



APPENDIX 4-7

***MCE RESPONSE TO FT
MITIGATION MEASURES***



Meenbog Wind Farm

CONSTRUCTION RESPONSE TO FEHILY TIMONY MITIGATION MEASURES



Revised August 2021

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Introduction:

Mitigation measures have been set out in the FT Assessment of Site with Respect to Peat Stability for Meenbog Wind Farm. This document outlines the response to the individual mitigation measures which will be applied to the remaining on-site civil works during civil construction.

In addition to the below it is noted that Paul Jennings will complete a fortnightly audit of the construction activities relevant to site stability and Martin Lyttle will have a full-time site role for the supervision of remaining civil works where excavation of peat is required. CV's are provided in the supporting documentation in Appendix 1 for reference.

Mitigation Measure 1:

Remaining construction works. The remaining construction works are summarised in **Error! Reference source not found.** The remaining works are generally minor in nature and do not require extensive groundworks, except for the works at T7 and the access to T18.

- (a) Any remaining works shall be subject to the mitigation measures given below, or any other such related requirements.
- (b) Where there are further works not included in the above, that may adversely affect ground stability, then these further works shall also be subject to the mitigation measures given below, or any other such related requirements.
- (c) All works shall be subject to detailed design.

Response 1:

- (a) Responses are provided to each of the detailed mitigation measures below confirming adherence to same
- (b) Responses are provided to each of the detailed mitigation measures below confirming adherence to same
- (c) All remaining works will be subject to detailed design. Designs will be provided by MCE subcontractor Ionic Consulting and where necessary input from the Designer will be provided for the MCE methodology for conducting the works (Sample Method Statements provided in Appendix 2). Designs for the remaining works will also be subject to review by both HES and MKO in terms of potential hydrology or ecology input where deemed necessary.

Mitigation Measure 2:

No further construction of floating roads is to be carried out. Given the potential risk associated with floating road construction alternative methods of construction shall be adopted.

- (d) Where alternative methods of construction are proposed these shall be subject to the mitigation measures given below, or any other such related requirements.
- (e) Detailed design shall be carried out and appropriate method statements produced to mitigate against the risk of peat and ground instability.
- (f) Alternative road construction would typically comprise road founded on competent strata below peat which will require excavate and replacement techniques. For alternative road construction the following items, which are non-exhaustive, shall be included:
 - (i) No side casting of arisings onto insitu peat surface. All arisings to be placed into designated storage areas.
 - (ii) Use of low permeability plugs along line of road at suitability spaced intervals to avoid longitudinal transmission of surface water.
 - (iii) Observational approach adopted to monitor side-wall stability of peat in excavations.
 - (iv) Construction programmed to minimise the time peat excavations are exposed prior to filling with suitable fill.

Response 2:

- a) As per the updated Peat Stability assessment provided by Ionic (Report reference: MNBG r057 – See Appendix D) no further construction of floating roads will be carried out on site.
- b) Detailed design for all remaining works is being undertaken by Ionic Consulting and associated RAMS for each element of works will be in place by MCE ahead of construction. This will be the case for any additional works that may arise on site. Appropriate checks and supervision in line with these recommendations are set out in the RAMS.

Please see attached sample design drawings and RAMS for the following works (Documentation included in Appendix 2):

- Upgrade of the access road for turbine no. 18
 - Re-alignment of T4 access road section and construction to solid formation
 - Construction of barrage south of T4 access road between the junction to T1 and junction to T2
- c) Alternative dig-and-replace construction methodology is assumed for all remaining road construction in areas of peat. Side casting will not be permitted and all peat arising from the construction works will be removed to the on-site peat deposition area. A competent foreman appointed by MCE will be present for all works. Martin Lyttle will also have a full-time supervisory role on site for remaining works in areas of peat (See appendix 1 for CV).

Mitigation Measure 3:

No loading of insitu peat. The instability recorded on site in all cases can be attributed to various degrees to excessive placed construction loading onto the insitu peat surface.

- (a) The remaining works on the site shall be carried out without placing of any arisings or loading on to the insitu peat. Placing of any load particularly onto the downslope margin of any works within peat shall be avoided.
- (b) It is recommended that the tracking of construction machinery onto the insitu peat is kept to a minimum and limited to the installation or maintenance of site drainage using appropriate low ground pressure plant. In the event that construction machinery has to track onto the insitu peat then the peat shall be inspected and assessed by a competent person to avoid excessive loading. If the competent person is in any doubt as to the suitability of the peat for tracking of machinery, no tracking of machines onto the peat should take place.
- (c) The definition of excessive loading shall be determined by the competent person and shall take into account the nature and type of loading and the nature and type of the insitu peat and general ground conditions.
- (d) Where required the assessment shall include visual inspection and appropriate testing of insitu peat with respect to depth and strength to full peat depth. For example, thin peaty soil (less than 0.5m thick) over mineral soil would not represent a notable risk of peat instability. The results of the assessment, pending satisfactory findings, shall be completed prior to any works commencing. A record of all such assessments shall be maintained.

Response 3:

No loading of in-situ peat will take place for the remainder of the works on site. There shall be no side casting permitted on site. All peat extracted during the works shall be removed and transported directly to the dedicated Borrow Pit area.

Tracking of machinery on in-situ peat will be minimised in so far as reasonably practicable however it will be necessary for some limited works e.g. construction of drainage in advance of construction of T18 access road. Where movement of machinery on in-situ peat is necessary in a given area, a competent MCE representative will assess the area prior to the works and shall consult the Designer Ionic Consulting prior to works where necessary to confirm if loading of the in-situ peat is acceptable for a specific area. John Shanahan or Cormac O'Dubhthaigh from Ionic Consulting will complete a site visit once a week while remaining construction works in peat are ongoing. On site supervision of works will also be available from FT representative Martin Lyttle as previously noted.

It is noted that the load case for tracking of machinery across all remaining construction areas has been assessed as part of the additional site testing completed to date and areas have been identified where tracking of vehicles will not be permitted (See sections 4, 5 and 6 of Ionic report MNBG r057 in Appendix D).

Mitigation Measure 4:

Monitoring of ground movement and constructed works. In order to monitor the performance of the constructed works within the peat areas, and any further construction works to be carried out, a series of monitoring points shall be established throughout the site.

- (a) Monitoring is proposed to provide advance warning of potential instability or possible longer term movement, that may represent potential for degradation of the works over time that could lead to instability.
- (b) Monitoring shall be sited at critical locations typically adjacent to the constructed works as given in Table 21 (refer to FT report). The exact location of the monitoring shall be determined following inspection. Other locations may be included as required by the designer or contractor.

Table 21 (FT report): Ground Monitoring Locations:

No	Location	Comments
1	Junction of access road to T1 with spur to T2 and T4 along downslope margin	Area of deepest peat in close proximity to concave break in slope
2	Along access to T3 about 50m from hard stand along downslope margin	Area of deeper peat in close proximity to concave break in slope
3	Along access to T2 about 100m from hard stand along downslope margin	Area of deeper peat in close proximity to concave break in slope
4	Along access to T4 about 150m from hard stand along downslope margin	Area of deeper peat in close proximity to concave break in slope
5	Along access from T5 to T3 about 200m from T5 along downslope margin	Area of deeper peat in close proximity to concave break in slope
6	Junction of access road to T7 about 100m along access to T7 along downslope margin	Area of deeper peat in close proximity to concave break in slope, within potential area of 12 November failure
7	South side of upper scar of 12 November failure	To monitor potential retrogression of scar upslope
8	On downslope margin of T7 base and hard stand prior to construction	To be installed in advance of any works
9	On downslope margin of T10 base and hard stand	Area of peat in close proximity to concave break in slope
10	Along access to T14 about 100m from hard stand along downslope margin	Area of peat in close proximity to concave break in slope
11	Along access to T18 at about chainage 1600m along downslope margin	Area of potential peat close to river
12	Along access to T16 about 50m from hard stand along downslope margin	Area of deeper peat in close proximity to concave break in slope and minor instability
13	Peat storage berms at T15	Minor signs of movement/distress. Where necessary the berm size is to be increased.
14	Peat storage berms at T17	Minor signs of movement/distress. Where necessary the berm size is to be increased.
15	Peat failure scar above road to T7	Upper scar of 12 November 2020 peat failure. Potential for retrogression of failure scar.
16	Peat failures at Borrow Pit between T5 and T6	Comprises 3 peat failures at this location. Monitoring at the head of each failure.
17	Peat failure at T12	Head of failure downslope of access road. Monitoring at the head of failure.
18	Instability at T5	Series of concentric tension cracks within the insitu peat
19	Instability at T16	Minor slumping of insitu peat
20	Ch.2630 on the north side of the S-bends on the approach road into the site	Stockpile caused a localised ground movement in the peat below the stockpile

- (c) Monitoring shall consist of a series of wooden posts (say 4 no.) inserted into the ground to create a straight line, ideally obliquely across the slope. A string line shall be tied to the first and last post. The line of posts shall be placed such that they can be sighted along from the

- position of the road. Any deviation of the posts would indicate potential movement of the peat.
- (d) The monitoring is intended to be easy to install, readily read without any equipment, and where required can be readily maintained and replaced.
 - (e) The monitoring locations shall be read weekly or following heavy rainfall. Readings shall be carried out until completion of the works.
 - (f) A record of the readings shall be maintained. The record shall include time, date, movement of any posts (or no movement), any follow-up inspections. Accidental movement of the posts shall be noted and the posts moved back into alignment, where possible.
 - (g) Trigger levels shall be taken as indicatively 100mm or continued rate of creep movement, as determined by the designer. Where trigger levels have been reached, the designer shall be notified and the reason for the movement established to determine whether the movement warrants further investigation.
 - (h) Where there are remaining works to be completed then monitoring shall be installed adjacent to the works at critical locations. Operatives shall be made aware of the monitoring and shall be required to observe the monitoring at regular intervals and to report any unusual observations to the construction management team.
 - (i) Where monitoring shows ground movement has occurred in an area where construction works is underway then works shall cease in that area and operatives and plant moved to a safe location and the designer notified and the reason for the movement established prior to re-commencing works.
 - (j) Inspection of constructed works indicated a number of locations where monitoring is required, these are included above. In addition, at T16 a small peat slip between the hard stand and the perimeter cut-off drain is causing water to flow into the hard stand, this shall be repaired.

Response 4:

Monitoring posts have been installed at 14 previously recommended locations identified specifically by FT and weekly monitoring has commenced. Posts shall be installed at the additional locations identified and monitoring will continue at the 20 no. locations outlined above. These line-of-sight posts will continue to be inspected weekly. A sample of weekly inspection sheets covering the previous 14 locations identified by FT in April are provided for reference – See Appendix 3. This monitoring will be increased at monitoring locations adjacent to ongoing works. Where works are ongoing/scheduled, daily checks will be completed each morning prior to the commencement of works.

Records of monitoring by MCE will be provided to Ionic Consulting on a weekly basis. In the event of a breach of trigger levels or signs of any continuous movement any works ongoing in the area in question will cease and the Designer will be consulted prior to the continuation of works. A copy of all records will also be kept on site.

Prior to the commencement of remaining works, Ionic Consulting will advise on additional line of sight monitoring locations which will be inspected daily also. The small peat slip noted adjacent to T16 will be repaired prior to any further works in that area.

Mitigation Measure 5:

Confirmatory testing and assessment in zone of influence in advance of construction works to be completed. The peat stability assessment within this report and the Ionic report (Appendix D) have concluded that the site is safe and the remaining works can be completed safely in accordance with the recommendation and mitigation measures contained herein. Notwithstanding, the following confirmation testing and assessment shall be carried out immediately in advance of construction. The confirmation testing and assessment is in addition to that already carried out in the peat stability assessment.

- (a) In advance of the construction of any remaining works, a zone of influence extending 50m minimum in all directions from the proposed works area shall be re-inspected and assessed by a competent person in advance of any works.
- (b) Where deemed necessary by the competent person, the zone of influence shall be extended to include any ground that is considered to be affected by the works.
- (c) The assessment within the zone of influence shall include visual inspection and appropriate testing of insitu peat with respect to depth and strength to full peat depth. The assessment shall include but not be limited to recording morphology, vegetation cover, drainage, proximity of drains and natural watercourses (an example of such an assessment for the proposed access road to T18 is included in Section **Error! Reference source not found.**). The results of the assessment shall be considered by the designer.
- (d) The further confirmatory testing of insitu peat with respect to depth and strength to full peat depth shall typically comprise the following within the zone of influence and shall be carried out immediately in advance of works commencing:
 - (i) Peat depth determined at typically at 20m spacing using peat probes or alternatively using continuous depth profiling such as ground penetrating radar (GPR).
 - (ii) Insitu shear vane testing, or similar technique that measures the operational shear strength of the peat, typically at 20m spacing depending on the encountered peat condition.
 - (iii) Spacing of probes and insitu shear vane testing, or similar, to be reduced where areas of deeper peat are encountered.
- (e) A hydrological assessment carried out by appropriate experienced and competent person, which will include but not be limited to drainage, proximity of drains and natural watercourses shall be carried out in advance of construction works. This work is being carried out by hydrological specialists HES.
- (f) The results of the assessment, pending satisfactory findings, shall be completed prior to any works commencing. Works shall only commence following a permit to work being issued.
- (g) A record of all such assessments shall be maintained.

Response 5:

Extensive zone of influence testing has been completed since November 2020 including peat probing, shear vane testing, trial holes and cores as set out in the report provided. This testing has informed the design for remaining works areas. Ionic Consulting will provide a Geotechnical Engineer on site one day per week to assess upcoming works areas and advise on necessary inspection and testing requirements.

Prior to commencement of works in the remaining areas where peat is present MCE shall appoint a competent supervisor to each relevant works area (areas of new construction or works in areas deemed high risk in terms of peat stability). This person will be responsible for a daily inspection of the area of intended works per Mitigation Measure 5c) above and will ensure that zone of influence testing is completed daily in advance of works where necessary. A daily record sheet (similar to the attached example in Appendix 4) will be kept and a copy will be made available to the Design Team along with daily photos of the works. Periodic drone inspection (every 2-3days weather permitting) of critical work areas will be conducted; the arial imagery will be provided to the Designer for remote oversight of the works. A copy of all records will be kept on site.

The results of additional peat probing and shear vane tests will be compared against prior records to determine if the results are comparable (within an allowable tolerance). Where results differ significantly from expected values, works will cease and the Designer will be consulted prior to continuing with the construction in the relevant area. A record will be kept on site of additional shear vane testing completed in advance of works. testing will be completed on an approximate 20 x 20m grid spacing. Where very shallow peat depths are noted or where risks have been identified as low by the Designer the spacing of tests may be increased accordingly in line with the level of risk.

John Shanahan or Cormac O'Dubhthaigh (Ionic) will be on site weekly during construction works in peat and will assess ongoing works along with works to take place the following week. Martin Lyttle (FTC) will be on site while works within peat are taking place. Ionic will have a resident engineer on site daily who will be reviewing previous test data and conducting further tests as required on an ongoing basis. The MCE site management team will coordinate works in conjunction with Ionic/FTC to ensure adequate testing and assessment is being conducted in advance of and during excavation.

Mitigation Measure 6:

Site supervision and permit to work with respect to peat stability. All construction on site shall be managed and controlled by the construction management team to ensure that all activities have been appropriately assessed with respect to peat stability and related health and safety. Procedures shall be put in place to clearly demonstrate how this has been achieved, for example:

- (a) Procedures that provide an auditable chain of command shall be put in place to clearly demonstrate that peat stability and related health and safety have been assessed in the construction management.
- (b) For any construction activity where peat stability and related health and safety have been assessed, then a permit to work shall be issued to the construction operative by the appropriate personnel.
- (c) No construction works shall be started until a permit to work has been issued to the construction operative by the appropriate personnel.
- (d) All works that may affect the stability of the site shall be routinely inspected and supervised on site by appropriate personnel.
- (e) The above procedure shall be independently audited by a suitably competent and experienced person(s). The competent person shall have suitable professional qualifications and have experience of carrying out similar roles for construction projects in peatland. Planree proposed to use suitably competent and experienced person from FT.
- (f) All persons involved in the assessment of peat stability on site shall have sufficient expertise, competency, and experience for the tasks to which they have been assigned.

Response 6:

- a) Please refer to the updated (August 2021) Organogram and separate design/ construction process flowchart for works on site in Appendix 6. This includes Designs, RAMS, daily checks and Supervision.
- b) A Permit to work system will be implemented (See Appendix 5). Permit to works will be issued and controlled by MCE site management (Chris O'Mahony / Gearoid White / Sean O'Driscoll). All personnel working under a permit to work will be briefed on the permit and associated RAMS. A copy of the permit to works will be held on site.
- c) No works will commence prior to a permit being issued.
- d) Full time supervision of critical works areas is outlined in the response to Mitigation Measure 5 above. As noted, daily records will be kept on site and a copy provided to the Designer for review. Martin Lyttle will be independently appointed as a supervisor for the works and will have a full time role on site while critical works are taking place.
- e) An independent auditor will be appointed to audit the site on a fortnightly basis. It is proposed that Paul Jennings of FT will complete this independent auditing (CV attached – see Appendix 1).
- f) Peat stability assessment will be completed only by suitably qualified, competent and experienced personnel.
- g) Martin Lyttle (FTC), who will be the competent person, will be on-site to assess and supervise works within peat.
- h) Given the fact that the vast majority of roads and hardstands are complete and that there will be no side casting of peat for the remainder of the works, requirements for tracking over peat etc. are unlikely and any proposed tracking of peat can be appropriately assessed during weekly Ionic site visits. Should an unforeseen circumstance arise where tracking over peat is required, Martin Lyttle will be available on site to assess the area, Ionic site engineer can conduct whatever testing is required and a call can be arranged with Cormac O'Dubhthaigh/John Shannahan to ascertain whether it is acceptable or not. (see project organogram for clarity on roles/responsibilities)

Mitigation Measure 7:

Proof testing of floating roads. Full-scale proof load tests to be carried out on floating roads to verify their capacity under the design loads for the construction traffic and for largest loading to be experienced by the road. Such testing may already be required under the design or contract. A suggested outline methodology is given below.

- (a) Rolling load test for all floating roads. Tests to be carried out using a fully laden dump truck. The weight of any truck should be recorded at a weighbridge. Typical test procedure as follows:
 - Condition and deflection of the floating road observed visually as the truck travels continuously over the floating road at a constant low speed.
 - The performance of the floating road shall be qualitatively classified as Good, Fair or Poor based on the condition of the road and the observed deflection under the weight of the truck.
- (b) Static load test at selected sections, if deemed appropriate by the designer. Sections of floating roads where the road performance was classified as Fair or Poor are selected for detailed static loading of placed fill as follows, as appropriate:
 - Loading (such as rock fill) placed incrementally up to the design limit as specified by the designer.
 - Deflection of road recorded following each load increment.
 - Maintained static loading for 24 hour period with measurement of deflection at end of period.
- (c) The results of the proof testing shall be analysed by the designer and any mitigation measures, which may include replacement with founded road on competent strata, to be incorporated into the design. All tests shall be carried out under controlled conditions to ensure that the road is not adversely damaged and that instability does not occur.

Response 7:

Rolling load testing (deflection testing) will be completed for validation of all floating roads constructed to date on the site. The results of the tests will be analysed by Ionic Consulting prior to sign off on these sections of access road.

Static load testing of floating roads is not deemed appropriate by the Designer for the site and such testing will not be completed.

For rolling load tests, the fully laden weight of dump trucks will either be calculated based on loading of a standard lorry with a loader equipped with a load cell or through use of a weighbridge where available.

A review of the full method statement(s) for all proposed works will be carried out by Ionic/ FTC to confirm that all recommendations of the peat stability assessment have been implemented, and the design requirements are reflected in the proposed methodology.

Mitigation Measure 8:

Construction and weather conditions. Restrictions on work during or after periods of heavy or sustained rainfall as recorded from weather station located on site, or from Met Eireann weather forecasts. Heavy intense rainfall can result in degradation of the works resulting in localised instability, and in extreme cases can trigger large-scale peat failure.

- (a) Following periods of heavy intense rainfall, such as 10mm/hr, >25mm in a 24 hour period, or >50% of monthly average in a 7 day period and in following 24 hours, no groundworks may take place and any ongoing works should be restricted to hardstanding areas.
- (b) When periods of heavy intense rainfall are predicted then works shall be ceased in advance and any construction works in critical areas with respect to stability are secured in advance.
- (c) Following periods of heavy intense rainfall the site shall be inspected prior to resumption of construction works by a competent person to ensure that all drainage is working, and critical areas with respect to stability are stable with no signs of ground movement.

Response 8:

The MCE site manager will be responsible for assessing the weather forecast on a daily basis no less than 24 hours ahead of works. Records of weather forecasts will be kept to confirm ongoing monitoring. The MCE site manager and supervisors will monitor the weather conditions on site as works are progressing. Site management have been briefed on the rainfall limits.

A rainfall gauge has been installed on the site and a remote text alert system has been set up to notify HES, MKO and MCE Site manager Chris O'Mahony of daily rainfall records every morning for the previous 24hour period. These records will be assessed daily to assess long cumulative rainfall within the 24hr and 7day limits specified. A record of these values will be kept on record for reference purposes – please see sample records provided (“Meenbog Rainfall data 28.04.2021” in Appendix 7).

Where heavy rainfall is forecast for the day ahead or where heavy rainfall is noted on the site during works, a proxy rainfall monitoring station (the local Lough Mourne OWS) will be assessed hourly by MCE Site management in consultation with the ECOW for potential breaches in instantaneous rainfall levels.

Where trigger levels are breached a decision to cease works will be taken by the Site Manager Chris O'Mahony. Similarly, where heavy rainfall event is forecast which would breach the trigger levels noted above, Works shall be restricted. This process has already been validated in practice following an intense rainfall event in March 2021*. Please refer to appended email circulation from MKO to site staff dated 29/03/21 notifying of a breach in the 24hr trigger level (See Appendix 7). Works were stood down immediately following the notification by the ECOW and all areas assessed before re-commencing works on site.

In the event of a failure of the on-site rain gauge monitor, the local Lough Mourne OWS shall be used as the reference for rainfall trigger levels on site.

*NOTE: It was agreed in writing with DCC that these works at bridge crossing EC5 could be completed in March 2021 to ensure safe access and egress of forestry vehicles still accessing the wind farm site.

Whilst monitoring will be carried out and is considered of benefit, it is only one element of the integrated peat stability measures that have been put in place to prevent or provide an early warning of potential failures.

Monitoring will take place after periods of heavy rainfall.

All RAMS, site supervision and a permit to work system produced by MCE shall be reviewed by FTC and Ionic with MCE to ensure that all parties are satisfied with the proposed approach, and that the intent behind FTC's recommendation has been fully captured in the methodology.

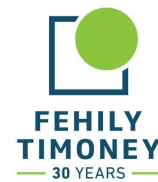
Appendix 1: CV's for FT personnel:

- Paul Jennings - CV
- Martin Lyttle - CV



Dr. Paul Jennings

Technical Director/Geotechnical Engineer



CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE & PLANNING

Profile

Paul is a geotechnical engineer with over 30 years' experience of design and construction of sub-surface structures, foundations, earthworks, infrastructure and earth-retaining structures; planning, supervision and interpretation of ground investigation; and providing expert geotechnical advice and reporting. Paul has particular experience in providing expert advice for slope stability problems, soft ground engineering, infrastructure, deep-excavations and forensic investigation of ground failure.

Educational and Professional Qualifications

BEng. (Tech) (Hons) (First Class) Civil Engineering University of Wales Institute of Science and Technology (UWIST) 1986

PhD, Prediction of Landslide Hazard in the Rhondda South Wales UWIST 1991

DipArb. Diploma in Arbitration, College of Estate Management, Reading University 1999

CEng, Chartered Engineer

MIEI, Member of the Institution of Engineers of Ireland

Member of the Geotechnical Society of Ireland

UK Registered Ground Engineering Professional (RoGEP) – Advisor

Project Supervisor Design Process (PSDP) Course, Institute of Engineers Ireland 2015

Selection of Previous Experience

- **Derrybrien Landslide REIAR, Ireland:** Following 2019 ECJ ruling a remedial impact assessment report (REIAR) was produced following landslide at wind farm site. Contributor as expert on geotechnical matters for REIAR with respect to ground conditions and stability for ESB.
- **High Speed (HS) 2, England:** Geotechnical Team Lead member for contract Lots C2 and C3 for Eiffage/Kier. Responsible for sections of geotechnical scheme design of embankments and cuttings along HS2. Total scheme cost about £1.34 billion.
- **Expert Evidence, Kazakhstan:** independent expert at arbitration on assessment of embankment fill material and excavation for 112km length of dual carriageway for the East-West Roads Project Almaty – Khorgos. Provided oral evidence and report at arbitration hearing for International Chamber of Commerce (ICC), Paris. Estimated project cost about €200 million.
- **Expert Evidence, Ireland:** expert report on assessment of viability of proposed rock borrow area along the route of the N18 Oranmore to Gort Dual Carriageway project. In support of adjudication action by Lagan Construction Group Limited. Total scheme cost about €430 million.
- **Expert Evidence, Ireland:** engaged by ESB Networks Ltd. to provide an expert opinion with respect to collapsed reservoir bank and alleged personal injury incident that was purported to have occurred at the Poulaphouca Reservoir in ESB -v- McCurtin. Expert witness in High Court, Dublin. Expert report on stability of reservoir bank and site assessment and inspection of reservoir perimeter bank.
- **Expert Evidence, Scotland:** expert report for adjudication. Report examines the use and feasibility of ground improvement by soil mixing in works at Muck Bridge on the B741 road. In support of legal action by NRS Group (NRS).

Key Information

Qualifications

BEng. (Tech) (Hons) First Class,
Civil Engineering, University of Wales,
Institute of Science and Technology
(UWIST), 1986

PhD, Prediction of Landslide Hazard in
the Rhondda South Wales, UWIST,
1991

DipArb, Diploma in Arbitration,
College of Estate Management,
Reading University, 1999

Project Supervisor Design Process
(PSDP) Course,
Institute of Engineers, Ireland, 2015

Professional Memberships

Chartered Engineer

Member of the Institution of
Engineers of Ireland

Member of the Geotechnical Society
of Ireland

UK Registered Ground Engineering
Professional (RoGEP) - Advisor

Employment History

2019- Present

Fehily Timoney & Company, Ireland

2000 – 2019

Applied Ground Engineering
Consultants Ltd. (AGEC), Ireland

1992 – 1999

Halcrow China Ltd, Hong Kong

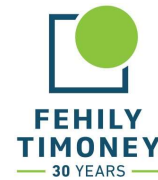
1989 – 1992

Sir William Halcrow & Partners, UK



Dr. Paul Jennings

Technical Director/Geotechnical Engineer



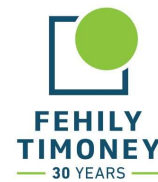
CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE & PLANNING

- **Expert Evidence, Ireland:** report on engineering appraisal of rock to determine use in engineering works in case of Elliott Construction Ltd. -v- Lagan and others. Provided advice to solicitors Maples and Calder.
- **M8 M74 M73 PPP Motorway Scheme, Scotland:** geotechnical analyses and design of permanent and temporary works. Assessment of design of remedial works for failed highway slope as part of scheme. Expert report on cracking of secant piled wall at Raith Junction. Total scheme cost about £400 million.
- **N3 Butlersbridge to Belturbet Road Improvement Scheme, Ireland:** arbitration involving geotechnical assessment and expert witness report related to the construction of bridge pier over soft ground (Aghnaguig Bog).
- **M17 M18 Gort to Tuam PPP Motorway Scheme, Ireland:** AGEC technical director for the geotechnical analyses and check of permanent works design and check certification for 57km scheme with cost of about €550 million.
- **Dublin Waste to Energy Incinerator Project, Ireland:** geotechnical assessment of ground conditions, procurement of ground investigation, design of piled foundations, design load transfer platform and reinforced earth structures. Project cost estimated at €500 million.
- **Diyar Al Muharraq Project, Bahrain:** assessment of ground conditions and site investigation data for a deep sewer line particularly regarding the environmental impact on the local aquifer.
- **Expert Advice, United Kingdom:** geotechnical expert report with respect to ground conditions encountered during tunnelling on the North St. Helier Flood Alleviation Scheme, Channel Islands. In support of J. Murphy & Sons Limited.
- **Expert Evidence, Ireland:** assessment report on engineering remediation of stability and backfilling of sand & gravel quarry, which was in breach of planning conditions. Court attendance and expert reports in case of Fowler -v- Keegan. Provided advice to solicitors Maples and Calder.
- **Expert Report, Ireland:** assessment and expert report on fatal slope collapse at Derrysallagh Wind Farm. Appointed by insurers to the contractor of the wind farm.
- **Kilgarvan Wind Farm, Ireland:** inspection of peat failure and assessment of remedial measures required.
- **Wind Farms (General), Ireland & United Kingdom:** geotechnical design of over 100 wind farm projects in Ireland and throughout the British Isles. Most sites comprised variable depths of soft ground. Design includes assessment of site stability (landslide), road/embankment design, bearing capacity appraisal, management of earthworks, construction supervision, planning advice/reporting (EIA/EIS) and technical expert advice at public planning hearings.
- **Expert Witness, Ireland:** geotechnical expert witness for geotechnical matters at planning hearing for Oweninny Wind Farm (about 100 turbines). Project cost estimated at €100 million.
- **Expert Witness, Ireland & United Kingdom:** geotechnical expert review report with respect to building distress. Expert report produced, and evidence given in legal proceedings. Geotechnical expert review report with respect to failure of fill slope behind dwelling houses for NHBC in UK. Expert report produced and attendance at mediation.
- **Tievebrack Sub-station earthworks (ESBI), Ireland:** Geotechnical design for sub-station platform located on stability sensitive slope. Design includes platform formation/retaining structures for multiple retaining bunds for storage of platform arising (peat).
- **Expert Report, Ireland:** geotechnical expert review report with respect to large scale peat failure during construction for Ballincollig wind farm. Expert reports produced on behalf of insurers ACE Group. Project cost estimated at +€10 million.
- **Design Co-ordinator – Corrib Gas (Shell Exploration and Production Ireland Ltd.), Ireland:** Management of engineering (civil) design deliverables and co-ordination of consultants for onshore section of gas pipeline. Pipeline includes 9km length comprising



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buried pipe in peatland/sandy soils and within tunnel. Geotechnical reviewer/checker for works which included fill platforms/road in peat, tunnel geotechnics, secant/piled wall for tunnel starter pit. Total project cost estimated at €3.6 billion.

- **Gas Pipeline Route Assessment – Corrib Gas, Ireland.** Compilation/author of stability reports for pipeline route through blanket peat for planning application and Environmental Impact Statement. Included walkover survey and geomorphological mapping of route. Technical support at planning Public Hearing. Pipeline cost estimated at €1.5 billion.
- **Power Station Site Appraisal (ESBI), United Kingdom:** Geotechnical site appraisal for gas turbine power station in Northern England. Site located within active coalfield, in proximity to waterway and disused chemical works. Site appraisal report produced.
- **DART Underground Rail Line (Irish Rail), Ireland:** geotechnical expert/reviewer for pre-oral hearing review for proposed underground metro. Project comprises approximately 8.6km of new rail (7.6km in tunnels) through Dublin from Inchicore to the Docklands area. Project cost estimated at €3 billion.
- **Stabilisation of Soils, Ireland:** Providing specialist geotechnical advice to ground stabilisation contractor for alternative design solutions to achieve sustainable/economic solutions. Role includes value engineering using stabilisation options for commercial/retail and highway.
- **Bay Lane Quarry Litigation, Ireland:** Investigation into the causes of cracking in residential properties related to floor slab movement. Tasks included inspection of remediated house, assessment of ground conditions, quarry visits, and finite element modelling of the behaviour of construction material.
- **Landslide Investigations, Ireland:** Geotechnical advisor/investigator for landslides in upland areas associated with blanket peat (for example peat/landslides on Corry/Kilronan Mountains, Garvagh Glebe Wind Farm, Hunters Hill Wind Farm, peat slide at Glencolmcille, multiple landslides (+38) at Croaghmoyle/Buckoogh Mountains.
- **Expert Witness, Ireland:** geotechnical expert review report with respect to remediation of lands following peat failure, Derrybrien, County Galway. Expert report produced, and evidence given in legal proceedings. Total project cost estimated at +€70 million.
- **Donegal 110kV Project, Ireland:** Reporting and walkover survey of 100km of proposed line including an assessment of peat stability. Geotechnical assessment report produced for planning application and Environmental Impact Statement. Technical support and expert witness at planning oral hearing. Project cost estimated at €100 million.
- **Connemara 110kV Project, Ireland:** Reporting and walkover survey of 48km of proposed line including an assessment of peat stability. Technical support and expert witness at planning oral hearing. Project cost estimated at €100 million.
- **Expert Report, Ireland:** geotechnical expert review report with respect to alleged settlement of foundations of industrial building due to dewatering from adjacent pipelaying works carried out at Roches Feeds, Limerick.
- **Ballincollig Wind Farm, Ireland:** Geotechnical advisor for wind farm project on blanket peat following large-scale peat failure during construction. Provided engineering advice for landslide remedial works, report into failure, and re-commencement of construction works with appropriate design and construction mitigation measures.
- **A4/A5 NI DBFO Scheme 3 Realignment, Northern Ireland:** Geotechnical Manager for 21km of dual/single carriageway. Included value engineering, earthworks design reports/specifications for cutting/embankment design, stability analysis of slopes, settlement, pavement foundations, acceptability of material re-use, design for special measures such as soft ground issues. Scheme cost estimated at £135 million.
- **N6 Kilbeggan to Athlone Dual Carriageway, Ireland:** Project manager responsible for design and implementation of band drain solution for 700m long embankment over soft ground.



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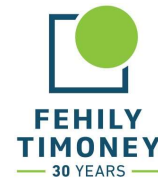
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- **M3 Clonee to North of Kells Bypass, Ireland:** Geotechnical Project Manager responsible for design of 60km of motorway and 50km of ancillary and access roads for M3 Motorway JV on €1 billion construction contract.
- **Clonsilla to Dunboyne Railway Scheme, Ireland:** Geotechnical Project Manager/Designer for interpretation and design of 34km railway scheme. Includes interpretation of ground conditions, design recommendations for earthworks along the rail route, proposed bridge/culvert foundations, proposed and existing stations and proposed new roads. Estimated cost €156 million
- **Assessment of Upland Peat Stability, United Kingdom/Ireland:** Assessment of peat stability on upland sites for proposed wind farm developments at Rothes II, Moray, Scotland; Mid Hill, Aberdeenshire, Scotland; Corry Mountain, County Leitrim/Roscommon.
- **Waterford Outer Ring Road, Ireland:** Assessment of rock excavatability for contractor. Design of rockfall protection measures.
- **Limerick Southern Relief Road, Ireland:** geotechnical checker for highway earthworks on 12km scheme with immersed tunnel involving construction of staged constructed and monitored embankments over soft estuarine deposits. Project cost estimated at €600 million.
- **N9 Powerstown to Prumplestown Geotechnical Advice, Ireland:** review of geotechnical design for Design and Build contractor Ascon Ltd. 20km motorway scheme. Estimated cost of €100 million.
- **Kavarna, Bulgaria:** appraisal of ground conditions and inspection of coastal site in Bulgaria in landslide prone terrain. Review of ground investigation and stabilisation measures.
- **Quarry Inspections, Ireland:** inspection of quarry face stability/incidences of instability at sites in Ballymoe, Arklow.
- **Rock and Soil Slope Support, Ireland:** design of support measures (gabion, soil nails, ground anchors) and inspection of failed slopes at sites in N8 Cashel-Mitchelstown, Cashel, Cork, Strancally Castle, Tralee.
- **Glounthaune to Midleton Railway Scheme, Ireland:** Geotechnical designer for re-generation of existing 20km railway line. Comprised walkover survey, inspection and risk assessment of existing earthworks, ground investigation, design of earthworks, karst risk assessment. Estimated cost €100 million.
- **N30 Moneytucker, Ireland:** Assessment of ground conditions and design of structure foundations and approach embankment foundations for Tramore House Regional Design Office.
- **N8 Cashel to Mitchelstown (ECI), Ireland:** Team Leader for walkover and reporting of preliminary sources study on Ireland's first early contractor involvement (ECI) road scheme, 38km dual carriageway N8 improvement and new 3.3km N24 link. Estimated scheme cost €240 million.
- **N15 Bundoran to Ballyshannon, Ireland:** Part of team for geotechnical design check for Contractor.
- **N22 Farranfore to Inchiveena, Ireland:** Assessment of temporary works slope for Contractor.
- **Expert Witness, Derrybrien Landslide, Galway, Ireland:** Expert Witness at District Court case for ESBI.
- **Dundalk Western Bypass, Ireland:** Review of designer's proposals for push-in structure on behalf of Irish Rail.
- **M3 Clonee to North of Kells, Ireland:** Geotechnical team Leader for Tender Design for PPP Scheme covering 52km on mainline and side roads. Supervision of walkover and reporting of potential Borrow Areas. Estimated €1 billion construction contract.
- **Waste Spoil Tip, Blessington, Ireland:** inspection of waste tips stability for Bord na Mona.



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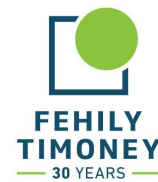
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- **Corrib Gas Terminal, Ireland:** Management of +€1 million ground investigation for gas terminal site located on blanket peat. Works included trial pits, rotary and cable percussion boreholes, in situ vane testing, pumping test, and peat storage and transportation trials.
- **Pollatomish Landslide, Ireland:** Geomorphological survey, risk assessment and reporting for natural landslide in North Mayo. Natural landslide included multiple failures of peat/soil slopes above village that occurred following high intensity rainfall event.
- **Derrybrien Landslide, Galway, Ireland:** Geomorphological survey, stability assessment and reporting of major peat slide on windfarm site. Engaged by developer to identify the probable causes of the peat slide and to assess the stability of the remaining site. Report produced giving recommendations to mitigate the probability of further failure.
- **M4/M6 Kinnegad-Enfield-Kilcock Motorway:** Earthworks design for 35km of motorway with estimated €300 million construction cost. Design included embankment and cutting slope geometrics in soil and rock and associated slope drainage, earthworks acceptability, road pavement foundation requirements.
- **Irish Rail Framework, Ireland:** Geotechnical advisor and call-out service to Irish Rail.
- **Corrib Field Development, Bellanaboy Bridge Gas Terminal, Ireland:** Specialist advice on access roads and stability of peat bog site for use as repository for surplus excavated material for ASI Corrib JV. Acted as Expert Witness for Shell-Enterprise Energy Ireland at An Bord Pleanála's re-opened Public Planning Hearing. Total project cost estimated at €3.6 billion.
- **Ground Water Supply Schemes, Ireland:** Geotechnical advice on buried pipeline routes in Northwest and Western Ireland for Jennings O'Donovan & Partners.
- **Kilkenny Ring Road Rail Diversion, Iarnród Éireann, Ireland:** Earthworks design for new railway alignment. Included ground investigation, geotechnical interpretive and design report, bill of quantities and contract specification. Estimated scheme cost €5 million.
- **Dundalk Western Bypass PPP, Ireland:** Providing geotechnical advice for bidding consortia, SIAC/Ferrovial. Advice involved assessment of potential borrow areas along the proposed road corridor, supervision of ground investigation and reporting of findings. Total project cost estimated at €340 million.
- **Settlement/collapse of ground above tunnel, St. Fintan's High School, Dublin, Ireland:** Geotechnical consultant for the remediation of ground following partial surface collapse as a result of about 0.5km length of shallow depth micro-tunnelling through loose sand deposits.
- **Cuttings & Embankments Assessment, Iarnród Éireann, Ireland:** Geotechnical Advisor for earthworks assessment programme encompassing over 700 slopes within the Limerick Division of Iarnród Éireann. Responsible for all geotechnical aspects of project including field inspections of slopes, stability assessment, design of stabilisation measures and reporting on findings.
- **Review of seismic design for Huntstown Power Station, Ireland:** Power station sited within blast influence area of working quarry.
- **Methods of Integrating Man-made Slopes into their Surroundings, GEO, Hong Kong:** Project Manager/author responsible for study to review the state-of-the-art for landscaping methods on man-made slopes in Hong Kong. Study involved assessment of 200 local slopes and the preparation and publication of report on study findings.
- **Landslip Investigation Consultancy, GEO, Hong Kong** – Study Team Leader responsible for inspecting/reporting on landslide incidents during 1997. Involved detailed study reports of critical landslide incidents. Included geomorphological mapping, groundwater assessment, geological modelling, rainfall analysis, slope stability and determination of likely causal factors.



