PSRA (GDG, 2023), the areas outlined for construction avoidance and/ or additional mitigation requirements must be adhered to during construction of the proposed access roads. Where permissible, side cast materials shall be placed to a maximum height of 1m and widths of a minimum 2m to 3m unless site-specific detail designs allow larger volumes of to be placed.

Particular buffer areas including construction buffers and peat stockpile restriction areas have been highlighted in Appendix 10-2 Peat stability risk assessment report (GDG, 2023) for this development and are shown presented in Appendix A.2.

4.2 Upgrade of Existing Roads

The general methodology to upgrade existing founded roads is presented in Section 4.3.7 in Chapter 4: Project Description of the EIAR. As no widening of the road is required, there will be no excavation of peat required as part of the upgrade works.

5 Excavation of Turbine Bases, Hardstandings, and Infrastructure Foundations

Methodologies of construction of the turbine bases/foundations and hardstands across the site are presented in Section 4.3 of Chapter 4: Project Description, of the EIAR.

Assessment of the ground conditions encountered in the ground investigations would suggest that much of the site is covered by a layer of peat with an average peat depth of 1.3m, with peat up to 3.5m deep within the main body of the Proposed Development. The material encountered beneath this peat is generally stiff or dense cohesive and granular till or weathered bedrock material. Generally, for the construction of any structure or platform foundation, such as turbine base, hardstand or substation, the removal of all soft material is required to a depth where a suitable bearing material is encountered.

During turbine construction, peat will be permanently excavated to the substrate to make room for the concrete turbine foundation, and for a working area surrounding the foundation footprint. The required diameter of the turbine foundation bases will be determined by the foundation design, largely dictated by the local ground conditions and the requirements of the turbine supplier. The plan area of the material to be removed will be dictated by the enabling temporary works design, allowable the excavation angle and the mean peat depths across each turbine location.

The design of the turbine base foundations is subject to further ground investigation and the detail designer's assessment.

Similarly, all turbine crane hardstands and the substation platform will be required to be founded on a suitable bearing material requiring the excavation of all peat and other soft ground materials, where present. The platform will be constructed in the excavated area using a suitable specified engineered stone fill. The selected locations have been identified as they a have lowers depth of peat materials, among other constrains. Less than 1m of peat has been identified at the substation location. Following the placement of the platform, the excavated peat can be re-used to batter the platform edges and landscape the platform back into the existing topography.

The mean peat depths collected from the ground investigations is used to calculate the estimated peat volumes at each structure foundation location. This is outlined further in Section 9.

6 Peat Repository Areas

The layouts for the proposed peat repository areas are outlined in Appendix B.

Six proposed peat repository areas have been identified at locations throughout the Proposed Development. The peat repository area locations have been selected based on the results of the peat stability risk assessment outlined in Appendix 10-2 and the engineering design, and stability analysis. The six peat repository areas form part of the overall peat management strategy (based upon peat probing and associated engineering calculations) which is considered to be wholly sufficient to accommodate the worst-case volumes generated. The peat reinstatement capacity and subsequent

peat balance is outlined in Section 9.Excavation of some peat will be required for the installation of the perimeter stone berm, either through excavation and replacement of the peat or in the development of a berm shear key structure. Any excavated material in this regard will be minimal in the overall context of the development and it will be used to reinstate other areas of the proposed development and placed within the peat storage area. The stone used for the berm material; will be a large granular sized stone material allowing for the draining of water from the placed peat material. This stone material will be won locally from one of the proposed borrow pit areas. If these areas are required they shall be constructed with the installation of a stone berm at its perimeter. The installation of internal and intermediate berms for material segregation or compartmentalisation of the peat material will be subject to the Contractors design.

A stability assessment at the peat repository areas outlining a bearing capacity check, sliding check and stability analysis examining the appropriate sizing of the stone berm has been outlined in associated technical note within the Peat Stability Risk Assessment (Appendix 10-2 of this EIAR).

The construction stage Contactor will develop a geotechnical investigation, testing and inspection regime for the peat repository areas prior to installation, during construction and for a period of time following the completion of the reinstatement following the principles outlined below.

The construction stage confirmatory ground investigations shall include;

- Further peat probe testing across the PRA footprint area, with particular close spacing on the footprint of the proposed stone berm,
- Trial pit locations to characterise the nature of the peat material,
- Shear vane testing in peat and underlying glacial till material to quantify the peat and overburden strength parameters.

Construction and post construction monitoring shall include;

- Monitoring posts in adjacent peat material, regularly inspected throughout construction, immediately following construction, and during wind farm operations,
- Inspection of the stone berm and all drainage networks throughout construction of the peat repository areas,
- Shear vane testing of the placed peat within the repository area.

7 Borrow Pits

Four borrow areas are proposed for the development as shown in Appendix A and C. The peat depths within the development footprints of the borrow pits are outlined in Table 7-1.

Table 7-1: Average peat depth at borrow pit

Borrow pit ID	Average peat depth (m)
Borrow pit 1	1.3
Borrow pit 2	1.8
Borrow pit 3	1.5
Borrow pit 4	0.4

Trial pit locations at borrow pit areas are indicative of peat material overlying predominantly gravel and weathered bedrock material and encountering bedrock between 1.5 and 2.2mbgl. Particle size distribution (PSD) testing carried out on samples recovered from the trial pits suggests that the material may be suitable for reuse during the construction of the wind farm. Assessment of the PSD test results suggests that four of the six samples tested meet the grading requirement for use as Class 1A, 6A and 6F and the remaining two samples meet the grading requirement for as Class 1A and 2C2 material as defined in Table 6/1 of Series 600 (TII, 2013). Further ground investigation and analysis of the feasibility of the borrow pits and the material reusability will be conducted at the detail design stage.

The rock within each proposed borrow pit footprint will be removed by either breaking or blasting depending on its excavatability, which will be determined from a ground investigation carried out at each of the proposed borrow pits. The excavated rock from the borrow pits will be used in the construction of the infrastructure elements (turbine bases, roads, etc.) of the wind farm. The proposed profiles of each of the borrow pits are included in Figures 4-8a to 4-8d of the EIAR. Where necessary, the project design engineer will determine the appropriate depth of excavation. Upon removal of the overburden and rock from the borrow pit, it is proposed to reinstate the borrow pit using surplus excavated peat and spoil. The contractor excavating the rock will be required to develop the borrow pits in a way which will allow the excavated peat and spoil to be placed safely. The final profile of the peat and spoil will vary across the base of the borrow pit.

The proposed design incorporates construction of upstands of intact bedrock within the borrow pits to help contain the reinstated peat and overburden, and the Contractor may further divide this into to cells using berms. This will allow for the safe placement and grading of the materials using dumper trucks and excavators.

A geogrid or geotextile material will be used to aid in the strengthening of the upper surface of the deposited material within the borrow pit and to aid in the promotion of growth and rehabilitation of the borrow pit area.

The borrow pit layout for each proposed borrow pit area are presented in Appendix C.

8 Sequencing of Works

Suitable consideration needs to be given to the sequencing of works for the feasibility of construction activities in a peat environment. Careful consideration needs to be given to the availability of safe reinstatement areas for peat material volumes generated during excavation works. The construction stage contractor will outline this within their construction stage peat management plan and method statements for the construction stage activities and it will be in line with all the principles in this plan including maintaining safety buffer areas and peat restriction areas as well as all the details outlined in Section 3 above. In the event planning consent is granted for the proposed development, this PMP will be updated prior to commencement of development to address the requirements of any relevant planning conditions, including any additional mitigation measures, which are conditioned and will be submitted to the planning authority for written approval.

A suitable contingency has been accounted for in the peat balance calculations and sensitivity outlined in Sections 9.3 and 9.5. These outline an allowance for any restrictions in the availability of reinstatement areas from the borrow pit locations due to sequencing and the full borrow pit volume not being available at the same time.

Additionally it should be noted that from the commencement of works, the existing forestry tracks will be immediately available and can be used to access the proposed borrow pit areas and peat repository areas to enable commencement of enabling works such as borrow pit construction and peat repository development without the generation of peat volumes during access roads construction.

9 Preliminary Peat Volumes

The ground investigation and design layout drawings have been reviewed to inform this chapter of the PMP. Peat volumes have been calculated based on the results of the intrusive investigations and the proposed design.

It is expected that peat excavation will be required for the following elements of the proposed development:

1. Founded access roads;
2. Turbine foundations and crane hardstands;
3. Substation compound;
4. Construction compound;
5. Meteorological mast foundation, and;
6. Borrow pits.

Peat excavated in association with the cable trenches is often replaced at its point of origin and therefore is not considered a volume loss. No further assessment of cable trench volumes will be undertaken.

A preliminary estimate of the approximate volumes of excavation and fill needed to construct the development was carried out. This was produced using typical limits to road and hardstand gradients and using road and hardstanding thickness typical to the windfarm ground conditions.

A construction stage peat management plan will be required to be carried out and updated throughout the construction stage as further information is collected. This construction stage peat management plan will include the findings of all confirmatory ground investigations and be in line with all the principles in this plan including maintaining safety buffer areas and peat restriction areas as well as all the details outlined in Section 3 above. In the event planning consent is granted for the proposed development, this PMP will be updated prior to commencement of development to address the requirements of any relevant planning conditions, including any additional mitigation measures, which are conditioned and will be submitted to the planning authority for written approval.

9.1 Peat Excavation Volumes

The peat depths examined in the ground investigation were reviewed at the Proposed Development assets such as each turbine hardstand, substation, borrow pit locations, and an average peat depth was determined in the area surrounding each proposed structure. The average peat depths at each structure were incorporated into the model along with the turbine and hardstand layout, access roads alignment and other associated infrastructures to estimate the volume of peat expected to be excavated.

A breakdown of the estimated peat excavation volumes is summarised in Table 9-1.

Table 9-1: Summary of preliminary excavation volumes

Infrastructure Item	Average Peat depth (m)	Excavated peat volume (m^3)
Access Roads (founded)	1.2	171,181.50
Turbine foundations	1.3	5,827
Crane hardstandings	1.3	72,504.0
Borrow Pit 1	1.3	20,978.1
Borrow Pit 2	1.8	66,183.3
Borrow Pit 3	1.5	45,301.5
Borrow Pit 4	0.4	11,652.8
Substation	0.4	2,944.6
Met mast hardstand	2.2	1,375.0
Contractor compound	1.3	28,729.7
Total		**426,677.00**

* The volume of peat material excavated has been estimated using the average peat depth calculated across the footprint of the structure to define the basal surface of the peat.

9.2 Peat Reinstatement Volumes

Peat generated during construction can be reused or reinstated across the development. Peat may be reused for landscaping on edges of constructed infrastructure (including road verges, around hardstand area and turbine foundations) and shall be placed as soon as reasonably practical after construction. This shall act as part of the landscaping restoration and tie-in with surrounding topography, reducing visual impacts and restoring the existing habitat.

Several considerations have been made in the estimation of reinstatement volumes:

- A conservative reinstatement volume of 2m^3 per lin.m of access road (1m^3 on each side of the trackway) has been used. This can often be increase to up to 4m^3 per lin.m following the detail design stage and the appropriate stability design considerations,
- An estimated reinstatement capacity of 2m^3 per external lin.m perimeter of hardstand areas such as the crane hardstands and substation,
- Peat material will be used to dress/ landscape around the turbine foundation footprint with an assumed thickness of 0.5m,
- As further discussed within the sensitivity analysis reduced volumes have been considered for storage in the borrow pits, as the borrow pits are constrained by the construction sequence and may not be open simultaneously during the construction phase,

Potential peat reuse/reinstatement volumes have been estimated and are also presented in Table 9-2.

