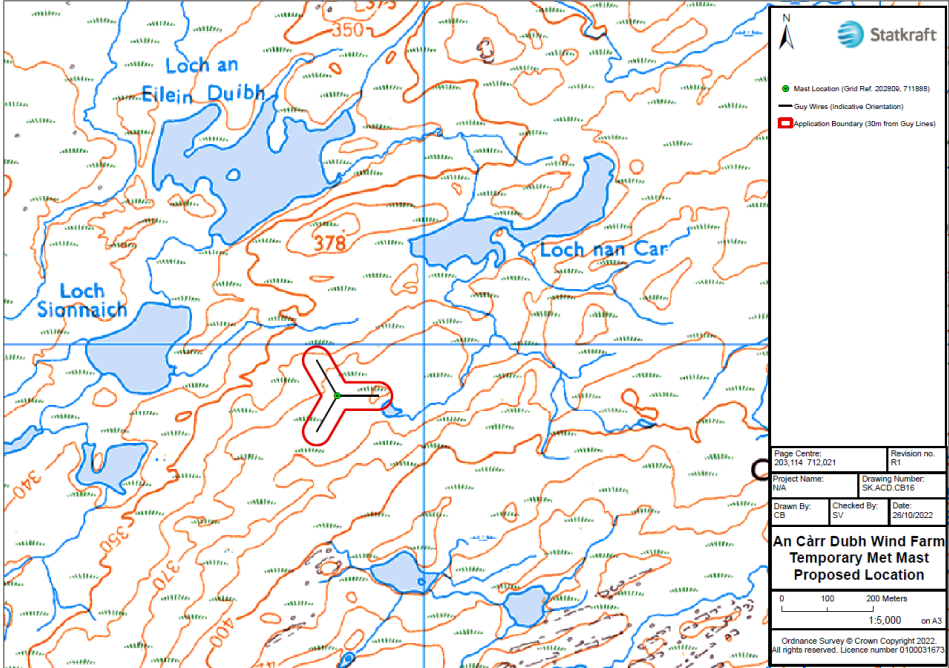


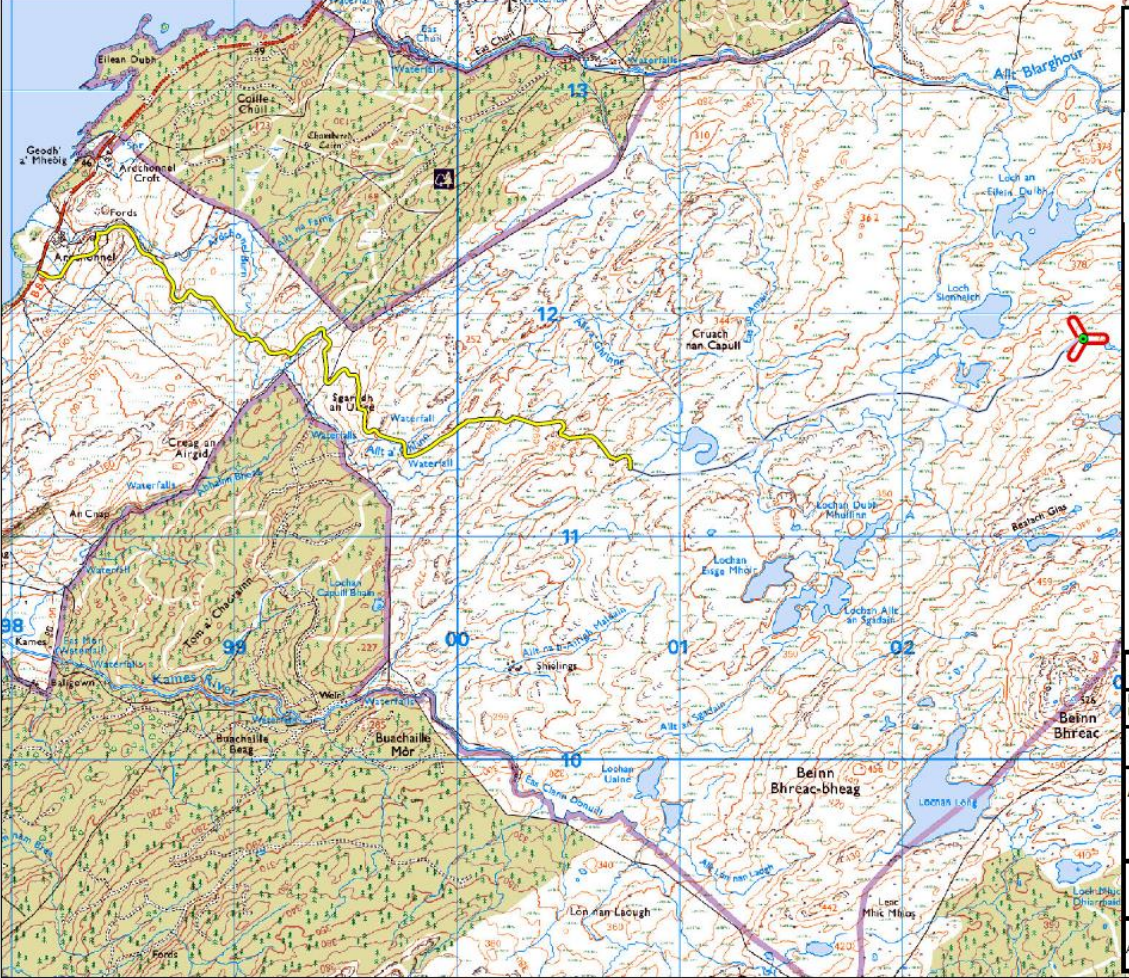
An Càrr Dubh Wind Farm – Temporary Met Mast

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AN CARR DUBH - SITE SPECIFIC REQUIREMENTS FOR MEASUREMENT MAST

<p>Location</p>	<p>Temporary Met Mast Location (X,Y): 202809, 711888</p>  <p><i>Figure 1</i></p>
<p>Height of Met Mast</p>	<p>Up to 100 m</p>
<p>Position of Anemometers</p>	<p>These would be located in accordance with International Standard (IEC 61400-12-1:2017), namely on sets of booms separated by at least 20 m, with no booms below 30 m, plus a top anemometer. That would give up to 7 measurement heights with booms on either side or in some cases only on one side of the mast. An indicative drawing is provided. The orientation of the booms are likely to be fixed 90 degrees to the predominant wind direction (i.e. south-westerly).</p>
<p>Structure</p>	<p>Base of 27 sleepers (rasharkin solution) for a lattice tower up to 100m. Three sets of 5 soft ground anchors orientated at 90 degrees, 210 degrees and 330 degrees from magnetic north.</p>
<p>Any required laydown area or working area</p>	<p>Dependent on supplier, construction technique used and space available for kit within landholding, but up to 20-30 m from the met mast base may be necessary.</p>
<p>Felling</p>	<p>None expected.</p>