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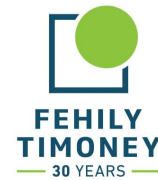
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- **Landslip Preventive Measures (LPM), GEO, Hong Kong:** Design Team Leader responsible for site investigation, design and reporting on soil/rock cut slope with history of previous multiple failures (11NE-A/C35 & C77) at Kwun Tong Road (estimated works cost HK\$30 million). Independent reviewer for slope design (LPM) reports.
- **Shum Wan Road Landslide, GEO, Hong Kong:** Geomorphological field assessment of hillside surrounding the 1995 fatal landslide site. Included API and reporting of findings including groundwater engineering assessment. Subsequent design of slope drainage and slope stabilisation measures.
- **North East New Territories (NENT) Landfill, FELT Ltd., Hong Kong:** Independent Checking (IC) geotechnical engineer on site for earthworks operation involving excavation of 6 million cubic metres of material and formation of rock/soil slopes within landfill bowl. Responsibilities included site checking/verification of geotechnical design, site monitoring.
- **Airport Roads (Contract 110), Airport Authority, Hong Kong:** Geotechnical engineer responsible for compiling foundation inspection procedures for bridge and retaining wall structures on intact/ blast fractured rock and rock fill.
- **Analysis of performance of railway, MTRC, Hong Kong:** Embankment over marine reclamation on man-made island, Chek Lap Kok Airport. Involved review of instrumentation readings, analysis of data, assessment of settlement and reporting.
- **Ap Lei Chau Bridge Road Improvement, Secan Ltd, Hong Kong:** Geotechnical Team Leader for the assessment of a hillside with a prior history of instability to identify geological, hydrogeological and physical factors controlling stability.
- **Tsing Yi and East Lantau Tunnels, MTRC, Hong Kong:** Geotechnical design Team Leader for preparation of geotechnical reports for twin hard rock rail tunnels in granitic/volcanic rock, Lantau Island, as part of the airport railway to Chek Lap Kok. Analysis of stresses in tunnel lining in shear/fault zone for extreme geotechnical loading conditions. Responsible for preparation of tunnel tender drawings for East Lantau and Tsing Yi Tunnels (Contracts 512 & 514).
- **Lantau Port Development, (CED), Hong Kong:** Study manager for geotechnical assessment of slopes bordering reclamation area, Pennys Bay (Hong Kong Disneyland Park). Produced geotechnical appraisal report and design for 0.9km of rock/soil cutting, 0.4km of reinforced concrete retaining wall, slope-dewatering scheme, 0.8km of embankment over reclamation.
- **Tenderer's Design Bid, Ting Kau Bridge, Paul Y Construction, Hong Kong:** Responsible for design of ship protection island around central pier in Rambler Channel and foundation report for main piers. Ship protection island designed to be founded on soft mud, design included staged construction, wick drains, toe trenches and pressure berms.
- **Geotechnical Advisory Service 1991-93, Housing Authority, Hong Kong:** Project Manager/Engineer involved in slope stability assessment and providing specialist geotechnical advice. Included management of costs and geotechnical teams, preparation/checking of reports, development of slope inspection methodology.
- **Kings Cross Project, United Kingdom:** Resident Engineer for site investigation for low-level interchange for Kings Cross area. Responsible for on-site works which included high quality thin-wall push sampling, self-boring pressuremeter testing, test programme and geotechnical interpretation.
- **Second Severn Crossing Site Investigation, United Kingdom:** Site engineer for contract valued in excess of £1 million including both marine and on land.



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- **Pithouse West, British Coal Open Cast Executive, United Kingdom:** Site engineer on earthworks compaction operations at Pithouse West, South Yorkshire. In charge of programming and supervision of in situ and site laboratory testing of compacted fill material and interpretation of results.

Publications

Jennings P J, Siddle H J and Bentley S P: Application of landslip potential maps to Rhondda Borough: a technology impact assessment. UWIST, Cardiff (1987).

Jennings P J, Bentley S P and Siddle H J. A comparative study of indirect methods of landslip potential assessment. Int. Conf. Slope stability engineering developments and applications, Isle of Wight, UK, ICE (1991).

Jennings P J and Siddle H J: The use of landslide inventory data to define the spatial location of landslide sites, South Wales, UK. EGAC 1995 Geohazards and Engineering Geology Conference Proceedings (1997).

Jennings P J: Mei Chung Court Flooding Incident, Shatin. In Investigation of Some Selected Landslide Incidents in 1997 (Volume 1). The Government of the Hong Kong Special Administrative Region (1999).

Jennings P J: Wonderland Villas, Kwai Chung. In Investigation of Some Selected Landslide Incidents in 1997 (Volume 2). The Government of the Hong Kong Special Administrative Region (1999).

Jennings P J: Villa de Cascade (Shatin College), Shatin. In Investigation of Some Selected Landslide Incidents in 1997 (Volume 3). The Government of the Hong Kong Special Administrative Region (1999).

Jennings P J and Thompson J: Ma On Shan, Shatin. In Investigation of Some Selected Landslide Incidents in 1997 (Volume 3). The Government of the Hong Kong Special Administrative Region (1999).

Jennings P J (main author): Review of Effective Methods of Integrating Man-made Slopes and Retaining Walls (Particularly for Roadside Slopes) into their Surroundings. GEO Report No. 116. Produced by Halcrow China Ltd for Geotechnical Engineering Office, Civil Engineering Department, The Government of the Hong Kong Special Administrative Region (2001).

Jennings P J and Muldoon P: Assessment of Stability of Man-made Slopes in Glacial Till: Case Study of Railway Slopes, Southwest Ireland, Iarnród Éireann. Earthworks in Transportation Seminar, December 2001.

Gavin K and Jennings P: Stability of man-made glacial slopes in southwest Ireland. Third International Conference on Landslides, Slopes Stability and the Safety of Infra-Structure, 11-12 July 2002, Singapore (2002).

Jennings P: Performance of 150-year-old railway slopes in glacial till: case study from southwest Ireland. Proc. XIII European Conference on Soil Mechanics and Geotechnical Engineering 2003, Prague Vol. 2, Session 5 (2003).

Jennings P: Hazard of Large-scale Peat Failures: Recent Irish Case Studies Ireland at Risk Conference, Dublin Castle, 4 October 2004. Gavin, K, Xue, J F and Jennings P: Assessment of the effect of pore pressures on the behaviour of railway foundations. XIIth Danube-European Conference on Geotechnical Engineering Ljubljana (2006).

Long M and Jennings P: Analysis of the peat slide at Pollatomish, County Mayo, Ireland. Landslides, Journal of the International Consortium on Landslides, 3, 2006, pp. 51-61, (2006).

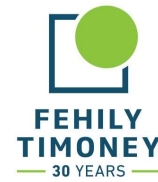
Long M, Jennings P and Ruttly P (eds): Soft ground Engineering. Proc. Conference on Soft Ground Engineering. Geotechnical Society of Ireland, February 2007.

Boylan N, Jennings P and Long M: Peat failures in Ireland. Quarterly Journal of Engineering Geology and Hydrogeology, 41, pp 93-108, (2008).



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Dykes A P and Jennings P: Peat slope failures and other mass movements in western Ireland, August 2008. Quarterly Journal of Engineering Geology and Hydrogeology 2011; v. 44; p. 5-16, (2011).

Long M, Jennings P and Carroll R: Irish peat slides 2006 - 2010. Landslides, Journal of the International Consortium on Landslides, 8 (3) 2011-03-02, pp 391-401, (2011).

Rutty P and Jennings P. Investigation, Design & Construction in Karst. Conference: Geotechnics on Irish Roads, 2000 - 2010. Thursday, 11 October 2012.

Jennings P, Kieran P, Gill M and Johnston T: Natural gas pipeline construction in sensitive peatland environment, Western Ireland. XVI European Conference on Soil Mechanics and Geotechnical Engineering, Edinburgh, September 2015 (poster).

Jennings P, Kieran P, Gill M and Johnston T: Use of peat as an engineering material - an engineering case study. XVI European Conference on Soil Mechanics and Geotechnical Engineering, Edinburgh, September 2015.

Jennings P & Kane G: Geotechnical engineering for wind farms on peatland sites. XVI European Conference on Soil Mechanics and Geotechnical Engineering, Edinburgh, September 2015.

Jennings, P & Grennan, R. Assessment of slope failure and engineering behaviour of raised marine deposits of the River Clyde, Scotland. Proceedings of the XVII ECSMGE-2019 Geotechnical Engineering foundation of the future, (2019).

Kane, G, Grennan, R & Jennings, P. Investigation into the likely cause of peat failure at Ballinacollig Hill Wind Farm, Ireland. Proceedings of the XVII ECSMGE-2019 Geotechnical Engineering foundation of the future, (2019).

Jennings, P & Kane, R. Assessment of peat slides and failure mechanism of blanket peat at Flughland, Ireland. Proceedings of the XVII ECSMGE-2019 Geotechnical Engineering foundation of the future, (2019).

Martin Lyttle

Senior Engineering Geologist



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Profile

Martin is an Engineering Geologist with 30 years' experience of ground investigation design, construction supervision, desk studies; planning, supervision and interpretation of ground investigations and providing geotechnical advice for site RE staff.

Previous Experience Essential for this Project

- **Derrysallagh Wind Farm**
Construction supervision (peat stability)
- **Maams Cross Road Scheme**
Site investigation supervision
- **Harburn Head, Wind Farm, Scotland, Dersalloch Wind Farm, Scotland**
Turbine foundation inspections
- **Leanamore Wind Farm, Gortfinbar Wind Farm**
Turbine foundation inspections
- **Kilgallioch 129 Turbine WF., Scotland**
DSR - Responsible for signing off on all geotechnical aspects of construction works (Turbine Foundation inspections, peat stability, road construction)
- **Tievenameenta Wind Farm Project**
Geotechnical Supervisor – Supervision of site investigation for turbine base foundations and temporary construction works.
- **Dublin Waste to Energy Project**
Geotechnical Representative – Provision of specialist geotechnical advice to the clients Resident Engineer with respect to supervision of construction and acceptability of the works in accordance with approved designs and specifications including site excavations, temporary and permanent works and piling works.
- **Corrib Gas Onshore Pipeline Project**
Geotechnical Representative – Provision of specialist geotechnical advice to the clients Resident Engineer with respect to supervision of construction and acceptability of the works in accordance with approved designs and specifications, and to advice on any geotechnical issues pertaining to the works. Also responsible for monitoring geotechnical hazards, material recording and selection, ongoing inspection and monitoring and ensuring construction and reinstatement of works is undertaken in accordance with conditions of consent.
- **N3 Butlersbridge to Belturbet Realignment**
Cavan County Council's Geotechnical Advisor for construction of the N3 realignment over an ecologically protected area (cSAC bog). The role involves reviewing design and construction methodologies for works over soft ground during construction.

Key Information

Qualifications

BEng (Hons) in Engineering Geology and Geotechnical Engineering, Portsmouth Polytechnic, 1990

National Diploma in Mineral Engineering, Athlone RTC, 1987

Professional Memberships

Fellow of Geological Society (FGS)

Training Agreement (1991-1994) & Training Review (1995), Institution of Civil Engineers

ICE Experience Appraisal (1997)

Committee member of the Ground Engineering Group, South Wales Association of ICE (1998-1999)

Employment History

2016-Present

Independent Geotechnical Engineering Consultant

2001 – 2016

Applied Ground Engineering Consultants Ltd. (AGEC)
Senior Geotechnical Engineer

1999 – 2001

Geotechnics Ireland Ltd.
Geotechnical Engineer

1996– 1999

Gwent Consultancy
Geotechnical Engineer

1990 – 1996

Gwent Co. Council
Senior Assistant Engineer (Geotechnical) & Assistant Engineer (Geotechnical)

- **A4/A5 Dungannon to Ballygawley DBFO 2**
Supervision of earthworks, monitoring of earthworks material acceptability assessment/soft ground investigations. Inspection of formations for foundations and roads and management of NCR approval.
- **Corrib Sruwaddacon Bay Site Investigation (Tunnel)**
Verification logging of all soil samples and rock core and reporting from near shore drilling.
- **N25 Waterford to Glenmore Rock Cut**
Discontinuity survey of rock cutting with included recording scanlines, dips and dip direction. Survey results were used to assess rock slope stability measures and to determine the excavatability of the rock where the existing carriageway was proposed to be widened. Findings were presented in a report to the client.
- **Tievebrack Substation, Donegal**
Management and supervision of ground investigation and site trials on behalf of the employer. Collated specific geotechnical parameters for detail design of slope stability of peat storage area and retaining structures.
- **N69 Rea to Tullig Realignment Scheme**
Preparation of ground investigation specification. Management and supervision of a ground investigation contract for a 2.3km road realignment scheme.
- **Derrybrien Landslide**
Geomorphological survey, stability assessment and reporting of major peat slide on wind farm site. Engaged by developer to identify the probable causes of the peat slide and to assess the stability of the remaining site. Report produced giving recommendations to mitigate the probability of further failure. Assessment of ground conditions around foundation bases of wind turbines.
- **Fullabrook Wind Farm, Devon, England**
Supervision of site investigation for a 24 turbine Wind Farm, scheduling of all testing and checking of factual report.
- **Corrib Peat Permeability Research**
Design and supervision of field tests to investigate the in-situ permeability of Peat at the Corrib Gas Terminal and supervision other site investigation works.
- **Muirhall Wind Farm Site Investigation, Scotland**
Supervision of site investigation over karst terrain, scheduling of tests and checking factual report.
- **Barna Wind Farm, Co. Cork**
Proposed wind farm site inspection including an assessment of peat stability. Geotechnical assessment of site by walkover inspection and reporting of findings including slope stability assessment. Supervision of ground investigation, logging of trial pits, interpretation of ground conditions and drafting of report.
- **Shanakeever Mountain Wind Farm, Co. Galway**
Proposed wind farm site inspection including an assessment of peat stability. Geotechnical assessment of site by walkover inspection and reporting of findings including slope stability assessment.
- **Corkermore Wind Farm, Co. Donegal**
Proposed wind farm site inspection. Geotechnical assessment of site by walkover inspection and reporting of findings.
- **Briska & Uggoool Wind Farms, Co. Mayo**
Proposed wind farm site inspection including an assessment of peat stability. Geotechnical assessment of site by walkover inspection and reporting of findings including slope stability assessment.

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- **Drynam Pyrite**
Supervision of expert investigations of buildings for court case.
- **N18 Gort**
Earthwork materials assessment to design specification requirements for claim.
- **Black Sea site investigation, Odessa, Ukraine**
Supervision of site investigation of large scale slope failure on the Black Sea near Odessa, Ukraine.
- **Site investigation procurement, Zaporozhye, Ukraine**
Procurement of site investigation for a development in Zaporozhye, Ukraine.
- **Site visit and geotechnical walkover reports in Ukraine**
Potential development sites were visited and geotechnically assessed at Zaporozhye, Kiev, Chernivsti, Poltava and Rivne, Ukraine.
- **Metro North Site Investigation**
Seconded to IGSL to manage Metro North (Ballymun to Swords) site investigation.
- **N9 rock excavation assessment**
Scanlines and reporting.
- **M3 Clonee to North of Kells**
Borrow pit material assessment (trial pitting, laboratory scheduling and reporting).
- **Waterville sewer walkover and additional Site Investigation**
Appraisal of site investigation data, walk over, additional site investigation and reporting.
- **Sewage Treatment works site investigations**
Supervision of site investigations for Fenagh, Rathoe and Clonegal.
- **NDEG**
Senior RE – Supervision of site investigation for road scheme, scheduling of tests, checking factual report and finalizing measure.
- **Development site investigations, (Moat, Donore road, Cong, Clonakilty)**
Supervision of site investigations, scheduling of tests, checking factual report and finalizing measure.
- **Midleton to Glounthaun Railway**
Senior RE – Supervision of site investigation over karst terrain, scheduling of tests, checking factual report and finalizing measure.
- **Donegal County Council**
Site investigation for culvert crossings, logging and reporting of ground conditions at various locations.
- **Kilsellagh WTP**
Senior RE – Supervising the site investigation and checking factual report.
- **N8 Cashel to Mitchelstown ECI**
Senior RE - Supervision of Supplementary Ground Investigation contractor on Ireland's first early contractor involvement (ECI) road scheme, €300 million 38 km dual carriageway N8 improvement and new 3.3km N24 link.

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- **N9 Kilcullen to Powerstown**
Senior RE - Supervision of Supplementary Ground Investigation contractor.
- **M3 Clonee to North of Kells**
Geomorphological Walkover for Borrow Area assessment.
- **Corrib Gas Terminal**
Site management and supervision of site investigation. Laboratory scheduling, trial-pit logging and groundwater monitoring.
- **Corrib Gas Pipeline**
Site management and supervision of site investigation.
- **Adamstown Development**
Site supervision and trial-pit logging.
- **Takeda, Bray**
Site supervision, laboratory scheduling, and geotechnical reporting for pharmaceutical development.
- **Tyrellstown, Co Dublin**
Site supervision, lab scheduling, geotechnical reporting for supermarket development.
- **Newcastlewest, Co Limerick**
Site supervision, lab scheduling, geotechnical reporting for supermarket development.
- **Larne Link Road, Ballymena**
Report checking
- **Buncranna Way, Derry**
Site supervision, lab scheduling, and geotechnical reporting for supermarket development.
- **N4 N6 Kinnegad to Kilcock Motorway Quarry Investigations**
Lab scheduling for material acceptability / classification.
- **Limerick Main Drainage 4.1**
Assessment of "As built" ground conditions.
- **N4 N6 Kinnegad to Kilcock Motorway Borrow Areas**
Trial pitting and assessment of material suitability.
- **N4 N6 Kinnegad to Kilcock Motorway Additional Structure**
Site supervision, lab scheduling.
- **Southeast Sligo GWSS**
Walkover and reporting (Geomorphological / geotechnical)
- **Carrickfergus**
Site supervision, lab scheduling and geotechnical reporting for supermarket development.
- **Liscasey GWSS**
Walkover and reporting (Geomorphological / geotechnical)

Martin Lyttle

Senior Engineering Geologist



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& PLANNING

- **N4 N6 Kinnegad to Kilcock Motorway additional borehole structures**
Site supervision, lab scheduling.
- **N4 N6 Kinnegad to Kilcock Motorway Royal Oak Underpass**
Site supervision, lab scheduling.
- **Supermarket Development Site**
Supervision of Contractor and logging and reporting of ground conditions for geotechnical design in Northern Ireland.
- **Corrib Field Development, Bellanaboy Bridge Gas Terminal**
Supervision of site investigation and scheduling of laboratory testing for subsequent geotechnical reporting on access roads and stability of peat bog site for use as repository for surplus excavated material for ASI Corrib JV.
- **R158 Trim – Summerhill - Kilcock**
Senior Resident Engineer supervising site investigation. Contract value €507,000 (£400,000) and co-author of the Geotechnical Interpretative Report.
- **M4 Kinnegad to Kilcock**
Supervision of geotechnical investigations of cuts and potential borrow pits to assess suitability of soils for reuse. Assessment of soils and rock for reuse and methods of excavation of rock material.
- **A4046 Cwm Relief Road, Meridog Viaduct**
Geotechnical assessment of Viaduct over landslip.
- **M1 Lissenhall to Balbriggan Northern Motorway**
Geotechnical Engineer responsible for supervision of geotechnical investigations of cuts and potential borrow pits to assess suitability of soils for reuse
- **M1 Dundalk Western Bypass**
Senior Resident Engineer for IR£600k Site Investigation.
- **N25 Waterford Bypass**
Senior Resident Engineer for IR£500k Site Investigation.
- **N9 Carlow Eastern Bypass**
Geotechnical Walkover Survey and preliminary Geotechnical Interpretative Report.
- **Kilkenny Ring Road**
Geotechnical Walkover Survey, Geotechnical Interpretative Report on Preliminary Site Investigation and design of Main Site Investigation.
- **N25 Kilmacthomas Design and Construct Project**
- **West Duffryn Link, SDR (Southern Distributor Road), Phase K, LG Site, £6.2 million**
Procedural Statement. Design and management of site investigation. Supervision and logging. Interim interpretive report. Factual report. Earthworks design, slope stability, materials classification, settlement analysis. Advice during construction.
- **Usk River Crossing, SDR - Phase E, estimated cost - £25 million**
Procedural statement. Desk study. Design of site investigation & preparation of contract documents. Engineer's Representative for SI (Investigation cost £34,000). Interpretive Report

- **Pontymoile Improvement, estimated cost - £12 million**
Advice during construction. Assessment of foundation conditions. Assessment of ground conditions behind anchored retaining wall and determination of anchor bonds. Assessment for unforeseen ground conditions claim (landslip in the temporary works for retaining wall).
- **SDR - Phase J, East Duffryn Link**
Procedural statement. Preliminary site Investigation & Factual report (Site investigation cost £10,000). Assessment of materials from Lucky Goldstar (LG) site, Preloading assessment, Geotechnical design options and costs.
- **SDR, West of the River Usk**
Procedural Statement, Desk Study, Site investigation across Newport docks and Newport Municipal Refuse Tip, Factual /Interpretive Report.
- **Desk Studies and Site Investigations and Interpretative Reports**
Reports for schools, housing and industrial developments mainly in Coal Mining Areas.
- **A4043 Abersychan Regeneration, estimated works cost - £3.5 million**
Procedural statement and desk study. Planned site investigation. Preparation of contract documents for site investigation. Engineer's representative for the contract (Site investigation cost £48,000). Planned and managed supplementary site investigation for investigation of mine workings. Mining search and interpretive report on supplementary site investigation.
- **A4046 Aberbeeg to Cwm Improvement, Estimated works cost - £9 million**
Planned and managed preliminary site investigation. Production of factual report. Preliminary Interpretive report (slope stability and earthworks design).
- **A4046 Cwm Bypass, estimated works cost - £17 million**
Logging and site supervision. Managed part of site investigation works. Organisation of monitoring (piezometers and inclinometers) and analysis. Production of factual report. Stability analysis (earthworks design and anchor forces for landslip). Assisted with Interpretive report
- **A4042 Llantarnam Bypass. works cost - £12 million**
Slope stability analysis. Planned supplementary site investigations. Preparation of contract documents for supplementary site investigations. Engineer's Representative, the supplementary site investigation. Interpretive report on supplementary site investigations. Foundation design and earthworks design. Advice during construction.
- **A40 Abergavenny Western Bypass, estimated works cost - £8 million**
Assisted in pile design for 290m long multi-span viaduct of composite construction.
- **A472 Pontymoile Improvement, cost - £14 million**
Assisted with desk study. Managed preliminary site investigation (SI cost £60,000). Site supervision and logging. Factual report for Preliminary Investigation. Partly managed Main site investigation. (SI cost £70,000). Assisted with interpretive report (foundation and earthworks design, geological interpretation and materials classification).
- **A472 Maesycwmmmer Newbridge Scheme, works cost - £19 million**
Assisted senior geotechnical engineer with interpretive report which included geological interpretation, foundation design, stability analysis/earthworks design and materials classification. Slope stability analysis/earthworks design. Drawdown assessment. Assessment for rock excavation (claim assessment - post construction).

Martin Lyttle

Senior Engineering Geologist



CONSULTANTS IN ENGINEERING,
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-
- **A4043 Pontypool Western Bypass , Works cost - £10 million**
Site supervision and logging of final stages of main investigation. Managed supplementary site investigation for Crane street car park retaining wall. Compiled factual report for entire investigation. During construction advice.
 - **Tredegar Bypass, estimated works cost - £ 7 million**
Site supervision and soil and rock core logging, Slope stability analysis/earthworks design, assisted senior engineer with interpretive report (geological interpretation, mining studies)
 - **Road failures & landslip assessments**
Investigation, analysis and design and supervision of remedial works
 - **Geophysics (EM-VLF and Magnetometry) field work and data processing for gold and base metal deposits.**
Field Technician. Gold Exploration involving soil and stream sampling (panning).

Appendix 2 - Sample MCE RAMS & Ionic Consulting Ltd. Design Drawings:

- MNBG MS 16030 Road Excavation Rev.6
 - MNBG d007.18.1- Spur to T18 - Sheet1_RevB
 - MNBG d007.18.2- Spur to T18 - Sheet2_RevB
 - MNBG d007.18.3- Spur to T18 - Sheet2_RevB
 - MNBG d007.18.4- Spur to T18 - Sheet4_RevA
 - MNBG d007.18.5- Spur to T18 - Sheet5_RevA
 - MNBG d007.18.6- Spur to T18 - Sheet6_RevA
 - MNBG d007.18.7- Spur to T18 - Sheet7_RevA
 - MNBG d018.2.1 T18 Road Upgrade Design_RevA
 - MNBG d027.18.1 Peat Profile @ Spur to T18_RevA
-
- MNBG MS 16037 T1 – T2 Barrage Rev.4
 - MNBG d018.4.4 - T4 Junction - Peat Depth Map & Section_RevB
 - MNBG d018.4.5 - T4 Junction - Peat Analysis Longsection_RevA
-
- MNBG MS 16038 T4 Road Upgrade Rev.4
 - MNBG d018.4.1 - Spur to T4 Road Layout_RevA
 - MNBG d018.4.1 - Spur to T4 Road Layout_RevA
 - MNBG d018.4.3 - Spur to T4 - Upgraded Adjacent Solid Road Section_RevA

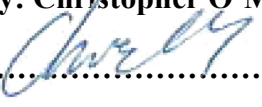


MS MNG 16030

T18 ROAD CONSTRUCTION



Prepared By: Christopher O'Mahony

Signed: 

Date: ... 26/08/2021

Reviewed By: Sean O'Driscoll

Signed: 

Date: ... 26/08/2021

1.0 Method Statement-MNG 16030

Project Name:	Meenbog Wind Farm.		
Contractor:	MCE Ltd, Lissarda Industrial Estate, Lissarda, Co. Cork		
Method Statement Title:	T18 Road Construction		
Method Statement No.:	MNG - 16030		
Prepared by:	Chris O'Mahony		
Date Prepared:	26/08/2021	Revision	006-26/08/2021
Specific Training Required:	Solas Safe Pass, Site Induction, EIA Training, CSCS Plant Ticket (where required).		
Relevant Legislation:	Safety, Health & Welfare at Work Act 2005 Safety, Health & Welfare at Work (General Application) Regulations 2007 Safety, Health & Welfare at Work (Construction) Regulations 2013		

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2.0 Statement Brief

Meenbog wind farm is comprised of 19 wind turbine generators, one 110kv substation and one meteorological mast along with associated roads, hardstands and other associated infrastructure. The wind farm access roads are designed to facilitate delivery of the 65m WTG blades using a ‘super wing’ delivery unit. This Method statement details the construction of the access road to turbine 18.

The Meenbog Site is primarily made up of rural and agricultural land, upland bog, commercial bog and forestry. Access to site may be shared with local domestic and commercial traffic and due care and attention should be taken at such access points. There is public access to the site and all contractors must conduct their activities in a manner that both protects and facilitates the general public in their enjoyment of the site. See site layout, Figure 1.0.

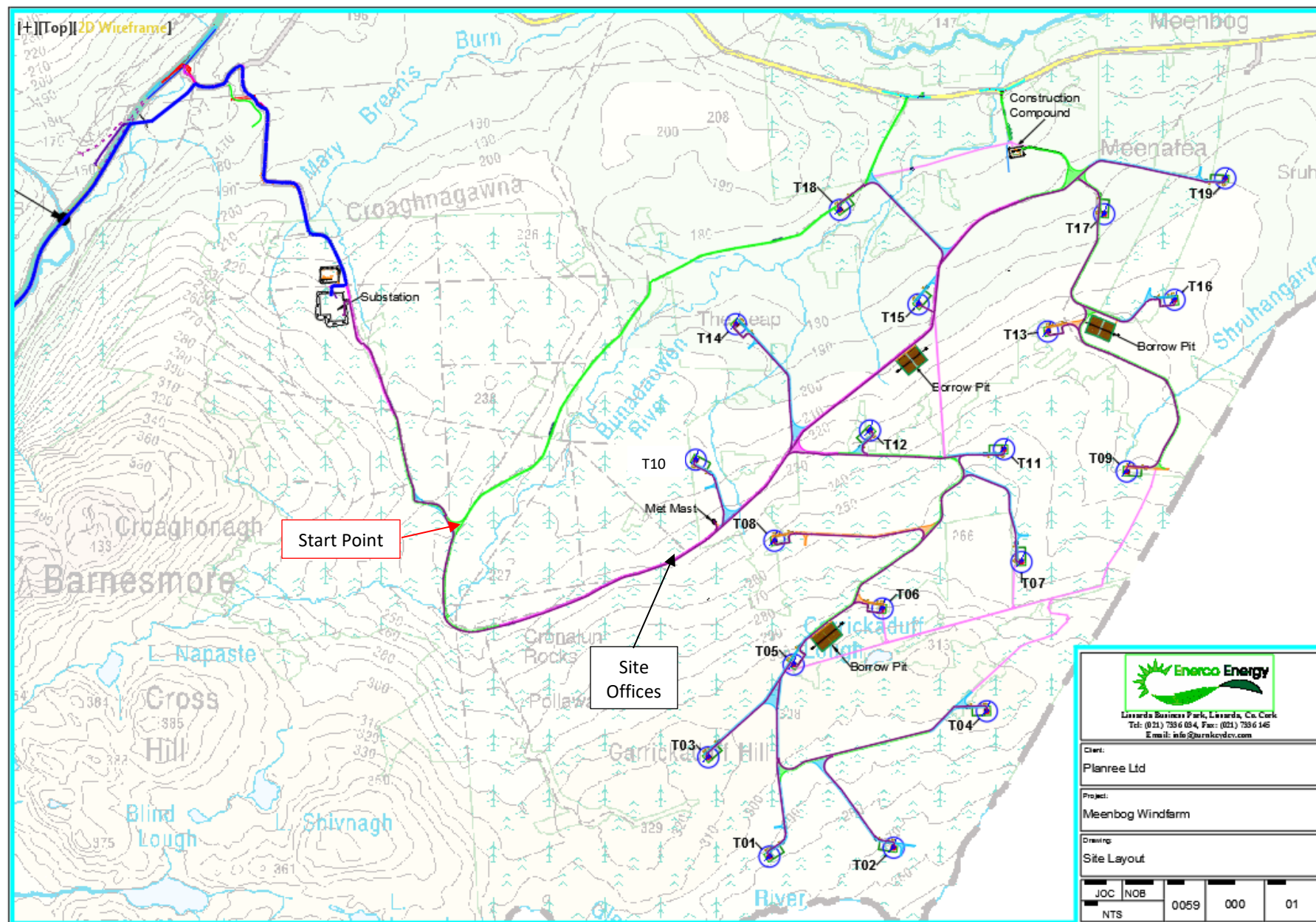


Fig 1.0 Meenbog Site Layout

2.1 Works Location

Meenbog Wind Farm & Substation entrance is located approximately 13km South West of Ballybofey and 14km North East of Donegal Town. All operatives are to text MCE Ltd operational controller when arriving onto site and again when leaving in the evening. The contact number is 086-8032620.

3.0 Restrictions / Precautions

Description	Yes	No
Work located near Underground services		√*
Work located near Overground services		√**
Work located near SAC / NHA	√***	
Work located near Watercourses / Streams	√****	
Work located near Steep Slopes	√*****	
Work located near Hillwalkers	√*****	

* = underground cables.

** = overhead power lines.

*** = Special Area of Conservation / National Heritage Area.

**** = Drainage measures to be put in place to ensure that no damage is caused to local watercourses in conjunction with Environmental consultant recommendations.

***** = Some road surfaces may be in close proximity to steep slopes.

***** = Hillwalkers frequent the development area and operatives have been made aware of their presence.

3.1 General Precautions

Prior to any works commencing all personnel onsite will be inducted by a MCE supervisor and will sign up to the relevant RAMS before commencing any work onsite. A number of other points to note include;

- GA2 forms to be completed weekly with a copy of the GA1 left in the machine at all times.
- All site-specific safety rules will be adhered to.
- All plant operators will have appropriate CSCS training.
- All personnel will have SOLAS Safe Pass training or equivalent training
- First aid supplies will be available in the work area.
- The road way will be maintained in clean condition at all times.
- Helmets, High Visibility clothing and safety footwear will be worn at all times with additional PPE as required.
- A competent foreman will be on site at all times.

4.0 Environmental Emergency Procedures

4.1 Excessive Peat Movement

There are a series of 20 monitoring locations across the site with trigger levels of 100mm recommended. (see appendix F). Where there is excessive peat movement or continuing peat movement recorded at a monitoring location or identified at any location within the site but no apparent signs of distress to the peat (e.g. cracking, surface rippling) then the following shall be carried out.

- (1) All construction activities shall cease within the affected area.
- (2) Further peat stability assessment completed
- (3) Increased monitoring at the location shall be carried out. The area will be monitored, as appropriate, until such time as movements have ceased.
- (4) Recommencement of limited construction activity shall only start following a cessation of movement completion of a geotechnical risk assessment by a geotechnical engineer.

4.2 Onset of Peat Slide

Where there is the onset or actual detachment of peat (e.g. cracking, surface rippling) then the following shall be carried out.

- (1) On alert of a peat slide incident, all construction activities will cease and all available resources will be diverted to assist in the required mitigation procedures.
- (2) Where considered possible, action will be taken to prevent a peat slide reaching any watercourse. This will take the form of the construction of check barrages on land. Due to the terrain, the possible short run-out length to watercourses, speed of movement and the inability to predict locations it may not be possible to implement any on land prevention measures, in this case a watercourse check barrage will be implemented.
- (3) For localised peat slides that do not represent a risk to a watercourse and have essentially come to rest the area will be stabilised initially by rock infill, if required. The failed area and surrounding area will then be assessed by the engineering staff and stabilisation procedures implemented. The area will be monitored, as appropriate, until such time as movements have ceased.

4.3 Reaction to Peat Slide

In the event that there is a significant movement of peat, MCE will follow a specific set of procedures, namely,

- MCE Site management will be contacted
 - Gearoid White: 086-0211525
 - Chris O'Mahony: 086-0329552
- Site management will ensure all employees and equipment are accounted for
- Area will be designated a 'no-go' zone until instructed otherwise
- An initial rapid assessment will be made to determine the immediate risks to personnel within the site, members of the public and the local environment
- If deemed necessary, measures may be taken to make the area safe in the short term
- MCE management and consultant engineers, will be contacted, notified of the situation and site staff will await further instruction
- In the event of a notable peat movement, the relevant statutory bodies will be notified.

4.4 Fuel / Oil Spill

The following mitigation measures are proposed to avoid release of hydrocarbons at the site:

- On-site refuelling will be conducted in a controlled and safe manner. Where possible fuel will be delivered by bunded mobile tanker. Bowsers and plant will be refuelled on a level platform away from any watercourses and areas susceptible to run-off.
- Refuelling to be conducted by competent and trained personnel
- Plant on site will be regularly inspected for leaks and fitness for purpose. Any defects to be reported to site management and plant owner immediately
- Emergency spill kits will be available to deal with any potential accidental spillage or discharge.
- Where there is a leak of any hazardous material all construction activities will cease and all available resources will be diverted to assist in the required mitigation procedures.
- The area will be sealed off so that no watercourses are affected, and the contaminated peat/land excavated and removed. Fuel spill kits will be used to clean up the area.
- Notify the ECoW immediately giving information on the location, type and extent of the spill so that they can take appropriate action.
- The ECoW will inspect the site and ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring.

-
- The ECoW will notify the appropriate regulatory body such as Donegal County Council, Department of the Environment, Climate and Communications (DECC), if deemed necessary.

5.0 Sequence of Works

5.1 Site Setup

1. The site has already been set up prior to works. MCE have a site compound set up with all required welfare and first aid facilities
2. A number of signs and fencing have been erected around the site so as to limit the risk of hill walkers from coming into the work area.
3. Site Safety signs have also been erected at a number of points alerting members of the public of dangers and the need for PPE as they are entering a construction site.
4. The assembly point for personnel involved in these works is at the MCE site offices
5. A rain gauge monitoring system is set up on site. Works will cease based on triggers set out in CEMP section 5.2.2 i.e. >25mm in 24 hours, 10mm in 1 hour or greater than the monthly average rainfall in the past 7 days.
6. 14nr. Peat Monitoring locations have been installed across the site in line with FTCO recommendations. There are to be monitored weekly site wide. Daily monitoring will be conducted on locations in the vicinity of works zone. (See appendix G)
7. In line with FTCO recommendation nr. 3. The remaining works on the site shall be carried out without placing of excessive loading onto the in-situ peat surface. Where loading is to be placed onto an area of in-situ peat then that area shall be inspected and assessed by a competent person. Where in doubt no loading shall be placed onto in-situ peat.
8. No further construction of floating roads is to be carried out. A number of the failures on site are related to construction of floating roads. Given the potential risk associated with floating road construction alternative methods of construction shall be adopted.
9. Zone of influence testing will be completed daily in advance of works. This will involve peat probing, shear vaning and inspecting the ground to 50m outside the works area along the path of the works to be completed. Probing and shear vaning will be carried out at 20m centres depending on the encountered peat conditions. The number of shear vaning carried out may vary depending on for example the depth and weakness of the encountered peat. The morphology, drainage, vegetation, and proximity to drains/watercourses will be checked. Tests will be cross-referenced to those completed to date.
10. Zone of influence testing and inspection shall be completed in a reasonable time in advance of the proposed works to allow assessment of the results to be completed.
11. All results, such as probing and vaning shall be documented on site using a standard template and transferred to digital medium (e.g. Excel spreadsheet), all of which shall be readily available for auditing.

5.2 Methodology

- All operatives are to read, understand and sign the RAMS before commencing any work and if unsure about any item they are to discuss with the site manager, Sean O'Driscoll / Chris O'Mahony/Gearoid White
- Works will be sequenced based on project organogram (see appendix G)
- Zone of influence testing will be conducted prior to works commencement. The area will be inspected by competent person, no works to take place until assessment is completed and signed off by Martin Lyttle (FTCO).
- The zone of influence testing will be cross referenced to the testing previously conducted along this road section which will back up the existing data. (see appendix C)
- The assessment of the findings of the zone of influence testing shall be assessed by a competent person who shall determine based on comparison with previous data contained within the Ionic report and recently completed data that works within the tested section can be commenced, or otherwise. Where there are adverse variations in the data then the designer (Ionic) shall be consulted as part of the assessment.
- No works can commence until the assessment is complete and the assessment has clearly demonstrated that the proposed works are safe to commence.
- The result of the assessment shall be documented using a standard template, which shall be in a suitable medium that can be readily audited.
- Excavation will begin at the T-junction on the T18 approach (205748.709, 385036)
- See Ionic construction drawing ref. MNBG d007.18.1 Rev B (see appendix C)
- The peat will be excavated min 2.5m wide. Depending on the depth, the excavation will be extended in order to allow the fill to be 'battered' to the roadside.
- Articulated dump trucks will reverse down along the road from the T-junction
- They will be loaded with peat and haul it to peat deposition area 1.
- Rock will be brought back from borrow pit B. It will be tipped along the road and excavator will place it.
- No construction machinery will track onto in-situ peat. In the event that machinery must track onto peat e.g. for pre-drainage works, the peat will be inspected and assessed by a competent person to avoid excessive loading. If in doubt machinery will not be tracked onto peat.
- Any drainage works required will be conducted under supervision of MKO. Silt containment measures will be installed as required. MCE will pre-empt any issues as far as reasonably practicable.