Table 9-2: Summary of preliminary peat reinstatement volumes

Infrastructure Item	Reinstatement volume (m^3)	Comments
	Peat	
Access roads - founded	47,950	Placement of arisings 2m^3/lin.m alongside existing and new founded roads, where topography allows
Turbine Foundations (17nr.)	2,163	Assumes a conservative estimate of 0.5m coverage of peat material across the turbine foundation footprint.
Crane Hardstands (17nr.)	19,380	Placement of arisings 2m^3/lin.m of external hardstand perimeter, where topography allows
Compound (3nr)	2,100	Placement of arisings 2m^3/lin.m of external hardstand perimeter, where topography allows
Borrow pit 1	444,116**	Assumes placement of 144,116m^3 of peat excavated from the borrow pit areas being replaced within the borrow pit areas on completion and an additional 300,000m^3 of available space for peat reinstated along the base of borrow pit
Borrow pit 2		
Borrow pit 3		
Borrow pit 4		
Peat repository 1	28,407.625	Assumes max. storage of 1m across peat storage area footprint minus the storage berm
Peat repository 2	15,006.875	
Peat repository 3	30,038.75	
Peat repository 4	90,28.875	
Peat repository 5	16,970.125	
Peat repository 6	15,772.375	

Infrastructure Item	Reinstatement volume (m^3)	Comments
	Peat	
Substation	780	Placement of arisings 2m^3/lin.m of external hardstand perimeter, where topography allows
Met mast hardstand	300	Placement of arisings 2m^3/lin.m of external hardstand perimeter, where topography allows
Total	**632,013**	

**Borrow pit excavation volume outlines what is considered to be an optimal volume for reinstatement as shown on the borrow pit figures. This equates to around 70% of the pre excavation capacity. The reinstatement profiles are consider to be capable to be engineered to be stable and has been landscaped to reduce visual impact. In reality the volumes excavated from borrow pits will be a function of the engineering fill material required and detailed design

The volumes quoted in Table 9-2 reflect normal earthworks practice where volumes of cut and fill are evaluated on a 1m^3 cut to 1 m^3 filled basis. It is acknowledged that the phenomenon of bulking can occur where placed soils occupy a greater volume due to a reduction in density. It is considered that bulking will be offset to a considerable degree by compaction of soils during placement and subsequent settlement to achieve the volumes outlined.

Placement and reinstatement of peat material is subject to stability requirements to be investigated by the detailed designer. A construction stage peat stability risk assessment will be conducted to investigate the peat stability and landslide risks by construction activities which may not be outlined in this report..

The excavated overburden material may be reused in fill aspects of the design subject to the material specification and the suitable of the excavated material. The planning stage assessment of borrow material, outlined in Section 7, suggests it should be suitable for use as an engineered fill material, however further investigation borrow pit material appraisal will be required by the detailed designer.

At this stage, no peat volume requirement has been identified for habitat restoration; however, should material be required, an increase in demand for peaty soil and acrotelmic peat is anticipated. In this event, the calculations presented herein will be revisited.

9.3 Peat Balance

The volume balance of excavated and reinstated peat is outlined in Table 9-3. This table outlines the estimated volumes of peat excavation and the reinstatement volumes as outlined in Sections 7.1 and 9.2 Peat Reinstatement Volumes0.

Table 9-3: Peat balance assessment

ITEM	SUPPLY	DEMAND	BALANCE
	Peat Excavation Volume (m^3)	Reinstatement Requirement (m^3)	Surplus (+) or Deficit (-) (m^3)
Access roads - founded	171,181.50	47,950.00	+123,231.50

ITEM	SUPPLY	DEMAND	BALANCE
	Peat Excavation Volume (m^3)	Reinstatement Requirement (m^3)	Surplus (+) or Deficit (-) (m^3)
Roads to be upgraded	0.00	0.00	0.00
Turbine foundations	5,827.00	2,163	+3,664.01
Crane hardstands	72,504.00	19,380.00	+53,124.00
Construction Compounds	28729.7	2,100	+26,629.70
Substation	2,944.55	780	+2,164.55
Met Mast	1,375.00	300	+1,075.00
Peat storage areas 1	0.00	28407.625	-28,407.63
Peat storage areas 2	0.00	15006.875	-15,006.88
Peat storage areas 3	0.00	30038.75	-30,038.75
Peat storage areas 4	0.00	9028.875	-9,028.88
Peat storage areas 5	0.00	16970.125	-16,970.13
Peat storage areas 6	0.00	15772.375	-15,772.38
Borrow Pit 1	20978.1	444,116*	-300,000
Borrow Pit 2	66183.25		
Borrow Pit 3	45301.5		
Borrow Pit 4	11652.8		
TOTAL	**426,677**	**632,103**	**-205,336**

*Optimal borrow pit reinstatement volumes as outlined in Table 9-2

The summary of preliminary earthwork volumes indicates that the peat storage capacity of the development, namely that provided once the borrow pit and peat storage areas are reinstated, is greater than the volume of peat excavated for the various infrastructures. Therefore, even if peat excavation volumes have been underestimated there is still ample capacity to accommodate the peat generated within these proposals.

9.4 Other earthworks materials

As noted in Section 1.4 a surplus of mineral soils or rock is not anticipated, and a cut and fill balance has been and will continue to be targeted with rock and mineral soils in the development earthworks. However, the peat balance above confirms that should a proportion of mineral soils be incapable of being reused as engineered fill there remains significant capacity to safely accommodate these materials as reinstatement in lieu of peat.

9.5 Sensitivity Analysis

Sensitivity analyses calculations indicates a workable peat storage capacity of the development. The current optimal borrow pit reinstatement volume is approximately 70%. The sensitivity analysis below considers a worse-case construction sequence, allowing for only 60% of the total peat excavated to

be deposited in the borrow pits, and secondly utilising only 50% of the total borrow pit capacity in the final calculations. In this instance the peat demand reduces from 637,000m^3 to 429,000m^3 and 508,000 m^3, respectively.

Table 9-4: Peat volume sensitivity analysis (rounded)

Borrow pit reinstatement condition	Associated Borrow pit reinstatement volume (m^3)	Total adjusted achievable Reinstatement (m^3)	Total peat balance Surplus (+) or Deficit (-) (m^3)
60% of total peat excavated	241,000	429,000	-4,000
50% of borrow pit max. volume	320,330	508,000	-83,000

The sensitivity analysis suggests that should construction sequencing constrain the ability to place peat as desired there still remains capacity to accommodate the required volumes of peat comfortably within the proposals. It should be emphasised that temporary storage of peat will be required during construction due to the volumes being handled and the availability of borrow pits. The use of peat storage areas for both temporary and permanent storage of peat may be required.

10 Guidelines for Good Construction Practice

10.1 General

Inappropriate storage of excavated peat and overburden, as well as uncontrolled loading of peat material is considered one of the main causes of peat instability and landslide event triggers during the wind farm construction process. The management and control of these activities is key to de-risking peat stability at the windfarm site. It is required that the construction method statements for the project also take into account, but not be limited, to the guidance documents listed in Section 1 and the recommendations and requirements outlined throughout this document including in Section 3 above.

The general requirements for the management of peat and spoil materials and the mitigation of peat instability at the site are as follows:

- Storage of peat material including temporary and side casting be carried out in the permitted areas only. No bulk peat storage is to be carried out outside of the designated storage areas and no peat material shall be stored, side cast, or used for landscaping in the designated Peat Stockpile Restriction Areas,
- Excavated peat shall not be stored on site and will be immediately moved to the designated peat storage areas. Acrotelm (upper) peat material may be used as landscaping material where topography allows and the detail designer has assessed the stability risk,
- Uncontrolled placement of peat or loading of peat material must be avoided.

- Water flows within drainage systems will be controlled. Velocities of flows must be controlled using check damns within drainage systems and the uncontrolled release of water onto slopes can create a landslide risk and must be avoided,
- All construction requiring cut and fill earthworks required a robust monitoring and inspection programme. The details of this inspection programme will depend on the purpose and methodologies of the works and the ground conditions and will comply with the principles outlined in Section 10.2 below,
- A method statement and risk assessment (RAMS) which considers the potential causes and mitigations of peat instabilities and landslide is required and must be regularly communicated to all site staff. An observational approach by all site staff to the ground conditions and the risks should be promoted and any changes in the ground or site conditions should be reported and the risk dynamically assessed.

10.2 Monitoring

The installation of movement monitoring posts is recommended for areas where works are taking place on or adjacent to identified peat depths greater than 2m and at all peat repositories.

Movement monitoring posts shall be installed upslope and downslope of the works areas and shall be as outlined:

- Posts shall be 1m to 1.5m in length, installed at 5m intervals with no less than seven posts in each line of sight (~30m).
- A string line shall in attached to the first and last post with all intermediate posts in contact with one side of the string line,
- A numbering system shall be designs for the monitoring posts and a record shall be kept of this numbering system.

Movement monitoring posts shall be observed at least once a day with more frequent inspections which adjacent works are ongoing. Should movements be recorded the frequency of these inspections will be increased. Record shall be kept of all monitor post inspections with reference to date, time and any relative movement between posts, if any. Any movement identified in the posts shall be recorded with reference to the post numbering system.

The contactor shall also develop a routine inspection of all areas surrounding work in peat, not just exclusively on the monitoring posts. These inspections shall include an assessment of ground stability and drainage conditions. These inspections should identify any cracking or deformation on the peat surface, excessive settlement on structures, drain blockages or springs etc.

10.3 Contingency Measures

Although the stability of the peat and overburden is considered to be safe for the constriction activities proposed, and should the peat and spoil be managed in line with the details of this document, the risk of a peat failure or landslide is negligible to very low. However, it is important to consider the actions

which shall be carried out if signs of instability are identified during the outlined monitoring or should a failure occur at the site.

The full methodologies for these activities will be outlined in the construction Contractors RAMS and include the methodologies for immediate and long-term response.

10.3.1 Movement or Instability Observed in Monitoring Areas

Where excessive movement has been observed in the installed monitoring outlined in Section 0 the following measures will be taken;

- All construction activities will be suspended in the area,
- The Contractors Geotechnical Engineer shall carry out an assessment of the peat instability including drainage. The Contractors Geotechnical Engineer shall compile a report outlining the surveys undertaken, the potential cause of the instability, assessment of any increased risk caused by the instability, and the further measures required to manage this risk,
- An increased monitoring regime shall be specified including increase in number of monitoring post lines, decrease on monitoring post spacing and an increase in the frequency of monitoring post observations,
- Should no further movement be detected, construction activities will be recommenced while maintaining the increased monitoring regime,
- Should further excessive movement be detected, the Contractors design and project geotechnical engineer will need to be informed and the design of further reinstatement works will be required such as excavation of the disturbed material, installation of a granular berms or similar.

10.3.2 Emergency Response to a Landslide Event

If the scenario of a landslide, bog burst or peat slide occurring at the site the following steps shall be carried out by the contractor:

- All member of the project will be alerted immediately or as it is safe to do so;
- All site works will be ceased, and all available resources will be used for the management and mitigation of the risks posed by the event;
- The key initial activity will be to prevent displaced materials from reaching any watercourses or sensitive environments. Given the terrain of the Proposed Development Site, the key risk is the development of a propagation landslide or slip within topographic valleys and watercourses. Where possible, check barrage structures on land or within these topographic valley and watercourses shall be constructed to aid prevent further run out of the disturbed peat or spoil material.

Check barrages are permeable granular structures constructed within the path of a landslide to prevent the further downhill or downstream movement of the disturbed material. Typically, these will be constructed of locally generated stone material, often of large sizing. The large material sizing will allow water to pass through the check barrage material, avoiding a build-up in hydrostatic pressure

while containing the debris within the slide. Check barrage will typically be a dam structure between 1 and 1.5m high, with slopes between 1(V):1.5(H) or 2(H), and constructed across the full section of topographic valley and/or water course.

Potential check barrage locations are outlined in Appendix D. The potential check barrage locations have been positioned in areas accessible from existing and proposed access roads within topographic valleys and watercourses which could be a route for a propagating landslide towards the Clydagh River and associated sensitive environments. The check barrage is an emergency preventative measure only to restrict or reduce the movement of displaced material downslope and away from a watercourse or to limit the volume of material from progressing downstream within a watercourse. Further assessment and reinstatement works will likely be required should a landslide occur, and engagement and reporting of the incident will be required by all parties involved in the project. Should the check barrage no longer be required it may be removed and the area reinstated.

The use of check barrages is only proposed for use in the unlikely event of a large landslide event. The proposed locations are only indicative, targeting potential topographic channels but will vary depending on the location and nature of the slide event. The Contractors will need to include an assessment of potential check barrage locations and method for their construction within the emergency procedures in their associated Method Statement documentation.

11 Risk Register

The items listed in Table 11-1 have been identified as geotechnical risks, what may have caused these risks and the steps that have been taken to mitigate these risks. Consideration of these risks shall be incorporated into all risk registers or assessments for any future works within the Proposed Development.