<p>Types of measurement equipment</p>	<p>Anemometers and wind vanes (likely to be Thies First Class sensors), thermometers, barometers. Further information available under GENERAL REQUIREMENTS FOR MEASUREMENT MAST. These sensors may be heated to ensure effective operation in cold climates.</p>
<p>Other equipment/features</p>	<p>There will be a lightning rod at the top and earthing gear throughout the mast protecting equipment. There will be a data logger and power supply / solar cell. See DESIGN AND ACCESS STATEMENT</p> <p>Description of Access</p> <ul style="list-style-type: none"> • From the A819 heading north from Inveraray, access will be taken along the B840 as far as the entrance to Ardchnonnel House (198129, 712184) • Components will be unloaded and stored at this location on the landowner's property, or at an appropriate location further up the track, then transferred to a suitable vehicle for the remaining distance (ATV / Hagglund) • From the location by Ardchnonnel House, components shall be transported utilising an existing access track (shown in yellow on the plan below) • From the end of the existing access track (200772, 711309), components shall be transported off-road to the site location (route tbc pending site surveys)  <p><i>Figure 2</i></p> <p>Obstacles/Obstructions</p> <ul style="list-style-type: none"> • Sharp turn immediately after Ardchnonnel House with unlocked gate, with a second gate further up the track. • Two stream crossing points