-
- Works will be conducted in a ‘dig and replace manner’
 - To avoid unsupported excavation faces and potential for tension cracks to develop, the excavation and filling will be sequenced to minimise the time that the excavation faces are unsupported. This will require limiting the amount of excavation to the available volume of fill at the point of excavation. If required there may be a need to place fill into the in-situ peat (using displacement method) at the toe of temporary excavation face to avoid excessive height of unsupported excavation face.
 - As excavation proceeds to the North East, deep peat will be encountered (>3m) with a low shear vane value.
 - As excavation progresses, a v-drain will be formed along the road side. The road will be cambered to bring the surface water across to this drain. It will join the existing drains flowing south towards the Bunadownen.
 - MCE/MKO will monitor the works at all times to ensure there are no unwanted discharges to the roadside drainage. If there are any issues with drainage and or unwanted discharges, works will cease, and remedial measures will be put in place to the satisfaction of the ECoW prior to recommencement of works
 - Road construction will simultaneously take place from T18 heading South west (207417.994, 387109.889)
 - It will continue in the same manner as with the North East bound construction with the rock source and peat deposition situated to the North of T18.
 - Once constructed the ducting will be installed along the road.
 - The duct trench will be excavated within the newly formed track, ref MNBG d018.2.1 (See Appendix E)
 - The trench will be excavated to a depth of 900mm.
 - Once backfilled to road level, a layer of seci-grid 40/40 will rolled out and covered with 300mm of 6N. this will provide adequate cover to the cable duct.
 - The newly formed alignment will be levelled, capped and CBR tested.
 - Martin Lyttle (FTCO) and Gearoid White (MCE) will monitor excavation works. John Shanahan/Cormac O’Dubhthaigh (Ionic) will be present for works commencement to ensure the methodology is satisfactory.
 - Once completed a final inspection will be conducted by Ionic consulting (John Shanahan & Cormac O’Dubhthaigh), FTCO (Martin Lyttle) and MCE management (Sean O’Driscoll & Chris O’Mahony)

6.0 Covid-19

Coronavirus/Covid-19 is an infectious disease which affects the upper respiratory system. It is potentially fatal and is particularly dangerous to those with underlying conditions and the elderly/infirm. 63% of confirmed cases have spread through community transmission. The infection is highly contagious and easily transmitted from person to person through close contact with either an infected individual or a contaminated area. For this reason, a set of standard operating procedures are to be adopted at Meenbog WF. Refer to construction stage safety plan for SOPs on Covid-19. Briefly summarised below,

- All workers are to sign in/out at the designated area
- Personnel will be asked to make a declaration which assess the key risk factors in virus transmission
- Hand sanitizer and gloves will be provided for instances where personnel must use a shared space i.e. toilets
- There will be no communal areas for eating in use for the foreseeable future
- Personnel will take their designated breaks at their own individual work area e.g. digger cab
- Site will be closed for access in the morning and opened at the end of the day, any entries/exits are to be notified to site management
- Anyone displaying symptoms of Covid-19 are to immediately notify site management and proceed to self-isolate

7.0 Plant / Equipment

1.	Various Size Excavators
2.	Roller / Plate Compactor / Generator
3.	25 Tonne Dumper
4.	Lorries / Dumpers
7.	Loadall
8.	Rock Breaker

7.1 Personal Protective Equipment (PPE)

1.	Hard Hat. (Worn at all times)		
2.	Hi Visibility Jacket/Vest. (Worn at all times)		
3.	Steel Toe Cap Boots. (Worn at all times)		
4.	Gloves. (Worn when required)		
5.	Eye Protection. (Worn when required)		
6.	Ear Protection. (Worn when required)		
7.	P3 Dust Masks. (Worn when required)		

7.2 Extra Safety Equipment to be used

Additional PPE such as hearing protection and dust masks to be used as required depending on operative activities.

8.0 Emergency Arrangements

In the case of an emergency, all operatives are to follow the emergency procedures as detailed in the site induction for Fire, Injury or Bog slide. General arrangements are;

- Assess/Attend to casualty if one is present
- Raise the alarm and call 999/112
- Alert the other site personnel as to the emergency
- Locate at the site assembly point and do not return to work until instructed that it is safe to do so
- Substation construction assembly point located at the site entrance gate

First Aid

First aid kits are located in the MCE Site Vehicle in addition to the MCE site office.

Emergency Contacts

1.	Emergency Numbers – 999/112
2.	Letterkenny University Hospital – 074 912 5888
3.	NowDoc – 1850 400 911
4.	Donegal Town Garda Station – 074 974 0190
5.	Sean O’Driscoll – Project Manager – 086 8528329
6.	Chris Murnane – Safety Officer – 086 7955083

Who Information Will be Communicated to.

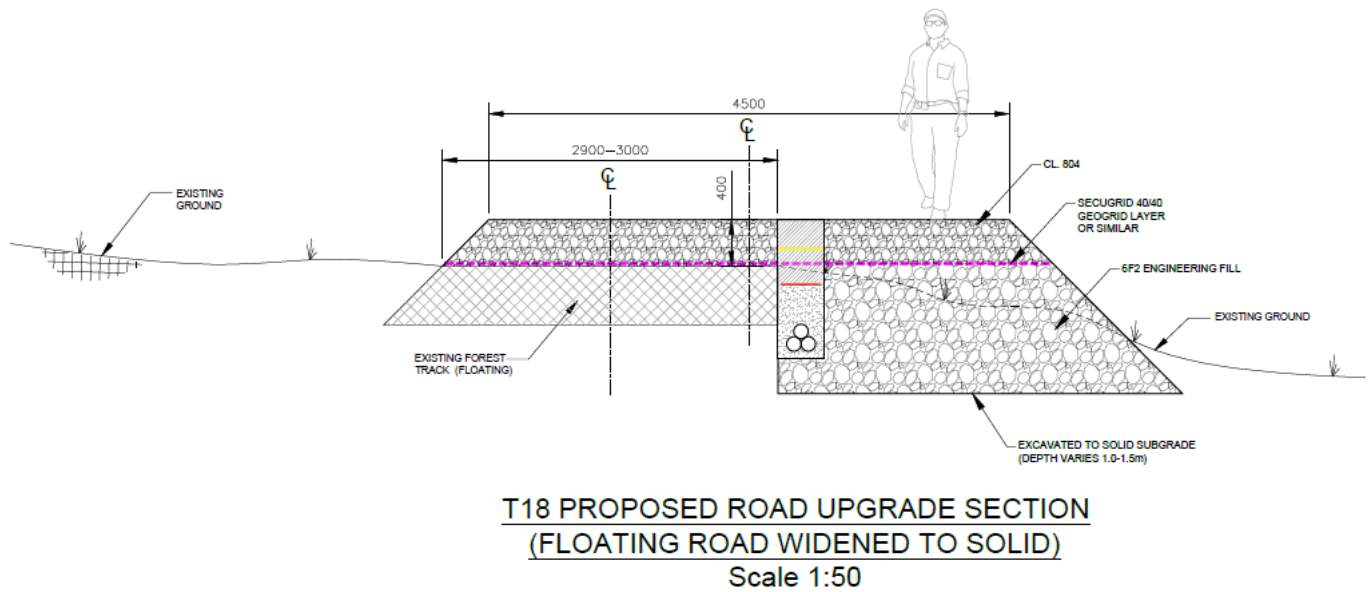
Chris O’Mahony/Sean O’Driscoll will communicate the method statement and risk assessment to the work force before the work commences on site.

Monitoring and Compliance

Chris O’Mahony/Sean O’Driscoll will ensure that method Statements will be adhered to by all MCE staff including any updates/changes made to the Method Statement.

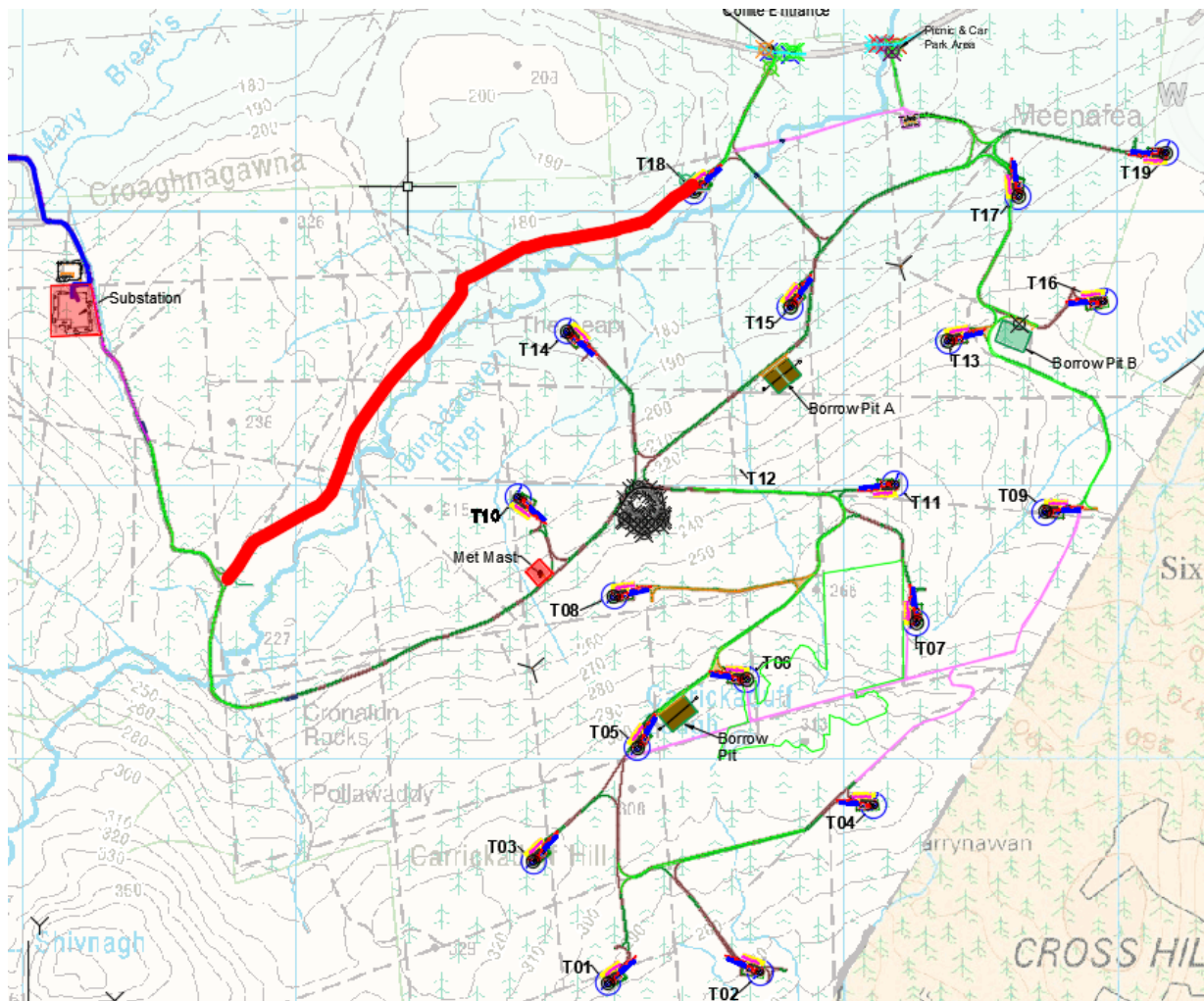
9.0 Appendices

Appendix A Road Cross Section

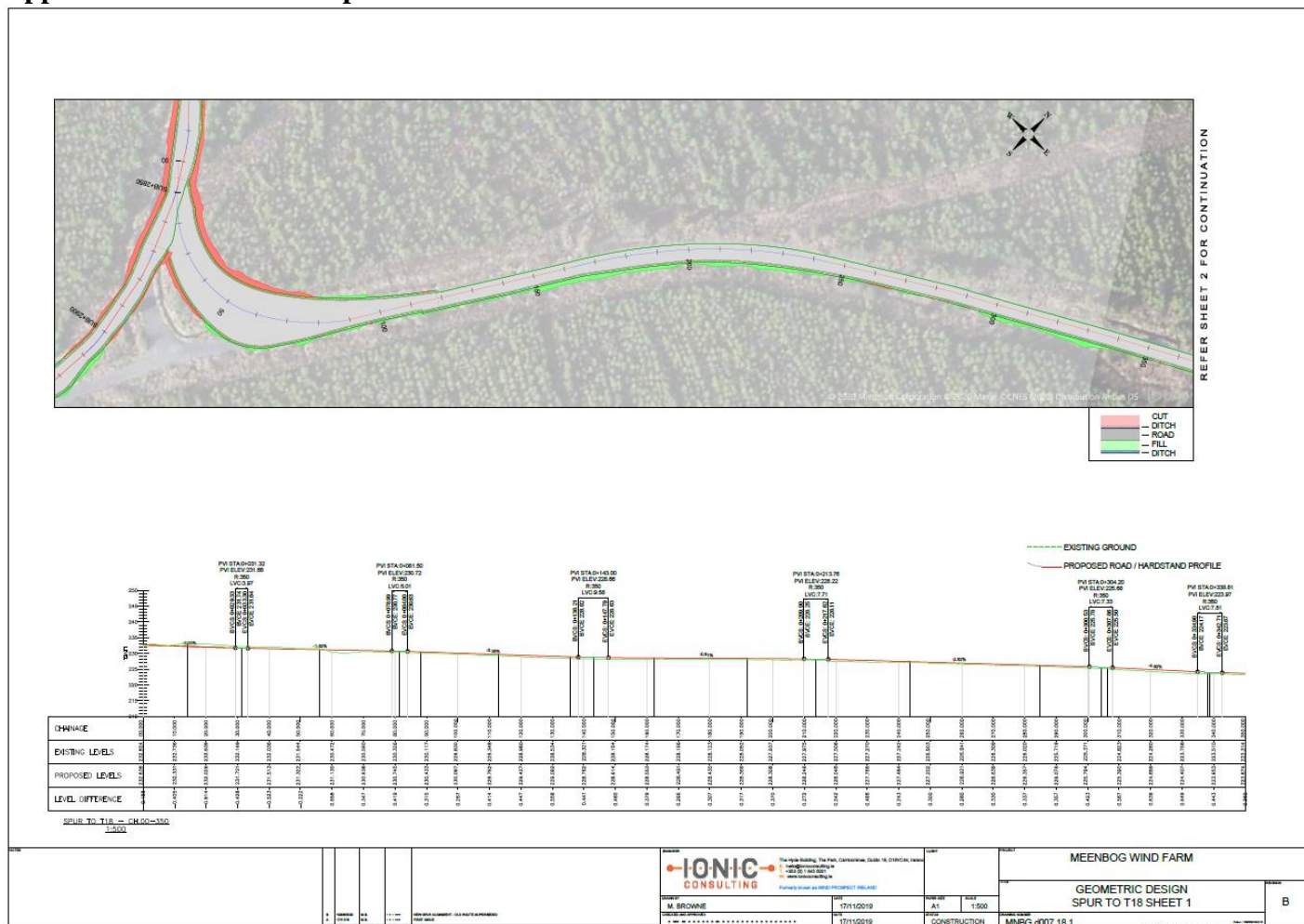


REF: Ionic Construction MNBG d018.2.1

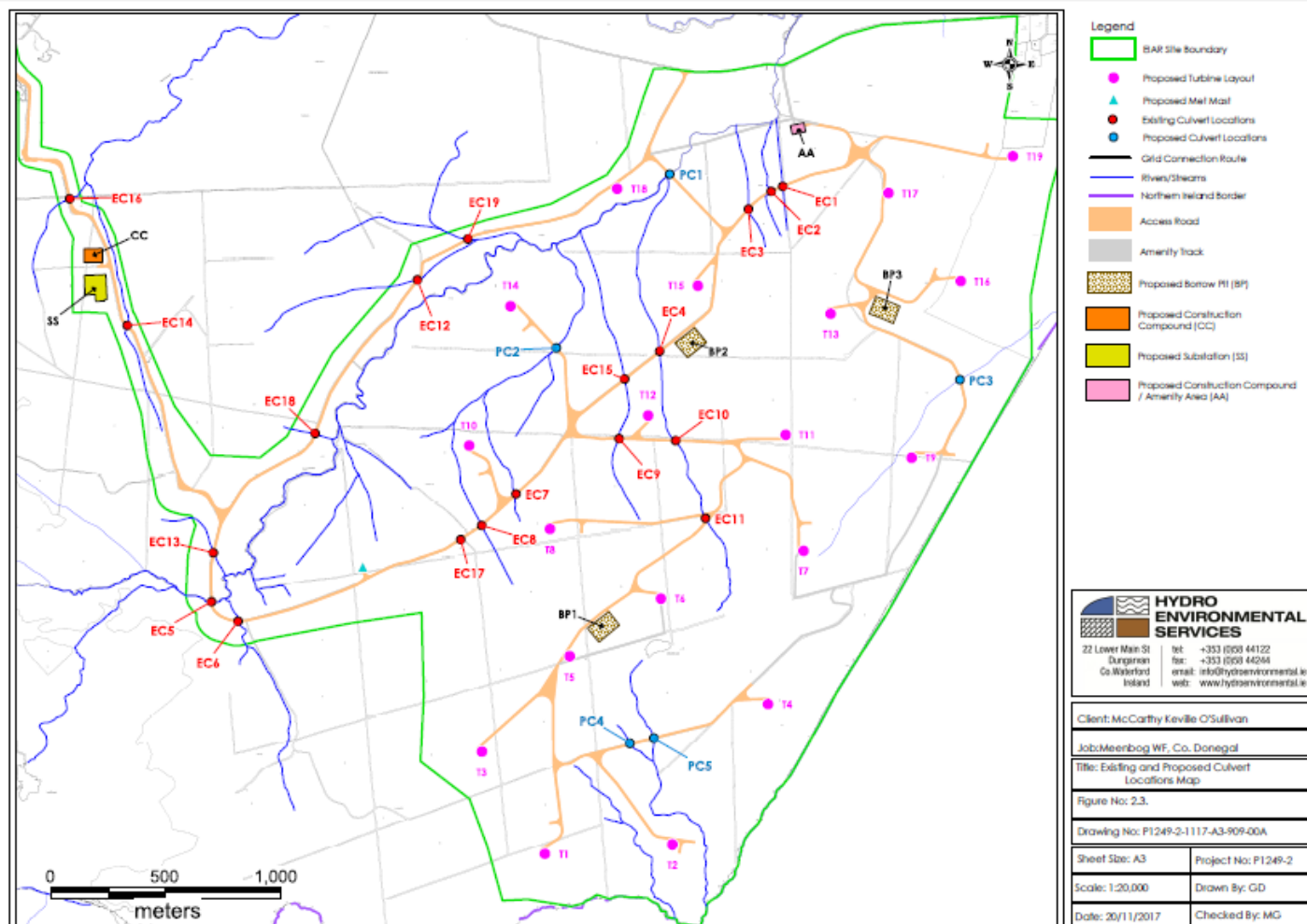
Appendix B Road Section to be Upgraded



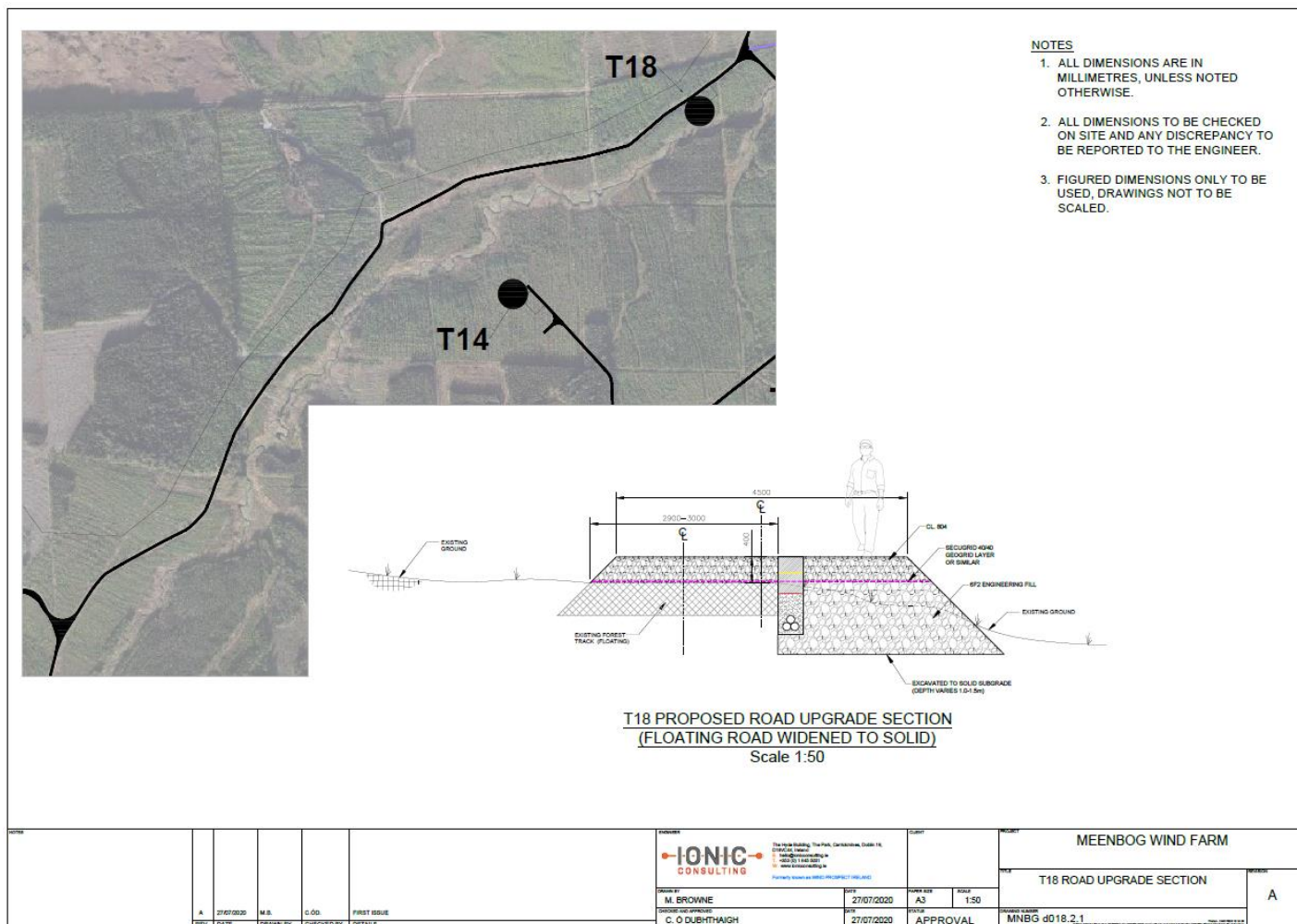
Appendix C Bend at T18 Spur Road



Appendix D Main Site Drainage



Appendix E Main Site Drains



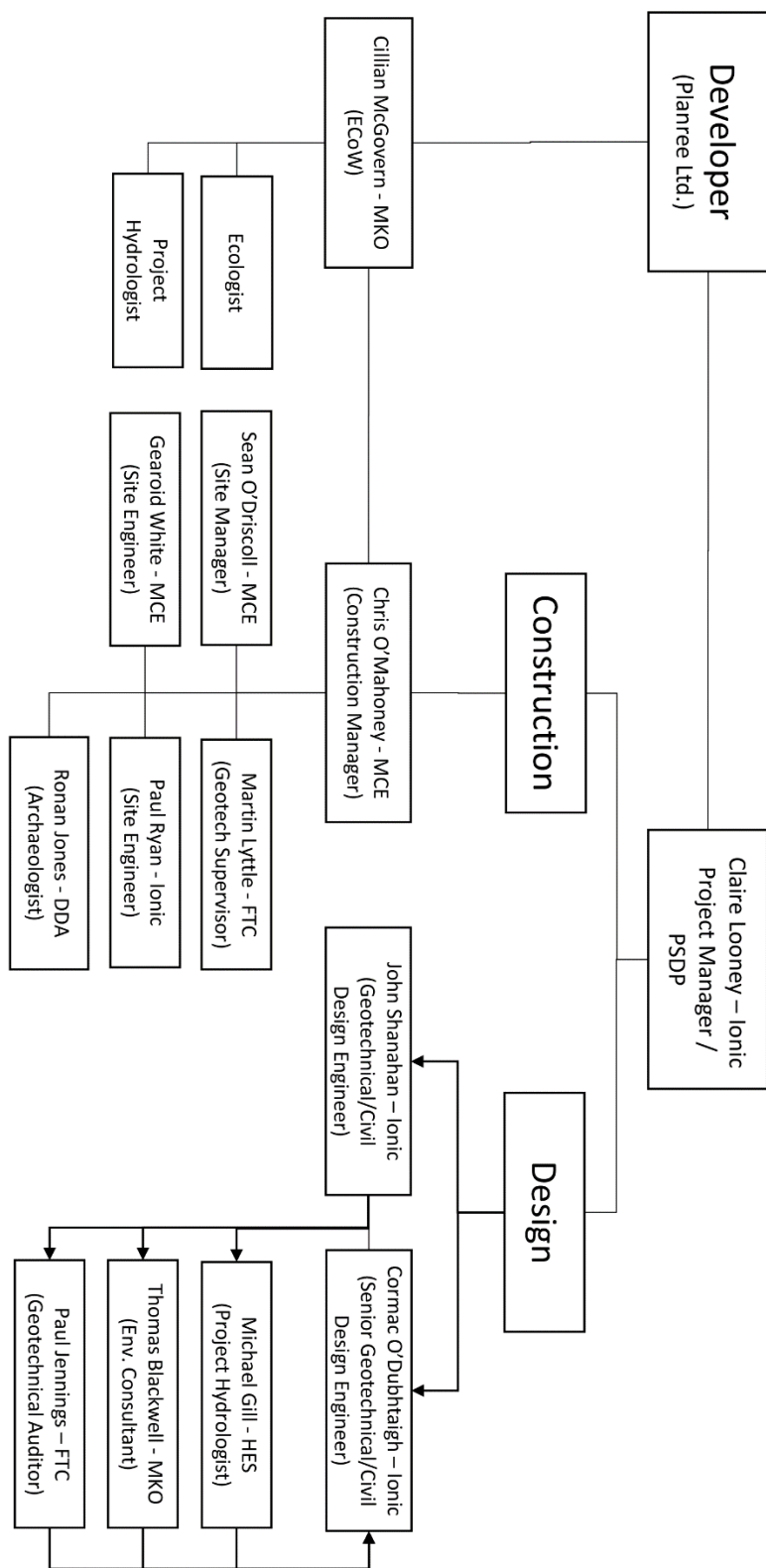
Appendix F Peat Monitoring Locations

No	Location	Comments
1	Junction of access road to T1 with spur to T2 and T4 along downslope margin	Area of deepest peat in close proximity to concave break in slope
2	Along access to T3 about 50m from hard stand along downslope margin	Area of deeper peat in close proximity to concave break in slope
3	Along access to T2 about 100m from hard stand along downslope margin	Area of deeper peat in close proximity to concave break in slope
4	Along access to T4 about 150m from hard stand along downslope margin	Area of deeper peat in close proximity to concave break in slope
5	Along access from T5 to T3 about 200m from T5 along downslope margin	Area of deeper peat in close proximity to concave break in slope
6	Junction of access road to T7 about 100m along access to T7 along downslope margin	Area of deeper peat in close proximity to concave break in slope, within potential area of 12 November failure
7	South side of upper scar of 12 November failure	To monitor potential retrogression of scar upslope
8	On downslope margin of T7 base and hard stand prior to construction	To be installed in advance of any works
9	On downslope margin of T10 base and hard stand	Area of peat in close proximity to concave break in slope
10	Along access to T14 about 100m from hard stand along downslope margin	Area of peat in close proximity to concave break in slope
11	Along access to T18 at about chainage 1600m along downslope margin	Area of potential peat close to river
12	Along access to T16 about 50m from hard stand along downslope margin	Area of deeper peat in close proximity to concave break in slope and minor instability
13	Peat storage berms at T15	Minor signs of movement/distress. Where necessary the berm size is to be increased.
14	Peat storage berms at T17	Minor signs of movement/distress. Where necessary the berm size is to be increased.
15	Peat failure scar above road to T7	Upper scar of 12 November 2020 peat failure. Potential for retrogression of failure scar.
16	Peat failures at Borrow Pit between T5 and T6	Comprises 3 peat failures at this location. Monitoring at the head of each failure.
17	Peat failure at T12	Head of failure downslope of access road. Monitoring at the head of failure.
18	Instability at T5	Series of concentric tension cracks within the insitu peat
19	Instability at T16	Minor slumping of insitu peat
20	Ch.2630 on the north side of the S-bends on the approach road into the site	Stockpile caused a localised ground movement in the peat below the stockpile

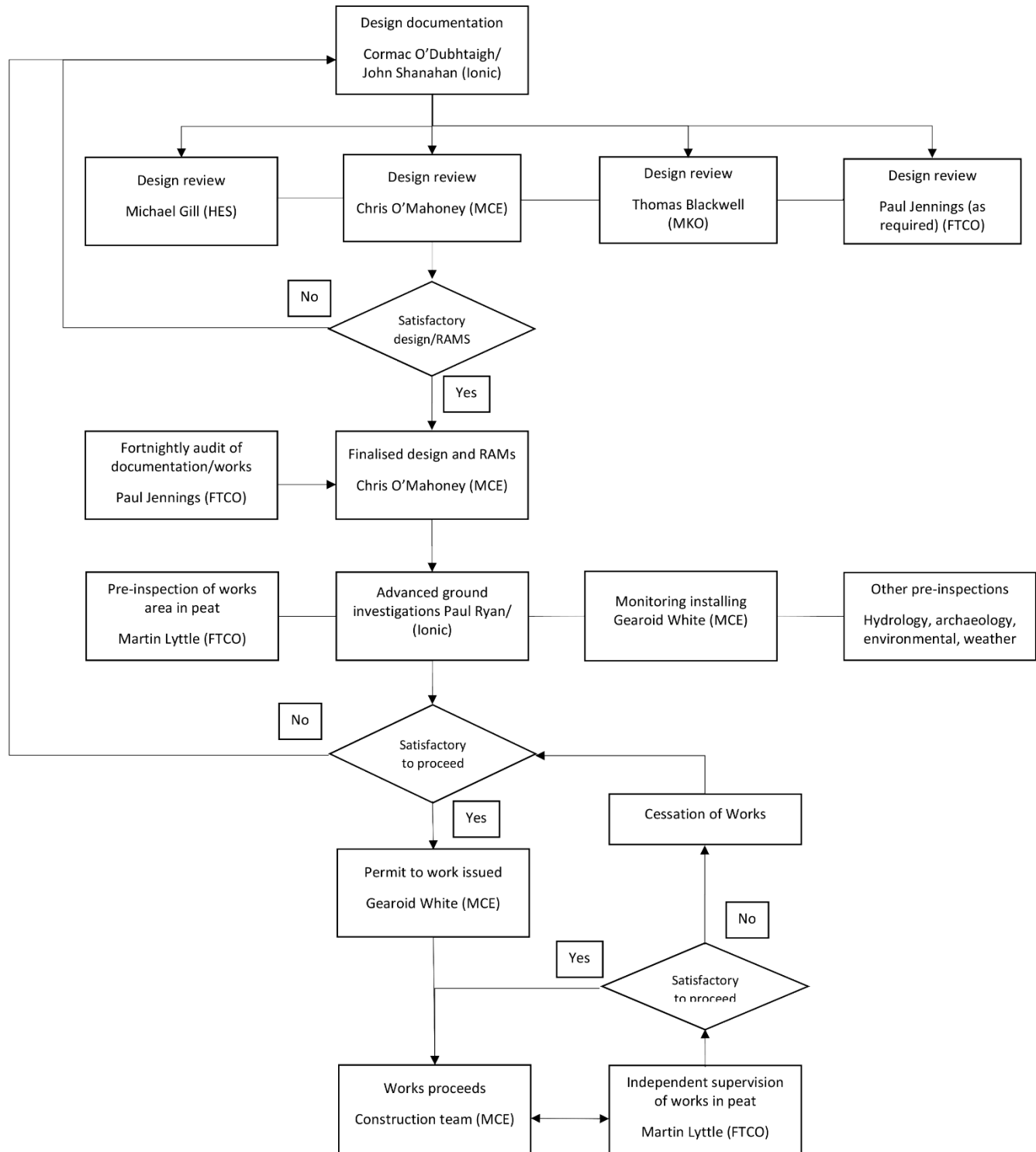
Ref: Fehily Timoney Peat Stability Assessment of Meenbog wind farm Jan 2021

Appendix G Project Organogram & Flow Chart

Organogram:



Design & Construction Flow Chart:



10.0 Risk Assessments

Assessing Level of Risk

		<u>Likelihood</u> →			
<u>Severity</u> ↓	0	1	2	3	
	1	1	2	3	
	2	2	4	6	
	3	3	6	9	

Likelihood			Severity		
1	=	Low	1	=	Slight
2	=	Medium	2	=	Serious
3	=	High	3	=	Major

Likelihood x Severity = Risk Rating

1 to 3	<u>Low</u>	<u>Work can proceed with control measure in place.</u>
4 to 6	<u>Medium</u>	<u>Work can proceed with control measures in place to reduce risk.</u>
7 to 9	<u>High</u>	<u>More control measures needed to reduce risk.</u>

Controls

Management must determine the controls required to eliminate or mitigate against the risks identified in the risk assessment. These controls must be consistent with the operational experience of employees and in accordance with the principles of prevention detailed below. They should also indicate any facility requirements and training needs. These controls are documented on the risk assessments.

Risk Matrix					 MCE Ltd.
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T18 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	

THIS RISK ASSESSMENT TAKES ACCOUNT OF THE FOLLOWING:

MCE SAFETY STATEMENT, MCE FULL SAFETY STATEMENTS HAZARD IDENTIFICATION & RISK ASSESSMENT, THE METHOD STATEMENT FOR THESE WORKS & THE PSCS CONSTRUCTION STAGE SAFETY PLAN.

Hazard: Peat Movement Risk: ➤ Slippage of peat ➤ Engulfment of personell or machinery ➤ Damage to the environment	2	3	6	➤ 14nr. peat monitoring stations installed ➤ Checked weekly. Stations in immediate vicinity checked daily. ➤ Works location probed and shear vaned – 50m grid outside of works area ➤ No works during periods of excessive rainfall see CEMP 5.2.2 ➤ No stockpiling of peat on top of in-situ material	2	1	2	- Site Supervisor (Foreman) - Site Operative
Hazard: Excavation / Trenches Risk: ➤ Falls. ➤ Entrapment. ➤ Suffocation. ➤ Crushing. ➤ Impact with machinery. ➤ Drowning. ➤ Electrocution. ➤ Serious bodily injury / fatality.	3	3	9	The Construction Regulations, 2013 must be complied with regarding all excavations. Verify ground conditions and soil type before excavating. No ground to be considered safe until investigated by a competent person. ➤ Schedule work so that excavations are not open for longer than necessary. ➤ Find, locate and mark all underground services. ➤ Organise suitable plant, equipment and required working space. ➤ Organise delivery and inspection of support materials / equipment.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T18 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
				➤ Provide appropriate protective clothing and equipment. ➤ Provide suitable barriers to protect against the fall of persons at work, materials or objects, including the inrush of water into the excavation. ➤ Provide adequate secured ladder and/or ramp access/egress to excavations. ➤ Most extracted spoil will be hauled away but any residual material will be stockpiled away from excavation edge at all times. ➤ Safe System of Work Plan should be completed for each task or a specific method statement completed and a new SSWP should be completed when the task or the environment changes. ➤ AF 3 to be completed as required by a competent person. ➤ Where there is a risk involved with a trench and/or an excavation, adequate precautions must be taken to protect against danger to persons at work from a fall or dislodgement of earth, rock, or peat, by suitable shoring or batter back edge to a safe angle of repose. ➤ If other methods are to be specified they must be selected based on the results of a risk assessment and a Temporary Works Design				

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T18 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
				Certificate will be prepared & issued. ➤ Appropriate precaution to be in place to protect the person carrying out the shoring				
Hazard: Movement & Use of Excavator Risk: ➤ Collisions. ➤ Overturning. ➤ Loss of Control. ➤ Risk of serious or fatal injury to the operator and bystanders in the vicinity due to Overturning. ➤ Collisions and loss of control or collision with other plant or vehicles.	3	3	9	➤ Excavators to be driven by trained, experienced operators, trained to CSCS level, as per the Construction Regulations, 2006. ➤ Driver to carry out weekly documented checks. ➤ Defects or suspected defects to be reported immediately to the Supervisor. ➤ Regular servicing and maintenance to be carried out and properly recorded. ➤ Warning signs to be posted at strategic locations to alert persons to the movements of excavators. ➤ Drivers of smaller vehicles must ensure that excavator drivers, when operating nearby, can see them. ➤ Where a workplace or a site road is close to an open edge, the edge must be clearly marked and lined with boulders and safety barriers. ➤ Site roads not to exceed a gradient of 1 in 5.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					 MCE Ltd.
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T18 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
				➤ Test certificates and form GA2 required for excavators used as lifting equipment.				
Hazard: Excavator – Various Risks Risk: ➤ Falls - Injury to driver entering or getting out of the cab ➤ Passengers ➤ Noise ➤ Partial /Total loss of hearing ➤ Dust ➤ Risk of serious ➤ Health damage from dust	2	3	6	➤ Hand and footholds to be fitted and maintained in good condition. ➤ Machine lights to be properly maintained. ➤ Carriage of passengers on any part of an excavator is not allowed. ➤ Machine to be stopped and switched off before any person including maintenance persons are permitted on the footsteps. ➤ Earmuffs to be provided and their wearing compulsory where noise levels reach 85Db or more. ➤ Cabs to be maintained to keep out dust. ➤ Proper masks to be provided and worn.	2	1	2	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T18 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
Hazard: Site Dumper / Lorries Risk: ➤ Overturning/Loss of control ➤ Collision ➤ Personal injury ➤ Disablement ➤ Fatality ➤ Pedestrians ➤ Personal injury ➤ Disablement ➤ Fatality ➤ Passengers ➤ Fall from dumper ➤ Fall underneath ➤ Loading ➤ Falling material ➤ Fire	3	3	9	➤ Only trained, experienced and authorised drivers to operate dump trucks/dumpers/lorries. ➤ Drivers must hold a CSCS Ticket (or recognised alternative). ➤ Each driver to carry out daily visual checks on their vehicles, to ensure that they are in safe working order. ➤ All dump trucks/dumpers must have all safety devices fitted as required in the Construction Regulations, 2006, S.I. 504, Schedule 6, Regulation 87. ➤ Safety belts are recommended for all existing and new dump trucks and where fitted they must be worn. ➤ Suspected defects must be immediately reported to your Supervisor. ➤ Regular recorded maintenance to be carried out. ➤ As a general rule, all other traffic gives way to loaded dump trucks. ➤ Lay-bys to be provided where dump trucks are likely to meet other traffic. ➤ Where a haul road passes near open edges, the edges are to be clearly marked and lined with large boulders or other safety measures and kept clean.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T18 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
				➤ Workings must be designed so that gradients do not exceed 1 in 5. ➤ Safety warning signs are to be posted at strategic areas to alert persons to movements of dump trucks and other vehicles. ➤ Pedestrians told to ensure that they keep clear of dump trucks, wear high visibility clothing, and ensure that the driver can see them. ➤ No pedestrians may go under an open edge while a dump truck is in operation above. ➤ Persons driving small vehicles must ensure that the driver of dump trucks can see them. ➤ No persons to be carried on any part of a dump truck, unless there is provision in the cab and they are authorised to be carried. No riding permitted on the foot steps. ➤ Drivers cab must always be protected by an overhead shield built into the body of the truck. ➤ Driver to remain inside the cab at all times during loading. ➤ Hand and foot-holds must always be provided to aid safe ascent to/decent from the dump truck.				