Table 11-1: Risk register

Ref.	Risk	Cause	Mitigation
1	Excavation of larger quantities of peat than expected	Increase in peat depth encountered	This report outlines the calculations carried out in the peat balance exercise. The peat balance calculations outlined in this report outline that the development has the ability to accommodate up to 200,000m^3 more peat than is calculated. The report outlines the volumes of peat excavation required for the construction of the proposed development and the capacity for the development for peat storage or rehabilitation, concluding that the peat balance is satisfactory for the construction of the proposed windfarm development. The peat depths used are developed from the ground investigations carried out at the site including peat probes, trial pits and Russian cores. Peat material can vary largely locally and the risk of missing a local deep area of peat can exist at the site. An increased density of ground investigation was carried out in the areas of proposed infrastructure. However, some areas had limited or no access and so ground investigations are limited. Further GI will be required across the proposed development during the detail and construction stage to assess peat depths and strengths. This will be carried out by the detail designer and Contractors team. The design team shall develop their own peat balance calculation to satisfy and de-risk the possibility of larger peat excavation volumes being encountered at these locations.
2	Inadequate storage space for excavated peat	Inadequate borrow pit and peat storage area volumes	The peat balance calculation has considered a sensitivity analysis of peat reinstatement volumes in the borrow pit locations as a consideration of works sequencing. Separate peat storage areas can be used for the storage of initial peat excavations and for peat material excavated from the borrow pit areas. The report outlines several contingency estimations for the peat volume and storage volume assessments. It is assumed that a suitable construction methodology and project timeline can be developed by the construction stage contractor and design team effectively manage peat excavations and storage areas.
3	Peat slippage from side casting of peat material	Overloading of insitu peat by sidecasting	The peat stability risk assessment (PSRA) report outlined in Appendix 11-2 examines the stability of the peat in several conditions including the inclusion of a 1m peat storage surcharge. This report outlines the methodologies to safely carry out the construction of the proposed development including the restriction for the storage of peat at key infrastructure. The construction stage design and construction team will need to construct the windfarm using these mitigation measures.

Ref.	Risk	Cause	Mitigation
			Further GI will be required across the full site including at the identified hazard areas during the detail and construction stage to assess peat depths and strengths. This will be carried out by the detail designer and Contractors team. The design team shall develop their own testing criteria to satisfy and de-risk the possibility of instability and peat failure It is assumed that the works will be undertaken by a competent contractor experienced in working in peat and soft ground conditions in upland areas, and will have carried out the appropriate due diligence and assessment relating to peat stability and appropriate peat storage.

12 Conclusion

This PMP has been prepared in order to outline a peat management strategy to ensure the workable and sustainable management of peat during the construction of the proposed development.

It is concluded that this PMP demonstrates that the majority of material excavated will comprise peaty soil and acrotelmic peat, however, it is noted that excavations of catotelmic peat will be required. Volumes of catotelmic peat generated will be fully utilised in the restoration of borrow pits and are not considered to represent waste material.

For the purposes of the peat balance assessment completed herein, volumes of peaty soil have been included to facilitate an assessment of the surficial material required for restoration and infrastructure dressing at the proposed development.

The peat balance calculations and sensitivity analysis represent the most likely scenario at the proposed development, and as such it is concluded that all of the peat material excavated can be reused safely on site during construction

A construction stage peat management plan and construction method statement specifically related to peat management with inclusion of the findings of this report will be required at the construction stage of the Proposed Development. It will be in line with all the principles in this plan including maintaining safety buffer areas and peat restriction areas as well as all the details outlined in Section 3 above. In the event planning consent is granted for the proposed development, this PMP will be updated prior to commencement of development to address the requirements of any relevant planning conditions, including any additional mitigation measures, which are conditioned and will be submitted to the planning authority for written approval.

Appendix A – Site Plans

A.1 – Site Layout and Peat Depth Plan

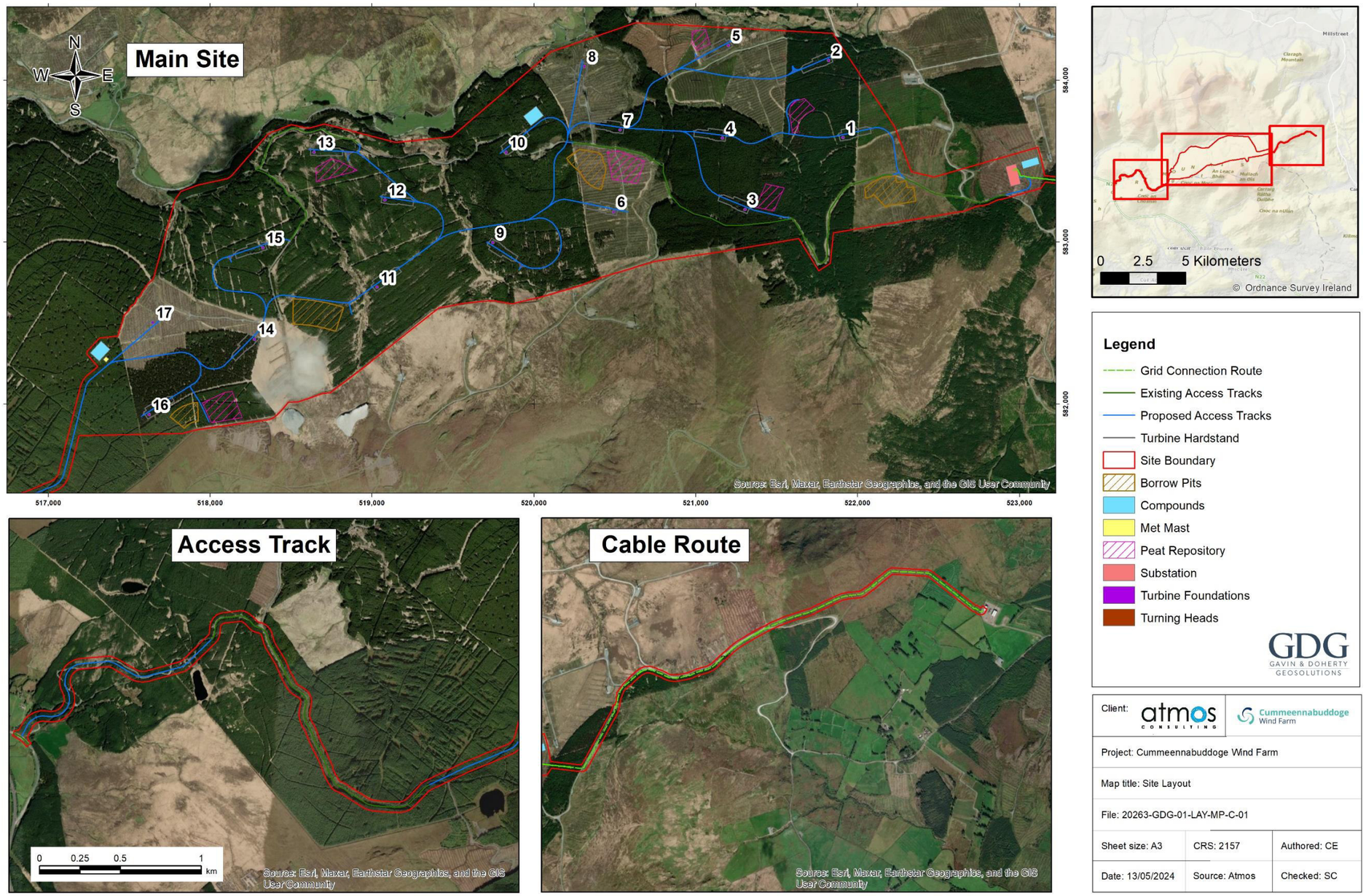


Figure A-1-1: Site layout

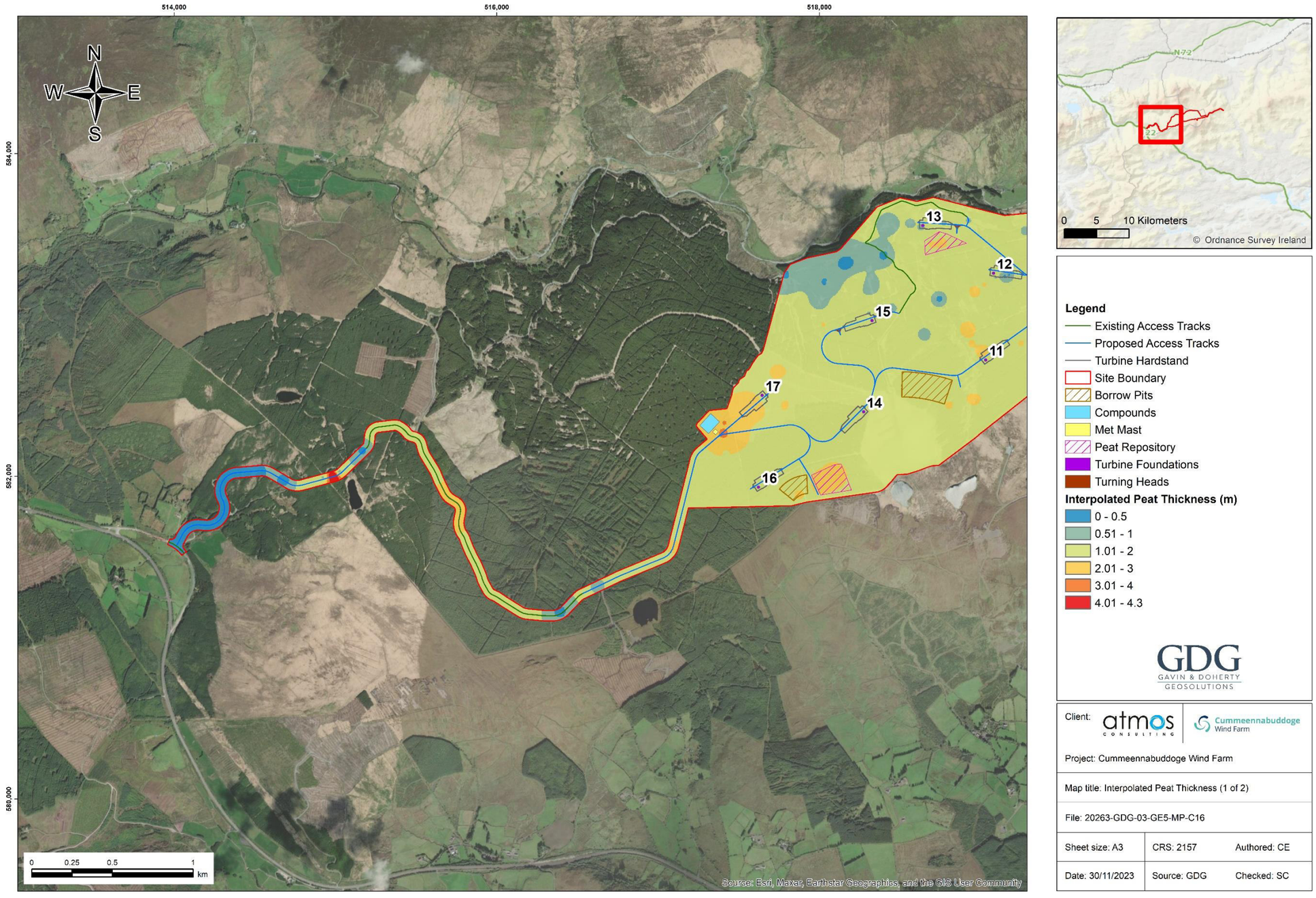
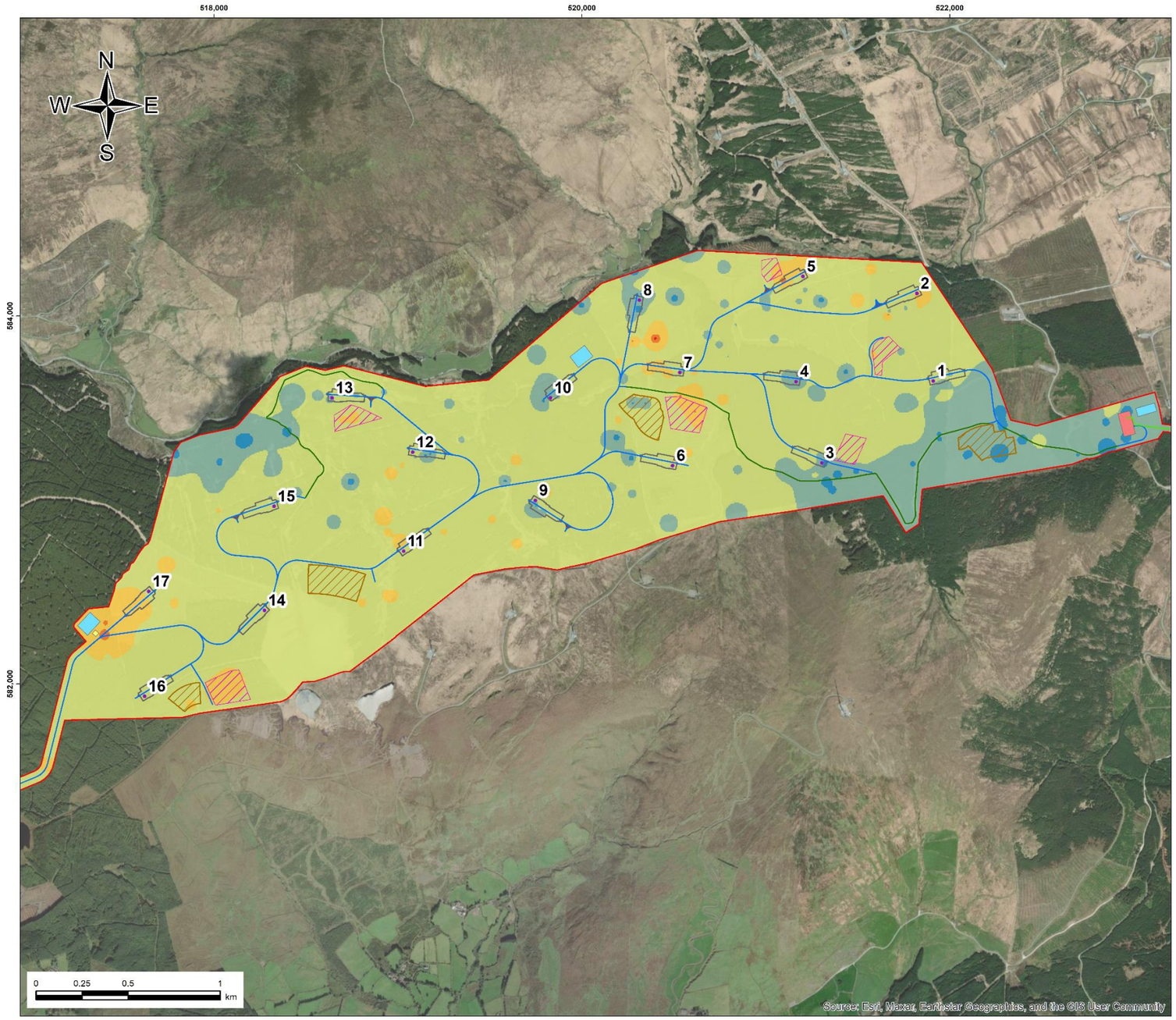
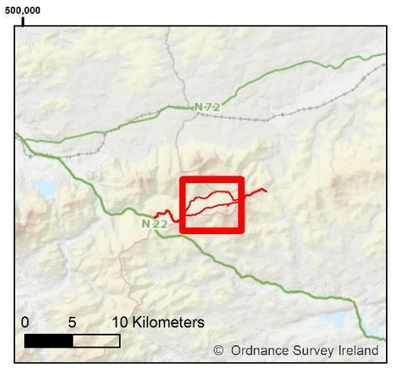