	<ul style="list-style-type: none"> Track terminates after c.4km (200774, 711305) from which point a further 1.5km off-road access will be required. Waterbodies, streams and peat hags to be navigated. <p>Vehicles</p> <ul style="list-style-type: none"> Articulated lorry will likely be used for initial delivery of components A suitable off-road vehicle shall take components to site location, most likely Hagglund or similar ATV A bogmaster digger or similar will be required to install anchors <p>Ground Conditions</p> <ul style="list-style-type: none"> Stone access track from the main road up to point of termination (200774, 711305) Rocky outcrops, peat hags, waterbodies and small streams present between this point and the application boundary. Area within site comprises grazed grassland, areas of shallow peat and rocky outcrops with undulating topography <p>Anchor Type</p> <ul style="list-style-type: none"> Mast will be supported by three sets of five guy wires with soft ground anchors Fencing around mast and anchors may be required <p>ORNITHOLOGY / ECOLOGY MITIGATION.</p>
Length of Planning Permission	3 years

GENERAL REQUIREMENTS FOR MEASUREMENT MAST

- All sensor boom dimensions should be compliant with IEC 61400 – 12 – 1:2017 standard.
- As built dimensions of the met mast should be supplied by the vendor after installation, as a separate chapter of the installation report.
- All the sensors should be calibrated according to MEASNET standards and the calibration certificates should be included in the installation report
- Measurement mast should be 100 m in height, which dictates that the top two anemometers in fork configuration are both at 100 m height. The dimensions of the fork configuration should comply with the IEC 61400 – 12 – 1:2017 standard.
- The measurement mast should be equipped with 7 anemometers at 100 m, 96m, 80m, 60m and 30m heights. All anemometers should be Thies First Class anemometers.
- The measurement mast should be equipped with 2 wind direction sensors at 96m and 74m. All direction sensors should be Thies direction sensors.
- All booms for an instrument should be supported with a support structure to reduce vibration.
- The measurement mast should be equipped with an adequate lightning protection system and earthed with an earthing rod.
- The measurement mast should have a foundation of 27 sleepers at the mast point. The guy wires will likely be connected to the ground using soft ground anchors.
- The measurement mast should be equipped with two temperature sensors. One temperature sensor should be around 4 m above ground, and the upper temperature sensor should be installed below the

last module of the met mast. As built height of the temperature sensors should be documented on the installation report.

- The measurement mast should also be equipped with one pressure sensor and one relative humidity sensor. As built heights of these sensors should be documented on the installation report.
- Temperature, pressure, and relative humidity sensors should also have a calibration documentation included in the installation report.
- The datalogger time should be setup as UTC - 0 (Local time). This should also be documented on the installation report.
- Measurements should be recorded in 10-minute intervals.
- Datalogger should send data to specified e-mail addresses daily.
- Maintenance visits to the measurement masts should be carried out in every three months and a maintenance report should be prepared.