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T18 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
Hazard: Tractor & Trailer Risk: ➤ Falls. ➤ Entrapment. ➤ Crushing. ➤ Impact with machinery. ➤ Serious bodily injury / Fatality. ➤ Collision.	3	3	9	➤ Wear hi-visibility vest and hardhat when working with moving equipment. ➤ Keep in operator's line of view. ➤ Don't travel on equipment. ➤ Watch out for objects nearby, particularly when reversing. ➤ Don't overload a trailer or stack it too high. Secure any loose loads. ➤ Use flashing amber beacon ➤ Trailer must be correctly attached to tractor (i.e safety chain, brakes and lights). ➤ Competent operators must only operate tractor. ➤ Tractors and trailers must be inspected before use.	3	1	3	- Site Supervisor (Foreman) - Site Operative
Hazard: Persons affected by the works Risk: ➤ Struck by site traffic. ➤ Fatalities ➤ Serious injuries	3	3	9	➤ Traffic Management Plans and Drawings are approved and made available. These plans will detail access routes both internal and external. ➤ All warning signs, cones with barriers are in place prior to the commencement of work on site. ➤ All signs will be clean and clearly visible. ➤ Once signs are in place the site access route will be assessed to ensure adequate visibility for drivers and pedestrians.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T18 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
				➤ All signs will be secure and weighted down where appropriate. ➤ All personnel onsite & on public roads will wear high visibility vests or jackets. . ➤ Contractor vehicles will be parked with consideration given to site traffic access.				
Hazard: Lifting Equipment Risk: ➤ Serious personal injury. ➤ Fatalities. ➤ Collision. ➤ Machine overturning. ➤ Material falling from height.	3	3	9	➤ The site management of MCE Ltd must ensure a competent person inspects the lifting equipment every 12 months and a GA1 is obtained. This must be available for inspection. ➤ Under the Construction Regulations, 2006 the lifting equipment must be inspected weekly by the operator and the results must be recorded on a GA2. ➤ A thorough visual inspection should take place before the driver operates the machine. ➤ The driver must be trained and competent to operate the machine (FAS CSCS standard or alternative excepted standard). ➤ All telescopic handlers/excavators must have safety devices fitted as per the Construction Regulations, 2006 S.I 504, Schedule 6, Regulation 87.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T18 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
Hazard: Noise created in the workplace - Rock Breaker Risk: ➤ Hearing impairment. ➤ Deafness. ➤ Tinnitus. ➤ Loss of concentration and annoyance leading to work ➤ place accidents and / or loss of production.	3	2	6	➤ MCE Ltd is aware that equipment such as consaws, angle grinders, etc. are over the 2nd Action Level and hearing protection must be worn. ➤ It is not anticipated that any member of our staff are exposed to such a dose that they will either daily or weekly require monitoring. ➤ Consult with staff and provide training where necessary. ➤ Signpost all excessively loud equipment, machinery, areas and processes which exceed the upper exposure action level of 85dB(A) and the lower exposure action level of 80dB(A). ➤ Reduce the worker exposure levels by reducing the amount of time spent near sources of excessive noise (job rotation). (Note: this should be considered as a last resort). ➤ Hearing protective equipment must be provided if deemed necessary, as per the Noise Regulations. ➤ Ensure hearing protection is worn for short-term noise exposures (this should also be a last resort). ➤ Remove other people from such noisy areas, unless their presence	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T18 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
				is required. They must wear hearing protection whilst in such areas.				
Hazard: Working in reduced light Risk: ➤ Fatalities ➤ Serious injury	3	3	9	➤ Working in diminished light is not permitted under the normal work rules. ➤ In cases where permission is granted so as enable MCE Ltd to remain in keeping with the project program or for special activities, concrete pours for turbine bases, etc and work in hours of reduced light is conducted, adequate lighting will be provided at all times. ➤ Any temporary work lighting will be erected with due regard to the visibility of plant operators and other traffic on site. This shall be the duty of MCE Ltd and any special arrangements will be documented in method statements, SSOW or traffic management plans. ➤ High visibility jackets are to be worn at all times regardless.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T18 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
Hazard: Chemicals Risk: ➤ Eye injury / loss. ➤ Skin infection. ➤ Burns. ➤ Inhalation. ➤ Ingestion with food. ➤ Fire. ➤ Explosion. ➤ Serious personal injury. ➤ Fatalities.	3	3	9	➤ Safety Data Sheets to be obtained for all chemicals and strictly followed. ➤ Copies to be available in case of an emergency. ➤ Containers to be properly labelled (hazard signs). ➤ Safe storage and dispensing of chemicals to be practiced. ➤ Follow manufacturer's requirements for handling, mixing, storage and first aid etc. ➤ Personal Protective Equipment to be provided and used. ➤ Training to be provided for staff working with chemicals. ➤ Familiarisation to be provided with the emergency procedure to all staff. ➤ Best possible hygiene procedures to be in place and enforced by Management. ➤ Sources of flame / ignition to be eliminated where flammable materials are used and / or stored. ➤ Spillage's to be immediately dealt with.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T18 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
Hazard: Lone Working Risk: ➤ Personal injury. ➤ Fatalities. ➤ Violence toward staff. ➤ Delay in treating medical emergencies.	3	2	6	➤ The company policy is that lone work is a last resort and must only be used for minor tasks. A system for communication with management must always be maintained. If lone working is required in keeping with the project programme it will be pursued under the following controls: ➤ The person must be trained & competent to carry out the tasks required. ➤ A means of communication must be available for the lone worker to contact foreman and the lone worker will be contacted at regular intervals during the anticipated work period. ➤ The lone worker must report he is leaving site to a designated person, this will be either the site manager or an appointed person. ➤ Periodic visits must be made to the lone worker, where possible. ➤ The lone worker must be furnished with the telephone numbers & emergency procedures information.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					 MCE Ltd.
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T18 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
Hazard: Roadworks Risk: ➤ Obstruction of Public. ➤ Injury to Public. ➤ Insufficient clearance between traffic routes. ➤ Collision. ➤ Accident or Bodily Injury.	3	3	9	➤ A Traffic Management Plan will be formulated for internal site roads. ➤ The main bulk of traffic will be generated with concrete pours and a traffic management plan will be created with concrete supplier and MCE Ltd. ➤ Communication will be maintained between MCE Ltd., and other civil contractors about traffic activities and all parties will be notified when pouring is taking place.	3	1	3	- Site Supervisor (Foreman) - Site Operative
Hazard: Fuel storage / refuelling Risk: ➤ Fire ➤ Burns ➤ Skin & Eye Irritant ➤ Dermatitis ➤ Environmental ➤ Slip / Fall	3	3	9	The risk of spilling fuel is at its greatest during refuelling of plant. To minimise this risk MCE Ltd will implement the following: this list is not exhaustive: ➤ Refuel will take place on a base away from drains or watercourses. ➤ A bunded bowser will be used. ➤ All refuelling and bulk deliveries will be are to be supervised. ➤ Check the available capacity in the tank before refuelling ➤ Check hoses and valves regularly for signs of wear ➤ Turn off valves after refuelling and lock them when not in use ➤ Position drip trays under pumps to catch minor spills	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T18 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
				➤ Keep a spill kit with sand, earth or commercial products for containment of spillages.				
Hazard: Public accessibility to work area on site. Risk: ➤ Serious personal injury. ➤ Fatality. ➤ Slips, trips, fall over goods, materials, rough terrain. ➤ Electrocution. ➤ Theft.	3	3	9	➤ Warning signs must be posted to highlight the dangers involved in entering work area, where MCE Ltd are responsible for site conditions e.g. turbine bases. ➤ All access points to work areas to be closed / barricaded to prevent access to unauthorised persons. ➤ Entrances must be fully secured each evening / end of each work shift. ➤ Only authorised personnel are allowed on site. Signs must be erected re same. ➤ A responsible person must check site boundaries on a regular basis.	3	1	3	- Site Supervisor (Foreman) - Site Operative
Hazard: Visitors Risk: ➤ Personal Injury ➤ Property damage ➤ Cuts	3	3	9	➤ All visitors must report to an employee or authorised person of MCE Ltd before entering the premises or area where we work. ➤ Those making deliveries must report to site office.	3	1	3	- Site Supervisor (Foreman)

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T18 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
➤ Puncture ➤ Entanglement ➤ Eye Injuries ➤ Electrocutation				➤ No visitor to the premises is allowed to use company equipment without permission of the company staff and instruction on its use. ➤ Each visitor is requested to abide by the Company Safety Policy and Regulations laid down therein. ➤ They must also abide by a request by a company employee in relation to their own Safety and Health and that of the company employees. ➤ In the event of an emergency or evacuation, all visitors must report to our designated Assembly Point in car park				- Site Operative
Hazard: Contractors Risk: Serious personal injury.	3	3	9	➤ We will monitor the ongoing activities of all sub contractors to MCE Ltd on our projects. ➤ Induction training must be provided for Contractors, their staff and all others on site. ➤ Presentation of Site Safety Plan by Sub-Contractor to the Supervisor. ➤ A Method Statement must be prepared for each necessary job by the Contractor and Sub-Contractors.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T18 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
Hazard: First Aid Equipment. Risk: ➤ Worsening of condition. ➤ Onset of infection. ➤ Fatality. ➤ Permanent injury / illness.	3	3	9	➤ Adequate first aid kits to be provided and filled to HSA guidelines. ➤ They must be regularly checked and refilled by a designated person.	3	1	3	- Site Supervisor (Foreman) - Site Operative
Hazard: Lack / Absence of First Aiders Risk: ➤ Improper diagnosis ➤ Improper treatment ➤ Delay in seeking professional medical help. ➤ Worsening of condition. ➤ Onset of infection. ➤ Fatality. ➤ Permanent injury / illness.	3	3	9	➤ Sean O'Driscoll and Chris Murnane are trained first aiders ➤ Arrangements to be in place with local doctor for emergencies. ➤ All employees to be aware of emergency procedures.	3	1	3	- Site Supervisor (Foreman) - Site Operative
Hazard: Personal Protective Equipment (P.P.E.) Risk: ➤ Impact from flying particles. ➤ Head injury. ➤ Foot injury. ➤ Falls from height.	2	3	6	➤ All necessary Personal Protective Equipment to be provided and used. ➤ Safety Signs to be put up to highlight this requirement. ➤ COMPULSARY SITE P.P.E.: ○ Hard hat. ○ High visibility clothing. ○ Safety boots / shoes.	2	1	2	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T18 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
➤ Burns or skin irritation etc.								
Hazard: Manual Handling Risk: ➤ Back. ➤ Neck. ➤ Shoulder Injury. ➤ Prolapsed Disk. ➤ Permanent Injury. ➤ Trip / Fall. ➤ Hit Against. ➤ Dropped Object.	3	2	6	➤ All MCE Ltd staff and subcontractors employees must be trained in Manual Handling. ➤ In Accordance with the General Application Regulations 2007, No 69, an employer must ensure that he/she takes appropriate organisational measures, or use the appropriate means, in particular mechanical equipment, to avoid the need for the manual handling of loads. ➤ Minimise all manual-handling tasks where possible. ➤ Provide suitable mechanical handling equipment Ensure these are used. ➤ Provide Manual Handling training to all staff whom have not received it. ➤ Personal Protective Equipment including gloves to be provided and used.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T18 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
Hazard: Poor Hand Hygiene Risk: ➤ Skin complaints. ➤ Dermatitis. ➤ Eczema. ➤ Ingestion of chemicals. ➤ Biological agents: • toxins, • bacteria and • viruses.	2	2	4	➤ Good hand hygiene is essential in the workplace. The hands are the most likely part of the body to come into contact with harmful substances. ➤ Wash hands before eating or smoking. ➤ Suitable gloves should be worn when handling potentially hazardous materials. ➤ Dirty hands should be cleaned using proper skin cleansing products. ➤ Do not clean hands with petrol, white spirits, thinners, turpentine etc. ➤ Always ensure you wash your hands after visiting the toilet.	2	1	2	- Site Supervisor (Foreman) - Site Operative
Hazard: Animals • Rats /mice. • Wasps /bees. • Small animals. • Dogs. Risk: ➤ Leptospirosis(Weil's Disease) ➤ Stings. ➤ Histoplasmosis (droppings) ➤ Fall from height. ➤ Sudden 'fright'.	2	2	4	➤ When working near water or where rats have been seen, care is to be taken to disinfect all cuts and cover them with waterproof plasters. ➤ Be aware that sudden movements of birds or small animals can cause a reflex action in the operator, which may overbalance them. ➤ Check for signs of nests, birds or other small animals. ➤ Practice caution if dogs are present.	2	1	2	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T18 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
➤ Bites.								
Hazard: Weather ➤ Sun ➤ Wind ➤ Rain ➤ Ice / snow Risk: ➤ Sun burn. ➤ Sunstroke. ➤ Skin cancer. ➤ Fall from height. ➤ Slip / fall. ➤ Bodily injury. ➤ Hit by object. ➤ Hypothermia.	2	2	4	➤ In sunny weather, cover the back of the neck and keep a shirt on at all times. ➤ Avoid sunburn and sun stroke where possible by keeping covered and wearing a high factor sun block. ➤ Be aware that strong winds or gusts can overbalance an operator. ➤ Don't work in heavy rain unless adequately protected. ➤ Be prepared for slippery conditions in icy weather. Salt or grit should be used where necessary.	2	1	2	- Site Supervisor (Foreman) - Site Operative
Hazard: Working near Water Risk: ➤ Drowning: ➤ Public and Workers	3	2	6	➤ Fencing and warning signs to be in place around deep water. ➤ Workers must operate in pairs at all times. ➤ Where necessary, suitable lifebuoys to be available in case of emergency and checked regularly.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T18 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
Hazard: Portable Electricity Generator Risk: ➤ Fire. ➤ Burns. ➤ Re-fuelling. ➤ Electrocution. ➤ Bodily injury. ➤ Back injury. ➤ Trip / fall.	3	3	9	➤ Store in a dry position and away from pedestrian routes. ➤ Fill petrol tank when the generator is cold. ➤ Avoid spillages when re-fuelling. Clean up any overspill immediately. ➤ Move fuel can a safe distance away. ➤ Ensure filler cap is securely replaced. ➤ To be operated by trained personnel only. ➤ To be maintained in good condition. ➤ Always inspect before use (i.e. oil / petrol level, electric connections not broken).	3	1	3	- Site Supervisor (Foreman) - Site Operative
Hazard: Abrasive Wheels, Consaws and Angle Grinders Risk: ➤ Wheels shattering at high speed. ➤ Serious facial / head injury. ➤ Cuts / wounds to hands, arms, upper body. ➤ Eye injury. ➤ Fire / explosion. ➤ Electric shock.	3	3	9	➤ Training must be provided as per the Abrasive Wheels Regulations, 1982 by MCE Ltd. ➤ Only trained and authorised personnel must be allowed to use abrasive wheels. ➤ The operator must carry out daily inspection. ➤ Guards must be in place at all times, when machine is being used. ➤ If electrically powered use 110v equipment only.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix						
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS		
Low	1	Slight	1	LOW = 1 - 3		
Medium	2	Serious	2	MED = 4 - 6		
High	3	Major	3	HIGH = 7 - 9		

MCE Ltd – T18 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
➤ Hand Arm Vibration Syndrome – white finger. ➤ Respiratory problems. ➤ Injury to bystanders.				➤ Store petrol for consaw in correct approved containers. ➤ Always refuel away from the work area. ➤ Do not use consaw close to other people. ➤ Correct Personal Protective Equipment must be worn at all times. (Gloves, ear protection, eye protection and steel toe capped boots). ➤ Inspect work area for all dangers prior to using abrasive wheels. ➤ A hot work permit may be required from management/site foreman. ➤ Use correct discs. Store them safely when not in use. ➤ Turn off consaws and unplug grinders when not in use.				
<i>“I understand the above method statement, risk assessment and the control measures and will undertake to carry out my work safely and in accordance with the control measures. I have been given the opportunity to raise any concerns that I may have and I realize that I can do this at anytime”.</i> Safe working is a condition of employment								
Print Name	Signature				Date			
1.								
2.								
3.								
4.								

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T18 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
5.								
6.								
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								
16.								
17.								
18.								
<i>“I understand the above method statement, risk assessment and the control measures and will undertake to carry out my work safely and in accordance with the control measures. I have been given the opportunity to raise any concerns that I may have and I realize that I can do this at anytime”.</i> Safe working is a condition of employment								
Print Name	Signature				Date			
19.								
20.								
21.								
22.								
23.								

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T18 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
24.								
25.								
26.								
27.								
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45.								
46.								

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T18 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
47.								
48.								
49.								
50.								
51.								
52.								
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54.								
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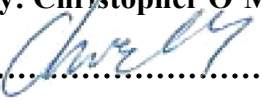


MS MNG 16037

REINFORCING BARRAGE AT T1-T2 SPUR ROAD



Prepared By: Christopher O'Mahony

Signed: 

Date: ... 26/08/2021

Reviewed By: Sean O'Driscoll

Signed: 

Date: ... 26/08/2021

1.0 Method Statement-MNG 16037

Project Name:	Meenbog Wind Farm.		
Contractor:	MCE Ltd, Lissarda Industrial Estate, Lissarda, Co. Cork		
Method Statement Title:	Construction of reinforcing barrage at T1 – T2 Spur		
Method Statement No.:	MNG - 16037		
Prepared by:	Chris O'Mahony		
Date Prepared:	26/08/2021	Revision	004-26/08/2021
Specific Training Required:	Solas Safe Pass, Site Induction, EIA Training, CSCS Plant Ticket (where required).		
Relevant Legislation:	Safety, Health & Welfare at Work Act 2005 Safety, Health & Welfare at Work (General Application) Regulations 2007 Safety, Health & Welfare at Work (Construction) Regulations 2013		

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2.0 Statement Brief

Meenbog wind farm is comprised of 19 wind turbine generators, one 110kv substation and one meteorological mast along with associated roads, hardstands and other associated infrastructure. The road infrastructure to the south of T5 has been designed and constructed as 'floating roads'. At the junction of T1/T2 and area of significantly deep peat was encountered. Additional testing and analysis of this area indicates stability factors >1 . However, given the topography, potential flow paths and proximity to water courses a higher degree of caution is warranted. It has therefore been decided that a stabilising barrage will be constructed along the South-East of the existing road which will reinforce the road from T1-T2. This method statement details the construction of barrage.

The Meenbog Site is primarily made up of rural and agricultural land, upland bog, commercial bog and forestry. Access to site may be shared with local domestic and commercial traffic and due care and attention should be taken at such access points. There is public access to the site and all contractors must conduct their activities in a manner that both protects and facilitates the general public in their enjoyment of the site. See site layout, Figure 1.0.

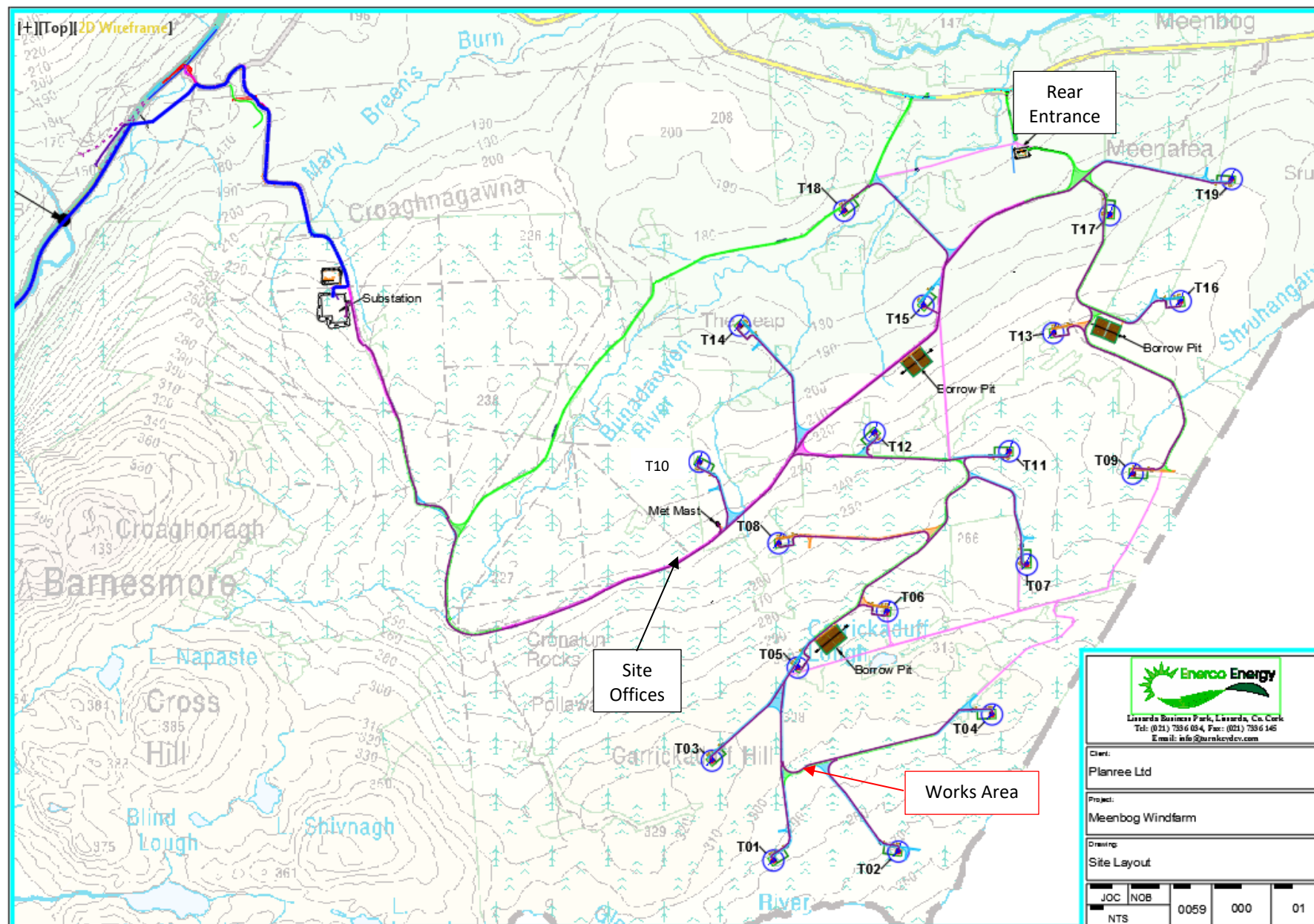


Fig 1.0 Meenbog Site Layout

2.1 Works Location

Meenbog Wind Farm & Substation entrance is located approximately 13km South West of Ballybofey and 14km North East of Donegal Town. All operatives are to text MCE Ltd operational controller when arriving onto site and again when leaving in the evening. The contact number is 086-8032620.

3.0 Restrictions / Precautions

Description	Yes	No
Work located near Underground services		√*
Work located near Overground services		√**
Work located near SAC / NHA	√***	
Work located near Watercourses / Streams	√****	
Work located near Steep Slopes	√*****	
Work located near Hillwalkers	√*****	

* = underground cables.

** = overhead power lines.

*** = Special Area of Conservation / National Heritage Area.

**** = Drainage measures to be put in place to ensure that no damage is caused to local watercourses in conjunction with Environmental consultant recommendations.

***** = Some road surfaces may be in close proximity to steep slopes.

***** = Hillwalkers frequent the development area and operatives have been made aware of their presence.

3.1 General Precautions

Prior to any works commencing all personnel onsite will be inducted by a MCE supervisor and will sign up to the relevant RAMS before commencing any work onsite. A number of other points to note include;

- GA2 forms to be completed weekly with a copy of the GA1 left in the machine at all times.
- All site-specific safety rules will be adhered to.
- All plant operators will have appropriate CSCS training.
- All personnel will have SOLAS Safe Pass training or equivalent training
- First aid supplies will be available in the work area.
- The road way will be maintained in clean condition at all times.
- Helmets, High Visibility clothing and safety footwear will be worn at all times with additional PPE as required.
- A competent foreman will be on site at all times.
- No excavations to be left open.

4.0 Environmental Emergency Procedures

4.1 Excessive Peat Movement

Where there is excessive peat movement or continuing peat movement recorded at a monitoring location or identified at any location within the site but no apparent signs of distress to the peat (e.g. cracking, surface rippling) then the following shall be carried out. There are a series of 20 monitoring locations across the site with trigger levels of 100mm recommended. (see appendix F). For this section of work a number of additional posts will be installed (see appendix H)

- (1) All construction activities shall cease within the affected area.
- (2) Further peat stability assessment completed
- (3) Increased monitoring at the location shall be carried out. The area will be monitored, as appropriate, until such time as movements have ceased.
- (4) Recommencement of limited construction activity shall only start following a cessation of movement and completion of a geotechnical risk assessment by a geotechnical engineer.

4.2 Onset of Peat Slide

Where there is the onset or actual detachment of peat (e.g. cracking, surface rippling) then the following shall be carried out.

- (1) On alert of a peat slide incident, all construction activities will cease and all available resources will be diverted to assist in the required mitigation procedures.
- (2) Where considered possible, action will be taken to prevent a peat slide reaching any watercourse. This will take the form of the construction of check barrages on land. Due to the terrain, the possible short run-out length to watercourses, speed of movement and the inability to predict locations it may not be possible to implement any on land prevention measures, in this case a watercourse check barrage will be implemented.
- (3) For localised peat slides that do not represent a risk to a watercourse and have essentially come to rest the area will be stabilised initially by rock infill, if required. The failed area and surrounding area will then be assessed by the engineering staff and stabilisation procedures implemented. The area will be monitored, as appropriate, until such time as movements have ceased.

4.3 Reaction to Peat Slide

In the event that there is a significant movement of peat, MCE will follow a specific set of procedures, namely,

- MCE Site management will be contacted
 - Gearoid White: 086-0211525
 - Chris O'Mahony: 086-0329552
- Site management will ensure all employees and equipment are accounted for
- Area will be designated a 'no-go' zone until instructed otherwise
- An initial rapid assessment will be made to determine the immediate risks to personnel within the site, members of the public and the local environment
- If deemed necessary, measures may be taken to make the area safe in the short term
- MCE management and consultant engineers, will be contacted, notified of the situation and site staff will await further instruction
- In the event of a notable peat movement, the relevant statutory bodies will be notified.

4.4 Fuel / Oil Spill

The following mitigation measures are proposed to avoid release of hydrocarbons at the site:

- On-site refuelling will be conducted in a controlled and safe manner. Where possible fuel will be delivered by bunded mobile tanker. Bowsers and plant will be refuelled on a level platform away from any watercourses and areas susceptible to run-off.
- Refuelling to be conducted by competent and trained personnel
- Plant on site will be regularly inspected for leaks and fitness for purpose. Any defects to be reported to site management and plant owner immediately
- Emergency spill kits will be available to deal with any potential accidental spillage or discharge.
- Where there is a leak of any hazardous material all construction activities will cease and all available resources will be diverted to assist in the required mitigation procedures.
- The area will be sealed off so that no watercourses are affected, and the contaminated peat/land excavated and removed. Fuel spill kits will be used to clean up the area.
- Notify the ECoW immediately giving information on the location, type and extent of the spill so that they can take appropriate action.
- The ECoW will inspect the site and ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring.

-
- The ECoW will notify the appropriate regulatory body such as Donegal County Council, Department of Communications, Climate Action and Environment (DCCAE), if deemed necessary.

5.0 Sequence of Works

5.1 Setup

1. The site has already been set up prior to works. MCE have a site compound set up with all required welfare and first aid facilities
2. A number of signs and fencing have been erected around the site so as to limit the risk of hill walkers from coming into the work area.
3. Site Safety signs have also been erected at a number of points alerting members of the public of dangers and the need for PPE as they are entering a construction site.
4. The assembly point for personnel involved in these works is at the MCE site offices
5. A rain gauge monitoring system is set up on site. Works will cease based on triggers set out in CEMP section 5.2.2 i.e. >25mm in 24 hours, 10mm in 1 hour or greater than the monthly average rainfall in the past 7 days.
6. 20nr. Peat Monitoring locations have been installed across the site in line with FTCO recommendations. There are to be monitored weekly site wide. Daily monitoring will be conducted on locations in the vicinity of works zone. (See appendix G & H)
7. In line with FTCO recommendation nr. 3. The remaining works on the site shall be carried out without placing of excessive loading onto the in-situ peat surface. Where loading is to be placed onto an area of in-situ peat then that area shall be inspected and assessed by a competent person. Where in doubt no loading shall be placed onto in-situ peat.
8. An additional series of monitoring locations will be installed in the area directly adjacent to works zone. These will be monitored on an ongoing basis throughout the workday.
9. Zone of influence testing will be completed daily in advance of works. This will involve peat probing, shear vaning and inspecting the ground to 50m outside the works area along the path of the works to be completed. Probing and shear vaning will be carried out at 20m centres depending on the encountered peat conditions. The number of shear vaning carried out may vary depending on for example the depth and weakness of the encountered peat. The morphology, drainage, vegetation, and proximity to drains/watercourses will be checked. Tests will be cross-referenced to those completed to date.
10. Zone of influence testing and inspection shall be completed in a reasonable time in advance of the proposed works to allow assessment of the results to be completed.
11. All results, such as probing and vaning shall be documented on site using a standard template and transferred to digital medium (e.g. Excel spreadsheet), all of which shall be readily available for auditing.

5.2 Methodology

- All operatives are to read, understand and sign the RAMS before commencing any work and if unsure about any item they are to discuss with the site manager, Sean O'Driscoll / Chris O'Mahony/Gearoid White
- Works will be sequenced based on project organogram (see appendix I)
- Zone of influence testing will be conducted prior to works commencement. The area will be inspected by competent person, no works to take place until assessment is completed.
- The zone of influence testing will be cross referenced to the testing previously conducted along this road section which will back up the existing data. (see appendix C)
- The assessment of the findings of the zone of influence testing shall be assessed by a competent person who shall determine based on comparison with previous data contained within the Ionic report and recently completed data that works within the tested section can be commenced, or otherwise. Where there are adverse variations in the data then the designer (Ionic) shall be consulted as part of the assessment.
- No works can commence until the assessment is complete and the assessment has clearly demonstrated that the proposed works are safe to commence.
- The result of the assessment shall be documented using a standard template, which shall be in a suitable medium that can be readily audited.
- The barrage will be constructed to solid stratum using the 'displacement' method.
- The excavation and filling will be sequenced to minimise potential for tension cracks to develop.
- The top layer of acrotelm and an amount of the peat beneath will be excavated. Large rocks will be pushed into the peat until competent bearing has been achieved. The peat will be forced upward and will then be removed to peat deposition area.
- The initial layer of peat to be removed is a function of the estimated shear strength of the peat. This is determined using on-site shear vane testing. The values can be taken as a relative value and not an absolute value for shear strength.
- The side wall collapse depth of an excavation in peat can be estimated using the formula below,

$$D = 2 \text{ to } 4 \times c_u / \text{peat density}$$

Where:

D=Depth

Cu=shear strength

2 to 4 are derivative values where 2 can be taken as more conservative.

Peat density taken as 10KN/m³

- For example, at the start point of the construction, a value of 6kpa has been given, therefore,
$$2 \times 6/10 = 1.2\text{m}$$
- This will be checked against pre-commencement testing. The more conservative value will be taken and excavation will be continued to 75% of the indicated depth thereby minimising the risk for side wall failure.
- Excavation will begin at CH 100 which has a peat depth of 1.4m and approx. Cu of 6Kpa. (see appendix B)
- Excavator will sit on existing floating road and load peat into articulated dump truck directly to the North. The road will not be surcharged along the lower side (barrage side).
- There is a ration of approx. 2 x peat to 1 x rock meaning approximately every two loads of peat removed will require one load of rock to replace.
- Waiting trucks will not be parked along the spur road within the risk area CH 00 – CH 100. This will be controlled by supervisor and requirements will be conveyed to operatives.
- Once peat is removed and rock is required, excavator will move away road leaving space for rock to be deposited. It will be unloaded at the road edge and placed by the excavator.
- ***Rock will not be deposited directly onto the floating road.***
- Rock will not be tipped directly into open excavation in an uncontrolled manner. Its placement will be controlled by excavator operator.
- A platform will be constructed allowing excavator to move off floating road. Barrage construction will turn towards T2 and approx. 20m will be constructed towards CH 150 providing a base for construction to continue into the deeper peat towards T1
- Construction will then continue towards CH 00 in the same manner.
- Traffic will be strictly controlled. Dump trucks will travel at the opposite side of the road to barrage construction, minimising loading of the barrage side of the floating road.
- The barrage will be min 4m wide on top with the base width determined by the depth of peat. W:D, 1.5:1 (See appendix A)
- Two nr. 450mm pipes will be installed at CH 60 to allow free passage of water through the barrage to an existing drain at this location (See appendix E).
- Between CH 00 and CH 40 there is a pocket of deep peat. It is largely contained within a bowl shape in the subsurface profile. There is a potential subsurface flow path at CH 40 (C-C). Beyond this point

the peat depth increases. The potential risk decreases once the flow path has been intercepted. (See appendix F)

- The peat excavated will be brought to on-site peat deposition areas. Rock will be sourced from on-site borrow pits, adjacent to T15 and T13. Given the long distance from each borrow pit, rock may be stockpiled for use at T5.
- No construction machinery will track onto in-situ peat. In the event that machinery must track onto peat the peat will be inspected and assessed by a competent person to avoid excessive loading. If in doubt machinery will not be tracked onto peat.
- Drainage works required will be conducted under supervision of MKO. A series of preventative measures will be put in place to protect water courses. Silt traps will be required within the existing forestry drains particularly within the drains at CH 60.
- MCE/MKO will monitor the works at all times to ensure there are no unwanted discharges to the roadside drainage. If there are any issues with drainage and or unwanted discharges, works will cease and remedial measures will be put in place to the satisfaction of the ECoW prior to recommencement of works.
- Barrage construction will continue to CH 00 on the T1 spur road.
- Martin Lyttle (FTCO) and Gearoid White (MCE) will monitor excavation works. John Shanahan/Cormac O'Dubhthaigh (Ionic) will be present for works commencement to ensure the methodology is satisfactory.
- Once completed a final inspection will be conducted by Ionic consulting (John Shanahan & Cormac O'Dubhthaigh), FTCO (Martin Lyttle) and MCE management (Sean O'Driscoll & Chris O'Mahony)

6.0 Covid-19

Coronavirus/Covid-19 is an infectious disease which affects the upper respiratory system. It is potentially fatal and is particularly dangerous to those with underlying conditions and the elderly/infirm. 63% of confirmed cases have spread through community transmission. The infection is highly contagious and easily transmitted from person to person through close contact with either an infected individual or a contaminated area. For this reason, a set of standard operating procedures are to be adopted at Meenbog WF. Refer to construction stage safety plan for SOPs on Covid-19. Briefly summarised below,

- All workers are to sign in/out at the designated area
- Personnel will be asked to make a declaration which assess the key risk factors in virus transmission
- Hand sanitizer and gloves will be provided for instances where personnel must use a shared space i.e. toilets
- There will be no communal areas for eating in use for the foreseeable future
- Personnel will take their designated breaks at their own individual work area e.g. digger cab
- Site will be closed for access in the morning and opened at the end of the day, any entries/exits are to be notified to site management
- Anyone displaying symptoms of Covid-19 are to immediately notify site management and proceed to self-isolate

7.0 Plant / Equipment

1.	Various Size Excavators
2.	Roller / Plate Compactor / Generator
3.	25 Tonne Dumper
4.	Lorries / Dumpers
7.	Loadall
8.	Drainage equipment (Pumps, silt bags etc.)

7.1 Personal Protective Equipment (PPE)

1.	Hard Hat. (Worn at all times)		
2.	Hi Visibility Jacket/Vest. (Worn at all times)		
3.	Steel Toe Cap Boots. (Worn at all times)		
4.	Gloves. (Worn when required)		
5.	Eye Protection. (Worn when required)		
6.	Ear Protection. (Worn when required)		
7.	P3 Dust Masks. (Worn when required)		

7.2 Extra Safety Equipment to be used

Additional PPE such as hearing protection and dust masks to be used as required depending on operative activities.

8.0 Emergency Arrangements

In the case of an emergency, all operatives are to follow the emergency procedures as detailed in the site induction for Fire, Injury or Bog slide. General arrangements are;

- Assess/Attend to casualty if one is present
- Raise the alarm and call 999/112
- Alert the other site personnel as to the emergency
- Locate at the site assembly point and do not return to work until instructed that it is safe to do so
- Substation construction assembly point located at the site entrance gate

First Aid

First aid kits are located in the MCE Site Vehicle in addition to the MCE site office.

Emergency Contacts

1.	Emergency Numbers – 999/112
2.	Letterkenny University Hospital – 074 912 5888
3.	NowDoc – 1850 400 911
4.	Donegal Town Garda Station – 074 974 0190
5.	Sean O’Driscoll – Project Manager – 086 8528329
6.	Chris Murnane – Safety Officer – 086 7955083
7.	Chris O’Mahony – Site Manager – 086 0329552
8.	Gearoid White – Site Foremen – 086 0211525

Who Information Will be Communicated to.

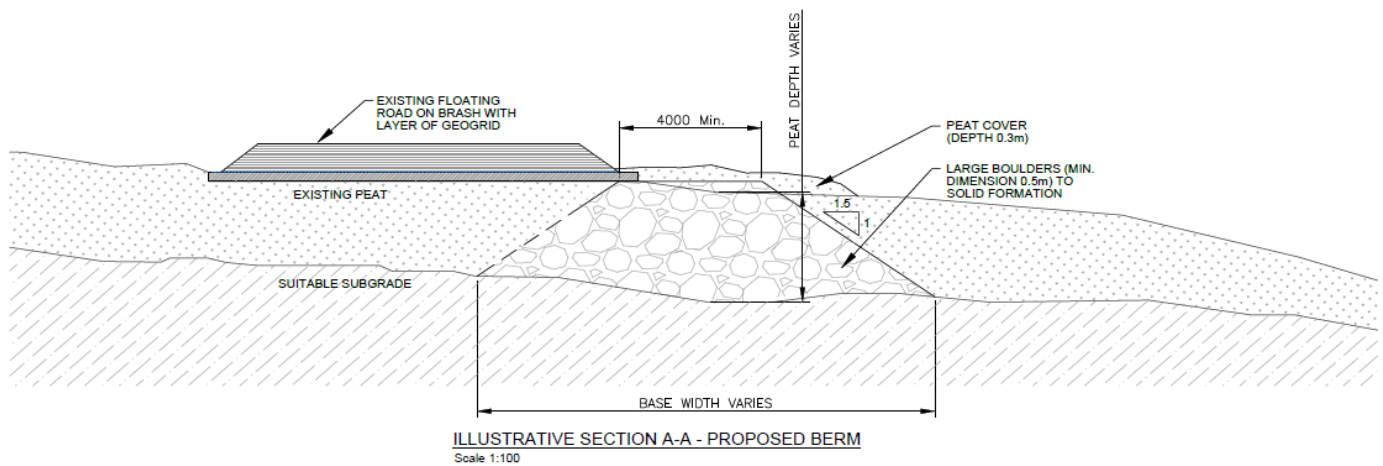
Chris O’Mahony/Sean O’Driscoll will communicate the method statement and risk assessment to the work force before the work commences on site.