Figure A-1-2: Interpolated peat depth





Legend

- Grid Connection Route
- Existing Access Tracks
- Proposed Access Tracks
- Turbine Hardstand
- Site Boundary
- Borrow Pits
- Compounds
- Met Mast
- Peat Repository
- Substation
- Turbine Foundations
- Turning Heads

Interpolated Peat Thickness (m)

- 0 - 0.5
- 0.51 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 4.3

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Client: atmos CONSULTING / Cummeennabuddoge Wind Farm		
Project: Cummeennabuddoge Wind Farm		
Map title: Interpolated Peat Thickness (2 of 2)		
File: 20263-GDG-03-IPT-MP-C17		
Sheet size: A3	CRS: 2157	Authored: CE
Date: 30/11/2023	Source: GDG	Checked: SC

Figure A-1-3

A.2 –Safety Buffer and Stockpile Restrictions

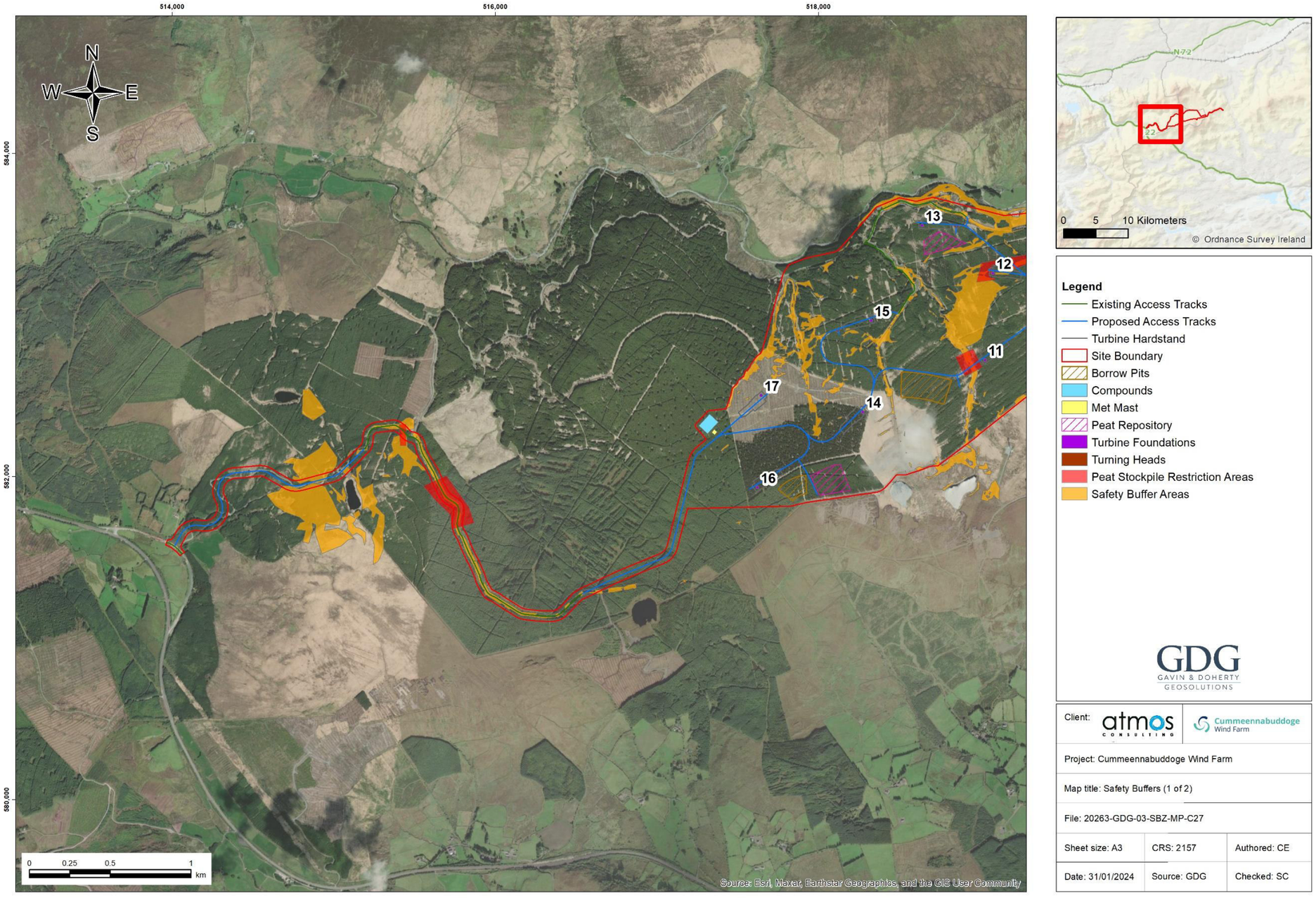


Figure A-2-1: Safety buffer areas and peat stockpile restriction areas

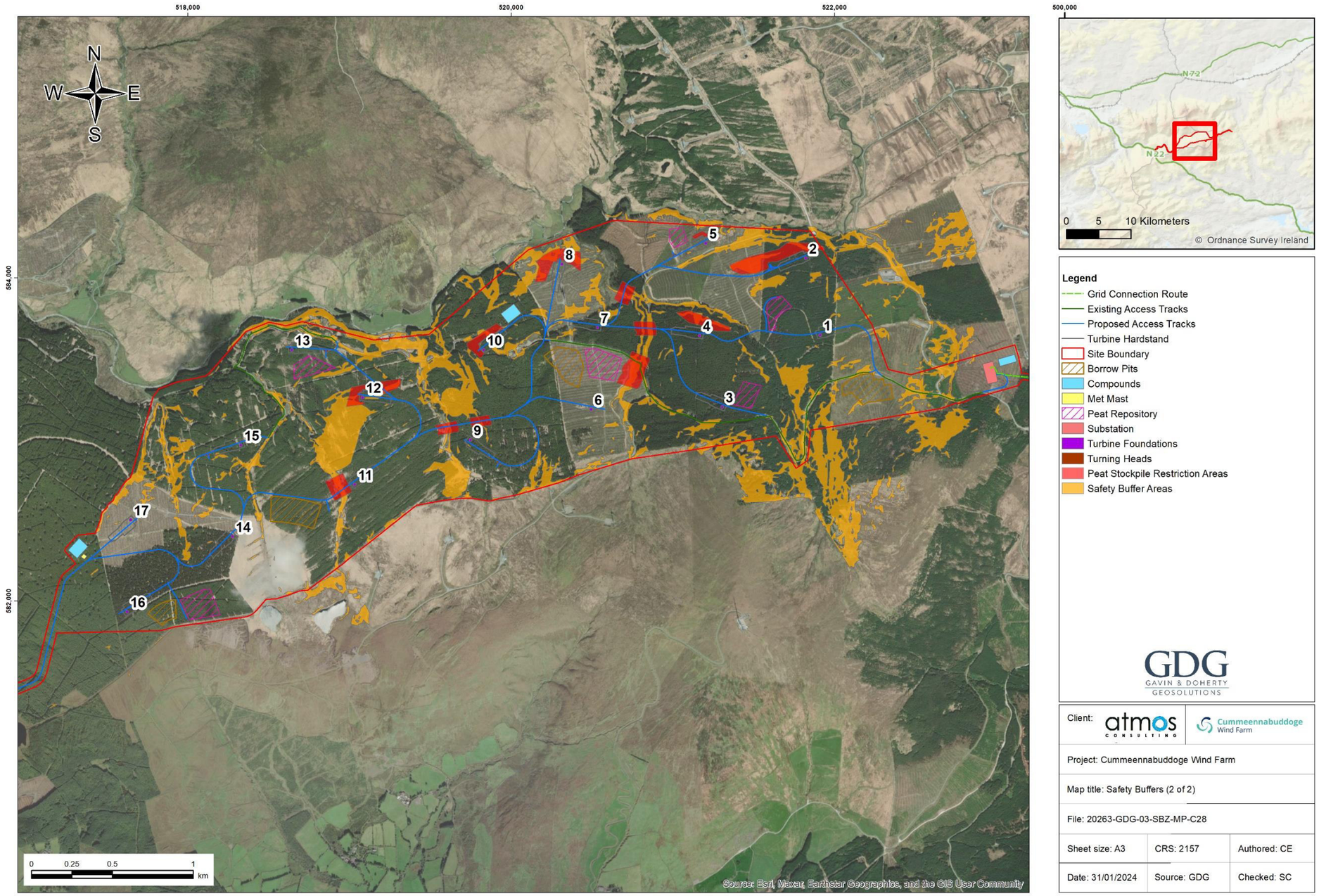
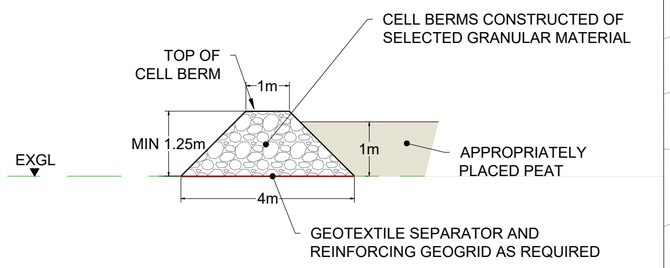


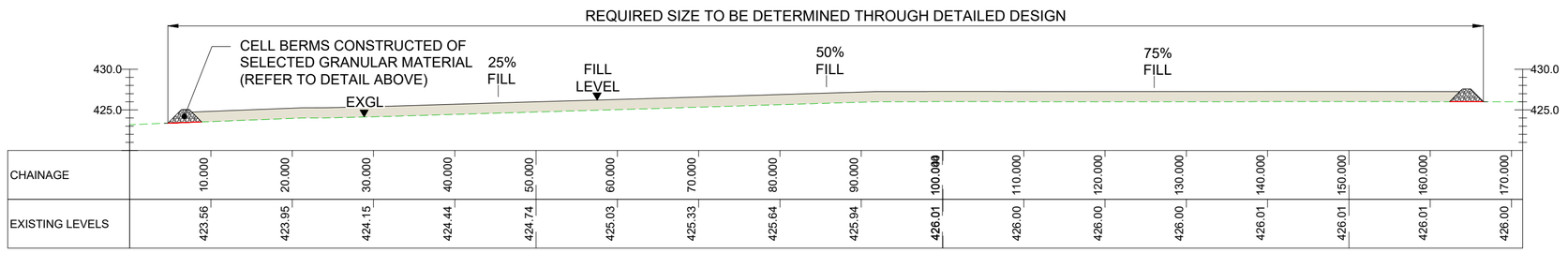
Figure A-2-2: Safety buffer areas and stockpile restriction areas

Appendix B – Peat Storage Area Details



CELL BERM DETAIL - PR1

SCALE 1:100



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6. PLEASE REFER TO MESSRS McCLOYS SURFACE WATER MANAGEMENT PLAN - M01944-02_DG0 FOR FULL DRAINAGE DETAILS - APPENDIX 11-4 OF EIAR.