DESIGN AND ACCESS STATEMENT

Description of Access

- From the A819 heading north from Inveraray, access will be taken along the B840 as far as the entrance to Ardchnonnel House (198129, 712184)
- Components will be unloaded and stored at this location on the landowner's property, or at an appropriate location further up the track, then transferred to a suitable vehicle for the remaining distance (ATV / Hagglund)
- From the location by Ardchnonnel House, components shall be transported utilising an existing access track (shown in yellow on the plan below)
- From the end of the existing access track (200772, 711309), components shall be transported off-road to the site location (route tbc pending site surveys)

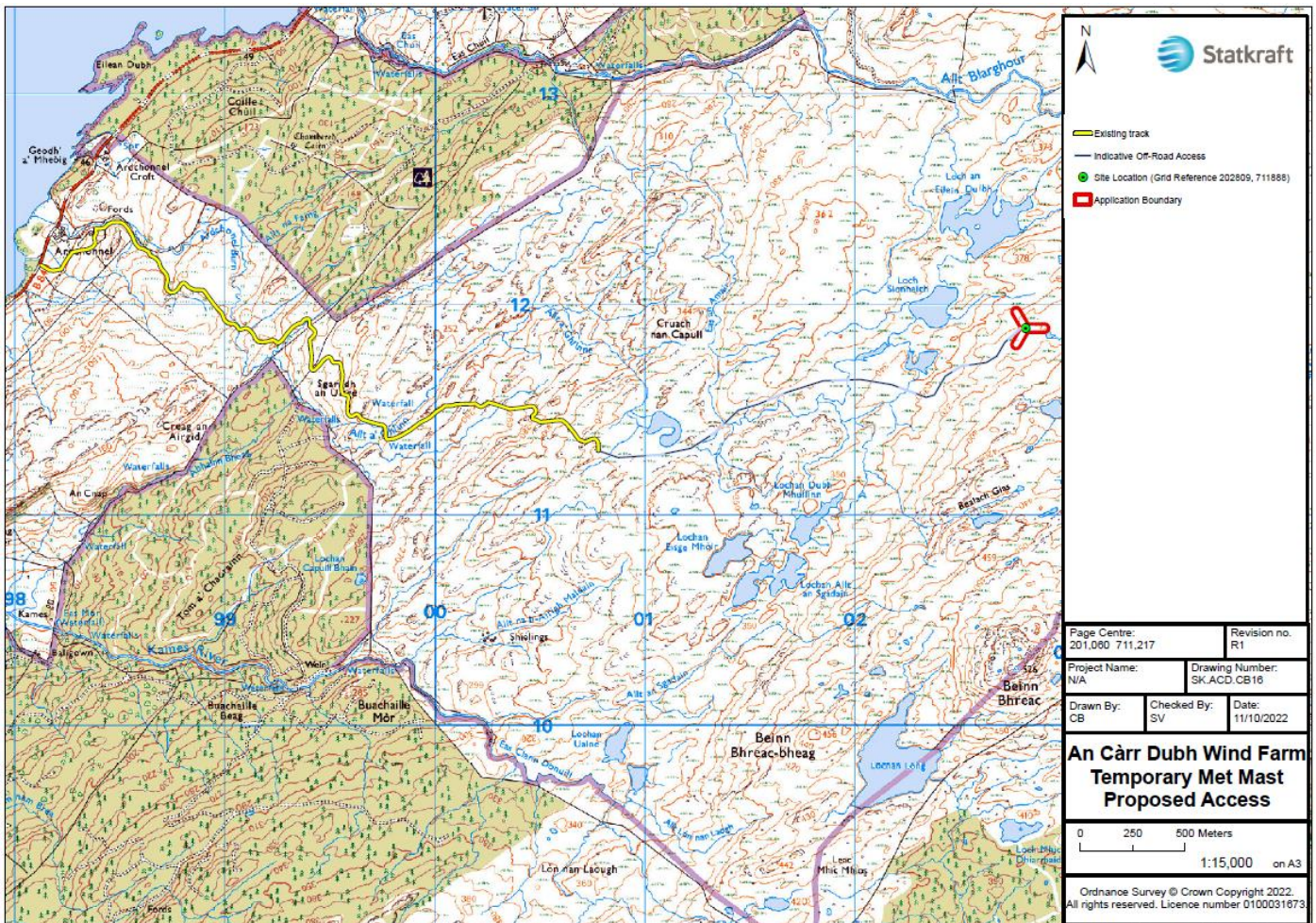


Figure 2

Obstacles/Obstructions

- Sharp turn immediately after Ardchnonnel House with unlocked gate, with a second gate further up the track.
- Two stream crossing points
- Track terminates after c.4km (200774, 711305) from which point a further 1.5km off-road access will be required. Waterbodies, streams and peat hags to be navigated.