Monitoring and Compliance

Chris O’Mahony/Sean O’Driscoll will ensure that method Statements will be adhered to by all MCE staff including any updates/changes made to the Method Statement.

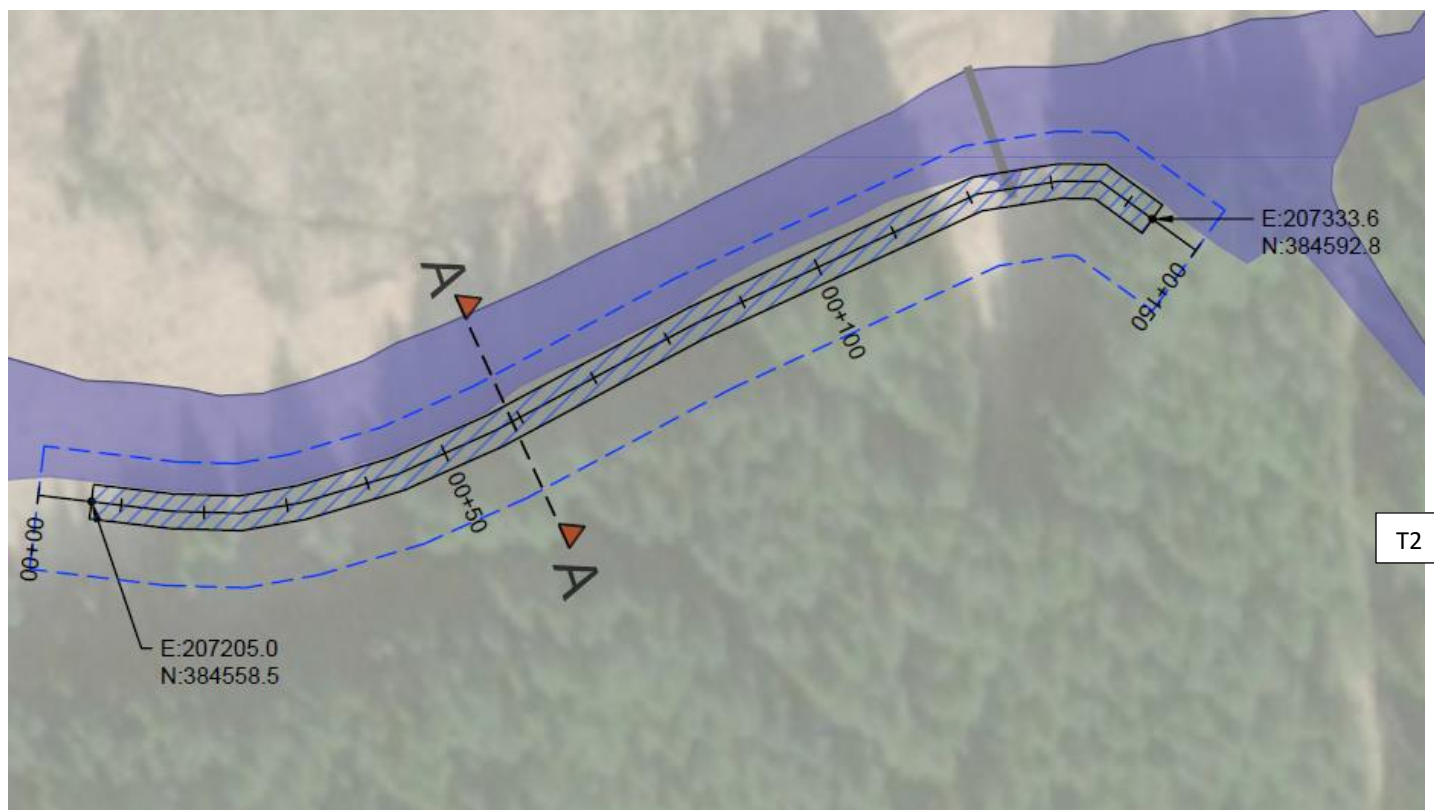
9.0 Appendices

Appendix A Section Through Barrage



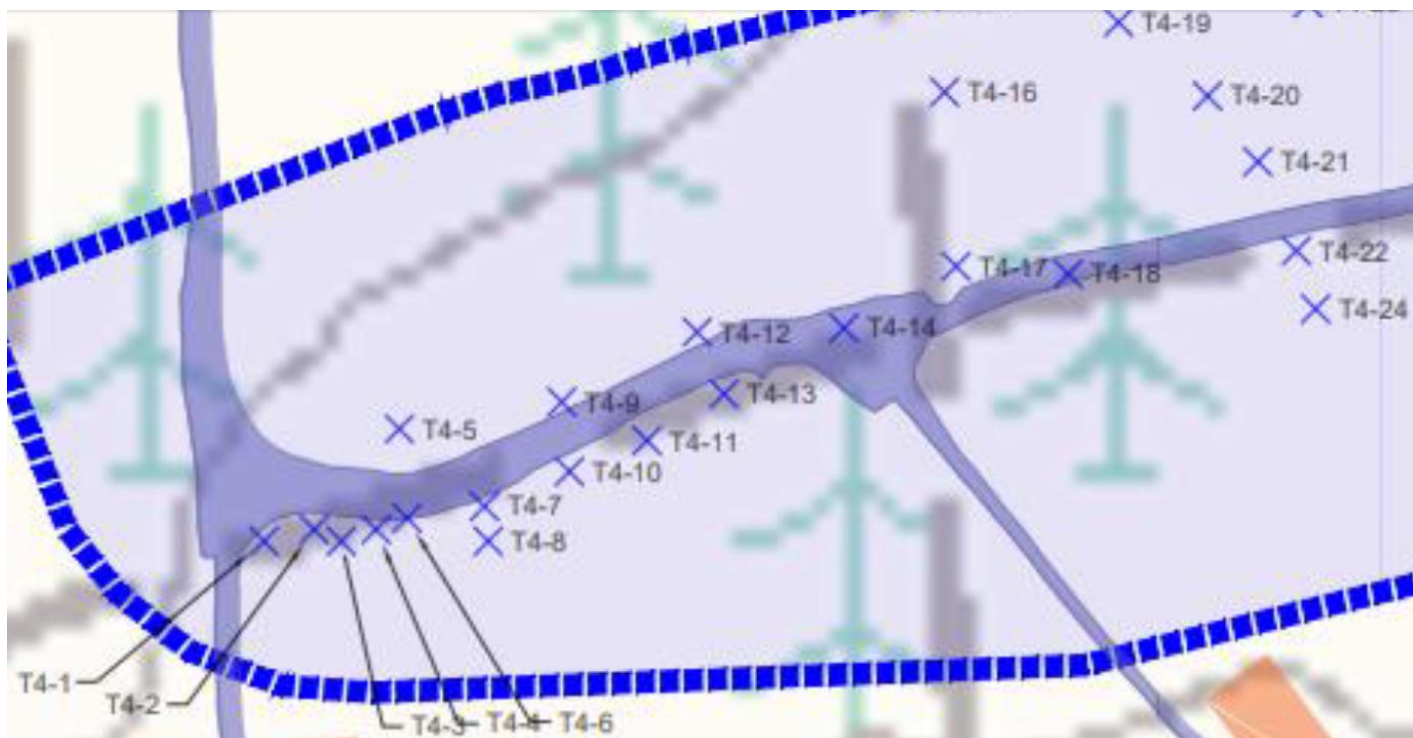
REF: Ionic Construction MNBG d018.4.4

Appendix B Plan View of Barrage



REF: Ionic Construction MNBG d018.4.4

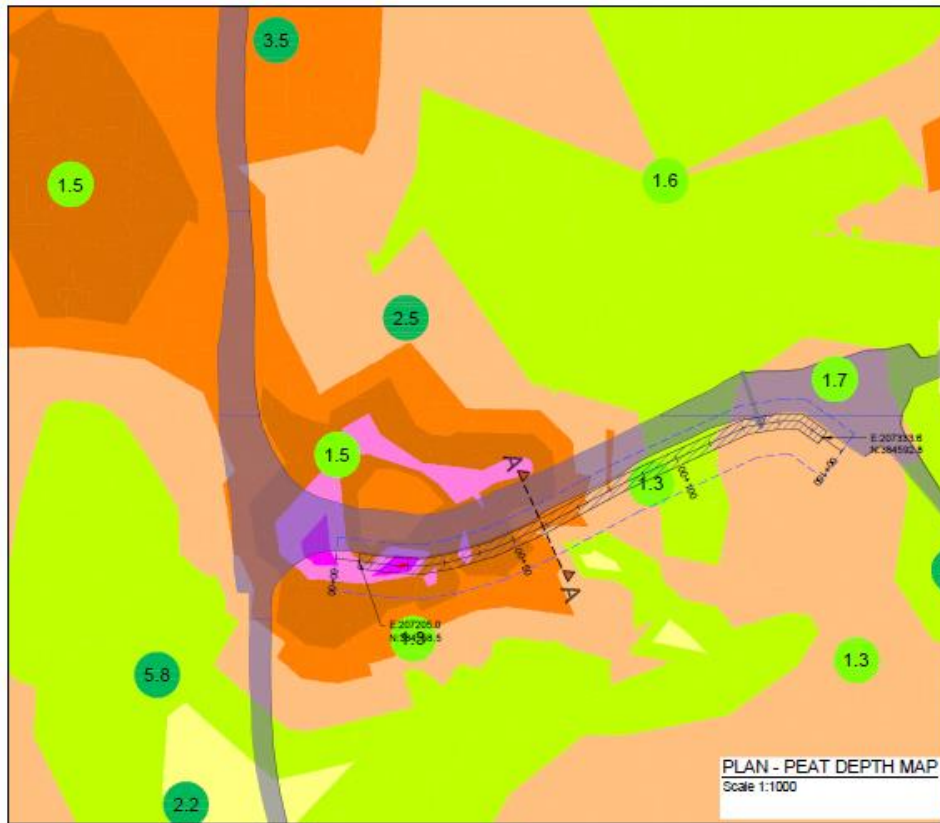
Appendix C Prior Testing



MEENBOG WIND FARM - PEAT ASSESSMENT TO EUROCODE 7 - ODF (overdesign factor)															
LOCATION			DATA				LOADING				ANALYSIS				
Location Ref.	Easting	Northing	Peat Depth (m)	Unit Weight Peat (kN/m³)	Undrained Shear Strength (kPa)	Slope (degrees)	Permanent Surcharge Peat Deposition I	Variable Load Construction (kPa) II	Permanent Surcharge Floating Road (kPa) III	Variable Load Crane (kPa) IV	ODF Existing (Self-weight Peat Only) 0	ODF Permanent Surcharge Peat 0+I	ODF Variable Load Construction 0+II	ODF Permanent Surcharge Floating Road 0+III	ODF Variable Load Crane 0+III+IV
T4-1	207187	384554	4.5	10	3	1.2	10	13.3	20.7	10.3	2.27		1.64		
T4-2	207200	384557	5.9	10	2	1	10	13.3	20.7	10.3	1.39		1.07		
T4-3	207207	384554	5.7	10	3.5	1.7	10	13.3	20.7	10.3	1.48		1.13		
T4-4	207216	384557	7.3	10	5.5	1.7	0	13.3	20.7	10.3	1.81	1.81	1.47	1.41	1.24
T4-5	207222	384583	5.2	10	3.5	1.8	10	13.3	20.7	10.3	1.53		1.15		
T4-6	207224	384560	5.0	10	6	2	0	13.3	20.7	10.3	2.46	2.46	1.83	1.74	1.46
T4-7	207244	384563	4.8	10	4	1.9	0	13.3	20.7	10.3	1.80	1.80	1.32	1.26	1.05
T4-8	207245	384554	4.1	10	4.5	3.1	10	13.3	20.7	10.3	1.45		1.02		
T4-9	207264	384590	3.0	10	7	3.2	0	13.3	20.7	10.3	2.99	2.99	1.90	1.77	1.40
T4-10	207266	384572	3.0	10	7	4.4	0	13.3	20.7	10.3	2.18	2.18	1.38	1.29	1.02
T4-11	207286	384580	2.2	10	7	3.8	0	13.3	20.7	10.3	3.44	3.44	1.92	1.77	1.35
T4-12	207299	384608	2.0	10	5	3.6	0	13.3	20.7	10.3	2.85	2.85	1.53	1.40	1.05
T4-13	207306	384592	3.0	10	6	3.8	0	13.3	20.7	10.3	2.16	2.16	1.37	1.28	1.01
T4-14	207337	384609	3.0	10	8	3	0	13.3	20.7	10.3	3.64	3.64	2.31	2.16	1.71
T4-15	207358	384695	4.9	10	3.5	1.5	10	13.3	20.7	10.3	1.95		1.44		
T4-16	207363	384670	3.6	10	4	2	10	13.3	20.7	10.3	2.28		1.54		
T4-17	207366	384625	1.0	10	9	3	0	13.3	20.7	10.3	12.30	12.30	4.51	4.01	2.79
T4-18	207395	384623	0.7	10	15	2.2	0	13.3	20.7	10.3	39.90	39.90	11.50	10.08	6.80
T4-19	207408	384688	4.0	10	3	1.5	10	13.3	20.7	10.3	2.05		1.43		
T4-20	207431	384669	1.1	10	7	2.3	10	13.3	20.7	10.3	11.34		4.41		
T4-21	207444	384652	1.6	10	5	3.0	10	13.3	20.7	10.3	4.27		2.05		
T4-22	207454	384629	1.4	10	9	3.0	10	13.3	20.7	10.3	8.79	5.13	3.93	3.54	2.56
T4-23	207457	384693	3.5	10	4	2.2	10	13.3	20.7	10.3	2.13		1.42		
T4-24	207459	384614	1.8	10	5	3	10	13.3	20.7	10.3	3.80		1.94		

REF: Ionic Construction MNBG r057 Rev B Peat Stability

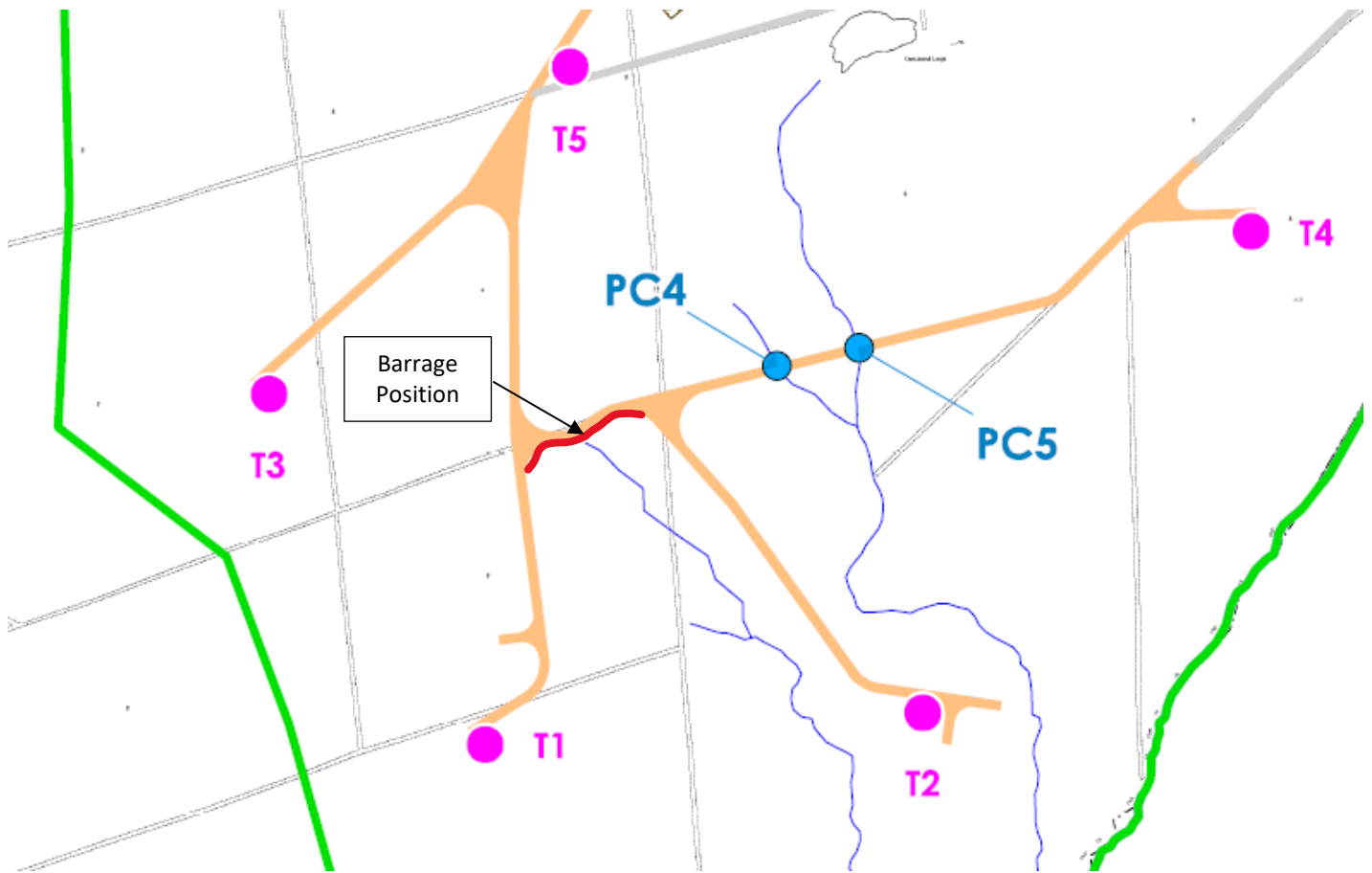
Appendix D Peat Depth Map



SURFACE LEVEL DATA			
NUMBER	MIN. PEAT DEPTH	MAX. PEAT DEPTH	COLOUR
1	0.00	1.00	Yellow
2	1.00	2.00	Light Green
3	2.00	3.00	Orange
4	3.00	4.00	Dark Orange
5	4.00	5.00	Brown
6	5.00	6.00	Pink
7	6.00	7.00	Magenta
8	7.00	20.00	Red

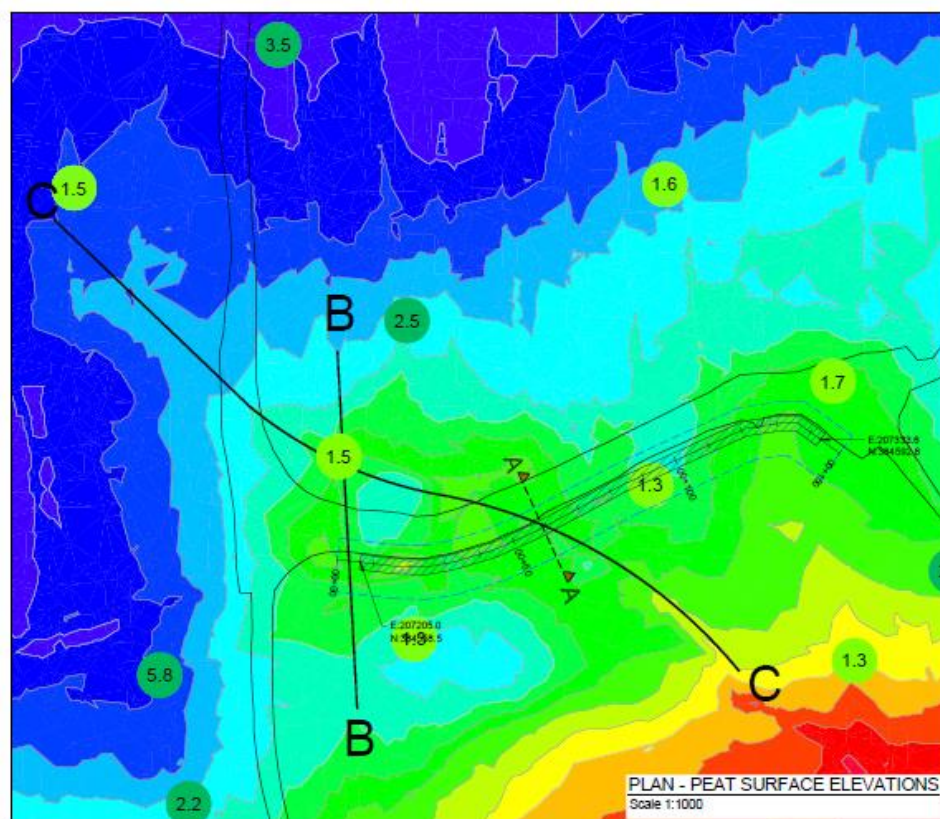
REF: Ionic Construction MNBG d018.4.4

Appendix E Site Drainage

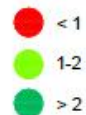


Ref: HES DWG Nr. P1249-2-1117-A3-909-00A

Appendix F Potential Flow Path



Eurocode 7 Overdesign Factor



Number	Minimum Elevation	Maximum Elevation	Area	Color
1	286.00	287.00	260.39	Red
2	287.00	288.00	700.11	Yellow
3	288.00	289.00	1308.27	Orange
4	289.00	290.00	1360.19	Light Orange
5	290.00	291.00	1217.11	Yellow
6	291.00	292.00	1676.63	Light Green
7	292.00	293.00	3056.39	Green
8	293.00	294.00	5016.27	Light Green
9	294.00	295.00	4812.44	Green
10	295.00	296.00	6526.49	Light Blue
11	296.00	297.00	7322.17	Blue
12	297.00	298.00	6205.29	Light Blue
13	298.00	299.00	7980.21	Blue
14	299.00	300.00	9786.20	Dark Blue
15	300.00	301.00	4141.62	Dark Blue
16	301.00	302.00	2.13	Purple

REF: Ionic Construction MNBG d018.4.4

Appendix G Peat Monitoring Locations

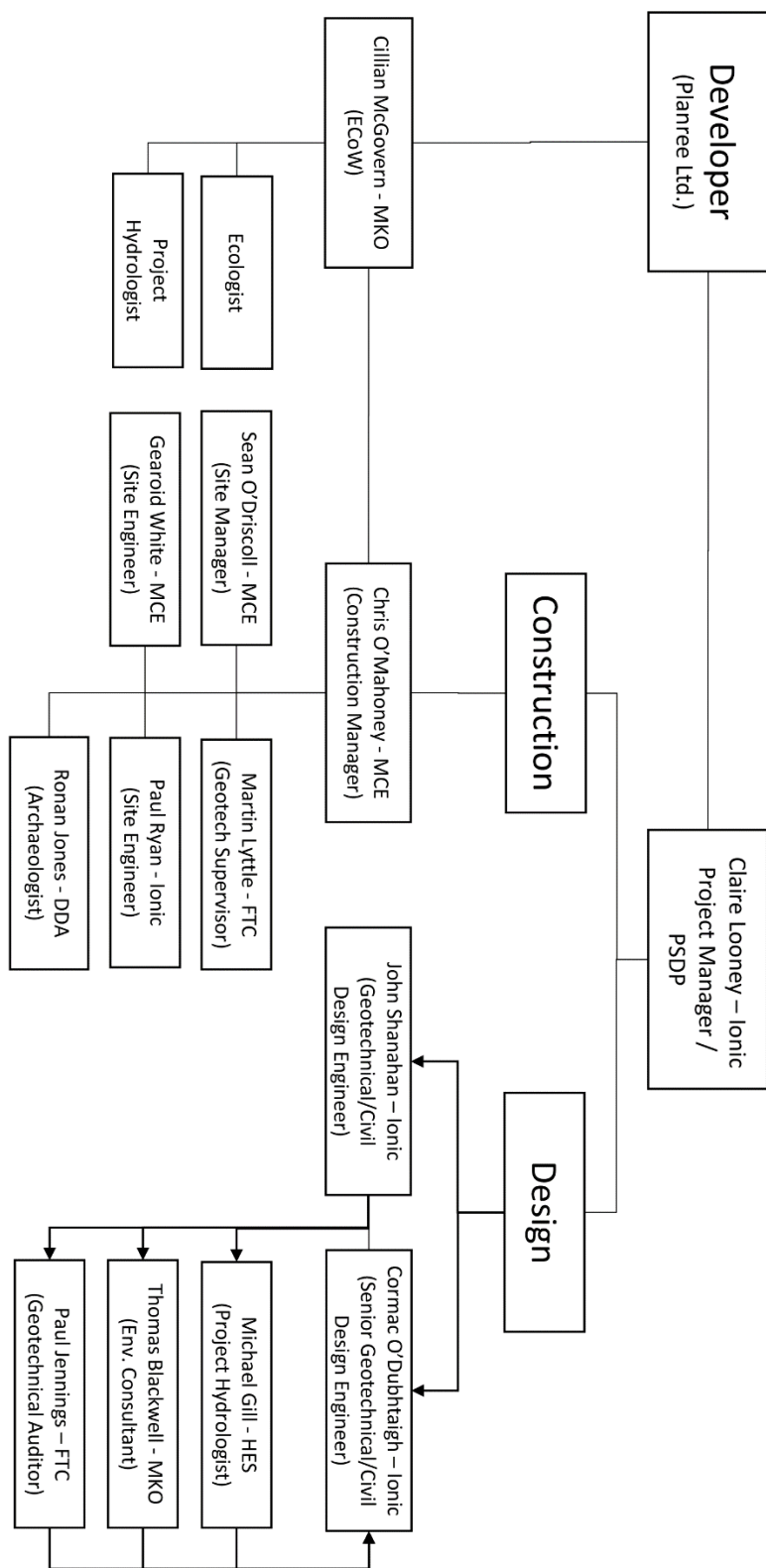
No	Location	Comments
1	Junction of access road to T1 with spur to T2 and T4 along downslope margin	Area of deepest peat in close proximity to concave break in slope
2	Along access to T3 about 50m from hard stand along downslope margin	Area of deeper peat in close proximity to concave break in slope
3	Along access to T2 about 100m from hard stand along downslope margin	Area of deeper peat in close proximity to concave break in slope
4	Along access to T4 about 150m from hard stand along downslope margin	Area of deeper peat in close proximity to concave break in slope
5	Along access from T5 to T3 about 200m from T5 along downslope margin	Area of deeper peat in close proximity to concave break in slope
6	Junction of access road to T7 about 100m along access to T7 along downslope margin	Area of deeper peat in close proximity to concave break in slope, within potential area of 12 November failure
7	South side of upper scar of 12 November failure	To monitor potential retrogression of scar upslope
8	On downslope margin of T7 base and hard stand prior to construction	To be installed in advance of any works
9	On downslope margin of T10 base and hard stand	Area of peat in close proximity to concave break in slope
10	Along access to T14 about 100m from hard stand along downslope margin	Area of peat in close proximity to concave break in slope
11	Along access to T18 at about chainage 1600m along downslope margin	Area of potential peat close to river
12	Along access to T16 about 50m from hard stand along downslope margin	Area of deeper peat in close proximity to concave break in slope and minor instability
13	Peat storage berms at T15	Minor signs of movement/distress. Where necessary the berm size is to be increased.
14	Peat storage berms at T17	Minor signs of movement/distress. Where necessary the berm size is to be increased.
15	Peat failure scar above road to T7	Upper scar of 12 November 2020 peat failure. Potential for retrogression of failure scar.
16	Peat failures at Borrow Pit between T5 and T6	Comprises 3 peat failures at this location. Monitoring at the head of each failure.
17	Peat failure at T12	Head of failure downslope of access road. Monitoring at the head of failure.
18	Instability at T5	Series of concentric tension cracks within the insitu peat
19	Instability at T16	Minor slumping of insitu peat
20	Ch.2630 on the north side of the S-bends on the approach road into the site	Stockpile caused a localised ground movement in the peat below the stockpile

Ref: Fehily Timoney Peat Stability Assessment of Meenbog wind farm Jan 2021

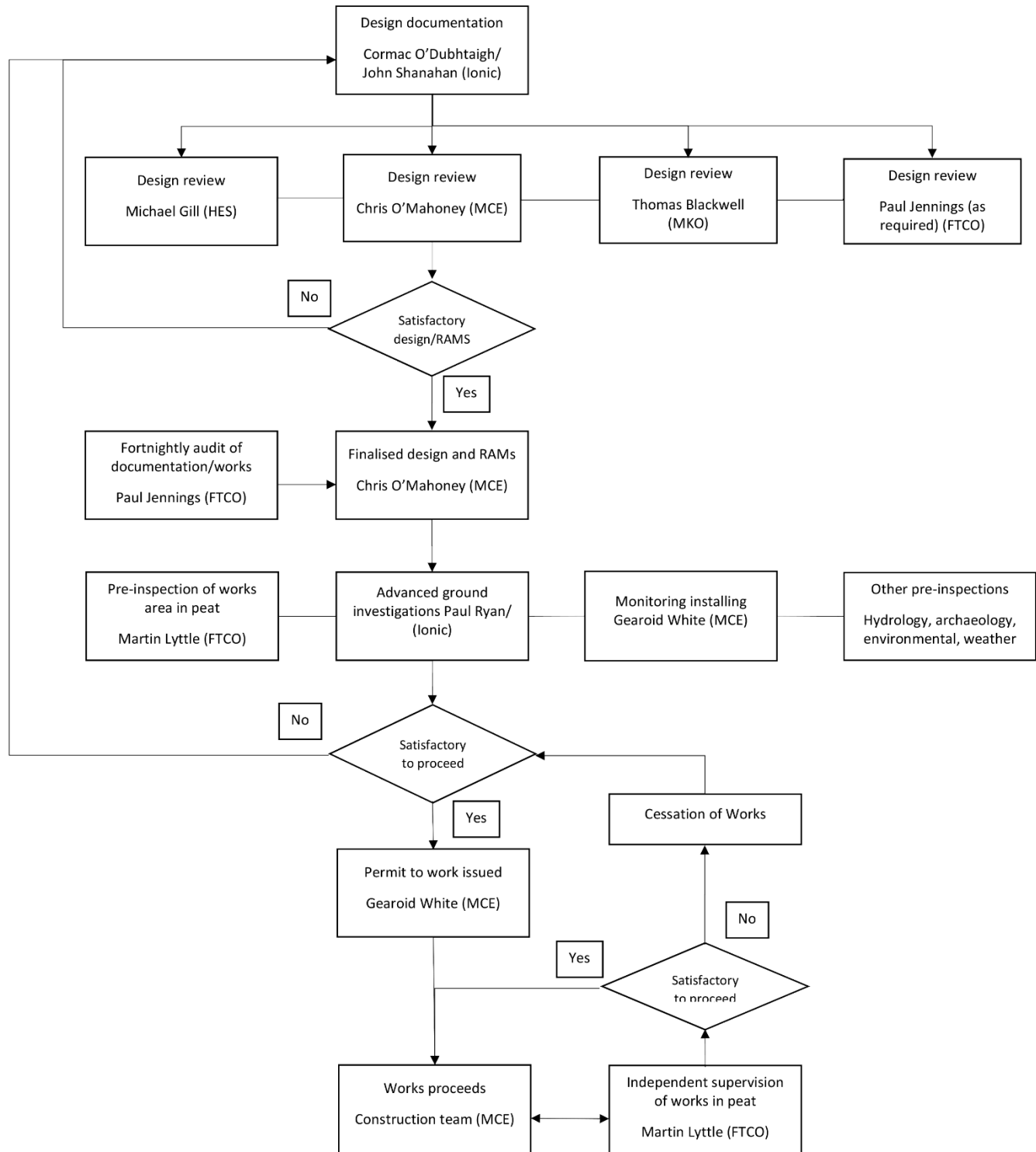
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Appendix I Project Organogram & Flow Chart

Organogram:



Design & Construction Flow Chart:



10.0 Risk Assessments

Assessing Level of Risk

		<u><i>Likelihood</i></u> →			
<u><i>Severity</i></u> ↓	0	1	2	3	
	1	1	2	3	
	2	2	4	6	
	3	3	6	9	

Likelihood			Severity		
1	=	Low	1	=	Slight
2	=	Medium	2	=	Serious
3	=	High	3	=	Major

Likelihood x Severity = Risk Rating

1 to 3	<u>Low</u>	<u>Work can proceed with control measure in place.</u>
4 to 6	<u>Medium</u>	<u>Work can proceed with control measures in place to reduce risk.</u>
7 to 9	<u>High</u>	<u>More control measures needed to reduce risk.</u>

Controls

Management must determine the controls required to eliminate or mitigate against the risks identified in the risk assessment. These controls must be consistent with the operational experience of employees and in accordance with the principles of prevention detailed below. They should also indicate any facility requirements and training needs. These controls are documented on the risk assessments.

Risk Matrix					 MCE Ltd.
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T1 – T2 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	

THIS RISK ASSESSMENT TAKES ACCOUNT OF THE FOLLOWING:

MCE SAFETY STATEMENT, MCE FULL SAFETY STATEMENTS HAZARD IDENTIFICATION & RISK ASSESSMENT, THE METHOD STATEMENT FOR THESE WORKS & THE PSCS CONSTRUCTION STAGE SAFETY PLAN.

Hazard: Peat Movement Risk: ➤ Slippage of peat ➤ Engulfment of personell or machinery ➤ Damage to the environment	2	3	6	➤ 14nr. peat monitoring stations installed ➤ Checked weekly. Stations in immediate vicinity checked daily. ➤ Works location probed and shear vaned – 50m grid outside of works area ➤ No works during periods of excessive rainfall see CEMP 5.2.2 ➤ No stockpiling of peat on top of in-situ material	2	1	2	- Site Supervisor (Foreman) - Site Operative
Hazard: Excavation / Trenches Risk: ➤ Falls. ➤ Entrapment. ➤ Suffocation. ➤ Crushing. ➤ Impact with machinery. ➤ Drowning. ➤ Electrocution. ➤ Serious bodily injury / fatality.	3	3	9	The Construction Regulations, 2013 must be complied with regarding all excavations. Verify ground conditions and soil type before excavating. No ground to be considered safe until investigated by a competent person. ➤ Schedule work so that excavations are not open for longer than necessary. ➤ Find, locate and mark all underground services. ➤ Organise suitable plant, equipment and required working space. ➤ Organise delivery and inspection of support materials / equipment.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T1 – T2 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
				➤ Provide appropriate protective clothing and equipment. ➤ Provide suitable barriers to protect against the fall of persons at work, materials or objects, including the inrush of water into the excavation. ➤ Provide adequate secured ladder and/or ramp access/egress to excavations. ➤ Most extracted spoil will be hauled away but any residual material will be stockpiled away from excavation edge at all times. ➤ Safe System of Work Plan should be completed for each task or a specific method statement completed and a new SSWP should be completed when the task or the environment changes. ➤ AF 3 to be completed as required by a competent person. ➤ Where there is a risk involved with a trench and/or an excavation, adequate precautions must be taken to protect against danger to persons at work from a fall or dislodgement of earth, rock, or peat, by suitable shoring or batter back edge to a safe angle of repose. ➤ If other methods are to be specified they must be selected based on the results of a risk assessment and a Temporary Works Design				

Risk Matrix					 MCE Ltd.
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T1 – T2 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
				Certificate will be prepared & issued. ➤ Appropriate precaution to be in place to protect the person carrying out the shoring				
Hazard: Movement & Use of Excavator Risk: ➤ Collisions. ➤ Overturning. ➤ Loss of Control. ➤ Risk of serious or fatal injury to the operator and bystanders in the vicinity due to Overturning. ➤ Collisions and loss of control or collision with other plant or vehicles.	3	3	9	➤ Excavators to be driven by trained, experienced operators, trained to CSCS level, as per the Construction Regulations, 2006. ➤ Driver to carry out weekly documented checks. ➤ Defects or suspected defects to be reported immediately to the Supervisor. ➤ Regular servicing and maintenance to be carried out and properly recorded. ➤ Warning signs to be posted at strategic locations to alert persons to the movements of excavators. ➤ Drivers of smaller vehicles must ensure that excavator drivers, when operating nearby, can see them. ➤ Where a workplace or a site road is close to an open edge, the edge must be clearly marked and lined with boulders and safety barriers. ➤ Site roads not to exceed a gradient of 1 in 5.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T1 – T2 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
				➤ Test certificates and form GA2 required for excavators used as lifting equipment.				
Hazard: Excavator – Various Risks Risk: ➤ Falls - Injury to driver entering or getting out of the cab ➤ Passengers ➤ Noise ➤ Partial /Total loss of hearing ➤ Dust ➤ Risk of serious ➤ Health damage from dust	2	3	6	➤ Hand and footholds to be fitted and maintained in good condition. ➤ Machine lights to be properly maintained. ➤ Carriage of passengers on any part of an excavator is not allowed. ➤ Machine to be stopped and switched off before any person including maintenance persons are permitted on the footsteps. ➤ Earmuffs to be provided and their wearing compulsory where noise levels reach 85Db or more. ➤ Cabs to be maintained to keep out dust. ➤ Proper masks to be provided and worn.	2	1	2	- Site Supervisor (Foreman) - Site Operative

Risk Matrix				
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS
Low	1	Slight	1	LOW = 1 - 3
Medium	2	Serious	2	MED = 4 - 6
High	3	Major	3	HIGH = 7 - 9



MCE Ltd.

MCE Ltd – T1 – T2 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
Hazard: Site Dumper / Lorries Risk: ➤ Overturning/Loss of control ➤ Collision ➤ Personal injury ➤ Disablement ➤ Fatality ➤ Pedestrians ➤ Personal injury ➤ Disablement ➤ Fatality ➤ Passengers ➤ Fall from dumper ➤ Fall underneath ➤ Loading ➤ Falling material ➤ Fire	3	3	9	➤ Only trained, experienced and authorised drivers to operate dump trucks/dumpers/lorries. ➤ Drivers must hold a CSCS Ticket (or recognised alternative). ➤ Each driver to carry out daily visual checks on their vehicles, to ensure that they are in safe working order. ➤ All dump trucks/dumpers must have all safety devices fitted as required in the Construction Regulations, 2006, S.I. 504, Schedule 6, Regulation 87. ➤ Safety belts are recommended for all existing and new dump trucks and where fitted they must be worn. ➤ Suspected defects must be immediately reported to your Supervisor. ➤ Regular recorded maintenance to be carried out. ➤ As a general rule, all other traffic gives way to loaded dump trucks. ➤ Lay-bys to be provided where dump trucks are likely to meet other traffic. ➤ Where a haul road passes near open edges, the edges are to be clearly marked and lined with large boulders or other safety measures and kept clean.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T1 – T2 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
				➤ Workings must be designed so that gradients do not exceed 1 in 5. ➤ Safety warning signs are to be posted at strategic areas to alert persons to movements of dump trucks and other vehicles. ➤ Pedestrians told to ensure that they keep clear of dump trucks, wear high visibility clothing, and ensure that the driver can see them. ➤ No pedestrians may go under an open edge while a dump truck is in operation above. ➤ Persons driving small vehicles must ensure that the driver of dump trucks can see them. ➤ No persons to be carried on any part of a dump truck, unless there is provision in the cab and they are authorised to be carried. No riding permitted on the foot steps. ➤ Drivers cab must always be protected by an overhead shield built into the body of the truck. ➤ Driver to remain inside the cab at all times during loading. ➤ Hand and foot-holds must always be provided to aid safe ascent to/decent from the dump truck.				