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DESCRIPTION:	FOR PLANNING		
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ISSUED AS: FOR PLANNING

CLIENT: Ireland FuturEnergy

PROJECT TITLE: CUMMEENNABUDDOGE WIND FARM

DRAWING No: 20263-GDG-Z-XX-DR-C-0901

Revision: -S4-P04

DRAWING TITLE: PEAT REPOSITORY 1 - PLAN AND DETAILS

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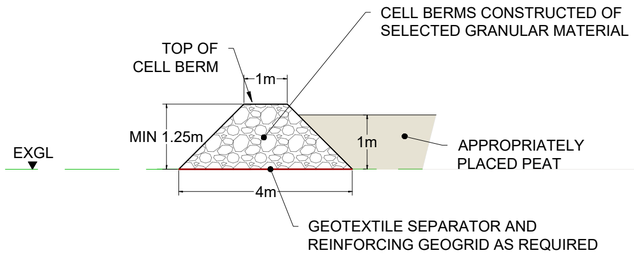
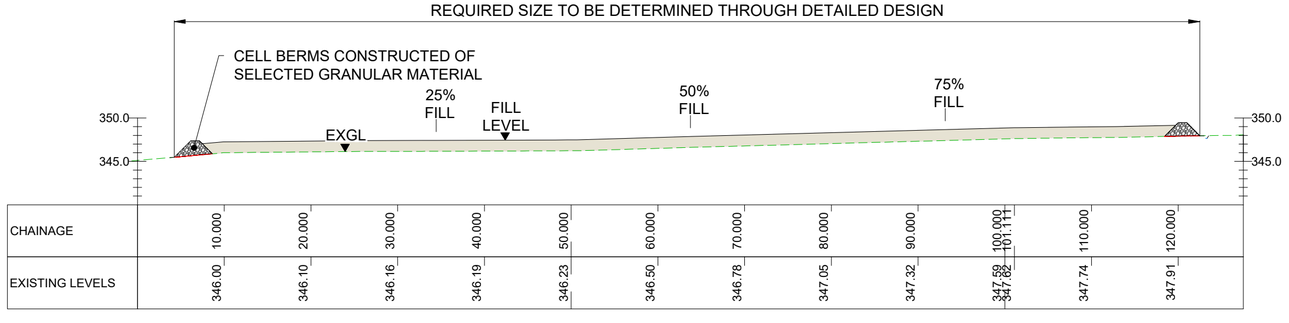


CELL BERM DETAIL

SCALE 1:100



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EXISTING LEVELS	346.00	346.10	346.16	346.19	346.23	346.50	346.78	347.05	347.32	347.59	347.62	347.74	347.91

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PROJECT TITLE: CUMMEENNABUDDOGE WIND FARM

DRAWING No: 20263-GDG-ZZ-XX-DR-C-0902

Revision: -S4-P04

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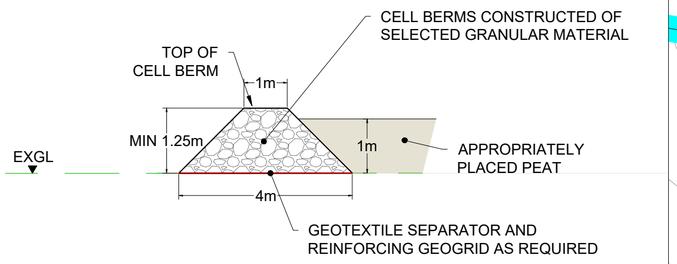

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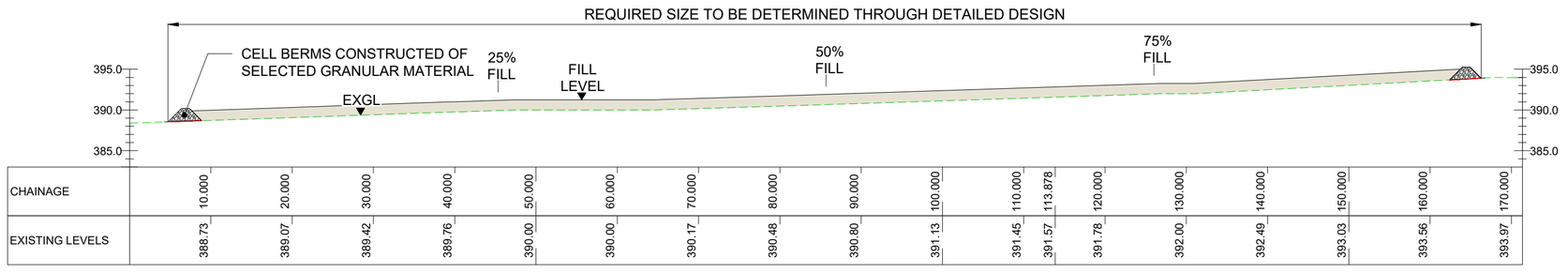

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PROJECT TITLE:
CUMMEENNABUDDOGE
WIND FARM

DRAWING No: 20263-GDG-ZZ-XX-DR-C-0903

Revision: -S4-P04

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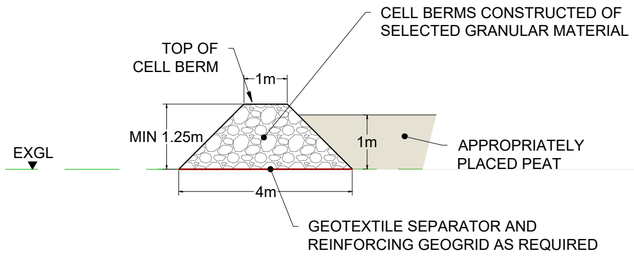

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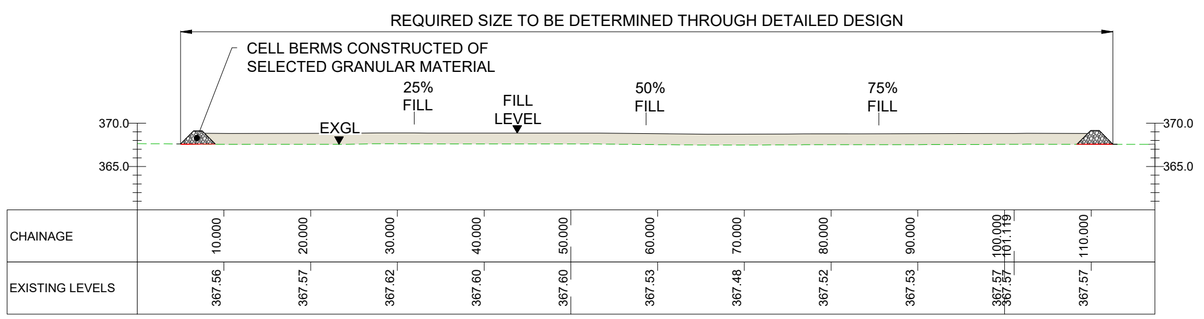

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DRAWING No: 20263-GDG-ZZ-XX-DR-C-0904

Revision: -S4-P04

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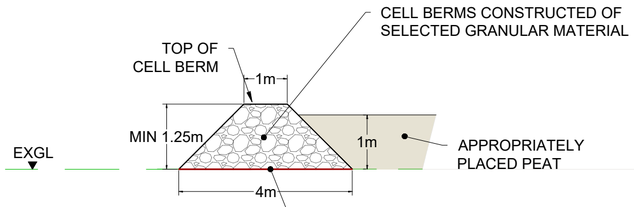
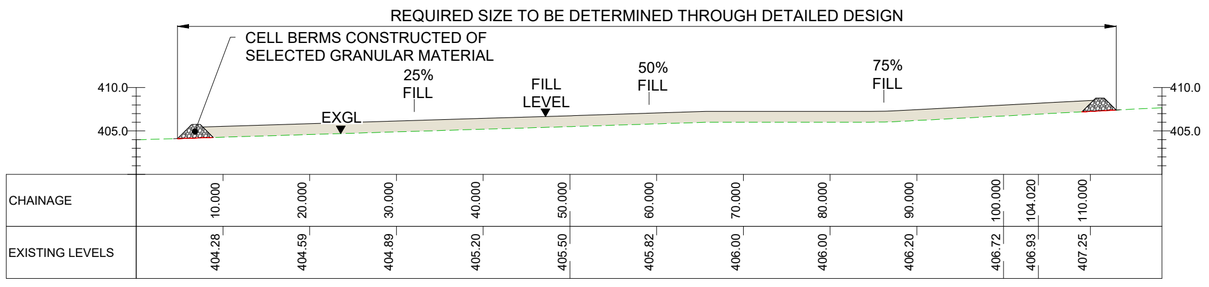


CELL BERM DETAIL

SCALE 1:100



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EXISTING LEVELS	404.28	404.59	404.89	405.20	405.50	405.82	406.00	406.00	406.20	406.72	406.93	407.25

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DESCRIPTION:	FOR PLANNING		
REV: S4-P03	DATE: 12/01/24	DRAWN BY: RW	CHECKED BY: BP
DESCRIPTION:	FOR APPROVAL		
REV: S2-02	DATE: 03/11/23	DRAWN BY: DPC	CHECKED BY: BP
DESCRIPTION:	DRAWING TITLE CHANGED, FOR INFORMATION		
REV: S2-01	DATE: 10/07/23	DRAWN BY: DPC	CHECKED BY: BP
DESCRIPTION:	FOR INFORMATION		

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ISSUED AS: FOR APPROVAL

CLIENT: Ireland FuturEnergy

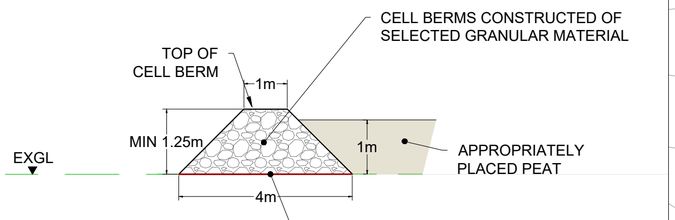
PROJECT TITLE: CUMMEENNABUDDOGE WIND FARM

DRAWING No: 20263-GDG-ZZ-XX-DR-C-0905

Revision: -S4-P04

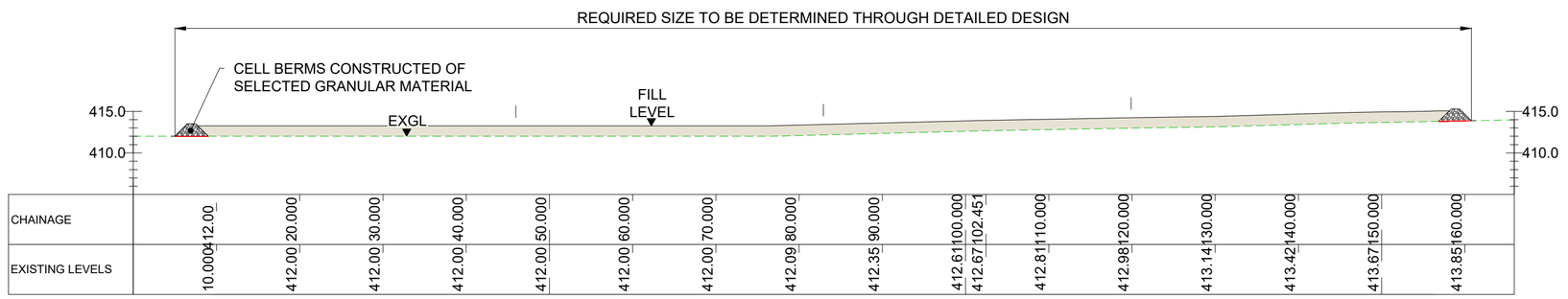
DRAWING TITLE: PEAT REPOSITORY 5 - PLAN AND DETAILS

SCALE: 1:1000	SHEET SIZE: A2	DATE: 07/07/23
DRAWN BY: D.P.C	CHECKED BY: B.P	APPROVED BY: R.Mcl.