Vehicles

- Articulated lorry will likely be used for initial delivery of components
- A suitable off-road vehicle shall take components to site location, most likely Hagglund or similar ATV
- A bogmaster digger or similar will be required to install anchors

Ground Conditions

- Stone access track from the main road up to point of termination (200774, 711305)
- Rocky outcrops, peat hags, waterbodies and small streams present between this point and the application boundary.
- Area within site comprises grazed grassland, areas of shallow peat and rocky outcrops with undulating topography

Anchor Type

- Mast will be supported by three sets of five guy wires with soft ground anchors
- Fencing around mast and anchors may be required

ORNITHOLOGY / ECOLOGY MITIGATION

NatureScot guidance (2016) provides advice on how to mitigate potential impacts to ornithological interests from meteorological (met) masts.

<https://www.nature.scot/doc/guidance-assessment-and-mitigation-impacts-power-lines-and-guyed-meteorological-masts-birds>

In accordance with NatureScot guidance (2016) mitigation measures to reduce the impacts of met masts upon ornithological interests can include:

- Siting the mast in a location with a low collision risk (i.e. as determined from Vantage Point surveys);
- Installing line markers on guy wires (and also on any fences if required, particularly where black grouse are present).
- Using non-guyed masts (although if using lattice towers, developers should be aware of the potential nest/perching site opportunities these present and site them appropriately); and,
- Carrying out construction and maintenance activities outside of the breeding season, or otherwise siting the mast beyond disturbance distances of sensitive species present in the area i.e. in accordance with specified disturbance buffers as detailed in NatureScot guidance (Goodship and Furness, 2022(2007)).

Examples of mitigation used on other met mast installations also include:

- Mesh fencing around the connection points of the mast and guy ropes with the ground.
- Bird deflectors/small flags located every 10 m along guy ropes.

Mitigation measures to be detailed under 'good practice' within the CEMP if applicable.

VP Surveys to quantify the level of “at collision risk” flight activity for ornithological species for the proposed wind farm application have been undertaken between February 2019 and January 2021, and which have provided survey coverage of the proposed met mast location.

Surveys identify that the proposed met mast location is within an area likely to have a low collision risk, particularly for golden eagle and which is known to breed locally. The suitability of habitats for golden eagle within proximity to the proposed met mast location has also been examined using the Golden Eagle Topographical (GET) model (Fielding *et al.*, 2019¹). Extensive satellite tagging data from an individual golden eagle associated with the G/LAE1B range and within which the met mast is located has also been obtained; this highly accurate data allowed detailed analysis of use of the area by golden eagles to be made

In review the met mast location is located within an area of ‘good’ but fragmented golden eagle habitat and which corresponds to a relatively low incidence of golden eagle flight activity recorded during VP surveys and relatively low incidence of satellite tag registrations, in comparison to other larger areas of more continuous and connected ‘good’ golden eagle habitat identified by the GET model in the wider locality.

Satellite tagging data, VP survey data and GET modelling provided consistent results. It can therefore be concluded, based on extensive and accurate data, that the proposed met mast is located in an area of low collision risk.

¹ Fielding, A.H., Haworth, P.F., Anderson, D., Benn, S., Dennis, R., Weston, E. and Whitfield, D.P. (2019). A simple topographical model to predict Golden Eagle *Aquila chrysaetos* space use during dispersal. *International Journal of Avian Science*, **162** (2), pp. 400-415.