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T1 – T2 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
Hazard: Tractor & Trailer Risk: ➤ Falls. ➤ Entrapment. ➤ Crushing. ➤ Impact with machinery. ➤ Serious bodily injury / Fatality. ➤ Collision.	3	3	9	➤ Wear hi-visibility vest and hardhat when working with moving equipment. ➤ Keep in operator's line of view. ➤ Don't travel on equipment. ➤ Watch out for objects nearby, particularly when reversing. ➤ Don't overload a trailer or stack it too high. Secure any loose loads. ➤ Use flashing amber beacon ➤ Trailer must be correctly attached to tractor (i.e safety chain, brakes and lights). ➤ Competent operators must only operate tractor. ➤ Tractors and trailers must be inspected before use.	3	1	3	- Site Supervisor (Foreman) - Site Operative
Hazard: Persons affected by the works Risk: ➤ Struck by site traffic. ➤ Fatalities ➤ Serious injuries	3	3	9	➤ Traffic Management Plans and Drawings are approved and made available. These plans will detail access routes both internal and external. ➤ All warning signs, cones with barriers are in place prior to the commencement of work on site. ➤ All signs will be clean and clearly visible. ➤ Once signs are in place the site access route will be assessed to ensure adequate visibility for drivers and pedestrians.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T1 – T2 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
				➤ All signs will be secure and weighted down where appropriate. ➤ All personnel onsite & on public roads will wear high visibility vests or jackets. . ➤ Contractor vehicles will be parked with consideration given to site traffic access.				
Hazard: Lifting Equipment Risk: ➤ Serious personal injury. ➤ Fatalities. ➤ Collision. ➤ Machine overturning. ➤ Material falling from height.	3	3	9	➤ The site management of MCE Ltd must ensure a competent person inspects the lifting equipment every 12 months and a GA1 is obtained. This must be available for inspection. ➤ Under the Construction Regulations, 2006 the lifting equipment must be inspected weekly by the operator and the results must be recorded on a GA2. ➤ A thorough visual inspection should take place before the driver operates the machine. ➤ The driver must be trained and competent to operate the machine (FAS CSCS standard or alternative excepted standard). ➤ All telescopic handlers/excavators must have safety devices fitted as per the Construction Regulations, 2006 S.I 504, Schedule 6, Regulation 87.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T1 – T2 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
Hazard: Working in reduced light Risk: ➤ Fatalities ➤ Serious injury	3	3	9	➤ Working in diminished light is not permitted under the normal work rules. ➤ In cases where permission is granted so as enable MCE Ltd to remain in keeping with the project program or for special activities, concrete pours for turbine bases, etc and work in hours of reduced light is conducted, adequate lighting will be provided at all times. ➤ Any temporary work lighting will be erected with due regard to the visibility of plant operators and other traffic on site. This shall be the duty of MCE Ltd and any special arrangements will be documented in method statements, SSOW or traffic management plans. ➤ High visibility jackets are to be worn at all times regardless.	3	1	3	- Site Supervisor (Foreman) - Site Operative
Hazard: Chemicals Risk: ➤ Eye injury / loss. ➤ Skin infection. ➤ Burns. ➤ Inhalation. ➤ Ingestion with food. ➤ Fire.	3	3	9	➤ Safety Data Sheets to be obtained for all chemicals and strictly followed. ➤ Copies to be available in case of an emergency. ➤ Containers to be properly labelled (hazard signs). ➤ Safe storage and dispensing of chemicals to be practiced.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T1 – T2 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
➤ Explosion. ➤ Serious personal injury. ➤ Fatalities.				➤ Follow manufacturer's requirements for handling, mixing, storage and first aid etc. ➤ Personal Protective Equipment to be provided and used. ➤ Training to be provided for staff working with chemicals. ➤ Familiarisation to be provided with the emergency procedure to all staff. ➤ Best possible hygiene procedures to be in place and enforced by Management. ➤ Sources of flame / ignition to be eliminated where flammable materials are used and / or stored. ➤ Spillage's to be immediately dealt with.				
Hazard: Lone Working Risk: ➤ Personal injury. ➤ Fatalities. ➤ Violence toward staff. ➤ Delay in treating medical emergencies.	3	2	6	➤ The company policy is that lone work is a last resort and must only be used for minor tasks. A system for communication with management must always be maintained. If lone working is required in keeping with the project programme it will be pursued under the following controls: ➤ The person must be trained & competent to carry out the tasks required.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					 MCE Ltd.
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T1 – T2 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
				➤ A means of communication must be available for the lone worker to contact foreman and the lone worker will be contacted at regular intervals during the anticipated work period. ➤ The lone worker must report he is leaving site to a designated person, this will be either the site manager or an appointed person. ➤ Periodic visits must be made to the lone worker, where possible. ➤ The lone worker must be furnished with the telephone numbers & emergency procedures information.				
Hazard: Roadworks Risk: ➤ Obstruction of Public. ➤ Injury to Public. ➤ Insufficient clearance between traffic routes. ➤ Collision. ➤ Accident or Bodily Injury.	3	3	9	➤ A Traffic Management Plan will be formulated for internal site roads. ➤ The main bulk of traffic will be generated with concrete pours and a traffic management plan will be created with concrete supplier and MCE Ltd. ➤ Communication will be maintained between MCE Ltd., and other civil contractors about traffic activities and all parties will be notified when pouring is taking place.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T1 – T2 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
Hazard: Fuel storage / refuelling Risk: ➤ Fire ➤ Burns ➤ Skin & Eye Irritant ➤ Dermatitis ➤ Environmental ➤ Slip / Fall	3	3	9	The risk of spilling fuel is at its greatest during refuelling of plant. To minimise this risk MCE Ltd will implement the following: this list is not exhaustive: ➤ Refuel will take place on a base away from drains or watercourses. ➤ A bunded bowser will be used. ➤ All refuelling and bulk deliveries will be are to be supervised. ➤ Check the available capacity in the tank before refuelling ➤ Check hoses and valves regularly for signs of wear ➤ Turn off valves after refuelling and lock them when not in use ➤ Position drip trays under pumps to catch minor spills ➤ Keep a spill kit with sand, earth or commercial products for containment of spillages.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T1 – T2 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
Hazard: Public accessibility to work area on site. Risk: ➤ Serious personal injury. ➤ Fatality. ➤ Slips, trips, fall over goods, materials, rough terrain. ➤ Electrocution. ➤ Theft.	3	3	9	➤ Warning signs must be posted to highlight the dangers involved in entering work area, where MCE Ltd are responsible for site conditions e.g. turbine bases. ➤ All access points to work areas to be closed / barricaded to prevent access to unauthorised persons. ➤ Entrances must be fully secured each evening / end of each work shift. ➤ Only authorised personnel are allowed on site. Signs must be erected re same. ➤ A responsible person must check site boundaries on a regular basis.	3	1	3	- Site Supervisor (Foreman) - Site Operative
Hazard: Visitors Risk: ➤ Personal Injury ➤ Property damage ➤ Cuts ➤ Puncture ➤ Entanglement ➤ Eye Injuries ➤ Electrocution	3	3	9	➤ All visitors must report to an employee or authorised person of MCE Ltd before entering the premises or area where we work. ➤ Those making deliveries must report to site office. ➤ No visitor to the premises is allowed to use company equipment without permission of the company staff and instruction on its use. ➤ Each visitor is requested to abide by the Company Safety Policy and Regulations laid down therein. ➤ They must also abide by a request by a company	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					 MCE Ltd.
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T1 – T2 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
				employee in relation to their own Safety and Health and that of the company employees. ➤ In the event of an emergency or evacuation, all visitors must report to our designated Assembly Point in car park				
Hazard: Contractors Risk: Serious personal injury.	3	3	9	➤ We will monitor the ongoing activities of all sub contractors to MCE Ltd on our projects. ➤ Induction training must be provided for Contractors, their staff and all others on site. ➤ Presentation of Site Safety Plan by Sub-Contractor to the Supervisor. ➤ A Method Statement must be prepared for each necessary job by the Contractor and Sub-Contractors.	3	1	3	- Site Supervisor (Foreman) - Site Operative
Hazard: First Aid Equipment. Risk: ➤ Worsening of condition. ➤ Onset of infection. ➤ Fatality. ➤ Permanent injury / illness.	3	3	9	➤ Adequate first aid kits to be provided and filled to HSA guidelines. ➤ They must be regularly checked and refilled by a designated person.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T1 – T2 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
Hazard: Lack / Absence of First Aiders Risk: ➤ Improper diagnosis ➤ Improper treatment ➤ Delay in seeking professional medical help. ➤ Worsening of condition. ➤ Onset of infection. ➤ Fatality. ➤ Permanent injury / illness.	3	3	9	➤ Sean O'Driscoll and Chris Murnane are trained first aiders ➤ Arrangements to be in place with local doctor for emergencies. ➤ All employees to be aware of emergency procedures.	3	1	3	- Site Supervisor (Foreman) - Site Operative
Hazard: Personal Protective Equipment (P.P.E.) Risk: ➤ Impact from flying particles. ➤ Head injury. ➤ Foot injury. ➤ Falls from height. ➤ Burns or skin irritation etc.	2	3	6	➤ All necessary Personal Protective Equipment to be provided and used. ➤ Safety Signs to be put up to highlight this requirement. ➤ COMPULSARY SITE P.P.E.: ○ Hard hat. ○ High visibility clothing. ○ Safety boots / shoes.	2	1	2	- Site Supervisor (Foreman) - Site Operative
Hazard: Manual Handling Risk: ➤ Back. ➤ Neck. ➤ Shoulder Injury.	3	2	6	➤ All MCE Ltd staff and subcontractors employees must be trained in Manual Handling. ➤ In Accordance with the General Application Regulations 2007, No 69, an employer must ensure that	3	1	3	- Site Supervisor (Foreman)

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T1 – T2 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
➤ Prolapsed Disk. ➤ Permanent Injury. ➤ Trip / Fall. ➤ Hit Against. ➤ Dropped Object.				he/she takes appropriate organisational measures, or use the appropriate means, in particular mechanical equipment, to avoid the need for the manual handling of loads. ➤ Minimise all manual-handling tasks where possible. ➤ Provide suitable mechanical handling equipment Ensure these are used. ➤ Provide Manual Handling training to all staff whom have not received it. ➤ Personal Protective Equipment including gloves to be provided and used.				- Site Operative
Hazard: Poor Hand Hygiene Risk: ➤ Skin complaints. ➤ Dermatitis. ➤ Eczema. ➤ Ingestion of chemicals. ➤ Biological agents: • toxins, • bacteria and • viruses.	2	2	4	➤ Good hand hygiene is essential in the workplace. The hands are the most likely part of the body to come into contact with harmful substances. ➤ Wash hands before eating or smoking. ➤ Suitable gloves should be worn when handling potentially hazardous materials. ➤ Dirty hands should be cleaned using proper skin cleansing products.	2	1	2	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T1 – T2 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
				➤ Do not clean hands with petrol, white spirits, thinners, turpentine etc. ➤ Always ensure you wash your hands after visiting the toilet.				
Hazard: Animals • Rats /mice. • Wasps /bees. • Small animals. • Dogs. Risk: ➤ Leptospirosis(Weil's Disease) ➤ Stings. ➤ Histoplasmosis (droppings) ➤ Fall from height. ➤ Sudden 'fright'. ➤ Bites.	2	2	4	➤ When working near water or where rats have been seen, care is to be taken to disinfect all cuts and cover them with waterproof plasters. ➤ Be aware that sudden movements of birds or small animals can cause a reflex action in the operator, which may overbalance them. ➤ Check for signs of nests, birds or other small animals. ➤ Practice caution if dogs are present.	2	1	2	- Site Supervisor (Foreman) - Site Operative
Hazard: Weather ➤ Sun ➤ Wind ➤ Rain ➤ Ice / snow Risk: ➤ Sun burn. ➤ Sunstroke. ➤ Skin cancer. ➤ Fall from height. ➤ Slip / fall.	2	2	4	➤ In sunny weather, cover the back of the neck and keep a shirt on at all times. ➤ Avoid sunburn and sun stroke where possible by keeping covered and wearing a high factor sun block. ➤ Be aware that strong winds or gusts can overbalance an operator. ➤ Don't work in heavy rain unless adequately protected.	2	1	2	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T1 – T2 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
➤ Bodily injury. ➤ Hit by object. ➤ Hypothermia.				➤ Be prepared for slippery conditions in icy weather. Salt or grit should be used where necessary.				
Hazard: Working near Water Risk: ➤ Drowning: ➤ Public and Workers	3	2	6	➤ Fencing and warning signs to be in place around deep water. ➤ Workers must operate in pairs at all times. ➤ Where necessary, suitable lifebuoys to be available in case of emergency and checked regularly.	3	1	3	- Site Supervisor (Foreman) - Site Operative
Hazard: Portable Electricity Generator Risk: ➤ Fire. ➤ Burns. ➤ Re-fuelling. ➤ Electrocution. ➤ Bodily injury. ➤ Back injury. ➤ Trip / fall.	3	3	9	➤ Store in a dry position and away from pedestrian routes. ➤ Fill petrol tank when the generator is cold. ➤ Avoid spillages when re-fuelling. Clean up any overspill immediately. ➤ Move fuel can a safe distance away. ➤ Ensure filler cap is securely replaced. ➤ To be operated by trained personnel only. ➤ To be maintained in good condition. ➤ Always inspect before use (i.e. oil / petrol level, electric connections not broken).	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T1 – T2 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
Hazard: Abrasive Wheels, Consaws and Angle Grinders Risk: ➤ Wheels shattering at high speed. ➤ Serious facial / head injury. ➤ Cuts / wounds to hands, arms, upper body. ➤ Eye injury. ➤ Fire / explosion. ➤ Electric shock. ➤ Hand Arm Vibration Syndrome – white finger. ➤ Respiratory problems. ➤ Injury to bystanders.	3	3	9	➤ Training must be provided as per the Abrasive Wheels Regulations, 1982 by MCE Ltd. ➤ Only trained and authorised personnel must be allowed to use abrasive wheels. ➤ The operator must carry out daily inspection. ➤ Guards must be in place at all times, when machine is being used. ➤ If electrically powered use 110v equipment only. ➤ Store petrol for consaw in correct approved containers. ➤ Always refuel away from the work area. ➤ Do not use consaw close to other people. ➤ Correct Personal Protective Equipment must be worn at all times. (Gloves, ear protection, eye protection and steel toe capped boots). ➤ Inspect work area for all dangers prior to using abrasive wheels. ➤ A hot work permit may be required from management/site foreman. ➤ Use correct discs. Store them safely when not in use. ➤ Turn off consaws and unplug grinders when not in use.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T1 – T2 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	

“I understand the above method statement, risk assessment and the control measures and will undertake to carry out my work safely and in accordance with the control measures. I have been given the opportunity to raise any concerns that I may have and I realize that I can do this at anytime”.

Safe working is a condition of employment

Print Name	Signature	Date
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Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T1 – T2 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	

“I understand the above method statement, risk assessment and the control measures and will undertake to carry out my work safely and in accordance with the control measures. I have been given the opportunity to raise any concerns that I may have and I realize that I can do this at anytime”.

Safe working is a condition of employment

Print Name	Signature	Date
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Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T1 – T2 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
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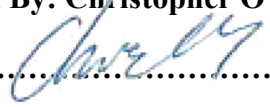


MS MNG 16038

T4 FLOATING ROAD UPGRADE



Prepared By: Christopher O'Mahony

Signed: 

Date: ... 26/08/2021

Reviewed By: Sean O'Driscoll

Signed: 

Date: ... 26/08/2021

1.0 Method Statement-MNG 16038

Project Name:	Meenbog Wind Farm.		
Contractor:	MCE Ltd, Lissarda Industrial Estate, Lissarda, Co. Cork		
Method Statement Title:	T4 Floating Road Upgrade		
Method Statement No.:	MNG - 16038		
Prepared by:	Chris O'Mahony		
Date Prepared:	26/08/2021	Revision	004-26/08/2021
Specific Training Required:	Solas Safe Pass, Site Induction, EIA Training, CSCS Plant Ticket (where required).		
Relevant Legislation:	Safety, Health & Welfare at Work Act 2005 Safety, Health & Welfare at Work (General Application) Regulations 2007 Safety, Health & Welfare at Work (Construction) Regulations 2013		

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2.0 Statement Brief

Meenbog wind farm is comprised of 19 wind turbine generators, one 110kv substation and one meteorological mast along with associated roads, hardstands and other associated infrastructure. The road infrastructure to the south of T5 has been designed and constructed as ‘floating roads’. Onn recommendation from Ionic Consulting, a short section of the T4 access road is to be upgraded as it is potentially unstable under the heavy loading imposed by turbine erection crane. The road has an overdesign factor of >1 for all other load cases including permanent and construction loading. A cautious approach is being taken to increase the factor of safety before any cranes or heavy turbine components are delivered. It is proposed to rebuild the section of road to solid sub-base and realign the final 100m to the original planning alignment correcting a deviation imposed by the turbine supplier specifications during the design process. This method statement details the methodology for these works.

The Meenbog Site is primarily made up of rural and agricultural land, upland bog, commercial bog and forestry. Access to site may be shared with local domestic and commercial traffic and due care and attention should be taken at such access points. There is public access to the site and all contractors must conduct their activities in a manner that both protects and facilitates the general public in their enjoyment of the site. See site layout, Figure 1.0.

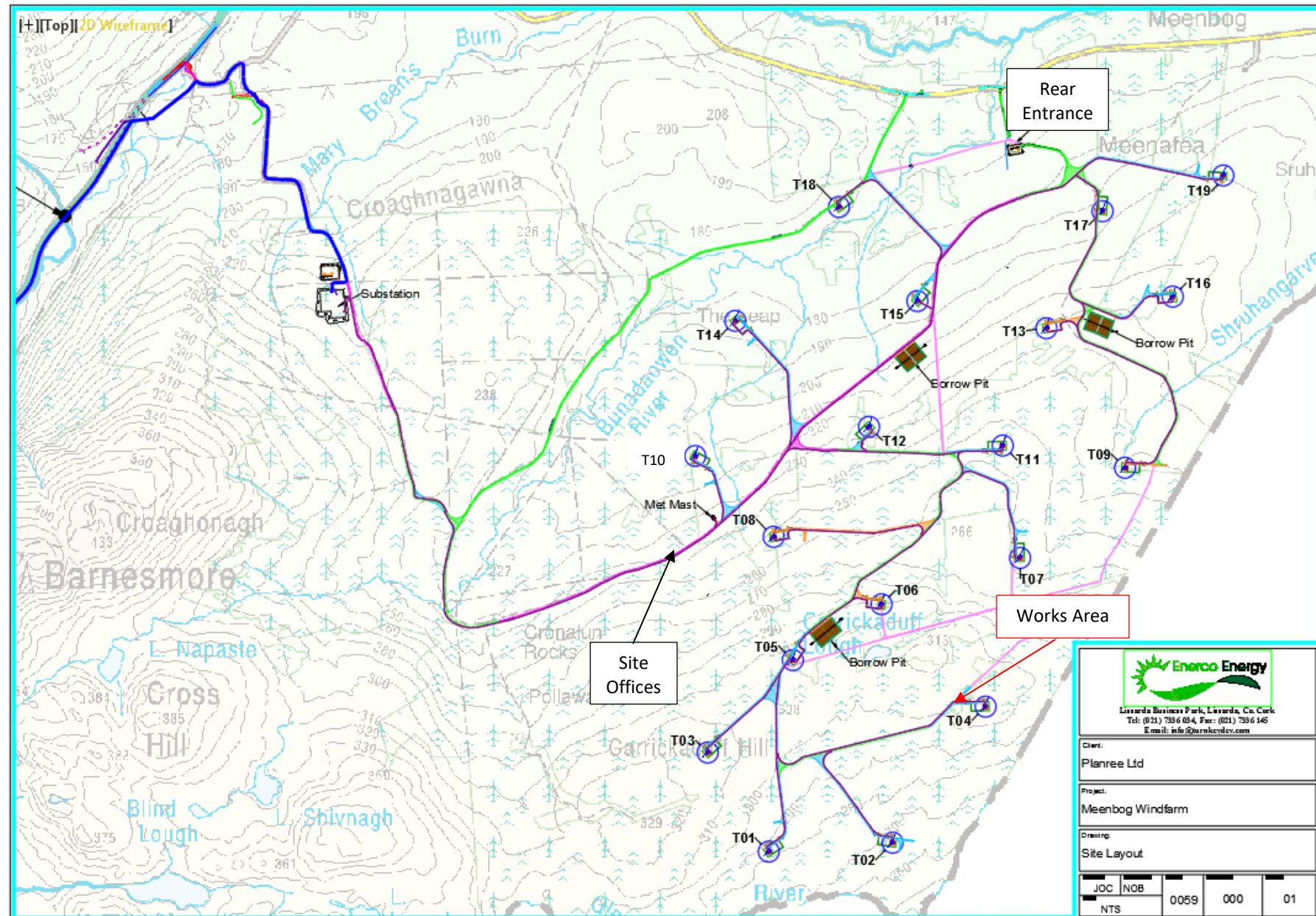


Fig 1.0 Meenbog Site Layout

2.1 Works Location

Meenbog Wind Farm & Substation entrance is located approximately 13km South West of Ballybofey and 14km North East of Donegal Town. All operatives are to text MCE Ltd operational controller when arriving onto site and again when leaving in the evening. The contact number is 086-8032620.

3.0 Restrictions / Precautions

Description	Yes	No
Work located near Underground services		√*
Work located near Overground services		√**
Work located near SAC / NHA	√***	
Work located near Watercourses / Streams	√****	
Work located near Steep Slopes	√*****	
Work located near Hillwalkers	√*****	

* = underground cables.

** = overhead power lines.

*** = Special Area of Conservation / National Heritage Area.

**** = Drainage measures to be put in place to ensure that no damage is caused to local watercourses in conjunction with Environmental consultant recommendations.

***** = Some road surfaces may be in close proximity to steep slopes.

***** = Hillwalkers frequent the development area and operatives have been made aware of their presence.

3.1 General Precautions

Prior to any works commencing all personnel onsite will be inducted by a MCE supervisor and will sign up to the relevant RAMS before commencing any work onsite. A number of other points to note include;

- GA2 forms to be completed weekly with a copy of the GA1 left in the machine at all times.
- All site-specific safety rules will be adhered to.
- All plant operators will have appropriate CSCS training.
- All personnel will have SOLAS Safe Pass training or equivalent training
- First aid supplies will be available in the work area.
- The road way will be maintained in clean condition at all times.
- Helmets, High Visibility clothing and safety footwear will be worn at all times with additional PPE as required.
- A competent foreman will be on site at all times.
- No excavations to be left open at the end of each day.

4.0 Environmental Emergency Procedures

4.1 Excessive Peat Movement

There are a series of 20 monitoring locations across the site with trigger levels of 100mm recommended. (see appendix F). For this section of work a number of additional posts will be installed (see appendix H). Where there is excessive peat movement or continuing peat movement recorded at a monitoring location or identified at any location within the site but no apparent signs of distress to the peat (e.g. cracking, surface rippling) then the following shall be carried out.

- (1) All construction activities shall cease within the affected area.
- (2) Further peat stability assessment completed
- (3) Increased monitoring at the location shall be carried out. The area will be monitored, as appropriate, until such time as movements have ceased.
- (4) Recommencement of limited construction activity shall only start following a cessation of movement and completion of a geotechnical risk assessment by a geotechnical engineer.

4.2 Onset of Peat Slide

Where there is the onset or actual detachment of peat (e.g. cracking, surface rippling) then the following shall be carried out.

- (1) On alert of a peat slide incident, all construction activities will cease and all available resources will be diverted to assist in the required mitigation procedures.
- (2) Where considered possible, action will be taken to prevent a peat slide reaching any watercourse. This will take the form of the construction of check barrages on land. Due to the terrain, the possible short run-out length to watercourses, speed of movement and the inability to predict locations it may not be possible to implement any on land prevention measures, in this case a watercourse check barrage will be implemented.
- (3) For localised peat slides that do not represent a risk to a watercourse and have essentially come to rest the area will be stabilised initially by rock infill, if required. The failed area and surrounding area will then be assessed by the engineering staff and stabilisation procedures implemented. The area will be monitored, as appropriate, until such time as movements have ceased.

4.3 Reaction to Peat Slide

In the event that there is a significant movement of peat, MCE will follow a specific set of procedures, namely,

- MCE Site management will be contacted
 - Gearoid White: 086-0211525
 - Chris O'Mahony: 086-0329552
- Site management will ensure all employees and equipment are accounted for
- Area will be designated a 'no-go' zone until instructed otherwise
- An initial rapid assessment will be made to determine the immediate risks to personnel within the site, members of the public and the local environment
- If deemed necessary, measures may be taken to make the area safe in the short term
- MCE management and consultant engineers, will be contacted, notified of the situation and site staff will await further instruction
- In the event of a notable peat movement, the relevant statutory bodies will be notified.

4.4 Fuel / Oil Spill

The following mitigation measures are proposed to avoid release of hydrocarbons at the site:

- On-site refuelling will be conducted in a controlled and safe manner. Where possible fuel will be delivered by bunded mobile tanker. Bowsers and plant will be refuelled on a level platform away from any watercourses and areas susceptible to run-off.
- Refuelling to be conducted by competent and trained personnel
- Plant on site will be regularly inspected for leaks and fitness for purpose. Any defects to be reported to site management and plant owner immediately
- Emergency spill kits will be available to deal with any potential accidental spillage or discharge.
- Where there is a leak of any hazardous material all construction activities will cease and all available resources will be diverted to assist in the required mitigation procedures.
- The area will be sealed off so that no watercourses are affected, and the contaminated peat/land excavated and removed. Fuel spill kits will be used to clean up the area.
- Notify the ECoW immediately giving information on the location, type and extent of the spill so that they can take appropriate action.
- The ECoW will inspect the site and ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring.

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- The ECoW will notify the appropriate regulatory body such as Donegal County Council, Department of the Environment, Climate and Communications (DECC), if deemed necessary.

5.0 Sequence of Works

5.1 Setup

1. The site has already been set up prior to works. MCE have a site compound set up with all required welfare and first aid facilities
2. A number of signs and fencing have been erected around the site so as to limit the risk of hill walkers from coming into the work area.
3. Site Safety signs have also been erected at a number of points alerting members of the public of dangers and the need for PPE as they are entering a construction site.
4. The assembly point for personnel involved in these works is at the MCE site offices
5. A rain gauge monitoring system is set up on site. Works will cease based on triggers set out in CEMP section 5.2.2 i.e. >25mm in 24 hours, 10mm in 1 hour or greater than the monthly average rainfall in the past 7 days.
6. 20nr. Peat Monitoring locations have been installed across the site in line with FTCO recommendations. There are to be monitored weekly site wide. Daily monitoring will be conducted on locations in the vicinity of works zone. (See appendix F & G)
7. In line with FTCO recommendation nr. 3. The remaining works on the site shall be carried out without placing of excessive loading onto the in-situ peat surface. Where loading is to be placed onto an area of in-situ peat then that area shall be inspected and assessed by a competent person. Where in doubt no loading shall be placed onto in-situ peat.
8. An additional series of monitoring locations will be installed in the area directly adjacent to works zone. These will be monitored on an ongoing basis throughout the workday.
9. Zone of influence testing will be completed daily in advance of works. This will involve peat probing, shear vaning and inspecting the ground to 50m outside the works area along the path of the works to be completed. Probing and shear vaning will be carried out at 20m centres depending on the encountered peat conditions. The number of shear vaning carried out may vary depending on for example the depth and weakness of the encountered peat. The morphology, drainage, vegetation, and proximity to drains/watercourses will be checked. Tests will be cross-referenced to those completed to date.
10. Zone of influence testing and inspection shall be completed in a reasonable time in advance of the proposed works to allow assessment of the results to be completed.
11. All results, such as probing and vaning shall be documented on site using a standard template and transferred to digital medium (e.g. Excel spreadsheet), all of which shall be readily available for auditing.

5.2 Methodology

- All operatives are to read, understand and sign the RAMS before commencing any work and if unsure about any item they are to discuss with the site manager, Sean O'Driscoll / Chris O'Mahony/Gearoid White
- Works will be sequenced based on project organogram (see appendix H)
- Zone of influence testing will be conducted prior to works commencement. The area will be inspected by competent person, no works to take place until assessment is completed and signed off by Martin Lyttle (FTCO).
- The zone of influence testing will be cross referenced to the testing previously conducted along this road section which will back up the existing data. (see appendix C)
- The assessment of the findings of the zone of influence testing shall be assessed by a competent person who shall determine based on comparison with previous data contained within the Ionic report and recently completed data that works within the tested section can be commenced, or otherwise. Where there are adverse variations in the data then the designer (Ionic) shall be consulted as part of the assessment.
- No works can commence until the assessment is complete and the assessment has clearly demonstrated that the proposed works are safe to commence.
- The result of the assessment shall be documented using a standard template, which shall be in a suitable medium that can be readily audited.
- The road will be upgraded using the 'excavate and replace method'.
- The turbine hardstanding at T4 is constructed to solid sub-formation. Along the North-West edge at CH 970 there is a turbine blade storage platform (blade finger) also constructed on solid strata. (see Appendix A).
- This blade finger will be used as a start point for the road re-alignment.
- Both sides of the new road alignment will be marked using GPS equipment.
- There is approx. 2.0m of in situ peat in the area surrounding the blade finger.
- Excavator will move onto blade finger and begin to excavate peat. Articulated dump truck will be sitting on turbine hardstanding and will move along the blade finger and onto new road alignment as excavation progresses.
- There is a ratio of approx. 2 x peat to 1 x rock meaning approximately every two loads of peat removed will require one load of rock to replace.

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- Although the FOS is deemed acceptable, waiting trucks will not be parked along the floating road. They will wait on the hardstanding area. This will be controlled by supervisor and requirements will be conveyed to operatives.
 - Once peat is removed and rock is required, excavator will move away from open excavation road leaving space for rock to be deposited. It will be unloaded onto the solid road and placed by the excavator.
 - ***No rock to be deposited directly onto floated road section.***
 - Rock will not be tipped directly into open excavation in an uncontrolled manner. Its placement will be controlled by excavator operator.
 - The road will be minimum 5m wide. The base width will vary depending on peat depth. Where the ratio will be W:D, 1.5:1 (See Appendix A)
 - The excavation will continue along the road alignment to CH 850.
 - A 'key' will be excavated into the existing floating road at this point. Once keyed in, excavator will move South-West and begin to remove the floating road at CH 750. The rationale for moving further along the floating road is that there is a degree of protection by isolating the section of road deemed less stable.
 - There is a culvert at approx. CH 750 which has been installed atop solid strata. The peat depths are <1.
 - Excavator will remove the layers of engineered fill. It will be loaded into articulated dump trucks removed to a nearby hardstand for reuse.
 - The peat will then be excavated, and the road will be reconstructed on solid sub-formation in a manner similar to above.
 - The road will be constructed to solid stratum using the 'displacement' method
 - To avoid unsupported excavation faces and potential for tension cracks to develop, the excavation and filling will be sequenced to minimise the time that the excavation faces are unsupported. This will require limiting the amount of excavation to the available volume of fill at the point of excavation. If required there may be a need to place fill into the in-situ peat (using displacement method) at the toe of temporary excavation face to avoid excessive height of unsupported excavation face.
 - Excavation will continue to join the prior constructed re-aligned section at CH 850.

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- Once the entire road has been upgraded the remaining floating road will be removed. This will start at the key installed at CH 850. Machinery will stay on existing road section and move back towards T4.
 - Excavator will move along the floating road from the T4 side. Engineered fill will be loaded into articulated dump trucks which will then be able to travel along the realigned road, bringing the fill to another location for reuse.
 - The peat beneath the floating will be reinstated and reseeded.
 - Traffic will be strictly controlled. Dump trucks will not be ‘stacked’ along floating road section.
 - The peat excavated will be brought to on-site peat deposition areas. Rock will be sourced from on-site borrow pit adjacent to T13.
 - No construction machinery will track onto in-situ peat. In the event that machinery must track on to peat the peat will be inspected and assessed by competent person (Martin Lyttle FTCO) to avoid excessive loading. If in doubt machinery will not be tracked onto peat.
 - Drainage works required will be conducted under supervision of MKO. A series of preventative measures will be put in place to protect water courses. Silt traps will be required at the water courses adjacent to the culver at CH 750.
 - MCE/MKO will monitor the works at all times to ensure there are no unwanted discharges to the roadside drainage. If there are any issues with drainage and or unwanted discharges, works will cease, and remedial measures will be put in place to the satisfaction of the ECoW prior to recommencement of works.
 - Martin Lyttle (FTCO) and Gearoid White (MCE) will monitor excavation works. John Shanahan/Cormac O’Dubhthaigh (Ionic) will be present for works commencement to ensure the methodology is satisfactory.
 - Once completed a final inspection will be conducted by Ionic consulting (John Shanahan & Cormac O’Dubhthaigh), FTCO (Martin Lyttle) and MCE management (Sean O’Driscoll & Chris O’Mahony)

6.0 Covid-19

Coronavirus/Covid-19 is an infectious disease which affects the upper respiratory system. It is potentially fatal and is particularly dangerous to those with underlying conditions and the elderly/infirm. 63% of confirmed cases have spread through community transmission. The infection is highly contagious and easily transmitted from person to person through close contact with either an infected individual or a contaminated area. For this reason, a set of standard operating procedures are to be adopted at Meenbog WF. Refer to construction stage safety plan for SOPs on Covid-19. Briefly summarised below,

- All workers are to sign in/out at the designated area
- Personnel will be asked to make a declaration which assess the key risk factors in virus transmission
- Hand sanitizer and gloves will be provided for instances where personnel must use a shared space i.e. toilets
- There will be no communal areas for eating in use for the foreseeable future
- Personnel will take their designated breaks at their own individual work area e.g. digger cab
- Site will be closed for access in the morning and opened at the end of the day, any entries/exits are to be notified to site management
- Anyone displaying symptoms of Covid-19 are to immediately notify site management and proceed to self-isolate

7.0 Plant / Equipment

1.	Various Size Excavators
2.	Roller / Plate Compactor / Generator
3.	25 Tonne Dumper
4.	Lorries / Dumpers
7.	Loadall
8.	Drainage equipment (pumps, silt bags etc.)

7.1 Personal Protective Equipment (PPE)

1.	Hard Hat. (Worn at all times)		
2.	Hi Visibility Jacket/Vest. (Worn at all times)		
3.	Steel Toe Cap Boots. (Worn at all times)		
4.	Gloves. (Worn when required)		
5.	Eye Protection. (Worn when required)		
6.	Ear Protection. (Worn when required)		
7.	P3 Dust Masks. (Worn when required)		

7.2 Extra Safety Equipment to be used

Additional PPE such as hearing protection and dust masks to be used as required depending on operative activities.

8.0 Emergency Arrangements

In the case of an emergency, all operatives are to follow the emergency procedures as detailed in the site induction for Fire, Injury or Bog slide. General arrangements are;

- Assess/Attend to casualty if one is present
- Raise the alarm and call 999/112
- Alert the other site personnel as to the emergency
- Locate at the site assembly point and do not return to work until instructed that it is safe to do so
- Substation construction assembly point located at the site entrance gate

First Aid

First aid kits are located in the MCE Site Vehicle in addition to the MCE site office.

Emergency Contacts

1.	Emergency Numbers – 999/112
2.	Letterkenny University Hospital – 074 912 5888
3.	NowDoc – 1850 400 911
4.	Donegal Town Garda Station – 074 974 0190
5.	Sean O’Driscoll – Project Manager – 086 8528329
6.	Chris Murnane – Safety Officer – 086 7955083
7.	Chris O’Mahony – Site Manager – 086 0329552
8.	Gearoid White – Site Foreman – 086 0211525

Who Information Will be Communicated to.

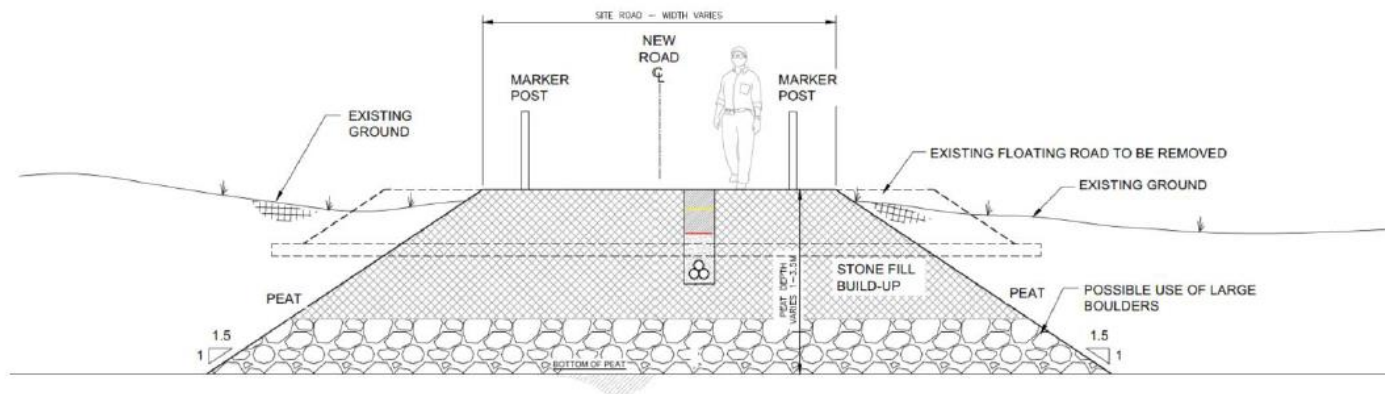
Chris O’Mahony/Sean O’Driscoll will communicate the method statement and risk assessment to the work force before the work commences on site.

Monitoring and Compliance

Chris O'Mahony/Sean O'Driscoll will ensure that method Statements will be adhered to by all MCE staff including any updates/changes made to the Method Statement.