CELL BERM DETAIL

SCALE 1:100



NOTES:

1. THIS DRAWING IS INDICATIVE ONLY, FOR PLANNING AND ENVIRONMENTAL IMPACT ASSESSMENT PURPOSES ONLY. DETAIL DESIGN REQUIRED POST PLANNING.
   NOT FOR CONSTRUCTION.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
3. WHERE POSSIBLE, THE ACROTELM SHALL BE STORED WITH THE VEGETATION PART OF THE SOD FACING THE RIGHT WAY UP TO ENCOURAGE GROWTH OF PLANTS AND VEGETATION AT THE SURFACE OF THE STORED PEAT WITHIN THE PEAT STORAGE AREAS
4. ALL PLACED MATERIAL WILL BE ALLOWED TO REVEGETATE NATURALLY FROM THE EXTENSIVE SEED SOURCE OF THE PLANTS THAT HAVE ALREADY COLONISED IN THE AREA. PLANTING ACROSS THE AREA MAY OCCUR BETWEEN 3-5 YEARS AFTER PLACEMENT, ASSUMING THE GROUND HAS STABILISED AND IS NOT WATERLOGGED.
5. BOG MATS TO BE USED WHERE NECESSARY TO FACILITATE PLANT & MACHINERY ACCESS OVER EXISTING SOFT GROUND. NOTE, PLANT & MACHINERY NOT TO TRAVERSE PLACED PEAT.
6. PLEASE REFER TO MESSRS McCLOYS SURFACE WATER MANAGEMENT PLAN - M01944-02_DG0 FOR FULL DRAINAGE DETAILS - APPENDIX 11-4 OF EIAR.

REV: S4-P04	DATE: 10/05/2024	DRAWN BY: DPC	CHECKED BY: BP
DESCRIPTION:	FOR PLANNING		
REV: S2-P03	DATE: 12/01/24	DRAWN BY: RW	CHECKED BY: BP
DESCRIPTION:	FOR INFORMATION		
REV: S2-02	DATE: 03/11/23	DRAWN BY: DPC	CHECKED BY: BP
DESCRIPTION:	DRAWING TITLE CHANGED, FOR INFORMATION		
REV: S2-01	DATE: 10/07/23	DRAWN BY: DPC	CHECKED BY: BP
DESCRIPTION:	FOR INFORMATION		

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ISSUED AS: FOR INFORMATION

CLIENT: Ireland FuturEnergy

PROJECT TITLE: CUMMEENNABUDDOGE WIND FARM

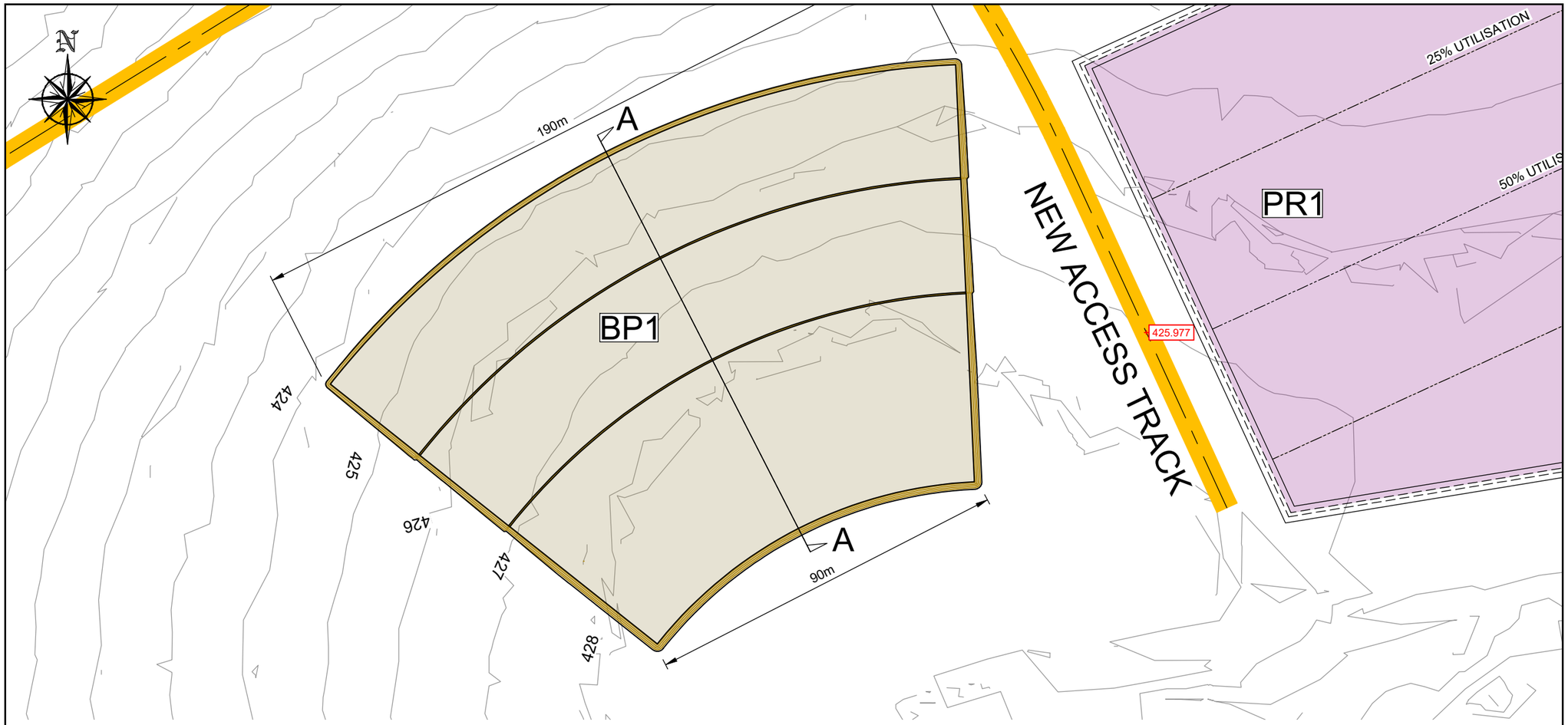
DRAWING No: 20263-GDG-ZZ-XX-DR-C-0906

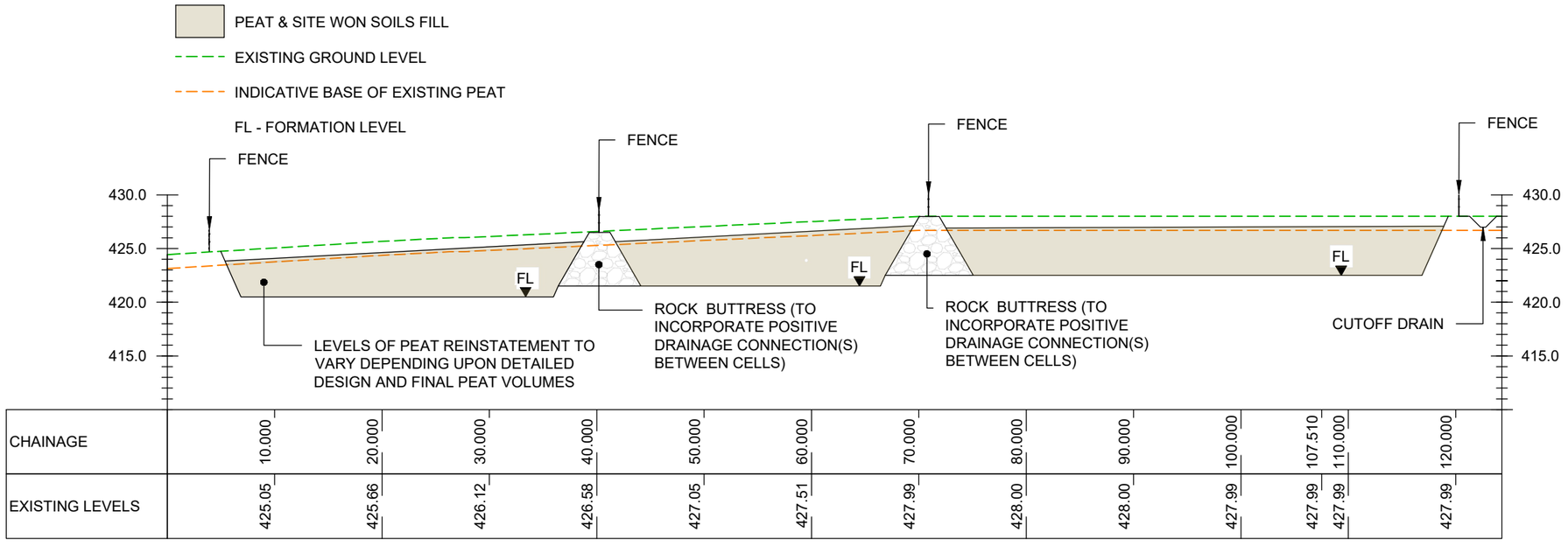
Revision: -S4-P04

DRAWING TITLE: PEAT REPOSITORY 6 - PLAN AND DETAILS

SCALE: 1:1000	SHEET SIZE: A2	DATE: 07/07/23
DRAWN BY: D.P.C	CHECKED BY: B.P	APPROVED BY: R.Mcl.

Appendix C – Borrow Pit Details





CHAINAGE	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	107.510	110.000	120.000
EXISTING LEVELS	425.05	425.66	426.12	426.58	427.05	427.51	427.99	428.00	428.00	427.99	427.99	427.99	427.99

NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEER'S DRAWINGS AND SPECIFICATIONS.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
3. THE OUTLINE AND CROSS SECTIONS ARE INDICATIVE AND ARE SUBJECT TO DETAILED DESIGN AND SLOPE STABILITY ASSESSMENT.
4. BORROW PIT EXCAVATION TECHNIQUES TO BE CONFIRMED FOLLOWING GROUND INVESTIGATION.
5. EXPOSED ROCK SLOPES SHALL BE FORMED AT SHALLOWER INCLINATIONS (TYPICALLY 60°) WITH FACE LEFT IRREGULAR WITH DECLIVITIES TO PROMOTE RE-VEGETATION AND PROVIDE A NATURAL APPEARANCE.
6. ENGINEERED ROCK BUTTRESS MAY BE LEFT IN-SITU TO RESTRAIN CELLS OF PLACED PEAT OVERBURDEN.
7. THE LOCATION OF THE ROCK BUTTRESSES SHOWN FOR THE BORROW AREAS ARE INDICATIVE ONLY AND SUBJECT TO DETAILED DESIGN.
8. THE EXCAVATABILITY OF THE ROCK AND DEPTH TO TOP OF ROCK WITHIN EACH OF THE BORROW AREAS WILL NEED TO BE DETERMINED FROM A GROUND INVESTIGATION.
9. REINSTATEMENT OF PEAT TO BE CARRIED OUT IN LINE WITH APPROVED PEAT MANAGEMENT PLAN.
10. FINAL BORROW PIT ACCESS TO BE CONFIRMED.
11. PLEASE REFER TO MESSRS McCLOYS SURFACE WATER MANAGEMENT PLAN - M01944-02_DG0 FOR FULL DRAINAGE DETAILS - APPENDIX 11-4 OF EIAR.

REV:	DATE:	DWG BY:	CHECK BY:
S4 - P03	10/05/2024	DPC	B.P
DESCRIPTION:	FOR PLANNING		
REV:	DATE:	DWG BY:	CHECK BY:
S2 - P02	12/01/24	RW	B.P
DESCRIPTION:	FOR INFORMATION		
REV:	DATE:	DWG BY:	CHECK BY:
S2 - P01	7/07/2023	D.P.C	B.P
DESCRIPTION:	FOR REVIEW		