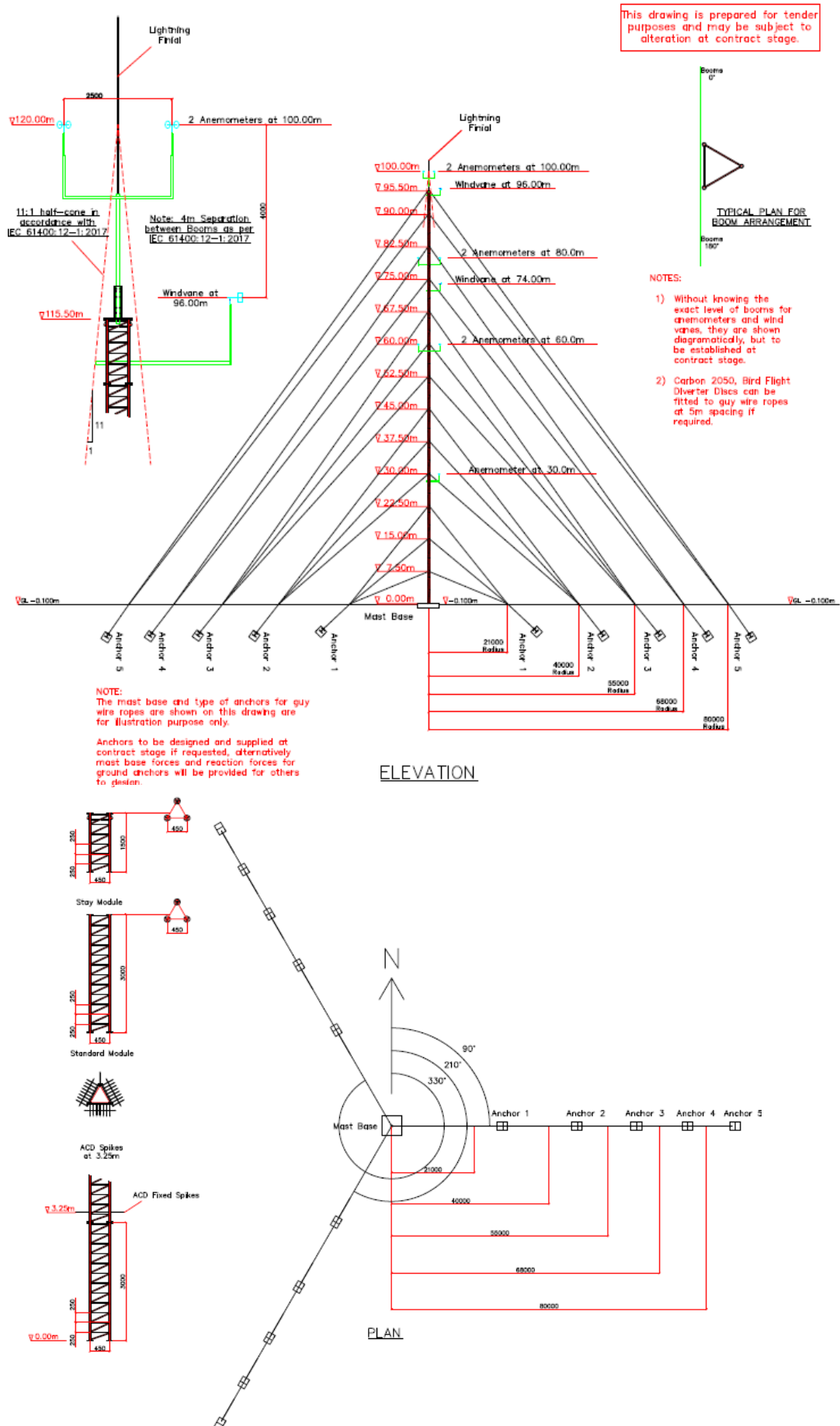


Figure 3 (Scale version submitted separately)