9.0 Appendices

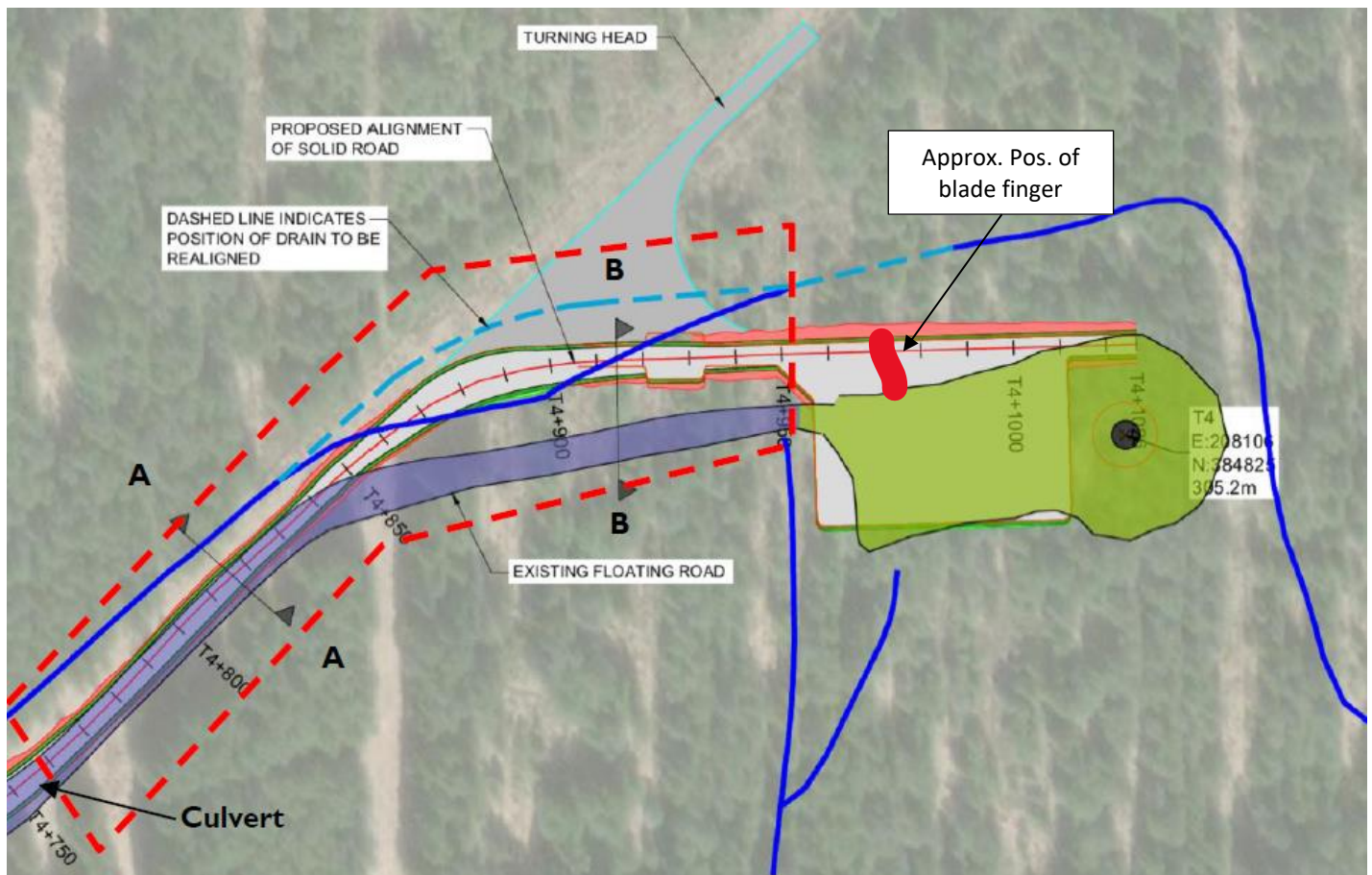
Appendix A Section Through Road



ILLUSTRATIVE SECTION THROUGH UPGRADED SOLID ROAD INCLUDING GRID ROUTE TRENCH

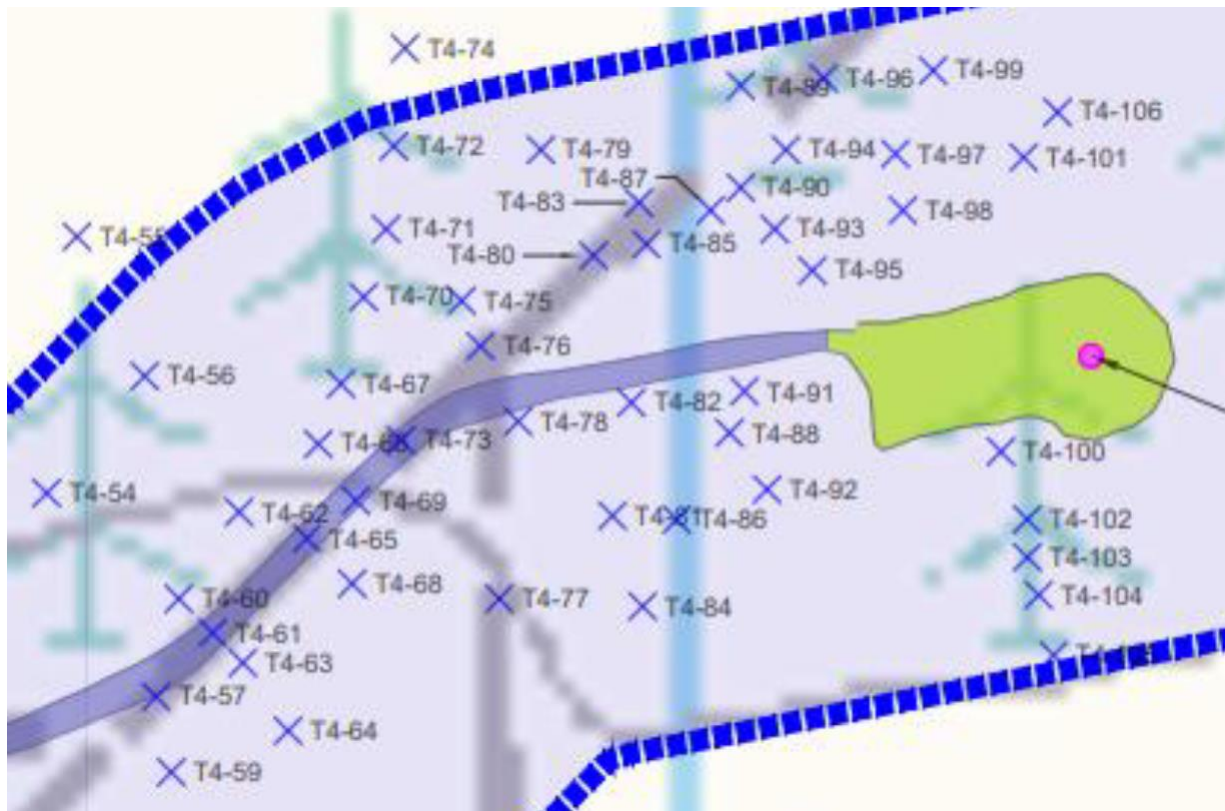
REF: Ionic Construction MNBG d018.4.4

Appendix B Plan View of Berm



REF: Ionic Construction MNBG d018.4.4

Appendix C Prior Testing

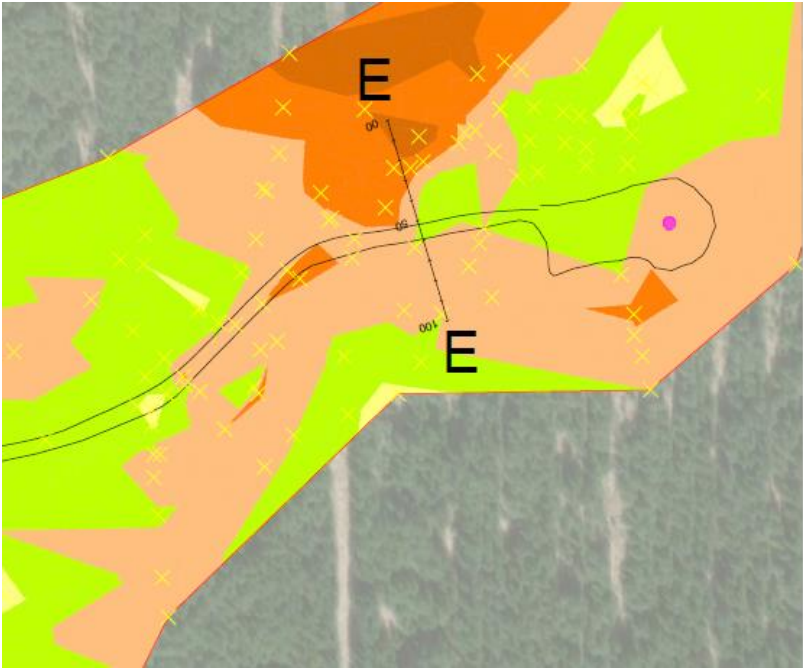


REF: Ionic Construction MNBG r057 Rev B Peat Stability

MEENBOG WIND FARM - PEAT ASSESSMENT TO EUROCODE 7 - ODF (overdesign factor)															
LOCATION			DATA				LOADING				ANALYSIS				
Location Ref.	Easting	Northing	Peat Depth (m)	Unit Weight Peat (kN/m3)	Undrained Shear Strength (kPa)	Slope (degrees)	Permanent Surcharge Peat Deposition I	Variable Load Construction (kPa) II	Permanent Surcharge Floating Road (kPa) III	Variable Load Crane (kPa) IV	ODF Existing (Self-weight Peat Only) 0	ODF Permanent Surcharge Peat 0+I	ODF Variable Load Construction 0+II	ODF Permanent Surcharge Floating Road 0+III	ODF Variable Load Crane 0+III+IV
T4-61	207873	384752	3.1	10	4	3.1	10	13.3	20.7	10.3	1.71		1.10		
T4-62	207880	384784	2.0	10	5	3.5	10	13.3	20.7	10.3	2.93		1.57		
T4-63	207881	384744	2.5	10	7	4	10	13.3	20.7	10.3	2.87		1.70		
T4-64	207893	384726	3.0	10	6	3.8	10	13.3	20.7	10.3	2.16		1.37		
T4-65	207898	384777	2.5	10	9	5.6	0	13.3	20.7	10.3	2.65	2.65	1.57	1.45	1.12
T4-66	207901	384802	1.7	10	5	5.7	10	13.3	20.7	10.3	2.13		1.05		
T4-67	207907	384818	2.8	10	4	3.4	10	13.3	20.7	10.3	1.72		1.07		
T4-68	207910	384765	3.0	10	5	4	10	13.3	20.7	10.3	1.71		1.09		
T4-69	207911	384787	3.0	10	9	4.8	0	13.3	20.7	10.3	2.57	2.57	1.63	1.52	1.20
T4-70	207913	384841	2.3	10	9	3.6	10	13.3	20.7	10.3	4.46		2.55		
T4-71	207919	384859	2.6	10	5.5	3.4	10	13.3	20.7	10.3	2.55		1.53		
T4-72	207921	384881	3.7	10	3.5	1.9	10	13.3	20.7	10.3	2.04		1.39		
T4-73	207923	384803	3.0	10	7	5.6	0	13.3	20.7	10.3	1.72	1.72	1.09	1.02	0.80
T4-74	207924	384907	4.3	10	3	1.9	10	13.3	20.7	10.3	1.50		1.07		
T4-75	207939	384840	3.3	10	5	3.4	10	13.3	20.7	10.3	1.83		1.20		
T4-76	207944	384828	2.8	10	7	3.8	0	13.3	20.7	10.3	2.70	2.70	1.67	1.55	1.22
T4-77	207949	384761	1.7	10	8	8.2	10	13.3	20.7	10.3	2.38		1.18		
T4-78	207954	384808	2.9	10	9	5.7	0	13.3	20.7	10.3	2.24	2.24	1.41	1.31	1.03
T4-79	207960	384880	3.9	10	4	1.7	10	13.3	20.7	10.3	2.47		1.71		
T4-80	207974	384852	3.6	10	3.5	2.4	10	13.3	20.7	10.3	1.66		1.12		
T4-81	207979	384783	2.1	10	8	5.2	10	13.3	20.7	10.3	3.01		1.65		
T4-82	207984	384813	2.0	10	6	3	0	13.3	20.7	10.3	4.10	4.10	2.20	2.01	1.52
T4-83	207986	384866	4.8	10	3.5	1.7	10	13.3	20.7	10.3	1.76		1.29		
T4-84	207987	384759	1.9	10	7	5	10	13.3	20.7	10.3	3.03		1.59		
T4-85	207988	384855	3.2	10	5	2.4	10	13.3	20.7	10.3	2.67		1.73		
T4-86	207996	384782	2.0	10	7	3.4	10	13.3	20.7	10.3	4.22		2.26		
T4-87	208005	384864	2.9	10	5.5	1.6	0	13.3	20.7	10.3	4.85	4.85	3.04	2.83	2.23
T4-88	208010	384805	2.1	10	7	4.3	10	13.3	20.7	10.3	3.18		1.75		
T4-89	208013	384897	4.1	10	3.5	1.9	10	13.3	20.7	10.3	1.84		1.29		
T4-90	208013	384870	2.7	10	3.5	1.6	10	13.3	20.7	10.3	3.32		2.02		
T4-91	208014	384816	2.3	10	3.5	2.1	10	13.3	20.7	10.3	2.97		1.69		
T4-92	208020	384790	2.4	10	5	2.1	10	13.3	20.7	10.3	4.06		2.36		
T4-93	208022	384859	2.2	10	7.5	1.7	10	13.3	20.7	10.3	8.21		4.60		
T4-94	208025	384880	2.0	10	6	3.5	10	13.3	20.7	10.3	3.52		1.89		
T4-95	208032	384848	2.0	10	5	1.7	10	13.3	20.7	10.3	6.02		3.23		
T4-96	208035	384899	2.2	10	6	1.7	10	13.3	20.7	10.3	6.57		3.68		
T4-97	208054	384879	1.9	10	5	1.6	10	13.3	20.7	10.3	6.73		3.53		
T4-98	208056	384864	1.7	10	6.5	2.1	0	13.3	20.7	10.3	7.46	7.46	3.70	3.36	2.48
T4-99	208064	384901	2.1	10	7	2.3	10	13.3	20.7	10.3	5.94		3.26		
T4-100	208082	384800	2.0	10	5.5	3.0	10	13.3	20.7	10.3	3.76		2.02		
T4-101	208088	384878	1.9	10	10	3	10	13.3	20.7	10.3	7.19		3.77		
T4-102	208089	384782	3.3	10	4.5	3	10	13.3	20.7	10.3	1.86		1.22		
T4-103	208089	384772	2.4	10	5	3.8	10	13.3	20.7	10.3	2.25		1.31		
T4-104	208092	384762	2.3	10	5	3.8	10	13.3	20.7	10.3	2.35		1.34		

REF: Ionic Construction MNBG r057 Rev B Peat Stability

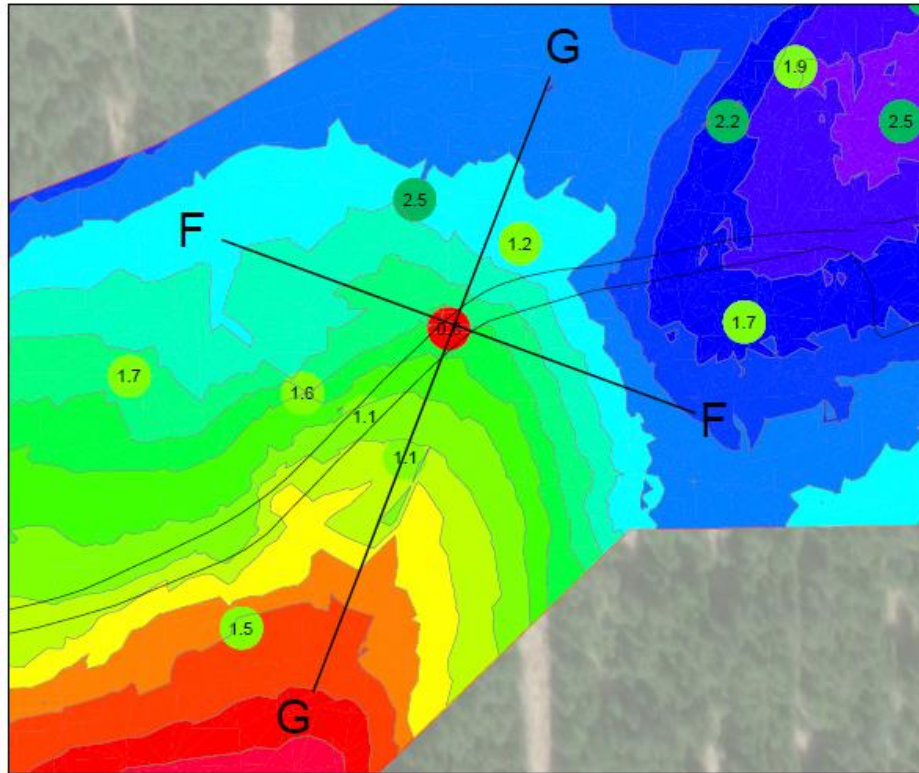
Appendix D Peat Depth Map



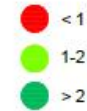
REF: Ionic Construction MNBG d018.4.4

SURFACE LEVEL DATA			
NUMBER	MIN. PEAT DEPTH	MAX. PEAT DEPTH	COLOUR
1	0.00	1.00	
2	1.00	2.00	
3	2.00	3.00	
4	3.00	4.00	
5	4.00	5.00	
6	5.00	6.00	
7	6.00	7.00	
8	7.00	20.00	

Appendix E Potential Flow Path



Eurocode 7 Overdesign Factor



Bottom of Peat Elevations Table

Number	Minimum Elevation	Maximum Elevation	Area	Color
1	289.00	290.00	394.70	Red
2	290.00	291.00	1177.83	Red
3	291.00	292.00	2230.77	Orange
4	292.00	293.00	1816.12	Yellow
5	293.00	294.00	2042.40	Yellow
6	294.00	295.00	2367.19	Yellow
7	295.00	296.00	2523.61	Yellow
8	296.00	297.00	2599.86	Yellow
9	297.00	298.00	2136.86	Yellow
10	298.00	299.00	2777.92	Yellow
11	299.00	300.00	3911.83	Yellow
12	300.00	301.00	5598.48	Yellow
13	301.00	302.00	9078.49	Yellow
14	302.00	303.00	3128.22	Yellow
15	303.00	304.00	3102.97	Yellow
16	304.00	305.00	2665.31	Yellow
17	305.00	306.00	1072.92	Yellow

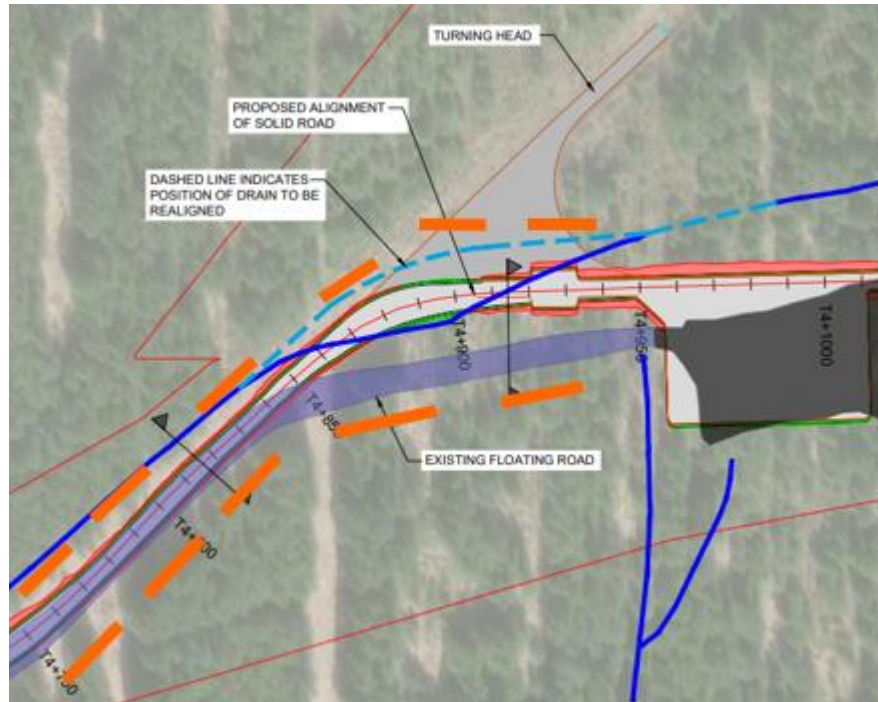
REF: Ionic Construction MNBG d018.4.4

Appendix F Peat Monitoring Locations

No	Location	Comments
1	Junction of access road to T1 with spur to T2 and T4 along downslope margin	Area of deepest peat in close proximity to concave break in slope
2	Along access to T3 about 50m from hard stand along downslope margin	Area of deeper peat in close proximity to concave break in slope
3	Along access to T2 about 100m from hard stand along downslope margin	Area of deeper peat in close proximity to concave break in slope
4	Along access to T4 about 150m from hard stand along downslope margin	Area of deeper peat in close proximity to concave break in slope
5	Along access from T5 to T3 about 200m from T5 along downslope margin	Area of deeper peat in close proximity to concave break in slope
6	Junction of access road to T7 about 100m along access to T7 along downslope margin	Area of deeper peat in close proximity to concave break in slope, within potential area of 12 November failure
7	South side of upper scar of 12 November failure	To monitor potential retrogression of scar upslope
8	On downslope margin of T7 base and hard stand prior to construction	To be installed in advance of any works
9	On downslope margin of T10 base and hard stand	Area of peat in close proximity to concave break in slope
10	Along access to T14 about 100m from hard stand along downslope margin	Area of peat in close proximity to concave break in slope
11	Along access to T18 at about chainage 1600m along downslope margin	Area of potential peat close to river
12	Along access to T16 about 50m from hard stand along downslope margin	Area of deeper peat in close proximity to concave break in slope and minor instability
13	Peat storage berms at T15	Minor signs of movement/distress. Where necessary the berm size is to be increased.
14	Peat storage berms at T17	Minor signs of movement/distress. Where necessary the berm size is to be increased.
15	Peat failure scar above road to T7	Upper scar of 12 November 2020 peat failure. Potential for retrogression of failure scar.
16	Peat failures at Borrow Pit between T5 and T6	Comprises 3 peat failures at this location. Monitoring at the head of each failure.
17	Peat failure at T12	Head of failure downslope of access road. Monitoring at the head of failure.
18	Instability at T5	Series of concentric tension cracks within the insitu peat
19	Instability at T16	Minor slumping of insitu peat
20	Ch.2630 on the north side of the S-bends on the approach road into the site	Stockpile caused a localised ground movement in the peat below the stockpile

Ref: Fehily Timoney Peat Stability Assessment of Meenbog wind farm Jan 2021

Appendix G Additional Peat Monitoring Locations

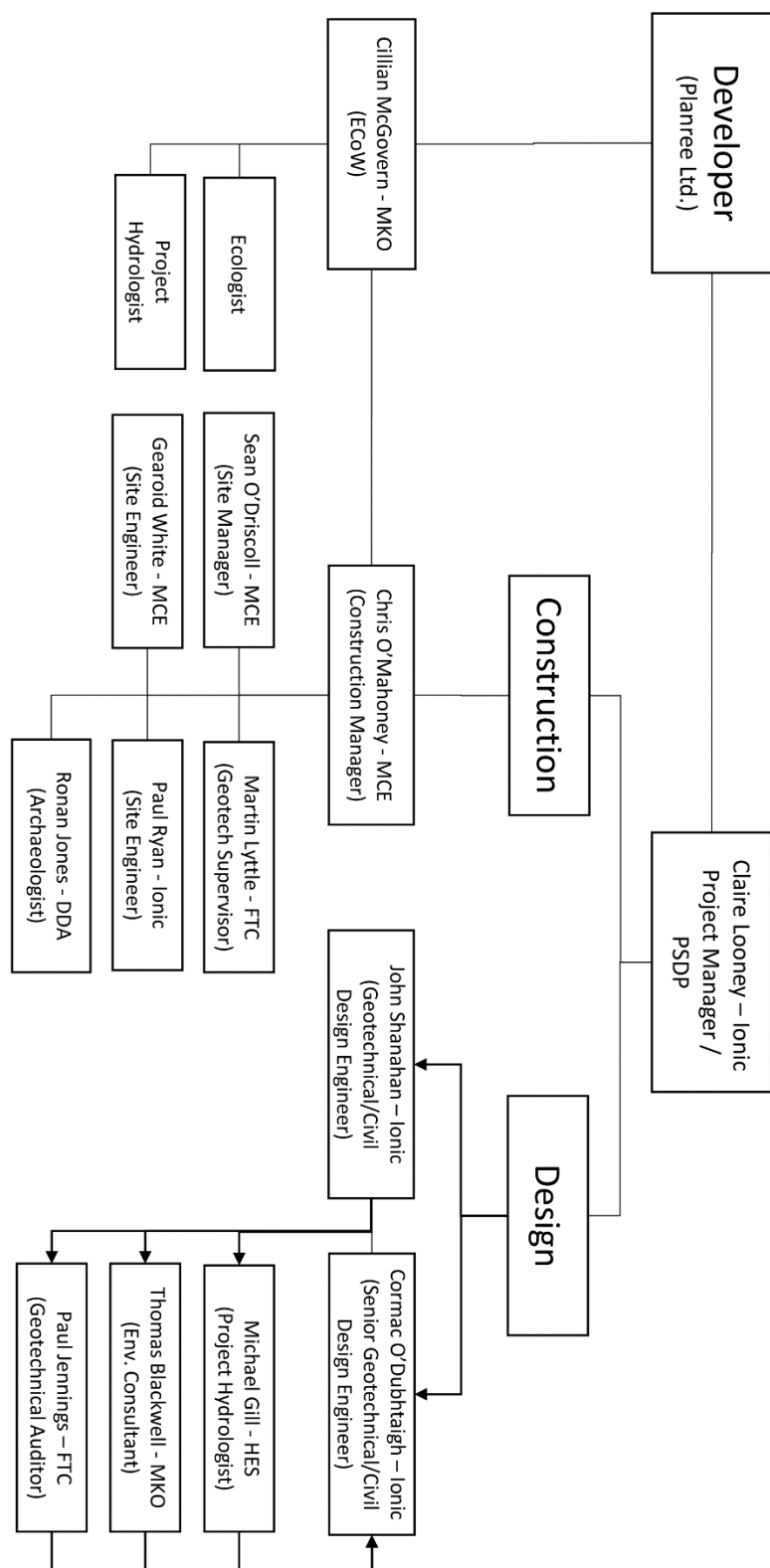


Additional Peat Monitoring Posts

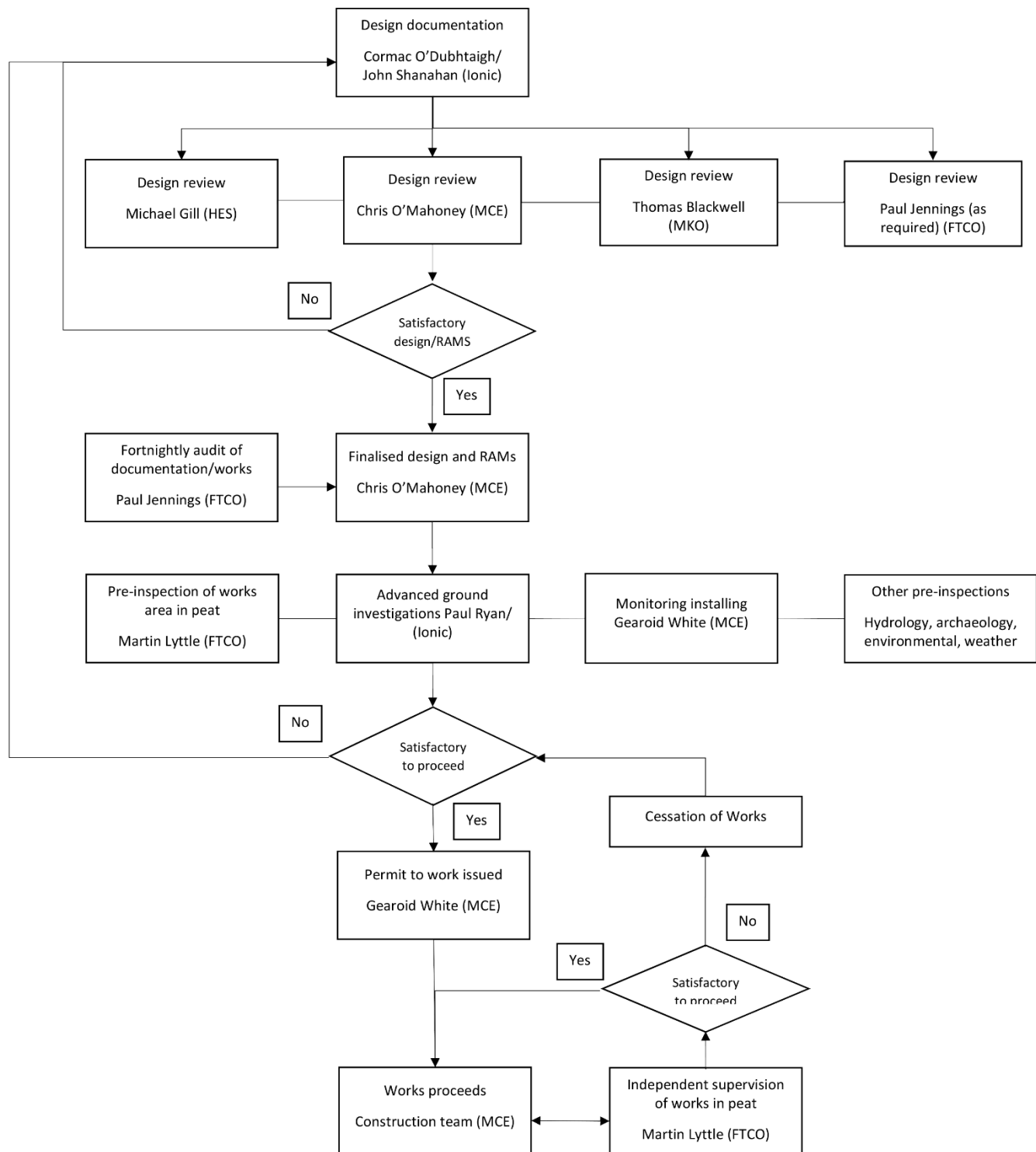
Note: Monitoring post locations are indicative. They will be adjusted to suit topography, ensuring adequate distance from active works zone.

Appendix H Project Organogram & Flow Chart

Organogram:



Design & Construction Flow Chart:



10.0 Risk Assessments

Assessing Level of Risk

		<u>Likelihood</u> →			
		0	1	2	3
<u>Severity</u> ↓	1		1	2	3
	2		2	4	6
	3		3	6	9

Likelihood			Severity		
1	=	Low	1	=	Slight
2	=	Medium	2	=	Serious
3	=	High	3	=	Major

Likelihood x Severity = Risk Rating

1 to 3	<u>Low</u>	<u>Work can proceed with control measure in place.</u>
4 to 6	<u>Medium</u>	<u>Work can proceed with control measures in place to reduce risk.</u>
7 to 9	<u>High</u>	<u>More control measures needed to reduce risk.</u>

Controls

Management must determine the controls required to eliminate or mitigate against the risks identified in the risk assessment. These controls must be consistent with the operational experience of employees and in accordance with the principles of prevention detailed below. They should also indicate any facility requirements and training needs. These controls are documented on the risk assessments.

Risk Matrix					 MCE Ltd.
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T4 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	

THIS RISK ASSESSMENT TAKES ACCOUNT OF THE FOLLOWING:

MCE SAFETY STATEMENT, MCE FULL SAFETY STATEMENTS HAZARD IDENTIFICATION & RISK ASSESSMENT, THE METHOD STATEMENT FOR THESE WORKS & THE PSCS CONSTRUCTION STAGE SAFETY PLAN.

Hazard: Peat Movement Risk: ➤ Slippage of peat ➤ Engulfment of personell or machinery ➤ Damage to the environment	2	3	6	➤ 14nr. peat monitoring stations installed ➤ Checked weekly. Stations in immediate vicinity checked daily. ➤ Works location probed and shear vaned – 50m grid outside of works area ➤ No works during periods of excessive rainfall see CEMP 5.2.2 ➤ No stockpiling of peat on top of in-situ material	2	1	2	- Site Supervisor (Foreman) - Site Operative
Hazard: Excavation / Trenches Risk: ➤ Falls. ➤ Entrapment. ➤ Suffocation. ➤ Crushing. ➤ Impact with machinery. ➤ Drowning. ➤ Electrocution. ➤ Serious bodily injury / fatality.	3	3	9	The Construction Regulations, 2013 must be complied with regarding all excavations. Verify ground conditions and soil type before excavating. No ground to be considered safe until investigated by a competent person. ➤ Schedule work so that excavations are not open for longer than necessary. ➤ Find, locate and mark all underground services. ➤ Organise suitable plant, equipment and required working space. ➤ Organise delivery and inspection of support materials / equipment.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T4 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
				➤ Provide appropriate protective clothing and equipment. ➤ Provide suitable barriers to protect against the fall of persons at work, materials or objects, including the inrush of water into the excavation. ➤ Provide adequate secured ladder and/or ramp access/egress to excavations. ➤ Most extracted spoil will be hauled away but any residual material will be stockpiled away from excavation edge at all times. ➤ Safe System of Work Plan should be completed for each task or a specific method statement completed and a new SSWP should be completed when the task or the environment changes. ➤ AF 3 to be completed as required by a competent person. ➤ Where there is a risk involved with a trench and/or an excavation, adequate precautions must be taken to protect against danger to persons at work from a fall or dislodgement of earth, rock, or peat, by suitable shoring or batter back edge to a safe angle of repose. ➤ If other methods are to be specified they must be selected based on the results of a risk assessment and a Temporary Works Design				

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T4 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
				Certificate will be prepared & issued. ➤ Appropriate precaution to be in place to protect the person carrying out the shoring				
Hazard: Movement & Use of Excavator Risk: ➤ Collisions. ➤ Overturning. ➤ Loss of Control. ➤ Risk of serious or fatal injury to the operator and bystanders in the vicinity due to Overturning. ➤ Collisions and loss of control or collision with other plant or vehicles.	3	3	9	➤ Excavators to be driven by trained, experienced operators, trained to CSCS level, as per the Construction Regulations, 2006. ➤ Driver to carry out weekly documented checks. ➤ Defects or suspected defects to be reported immediately to the Supervisor. ➤ Regular servicing and maintenance to be carried out and properly recorded. ➤ Warning signs to be posted at strategic locations to alert persons to the movements of excavators. ➤ Drivers of smaller vehicles must ensure that excavator drivers, when operating nearby, can see them. ➤ Where a workplace or a site road is close to an open edge, the edge must be clearly marked and lined with boulders and safety barriers. ➤ Site roads not to exceed a gradient of 1 in 5.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T4 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
				➤ Test certificates and form GA2 required for excavators used as lifting equipment.				
Hazard: Excavator – Various Risks Risk: ➤ Falls - Injury to driver entering or getting out of the cab ➤ Passengers ➤ Noise Partial /Total loss of hearing ➤ Dust ➤ Risk of serious ➤ Health damage from dust	2	3	6	➤ Hand and footholds to be fitted and maintained in good condition. ➤ Machine lights to be properly maintained. ➤ Carriage of passengers on any part of an excavator is not allowed. ➤ Machine to be stopped and switched off before any person including maintenance persons are permitted on the footsteps. ➤ Earmuffs to be provided and their wearing compulsory where noise levels reach 85Db or more. ➤ Cabs to be maintained to keep out dust. ➤ Proper masks to be provided and worn.	2	1	2	- Site Supervisor (Foreman) - Site Operative



MCE Ltd – T4 Road Upgrade

[illegible]

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T4 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
				➤ Workings must be designed so that gradients do not exceed 1 in 5. ➤ Safety warning signs are to be posted at strategic areas to alert persons to movements of dump trucks and other vehicles. ➤ Pedestrians told to ensure that they keep clear of dump trucks, wear high visibility clothing, and ensure that the driver can see them. ➤ No pedestrians may go under an open edge while a dump truck is in operation above. ➤ Persons driving small vehicles must ensure that the driver of dump trucks can see them. ➤ No persons to be carried on any part of a dump truck, unless there is provision in the cab and they are authorised to be carried. No riding permitted on the foot steps. ➤ Drivers cab must always be protected by an overhead shield built into the body of the truck. ➤ Driver to remain inside the cab at all times during loading. ➤ Hand and foot-holds must always be provided to aid safe ascent to/decent from the dump truck.				

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T4 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
Hazard: Tractor & Trailer Risk: ➤ Falls. ➤ Entrapment. ➤ Crushing. ➤ Impact with machinery. ➤ Serious bodily injury / Fatality. ➤ Collision.	3	3	9	➤ Wear hi-visibility vest and hardhat when working with moving equipment. ➤ Keep in operator's line of view. ➤ Don't travel on equipment. ➤ Watch out for objects nearby, particularly when reversing. ➤ Don't overload a trailer or stack it too high. Secure any loose loads. ➤ Use flashing amber beacon ➤ Trailer must be correctly attached to tractor (i.e safety chain, brakes and lights). ➤ Competent operators must only operate tractor. ➤ Tractors and trailers must be inspected before use.	3	1	3	- Site Supervisor (Foreman) - Site Operative
Hazard: Persons affected by the works Risk: ➤ Struck by site traffic. ➤ Fatalities ➤ Serious injuries	3	3	9	➤ Traffic Management Plans and Drawings are approved and made available. These plans will detail access routes both internal and external. ➤ All warning signs, cones with barriers are in place prior to the commencement of work on site. ➤ All signs will be clean and clearly visible. ➤ Once signs are in place the site access route will be assessed to ensure adequate visibility for drivers and pedestrians.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T4 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
				➤ All signs will be secure and weighted down where appropriate. ➤ All personnel onsite & on public roads will wear high visibility vests or jackets. . ➤ Contractor vehicles will be parked with consideration given to site traffic access.				
Hazard: Lifting Equipment Risk: ➤ Serious personal injury. ➤ Fatalities. ➤ Collision. ➤ Machine overturning. ➤ Material falling from height.	3	3	9	➤ The site management of MCE Ltd must ensure a competent person inspects the lifting equipment every 12 months and a GA1 is obtained. This must be available for inspection. ➤ Under the Construction Regulations, 2006 the lifting equipment must be inspected weekly by the operator and the results must be recorded on a GA2. ➤ A thorough visual inspection should take place before the driver operates the machine. ➤ The driver must be trained and competent to operate the machine (FAS CSCS standard or alternative excepted standard). ➤ All telescopic handlers/excavators must have safety devices fitted as per the Construction Regulations, 2006 S.I 504, Schedule 6, Regulation 87.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T4 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
Hazard: Noise created in the workplace - Rock Breaker Risk: ➤ Hearing impairment. ➤ Deafness. ➤ Tinnitus. ➤ Loss of concentration and annoyance leading to work ➤ place accidents and / or loss of production.	3	2	6	➤ MCE Ltd is aware that equipment such as consaws, angle grinders, etc. are over the 2nd Action Level and hearing protection must be worn. ➤ It is not anticipated that any member of our staff are exposed to such a dose that they will either daily or weekly require monitoring. ➤ Consult with staff and provide training where necessary. ➤ Signpost all excessively loud equipment, machinery, areas and processes which exceed the upper exposure action level of 85dB(A) and the lower exposure action level of 80dB(A). ➤ Reduce the worker exposure levels by reducing the amount of time spent near sources of excessive noise (job rotation). (Note: this should be considered as a last resort). ➤ Hearing protective equipment must be provided if deemed necessary, as per the Noise Regulations. ➤ Ensure hearing protection is worn for short-term noise exposures (this should also be a last resort). ➤ Remove other people from such noisy areas, unless their presence	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					 MCE Ltd.
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T4 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
				is required. They must wear hearing protection whilst in such areas.				
Hazard: Working in reduced light Risk: ➤ Fatalities ➤ Serious injury	3	3	9	➤ Working in diminished light is not permitted under the normal work rules. ➤ In cases where permission is granted so as enable MCE Ltd to remain in keeping with the project program or for special activities, concrete pours for turbine bases, etc and work in hours of reduced light is conducted, adequate lighting will be provided at all times. ➤ Any temporary work lighting will be erected with due regard to the visibility of plant operators and other traffic on site. This shall be the duty of MCE Ltd and any special arrangements will be documented in method statements, SSOW or traffic management plans. ➤ High visibility jackets are to be worn at all times regardless.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T4 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
Hazard: Lone Working Risk: ➤ Personal injury. ➤ Fatalities. ➤ Violence toward staff. ➤ Delay in treating medical emergencies.	3	2	6	➤ The company policy is that lone work is a last resort and must only be used for minor tasks. A system for communication with management must always be maintained. If lone working is required in keeping with the project programme it will be pursued under the following controls: ➤ The person must be trained & competent to carry out the tasks required. ➤ A means of communication must be available for the lone worker to contact foreman and the lone worker will be contacted at regular intervals during the anticipated work period. ➤ The lone worker must report he is leaving site to a designated person, this will be either the site manager or an appointed person. ➤ Periodic visits must be made to the lone worker, where possible. ➤ The lone worker must be furnished with the telephone numbers & emergency procedures information.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					 MCE Ltd.
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T4 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
Hazard: Roadworks Risk: ➤ Obstruction of Public. ➤ Injury to Public. ➤ Insufficient clearance between traffic routes. ➤ Collision. ➤ Accident or Bodily Injury.	3	3	9	➤ A Traffic Management Plan will be formulated for internal site roads. ➤ The main bulk of traffic will be generated with concrete pours and a traffic management plan will be created with concrete supplier and MCE Ltd. ➤ Communication will be maintained between MCE Ltd., and other civil contractors about traffic activities and all parties will be notified when pouring is taking place.	3	1	3	- Site Supervisor (Foreman) - Site Operative
Hazard: Fuel storage / refuelling Risk: ➤ Fire ➤ Burns ➤ Skin & Eye Irritant ➤ Dermatitis ➤ Environmental ➤ Slip / Fall	3	3	9	The risk of spilling fuel is at its greatest during refuelling of plant. To minimise this risk MCE Ltd will implement the following: this list is not exhaustive: ➤ Refuel will take place on a base away from drains or watercourses. ➤ A bunded bowser will be used. ➤ All refuelling and bulk deliveries will be are to be supervised. ➤ Check the available capacity in the tank before refuelling ➤ Check hoses and valves regularly for signs of wear ➤ Turn off valves after refuelling and lock them when not in use ➤ Position drip trays under pumps to catch minor spills	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix				
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS
Low	1	Slight	1	LOW = 1 - 3
Medium	2	Serious	2	MED = 4 - 6
High	3	Major	3	HIGH = 7 - 9



MCE Ltd.