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ISSUED AS: FOR PLANNING

CLIENT: Ireland FuturEnergy

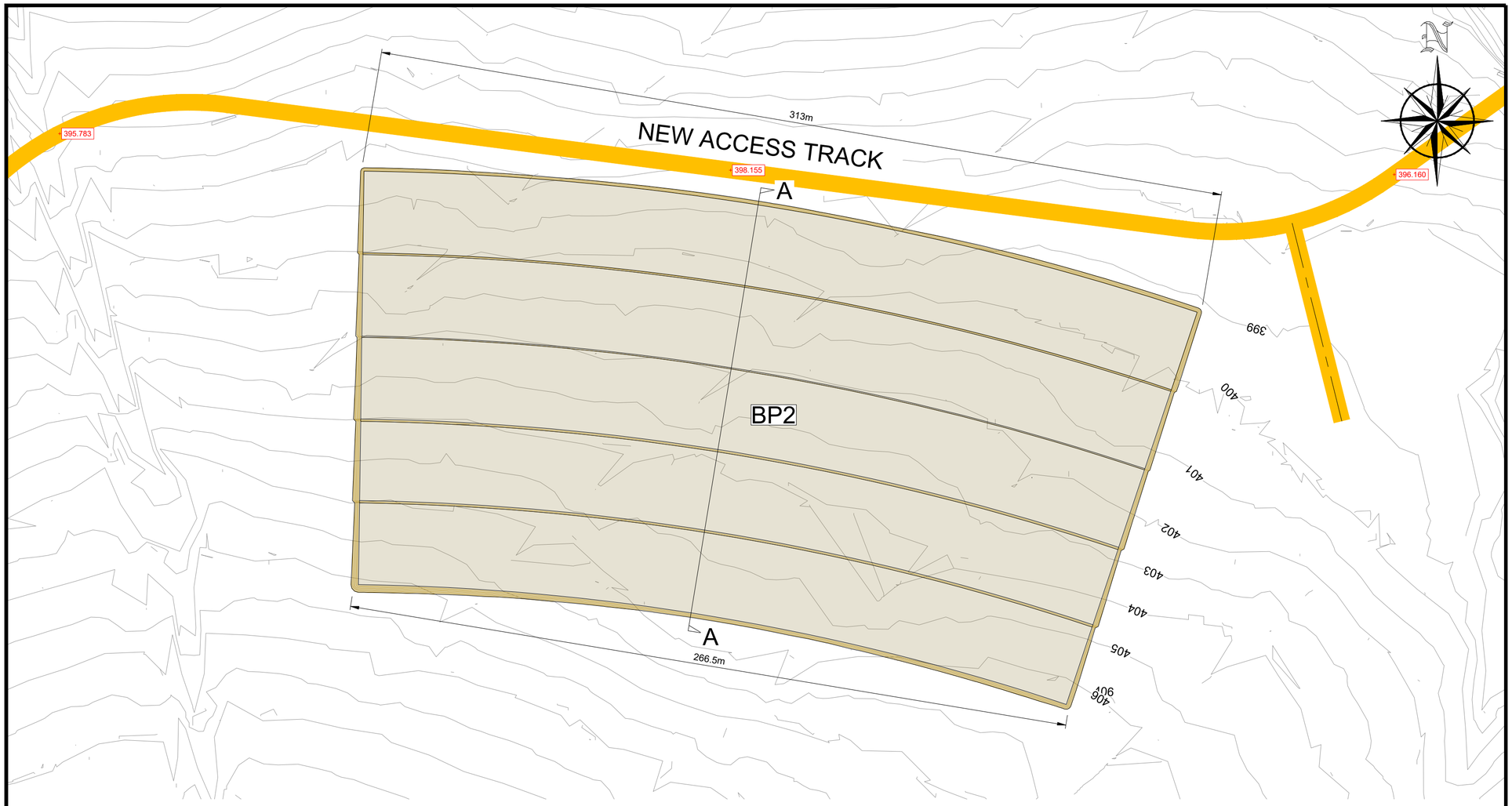
PROJECT TITLE: CUMMEENNABUDDOGE WIND FARM

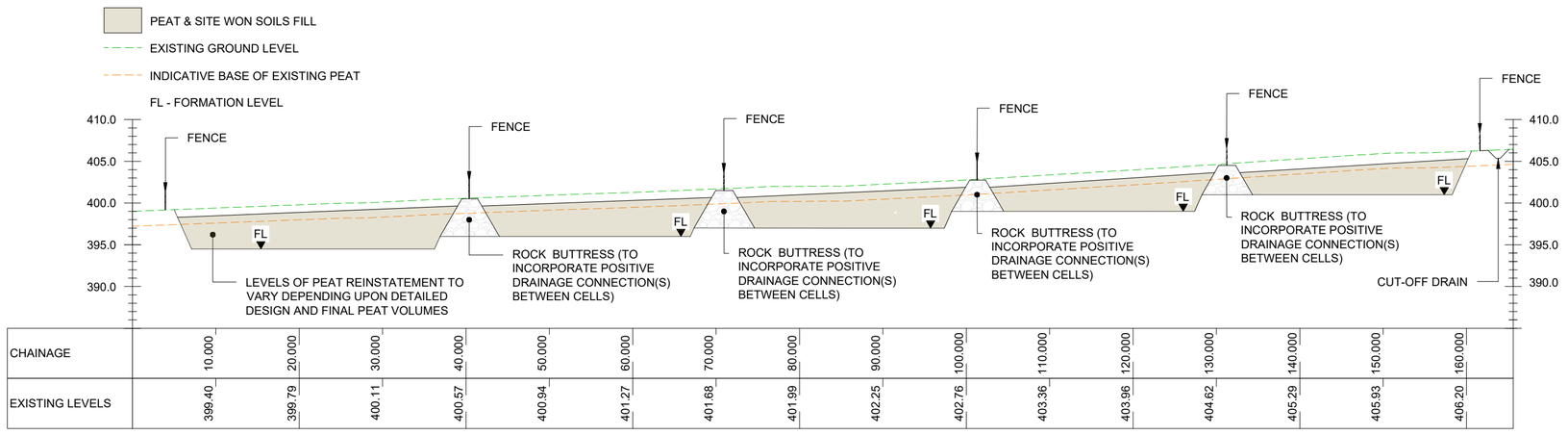
PROJECT No: 20268 - GDG - ZZ - XX - DR - C - 0801

Revision: - S4 - P03

DRAWING TITLE: BORROW PIT 1 - PLAN AND SECTION

SCALE:	SHEET SIZE:	DATE:
1:1250 / 1:500	A3	7/07/2023
DWG BY:	CHECKED BY:	APPROVED BY:
D.P.C.	B.P	R.McI





CHAINAGE	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000
EXISTING LEVELS	399.40	399.79	400.11	400.57	400.94	401.27	401.68	401.99	402.25	402.76	403.36	403.96	404.62	405.29	405.93	406.20

NOTES:

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REV: S4-P03	DATE: 10/05/2024	DRAWN BY: DPC	CHECKED BY: BP
DESCRIPTION:	FOR PLANNING		
REV: S1-P02	DATE: 12/01/24	DRAWN BY: RW	CHECKED BY: BP
DESCRIPTION:	FOR INFORMATION		
REV: S2-P01	DATE: 10/07/23	DRAWN BY: DPC	CHECKED BY: BP
DESCRIPTION:	FOR INFORMATION		

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ISSUED AS: FOR PLANNING

CLIENT: Ireland FuturEnergy

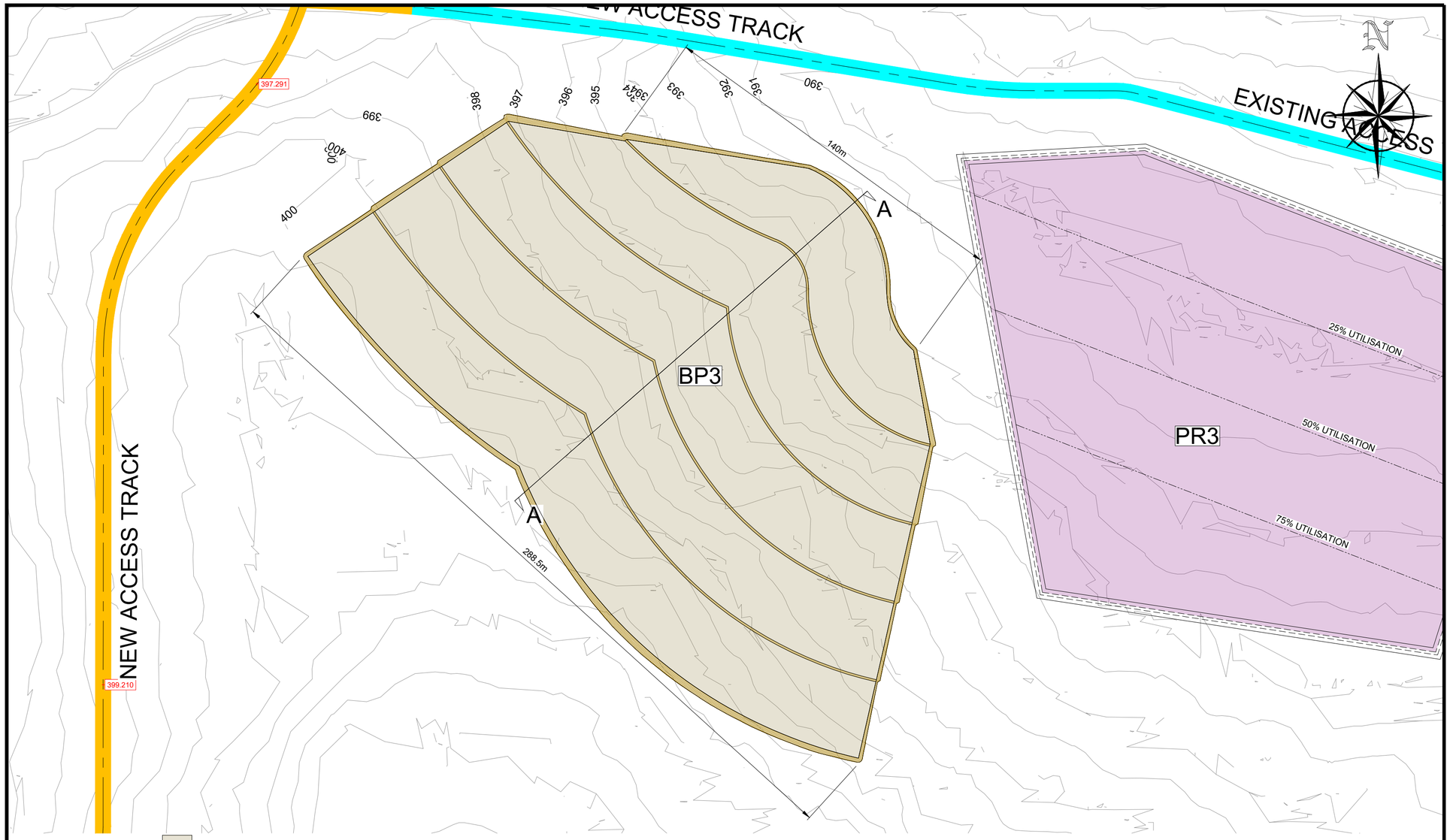
PROJECT TITLE: CUMMEENNABUDDOGE WIND FARM

DRAWING No: 20263-GDG-ZZ-XX-DR-C-0802

Revision: -S4-P03

DRAWING TITLE: BORROW PIT 2 - PLAN AND SECTION

SCALE: 1:1250 / 1:500	SHEET SIZE: A2	DATE: 07/07/23	
DRAWN BY: D.P.C	CHECKED BY: B.P	APPROVED BY: R.Mcl.	

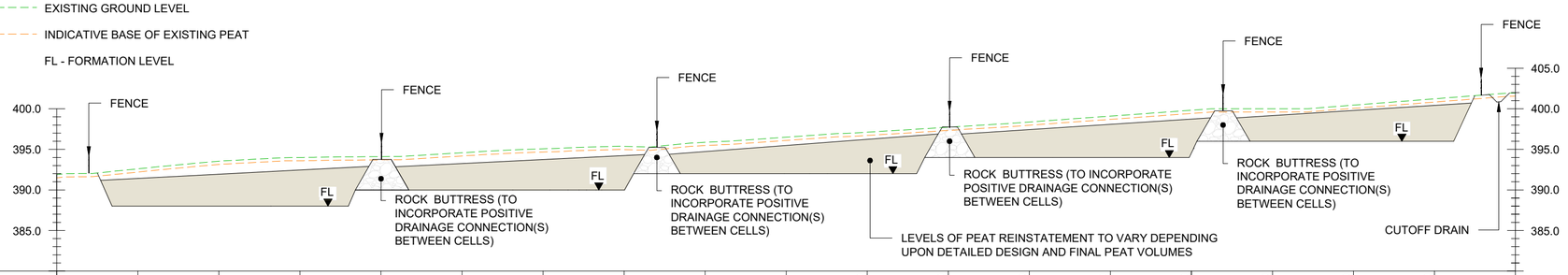


PEAT & SITE WON SOILS FILL

EXISTING GROUND LEVEL

INDICATIVE BASE OF EXISTING PEAT

FL - FORMATION LEVEL



CHAINAGE	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000	170.000
EXISTING LEVELS	392.60	393.54	394.00	394.11	394.58	395.07	395.38	395.87	396.50	397.12	397.73	398.37	399.10	399.82	400.00	400.45	401.23

NOTES:

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REV: S4-P03	DATE: 10/05/2024	DRAWN BY: DPC	CHECKED BY: BP
DESCRIPTION:	FOR PLANNING		
REV: S2-P02	DATE: 12/01/24	DRAWN BY: RW	CHECKED BY: BP
DESCRIPTION:	FOR INFORMATION		
REV: S2-P01	DATE: 10/07/23	DRAWN BY: DPC	CHECKED BY: BP
DESCRIPTION:	FOR INFORMATION		

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ISSUED AS: FOR PLANNING

CLIENT: Ireland FuturEnergy

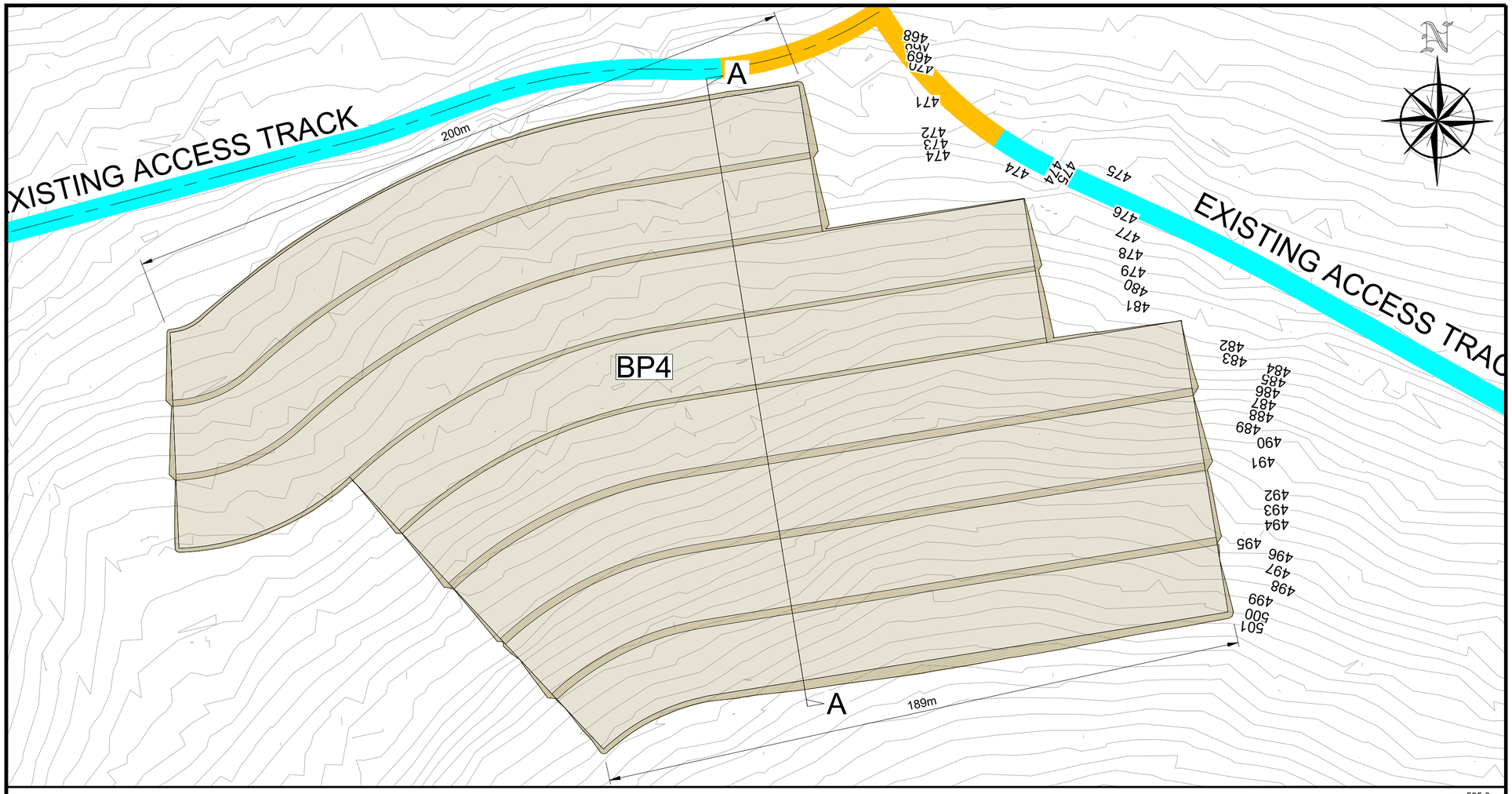
PROJECT TITLE: CUMMEENNABUDDOGE WIND FARM

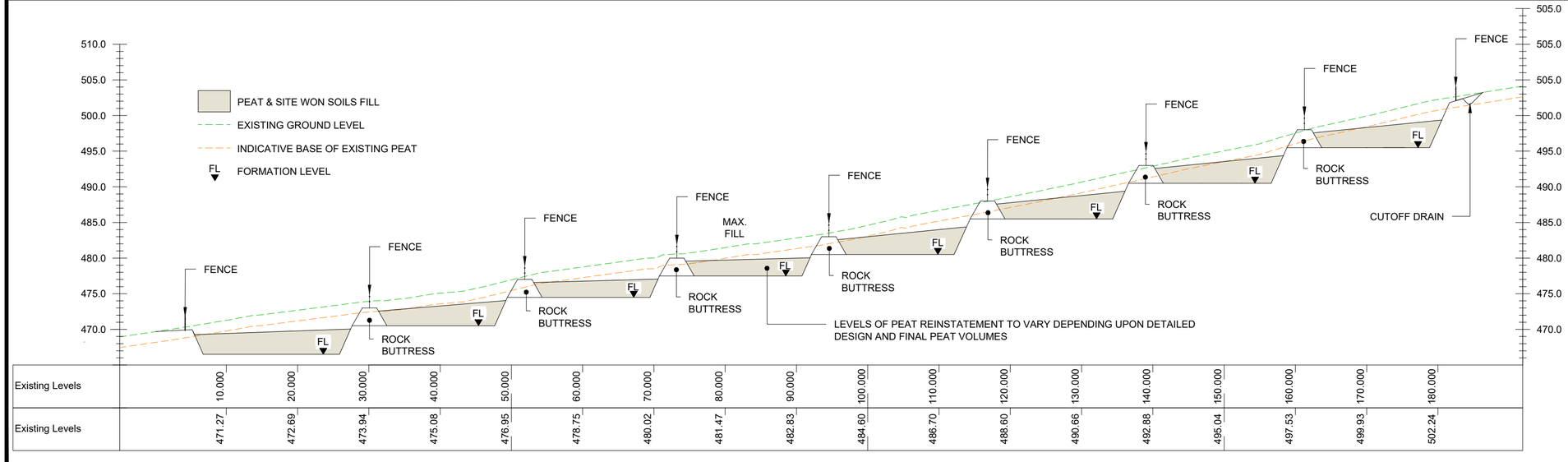
DRAWING No: 20263-GDG-ZZ-XX-DR-C-0803

Revision: -S4-P03

DRAWING TITLE: BORROW PIT 3 - PLAN AND SECTION

SCALE:	SHEET SIZE:	DATE:
1:1250 / 1:500	A2	07/07/23
DRAWN BY: D.P.C	CHECKED BY: B.P	APPROVED BY: R.Mcl.





NOTES:

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11. PLEASE REFER TO MESSRS McCLOYS SURFACE WATER MANAGEMENT PLAN - M01944-02_DG0 FOR FULL DRAINAGE DETAILS - APPENDIX 11-4 OF EIAR.

REV: S4-P03	DATE: 10/05/2024	DRAWN BY: DPC	CHECKED BY: BP
DESCRIPTION:	FOR PLANNING		
REV: S2-P02	DATE: 12/01/24	DRAWN BY: RW	CHECKED BY: BP
DESCRIPTION:	FOR INFORMATION		
REV: S2-P01	DATE: 10/07/23	DRAWN BY: DPC	CHECKED BY: BP
DESCRIPTION:	FOR INFORMATION		

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ISSUED AS: FOR PLANNING

CLIENT: Ireland FuturEnergy

PROJECT TITLE: CUMMEENNABUDDOGE WIND FARM

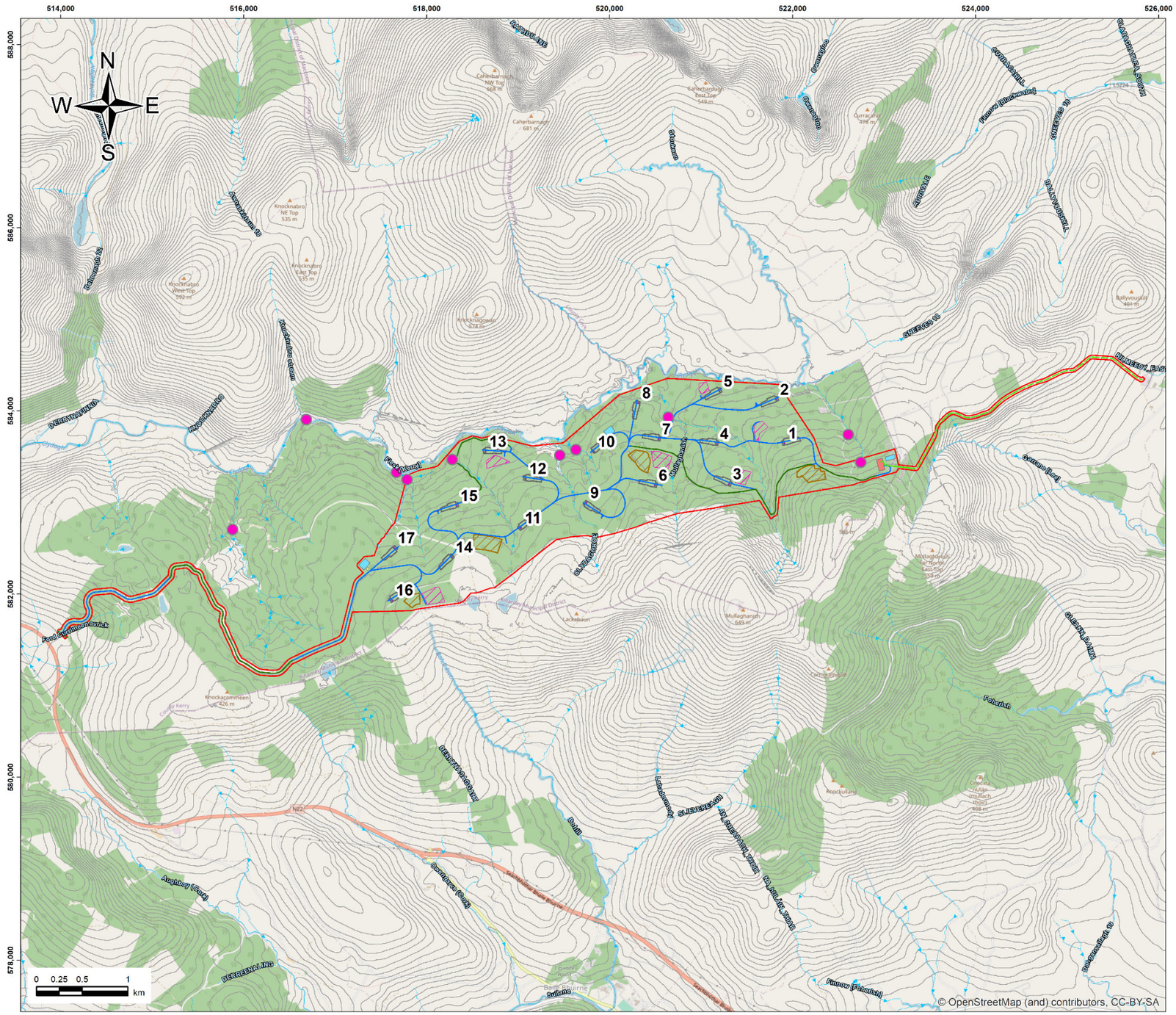
DRAWING No: 20263-GDG-ZZ-XX-DR-C-0804

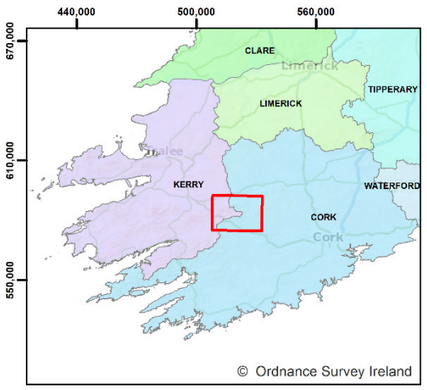
Revision: -S4-P03

DRAWING TITLE: BORROW PIT 4 - PLAN AND SECTION

SCALE: 1:1000 / 1:500	SHEET SIZE: A2	DATE: 07/07/23
DRAWN BY: D.P.C	CHECKED BY: B.P	APPROVED BY: R.Mcl.

Appendix D – Check Barrage Locations





Legend

- Proposed Check Barrage Locations
- 10m Contours
- Existing Access Tracks
- Proposed Access Tracks
- Rivers
- Grid Connection Route
- Turbine Hardstand
- Site Boundary
- Borrow Pits
- Compounds
- Met Mast
- Peat Repository
- Substation
- Turbine Foundations
- Turning Heads

GDG GAVIN & DOHERTY GEOSOLUTIONS

Client: atmos CONSULTING / Cummeennabuddoge Wind Farm		
Project: Cummeennabuddoge Wind Farm		
Map title: Proposed Check barrage Locations		
File: 20263-GDG-02-PCB-MP-C-26		
Sheet size: A3	CRS: 2157	Authored: CE
Date: 30/11/2023	Source: GDG	Checked: SC

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Phone: +44 1 313 444 605

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