MCE Ltd – T4 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
				➤ Keep a spill kit with sand, earth or commercial products for containment of spillages.				
Hazard: Public accessibility to work area on site. Risk: ➤ Serious personal injury. ➤ Fatality. ➤ Slips, trips, fall over goods, materials, rough terrain. ➤ Electrocution. ➤ Theft.	3	3	9	➤ Warning signs must be posted to highlight the dangers involved in entering work area, where MCE Ltd are responsible for site conditions e.g. turbine bases. ➤ All access points to work areas to be closed / barricaded to prevent access to unauthorised persons. ➤ Entrances must be fully secured each evening / end of each work shift. ➤ Only authorised personnel are allowed on site. Signs must be erected re same. ➤ A responsible person must check site boundaries on a regular basis.	3	1	3	- Site Supervisor (Foreman) - Site Operative
Hazard: Visitors Risk: ➤ Personal Injury ➤ Property damage ➤ Cuts	3	3	9	➤ All visitors must report to an employee or authorised person of MCE Ltd before entering the premises or area where we work. ➤ Those making deliveries must report to site office.	3	1	3	- Site Supervisor (Foreman)

Risk Matrix					 MCE Ltd.
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T4 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
➤ Puncture ➤ Entanglement ➤ Eye Injuries ➤ Electrocutation				➤ No visitor to the premises is allowed to use company equipment without permission of the company staff and instruction on its use. ➤ Each visitor is requested to abide by the Company Safety Policy and Regulations laid down therein. ➤ They must also abide by a request by a company employee in relation to their own Safety and Health and that of the company employees. ➤ In the event of an emergency or evacuation, all visitors must report to our designated Assembly Point in car park				- Site Operative
Hazard: Contractors Risk: Serious personal injury.	3	3	9	➤ We will monitor the ongoing activities of all sub contractors to MCE Ltd on our projects. ➤ Induction training must be provided for Contractors, their staff and all others on site. ➤ Presentation of Site Safety Plan by Sub-Contractor to the Supervisor. ➤ A Method Statement must be prepared for each necessary job by the Contractor and Sub-Contractors.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T4 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
Hazard: First Aid Equipment. Risk: ➤ Worsening of condition. ➤ Onset of infection. ➤ Fatality. ➤ Permanent injury / illness.	3	3	9	➤ Adequate first aid kits to be provided and filled to HSA guidelines. ➤ They must be regularly checked and refilled by a designated person.	3	1	3	- Site Supervisor (Foreman) - Site Operative
Hazard: Lack / Absence of First Aiders Risk: ➤ Improper diagnosis ➤ Improper treatment ➤ Delay in seeking professional medical help. ➤ Worsening of condition. ➤ Onset of infection. ➤ Fatality. ➤ Permanent injury / illness.	3	3	9	➤ Sean O'Driscoll and Chris Murnane are trained first aiders ➤ Arrangements to be in place with local doctor for emergencies. ➤ All employees to be aware of emergency procedures.	3	1	3	- Site Supervisor (Foreman) - Site Operative
Hazard: Personal Protective Equipment (P.P.E.) Risk: ➤ Impact from flying particles. ➤ Head injury. ➤ Foot injury. ➤ Falls from height.	2	3	6	➤ All necessary Personal Protective Equipment to be provided and used. ➤ Safety Signs to be put up to highlight this requirement. ➤ COMPULSARY SITE P.P.E.: ○ Hard hat. ○ High visibility clothing. ○ Safety boots / shoes.	2	1	2	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T4 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
➤ Burns or skin irritation etc.								
Hazard: Manual Handling Risk: ➤ Back. ➤ Neck. ➤ Shoulder Injury. ➤ Prolapsed Disk. ➤ Permanent Injury. ➤ Trip / Fall. ➤ Hit Against. ➤ Dropped Object.	3	2	6	➤ All MCE Ltd staff and subcontractors employees must be trained in Manual Handling. ➤ In Accordance with the General Application Regulations 2007, No 69, an employer must ensure that he/she takes appropriate organisational measures, or use the appropriate means, in particular mechanical equipment, to avoid the need for the manual handling of loads. ➤ Minimise all manual-handling tasks where possible. ➤ Provide suitable mechanical handling equipment Ensure these are used. ➤ Provide Manual Handling training to all staff whom have not received it. ➤ Personal Protective Equipment including gloves to be provided and used.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T4 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
Hazard: Poor Hand Hygiene Risk: ➤ Skin complaints. ➤ Dermatitis. ➤ Eczema. ➤ Ingestion of chemicals. ➤ Biological agents: • toxins, • bacteria and • viruses.	2	2	4	➤ Good hand hygiene is essential in the workplace. The hands are the most likely part of the body to come into contact with harmful substances. ➤ Wash hands before eating or smoking. ➤ Suitable gloves should be worn when handling potentially hazardous materials. ➤ Dirty hands should be cleaned using proper skin cleansing products. ➤ Do not clean hands with petrol, white spirits, thinners, turpentine etc. ➤ Always ensure you wash your hands after visiting the toilet.	2	1	2	- Site Supervisor (Foreman) - Site Operative
Hazard: Animals • Rats /mice. • Wasps /bees. • Small animals. • Dogs. Risk: ➤ Leptospirosis(Weil's Disease) ➤ Stings. ➤ Histoplasmosis (droppings) ➤ Fall from height. ➤ Sudden 'fright'.	2	2	4	➤ When working near water or where rats have been seen, care is to be taken to disinfect all cuts and cover them with waterproof plasters. ➤ Be aware that sudden movements of birds or small animals can cause a reflex action in the operator, which may overbalance them. ➤ Check for signs of nests, birds or other small animals. ➤ Practice caution if dogs are present.	2	1	2	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T4 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
➤ Bites.								
Hazard: Weather ➤ Sun ➤ Wind ➤ Rain ➤ Ice / snow Risk: ➤ Sun burn. ➤ Sunstroke. ➤ Skin cancer. ➤ Fall from height. ➤ Slip / fall. ➤ Bodily injury. ➤ Hit by object. ➤ Hypothermia.	2	2	4	➤ In sunny weather, cover the back of the neck and keep a shirt on at all times. ➤ Avoid sunburn and sun stroke where possible by keeping covered and wearing a high factor sun block. ➤ Be aware that strong winds or gusts can overbalance an operator. ➤ Don't work in heavy rain unless adequately protected. ➤ Be prepared for slippery conditions in icy weather. Salt or grit should be used where necessary.	2	1	2	- Site Supervisor (Foreman) - Site Operative
Hazard: Working near Water Risk: ➤ Drowning: ➤ Public and Workers	3	2	6	➤ Fencing and warning signs to be in place around deep water. ➤ Workers must operate in pairs at all times. ➤ Where necessary, suitable lifebuoys to be available in case of emergency and checked regularly.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T4 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
Hazard: Portable Electricity Generator Risk: ➤ Fire. ➤ Burns. ➤ Re-fuelling. ➤ Electrocution. ➤ Bodily injury. ➤ Back injury. ➤ Trip / fall.	3	3	9	➤ Store in a dry position and away from pedestrian routes. ➤ Fill petrol tank when the generator is cold. ➤ Avoid spillages when re-fuelling. Clean up any overspill immediately. ➤ Move fuel can a safe distance away. ➤ Ensure filler cap is securely replaced. ➤ To be operated by trained personnel only. ➤ To be maintained in good condition. ➤ Always inspect before use (i.e. oil / petrol level, electric connections not broken).	3	1	3	- Site Supervisor (Foreman) - Site Operative
Hazard: Abrasive Wheels, Consaws and Angle Grinders Risk: ➤ Wheels shattering at high speed. ➤ Serious facial / head injury. ➤ Cuts / wounds to hands, arms, upper body. ➤ Eye injury. ➤ Fire / explosion. ➤ Electric shock.	3	3	9	➤ Training must be provided as per the Abrasive Wheels Regulations, 1982 by MCE Ltd. ➤ Only trained and authorised personnel must be allowed to use abrasive wheels. ➤ The operator must carry out daily inspection. ➤ Guards must be in place at all times, when machine is being used. ➤ If electrically powered use 110v equipment only.	3	1	3	- Site Supervisor (Foreman) - Site Operative

Risk Matrix						
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS		
Low	1	Slight	1	LOW = 1 - 3		
Medium	2	Serious	2	MED = 4 - 6		
High	3	Major	3	HIGH = 7 - 9		

MCE Ltd – T4 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
➤ Hand Arm Vibration Syndrome – white finger. ➤ Respiratory problems. ➤ Injury to bystanders.				➤ Store petrol for consaw in correct approved containers. ➤ Always refuel away from the work area. ➤ Do not use consaw close to other people. ➤ Correct Personal Protective Equipment must be worn at all times. (Gloves, ear protection, eye protection and steel toe capped boots). ➤ Inspect work area for all dangers prior to using abrasive wheels. ➤ A hot work permit may be required from management/site foreman. ➤ Use correct discs. Store them safely when not in use. ➤ Turn off consaws and unplug grinders when not in use.				
<i>“I understand the above method statement, risk assessment and the control measures and will undertake to carry out my work safely and in accordance with the control measures. I have been given the opportunity to raise any concerns that I may have and I realize that I can do this at anytime”.</i> Safe working is a condition of employment								
Print Name	Signature				Date			
1.								
2.								
3.								
4.								

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T4 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
5.								
6.								
7.								
8.								
9.								
10.								
11.								
12.								
13.								
14.								
15.								
16.								
17.								
18.								
<i>“I understand the above method statement, risk assessment and the control measures and will undertake to carry out my work safely and in accordance with the control measures. I have been given the opportunity to raise any concerns that I may have and I realize that I can do this at anytime”.</i> Safe working is a condition of employment								
Print Name	Signature				Date			
19.								
20.								
21.								
22.								
23.								

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T4 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
24.								
25.								
26.								
27.								
28.								
29.								
30.								
31.								
32.								
33.								
34.								
35.								
36.								
37.								
38.								
39.								
40.								
41.								
42.								
43.								
44.								
45.								
46.								

Risk Matrix					
Likelihood of accident (L)		Severity of injury (S)		Risk = LXS	
Low	1	Slight	1	LOW = 1 - 3	
Medium	2	Serious	2	MED = 4 - 6	
High	3	Major	3	HIGH = 7 - 9	

MCE Ltd – T4 Road Upgrade

HAZARD / RISK	Before control measures			ACTIONS TO CONTROL RISKS	After control measures			RESPONSIBILITY
	S	L	Risk		S	L	Risk	
47.								
48.								
49.								
50.								
51.								
52.								
53.								
54.								
55.								
56.								
57.								
58.								
59.								

Appendix 3 - Sample Peat Monitoring Checksheets:

- Peat monitoring posts - Checksheet 30-3-2021
- Peat monitoring posts - Checksheet 07-4-2021
- Peat monitoring posts - Checksheet 09-4-2021
- Peat monitoring posts - Checksheet 14-4-2021

PEAT MONITORING POSTS - CHECKSHEET
(MEENBOG WIND FARM)

Date:	30/03/2021
-------	------------

Line of Sight Posts Location no.	Location Ref	Movement Noted (Y/N)	Comment (If posts have moved, note approx amount of post movement / other relevant info)
#1	T1	N	Heavy rainfall on 28-3-21 & 29-3-21, no effect on peat stability, works suspended on site on 29-3-21
#2	T3	N	
#3	T2	N	
#4	T4	N	
#5	T5	N	
#6	T7	N	
#7	T7b	N	
#8	T7c	N	
#9	T10	N	
#10	T14	N	
#11	T18	N	
#12	T16	N	
#13	T15	N	
#14	T17	N	

Signed: 

NOTE: Photo of each set of posts to be taken & sent to mark.cobbe@ionicconsulting.ie for records

PEAT MONITORING POSTS - CHECKSHEET
(MEENBOG WIND FARM)

Date:	07/04/2021
-------	------------

Line of Sight Posts Location no.	Location Ref	Movement Noted (Y/N)	Comment (If posts have moved, note approx amount of post movement / other relevant info)
#1	T1	N	
#2	T3	N	
#3	T2	N	
#4	T4	N	
#5	T5	N	
#6	T7	N	
#7	T7b	N	
#8	T7c	N	
#9	T10	N	
#10	T14	N	
#11	T18	N	
#12	T16	N	
#13	T15	N	
#14	T17	N	

Signed: 

NOTE: Photo of each set of posts to be taken & sent to mark.cobbe@ionicconsulting.ie for records

PEAT MONITORING POSTS - CHECKSHEET
(MEENBOG WIND FARM)

Date: 09/04/2021

Line of Sight Posts Location no.	Location Ref	Movement Noted (Y/N)	Comment (If posts have moved, note approx amount of post movement / other relevant info)
#1	T1	N	Heavy rainfall on 08-04-2021, no effect on peat stability
#2	T3	N	
#3	T2	N	
#4	T4	N	
#5	T5	N	
#6	T7	N	
#7	T7b	N	
#8	T7c	N	
#9	T10	N	
#10	T14	N	
#11	T18	N	
#12	T16	N	
#13	T15	N	
#14	T17	N	

Signed: _____



NOTE: Photo of each set of posts to be taken & sent to mark.cobbe@ionicconsulting.ie for records

PEAT MONITORING POSTS - CHECKSHEET
(MEENBOG WIND FARM)

Date:	14/04/2021
-------	------------

Line of Sight Posts Location no.	Location Ref	Movement Noted (Y/N)	Comment (If posts have moved, note approx amount of post movement / other relevant info)
#1	T1	N	Low rainfall at all locations over previous days
#2	T3	N	
#3	T2	N	
#4	T4	N	
#5	T5	N	
#6	T7	N	
#7	T7b	N	
#8	T7c	N	
#9	T10	N	
#10	T14	N	
#11	T18	N	
#12	T16	N	
#13	T15	N	
#14	T17	N	

Signed: _____



NOTE: Photo of each set of posts to be taken & sent to mark.cobbe@ionicconsulting.ie for records

Appendix 4 - Sample Daily Works Inspection Sheet:

Daily Works Record		
Works Location:		
Date:	Time:	
Contractor to undertake work:		
Persons involved/supervisor:		
Pre Works-Inspection		
Primary Checks	Yes	No
Has the forecast been checked and is the weather acceptable?		
Have the pre-works ground investigations been completed?		
Have pest monitoring points been checked and noted?		
Is the ECOW aware of the works?		
Is there a plan in place to stop works should conditions deteriorate?		
Are there adequate environmental protections in place?		
Is specific PPE required?		
Notes on inspection of ground conditions including morphology, vegetation cover, drainage, proximity of drains and natural watercourses:		

Photographs to be uploaded to eShare weekly.

Page 1 of 2

Post Works-Inspection		
Have there been any excess pest movements?	Yes	No
Has the works area been made safe?		
Have there been any environmental impacts from works?		
Is the ECOW aware of the works completion?		
Has it been necessary to cease works?		
Have photographs been taken during works and on completion?		
Authorisation and Acceptance		
I confirm that the above information is correct and I have done as much as is reasonably practicable to ensure works are undertaken safely and successfully.		
Company:	Date	Time
Signature:		

Photographs to be uploaded to eShare weekly.

Page 2 of 2

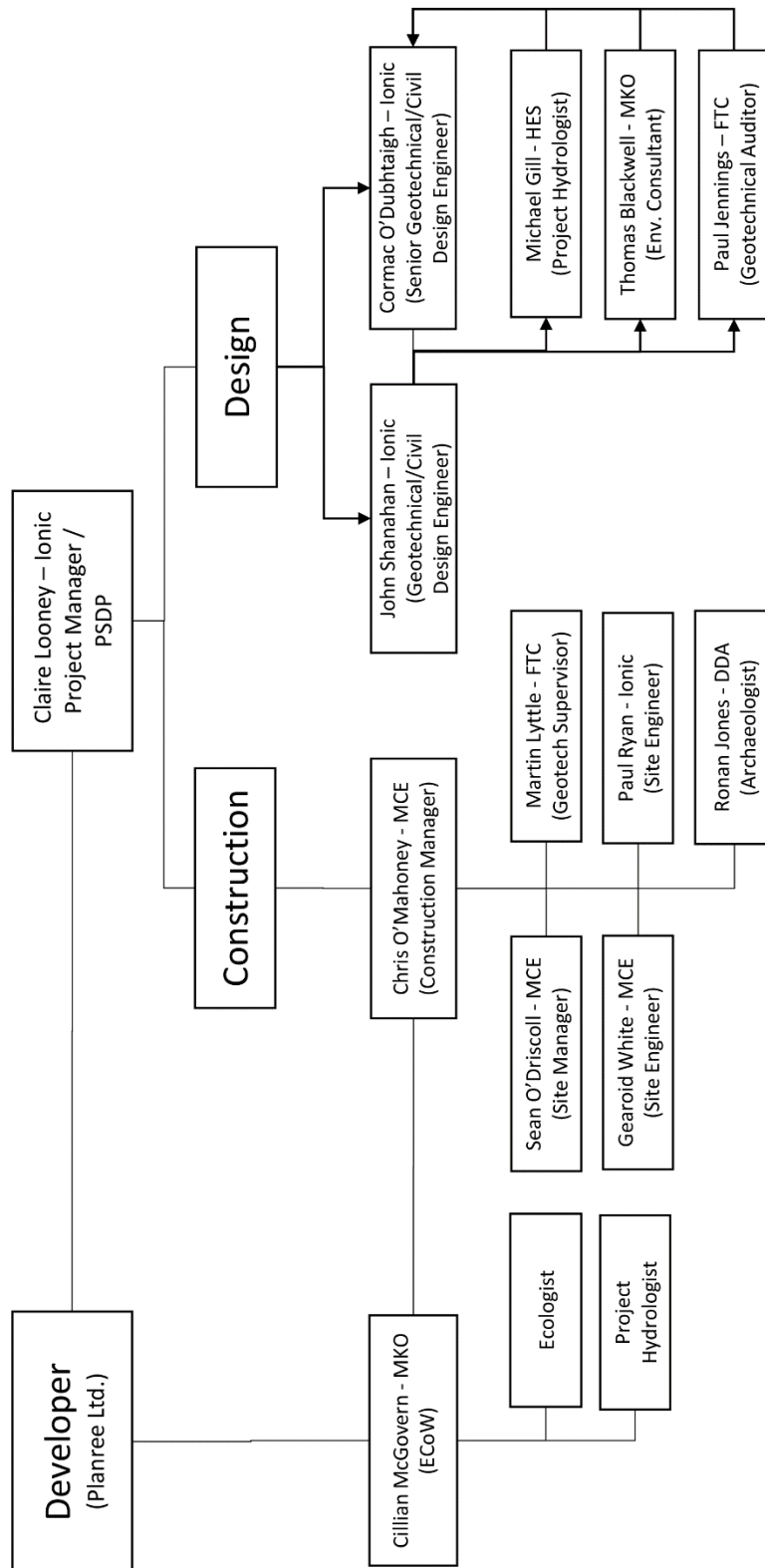
Appendix 5 - Sample Permit to Work:

Excavation Permit to Work		
Site:	PTW No.	
Precise Location:	Issue date/duration:	
Contractor to undertake work:		
Persons involved/supervisor:		
Equipment to be used:		
Hazard Identification		
Primary Hazards	Yes	No
Are you qualified/competent to undertake works?		
Have you signed on to relevant RAMS?		
Have you been briefed on the specific risks in your works area?		
Are you aware of the emergency procedures in the event of an accident/incident?		
Has the area been checked for overhead lines or underground services where applicable?		
Are there adequate environmental protections in place?		
Is there safe access/egress to the works area?		
Is specific PPE required?		
Are excavation protection measures available?		
Has site supervisor briefed you on your specific tasks?		
Comment on any additional hazards and controls		

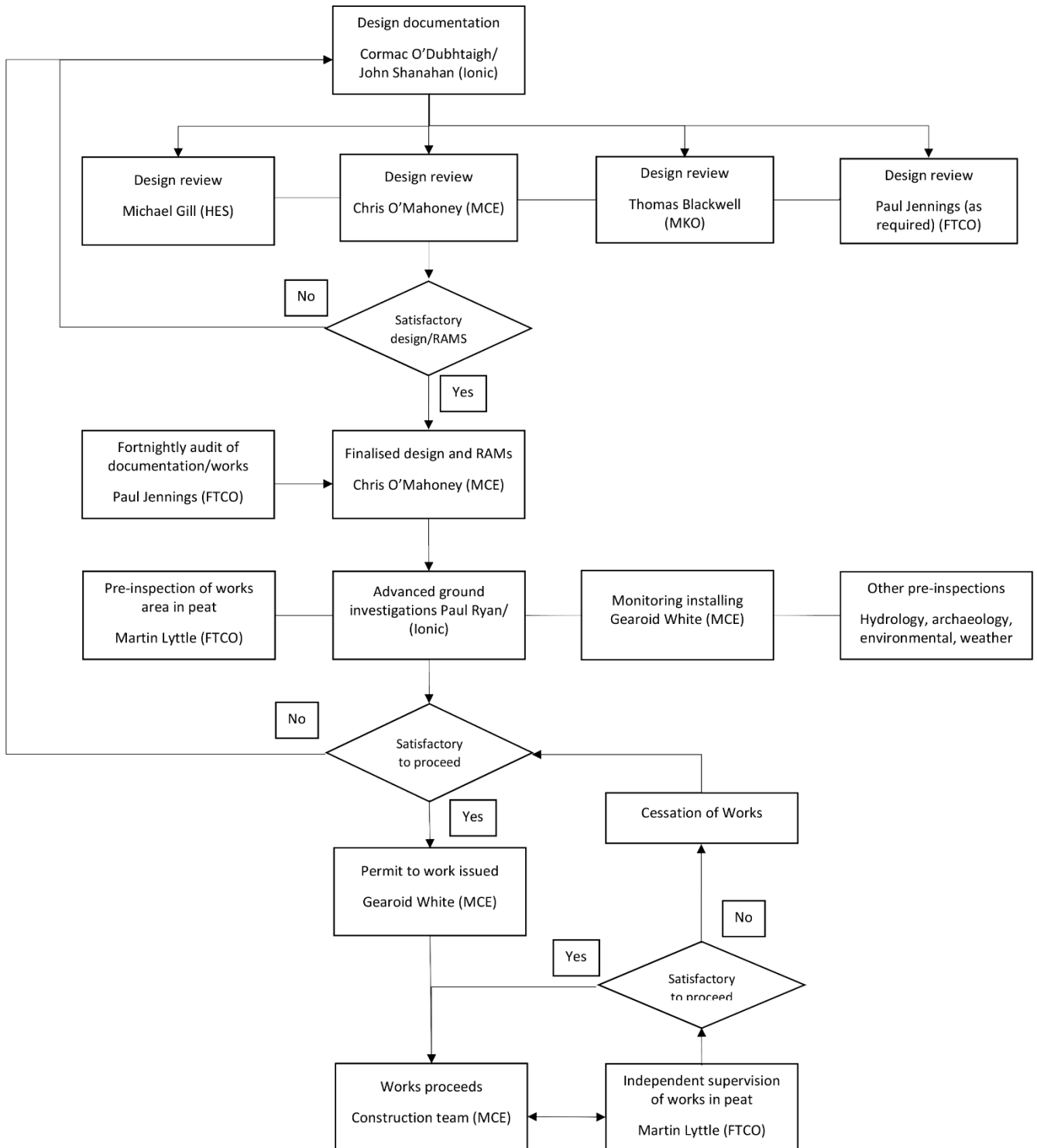
Authorization and Acceptance			
I confirm that the above information is correct and I have done as much as is reasonably practicable to ensure works are undertaken safely and successfully. I commit to explaining this permit and its requirements to all workers involved and accept responsibility for the works described herein			
Person Authorizing PTW:			
Company:	Date	Time	
Signature:			
Person Accepting PTW:			
Company:	Date	Time	
Signature:			
Hand back and Cancellation			
I confirm that work has been completed/partially completed, checked by myself and the area left safe and in a tidy condition			
Person in Charge	Signature	Date	Time
Issuing person			

Appendix 6 – Meenbog Organogram & Flow Chart:

Organogram:



Design & Construction Flow Chart:



Outline of Roles/Responsibilities

This section outlines the updated roles and responsibilities of the construction team to ensure that the remaining works are completed in accordance with the mitigation measures and recommendations in the peat stability assessment report.

Claire Looney (Ionic)

Project Manager and PSDP. Claire is the Project Manager for the windfarm as appointed by the developer Planree Ltd. Her responsibilities include scoping the project and managing the execution of this scope until all construction works are complete. She also acts as PSDP and therefore has responsibility for the coordination of designs and must ensure a communication channel is open between all designers and constructors in an orderly and controlled manner. Her responsibilities further extend to the communication and coordination of all main contractors and PSCS, escalation of all issues to the developer and other authorities as required and acting as the Engineer under the contracts.

Construction Manager (MCE)

The MCE Construction Manager for the site is Chris O'Mahony, supported by Sean O'Driscoll, Site Manager and Gearoid White, Site Engineer. The construction manager has responsibility for the organisation and execution of elements of construction including environmental and health & Safety requirements. He is responsible for the preparation of appropriate RAMS for all works to the satisfaction of the design team and the full implementation of the RAMS during construction.

Cormac O'Dubhthigh & John Shanahan (Ionic)

Cormac O'Dubhthigh is the Senior Geotechnical/ civil design engineer supported by John Shanahan, Geotechnical/ civil design engineer. They are responsible for assessment of peat and providing appropriate civil design for approval by the entire design team prior to finalising the design and proceeding to construction. They also fulfil a supervisory/ advisory role with a site visit at least once per week during works in peat and will remain available to the contractor as required throughout the construction of the development. They will be responsible for verifying the stability of the site infrastructure prior to and during the erection of the wind turbines.

Paul Ryan (Ionic)

Paul Ryan is the Ionic Site Engineer and is responsible for surveying and site testing as required by the consultant engineers and site management. He will assess current status versus previous investigative data on each section of proposed works areas and discuss the results with Martin Lyttle (FT), Ionic and MCE management.

Paul Jennings (FTCO)

Reviews RAMS where required. Conducts periodic audits of project documentation and site activities.

Martin Lyttle (FTCO)

Martin Lyttle will be present during construction works in peat. His responsibility will include assessing zone of influence prior to works commencing and to observe ongoing works. He will have the authority to halt works where there is the potential for peat instability.

Hydro Environmental Services (HES)

HES are the project hydrologists, led by Michael Gill. HES are part of the design team and provide the detailed drainage design for the construction phase of the project, while also supporting the ECoW in monitoring, overseeing and auditing the effective implementation of the detailed drainage design on site. The Project Hydrologist will not be full time on site but will be required to visit as necessary to oversee the implementation of their drainage design.

Thomas Blackwell (MKO)

Thomas Blackwell is the MKO environmental consultant appointed to co-ordinate MKO inputs on the project, including review design documents from an environmental perspective.

Killian McGovern (MKO)

MKO are the appointed Environmental Clerk of Works (ECoW), the ECoW role is fulfilled by Killian McGovern. The ECoW works closely with the Construction Manager in relation to the contractor's day-to-day implementation of the CEMP. He undertakes environmental monitoring, inspections and reviews to audit that the works are carried out in compliance with the CEMP and ensures the necessary environmental records are maintained throughout the construction period. He also coordinates the required inputs and site visits from the Project Ecologist or Project Hydrologist etc. as required.

Project Ecologist (MKO)

MKO are the Project Ecologist, led by Pat Roberts. MKO ecologists will be available to support the ECoW on matters relating to the protection of sensitive habitats and species encountered prior to or during the construction phase of the wind farm. The Project Ecologist will not be full time on site but will undertake pre-commencement surveys and visit the site as required.

Archaeologist (DDA)

Dominic Delany and Associates are the project archaeologists, represented on site by Ronan Jones. The archaeologist monitors all ground works at the construction phase of development to avoid any potential direct or indirect impacts on sub-surface archaeological finds, features or deposits which may exist on the site.

Project Ecologist (MKO)

MKO are the Project Ecologist, led by Pat Roberts. MKO ecologists will be available to support the ECoW on matters relating to the protection of sensitive habitats and species encountered prior to or during the construction phase of the wind farm. The Project Ecologist will not be full time on site but will undertake pre-commencement surveys and visit the site as required.

Appendix 7 - Records & Correspondence:

- Email Correspondence of rainfall records
- Email Correspondence evidencing stop works instruction from ECOW for rainfall totals

Mark Cobbe

From: Conor McGettigan <conor@hydroenvironmental.ie>
Sent: 21 May 2021 09:51
To: Michael Gill; Christopher O'Mahony
Cc: Stephen Corrigan; Killian McGovern; Mark Cobbe; Thomas Blackwell; michaelmurnane@turnkeydev.com
Subject: Re: Meenbog WF - rainfall totals

All,

Date	Daily rainfall (mm)
20/05/2021	15.4
21/05/2021	2.2 total until 8.30am this morning

Kind Regards
Conor McGettigan – HES
058-44122 / 086-2457718

From: Michael Gill <michael@hydroenvironmental.ie>
Sent: 20 May 2021 09:45
To: Christopher O'Mahony <christopher.omahony@turnkeydev.com>; Conor McGettigan <conor@hydroenvironmental.ie>
Cc: Stephen Corrigan <scorrigan@mkoireland.ie>; Killian McGovern <kmcgovern@mkoireland.ie>; Mark Cobbe <mark.cobbe@ionicconsulting.ie>; Thomas Blackwell <tblackwell@mkoireland.ie>; michaelmurnane@turnkeydev.com <michaelmurnane@turnkeydev.com>
Subject: Meenbog WF - rainfall totals

All,
See below. These are all the daily rainfall totals to date, including a plot of same.
In response to recent requests for data transfer, Conor or I will provide a daily update by email of the daily total for the preceding day, and accumulated total for the current day each morning around this time (if we are not on site somewhere, but you will get the WhatsApp message anyway). The spreadsheet updates are purely for audit purposes.

I trust this is in order, if anyway requires the data in any other form then please let me know.

Date	Daily rainfall (mm)
19/05/2021	2.2
20/05/2021	5.6 total till 8.30am this morning

(Highlighted is an example of what you will get each morning going forward).

All data to date (for your records)

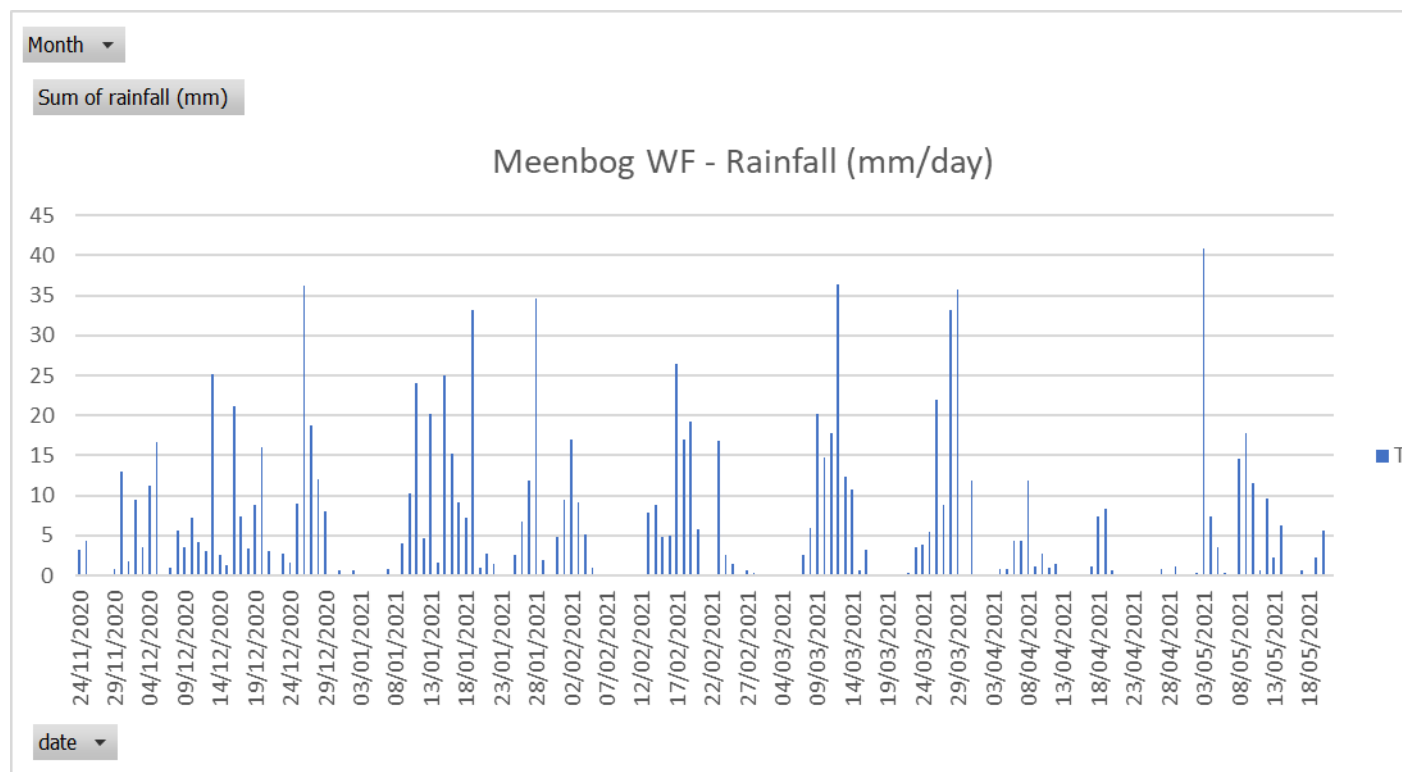
24/11/2020	3.2
25/11/2020	4.4
26/11/2020	0.2
27/11/2020	0
28/11/2020	0.2
29/11/2020	0.8

30/11/2020	13
01/12/2020	1.8
02/12/2020	9.4
03/12/2020	3.6
04/12/2020	11.2
05/12/2020	16.6
06/12/2020	0.2
07/12/2020	1
08/12/2020	5.6
09/12/2020	3.6
10/12/2020	7.25
11/12/2020	4.25
12/12/2020	3
13/12/2020	25.25
14/12/2020	2.5
15/12/2020	1.25
16/12/2020	21.2
17/12/2020	7.4
18/12/2020	3.4
19/12/2020	8.8
20/12/2020	16
21/12/2020	3
22/12/2020	0.2
23/12/2020	2.8
24/12/2020	1.6
25/12/2020	9
26/12/2020	36.2
27/12/2020	18.8
28/12/2020	12
29/12/2020	8
30/12/2020	0
31/12/2020	0.6
01/01/2021	0.2
02/01/2021	0.6
03/01/2021	0.2
04/01/2021	0.2
05/01/2021	0.2
06/01/2021	0
07/01/2021	0.8
08/01/2021	0.2
09/01/2021	4
10/01/2021	10.2
11/01/2021	24
12/01/2021	4.6
13/01/2021	20.2
14/01/2021	1.6
15/01/2021	25
16/01/2021	15.2
17/01/2021	9.2
18/01/2021	7.2
19/01/2021	33.2
20/01/2021	1
21/01/2021	2.8
22/01/2021	1.4
23/01/2021	0
24/01/2021	0

25/01/2021	2.6
26/01/2021	6.8
27/01/2021	11.8
28/01/2021	34.6
29/01/2021	2
30/01/2021	0
31/01/2021	4.8
01/02/2021	9.4
02/02/2021	17
03/02/2021	9.2
04/02/2021	5.2
05/02/2021	1
06/02/2021	0
07/02/2021	0
08/02/2021	0
09/02/2021	0
10/02/2021	0
11/02/2021	0
12/02/2021	0
13/02/2021	7.8
14/02/2021	8.8
15/02/2021	4.8
16/02/2021	5
17/02/2021	26.4
18/02/2021	17
19/02/2021	19.2
20/02/2021	5.8
21/02/2021	0.2
22/02/2021	0.2
23/02/2021	16.8
24/02/2021	2.6
25/02/2021	1.4
26/02/2021	0
27/02/2021	0.6
28/02/2021	0.4
01/03/2021	0
02/03/2021	0.2
03/03/2021	0
04/03/2021	0.2
05/03/2021	0
06/03/2021	0
07/03/2021	2.6
08/03/2021	6
09/03/2021	20.2
10/03/2021	14.8
11/03/2021	17.8
12/03/2021	36.4
13/03/2021	12.4
14/03/2021	10.8
15/03/2021	0.6
16/03/2021	3.2
17/03/2021	0
18/03/2021	0
19/03/2021	0
20/03/2021	0
21/03/2021	0.2

22/03/2021	0.4
23/03/2021	3.6
24/03/2021	3.8
25/03/2021	5.4
26/03/2021	22
27/03/2021	8.8
28/03/2021	33.2
29/03/2021	35.8
30/03/2021	0
31/03/2021	11.8
01/04/2021	0
02/04/2021	0.2
03/04/2021	0
04/04/2021	0.8
05/04/2021	0.8
06/04/2021	4.4
07/04/2021	4.4
08/04/2021	11.8
09/04/2021	1.2
10/04/2021	2.8
11/04/2021	1
12/04/2021	1.4
13/04/2021	0
14/04/2021	0
15/04/2021	0
16/04/2021	0
17/04/2021	1.2
18/04/2021	7.4
19/04/2021	8.4
20/04/2021	0.6
21/04/2021	0
22/04/2021	0
23/04/2021	0
24/04/2021	0
25/04/2021	0
26/04/2021	0
27/04/2021	0.8
28/04/2021	0
29/04/2021	1.2
30/04/2021	0
01/05/2021	0.2
02/05/2021	0.4
03/05/2021	40.8
04/05/2021	7.4
05/05/2021	3.6
06/05/2021	0.4
07/05/2021	0
08/05/2021	14.6
09/05/2021	17.8
10/05/2021	11.6
11/05/2021	0.6
12/05/2021	9.6
13/05/2021	2.2
14/05/2021	6.2
15/05/2021	0.2
16/05/2021	0

17/05/2021	0.6	
18/05/2021	0	
19/05/2021	2.2	
20/05/2021	5.6	total till 8.30am this morning



Mark Cobbe

From: Stephen Corrigan <scorrigan@mkoireland.ie>
Sent: 29 March 2021 10:36
To: Thomas Blackwell; Christopher O'Mahony; Garry Mangan; Darren Gallagher; bothar; 'geoffreysheridan01@gmail.com'; G White
Cc: Michael Murnane; Michael Watson; Claire Looney; Mark Cobbe; Brian Keville; Michael Watson; Owen Cahill; Killian McGovern
Subject: 190501 - Meenbog Windfarm Co.Donegal - Heavy Rainfall Event - Temporary Halt of Works - 29/03/21

Hi all,

Due to 55mm of rainfall recorded in the past 24 hours on Meenbog Windfarm Co.Donegal and the continued heavy rainfall today I am recommending a halt of all ground works on site. Please contact me if you have any questions.

Best Regards,

Stephen Corrigan.



Stephen Corrigan
Environmental Scientist

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Ireland, H91 VW84
+353 (0) 91 735611
www.mkoireland.ie



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