Hargate Hill Wind Scheme
Design and Access Statement
Lantanier Ltd

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1. Introduction

1.1 Background

1.1.1 This Design and Access Statement accompanies the planning application by Lantanier Ltd for the erection of a wind turbine and ancillary infrastructure on land to the east of Moor Lane, near Great Houghton, Barnsley, South Yorkshire.

1.1.2 The statement has been prepared in accordance with the Town and Country (General Development Procedure) Order 1995 (as amended) and takes into account guidance set out in:

- Department for Communities & Local Government, Circular 01/2006; and
- Commission for Architecture and the Built Environment, Design and Access Statements: How to Write, Read and Use Them (June 2006).

1.1.3 The proposed development would comprise a single wind turbine with a hub height of up to 60 m and a maximum height to the blade tip of 87 m. The wind turbine would have a generating capacity of up to 500 kW. The following associated infrastructure would be included in the development:

- construction of an access track to the turbine site composed of crushed stone;
- construction of a crane hard standing;
- an underground grid connection cable;
- a substation, and
- temporary construction compound and components lay down area.

1.1.4 The proposed development would have the following benefits:

- The proposed wind turbine would have a positive benefit of emissions savings. Every year of its expected 25 year operational life it is likely to prevent between 457 tonnes and 1,051 tonnes of carbon dioxide from entering the atmosphere based on a capacity factor of 26.4 % and that 396 g and 910 g of carbon dioxide are released each kilowatt hour when generation is from gas and coal respectively (DECC, Digest of UK Energy Statistics, 2012).
- It is estimated that the amount of electrical energy generated by the wind turbine would be equivalent to supplying the approximate domestic needs of up to 270 average households each year (based on annual electricity consumption per home of 4,266 kWh).
- Potential opportunities for local contractors to be involved in the construction of the wind turbine.

1.1.5 It is considered that the renewable energy generated and CO_2 saved is a significant district level positive potential effect from the scheme as proposed.

1.2 Objectives

1.2.1 The objective of the proposed wind turbine is the generation of electricity from a renewable source, in line with the Government target of supplying 15 % of United Kingdom (UK) energy demand from renewable sources by 2020.

1.2.2 In accordance with international obligations the UK Government has committed to reduce emissions of greenhouse gases to reduce the effects of climate change. In the Climate Change Act, 2008 the Government set a binding commitment to cut the UK's carbon emissions by 80 % by 2050 and requires that limits be set on the total amount of emissions in successive five year periods, with a minimum 26 % reduction by 2020 (against a 1990 baseline); increased in 2009 by the first Carbon Budget to a reduction of 34 % by 2018-2022 (against a 1990 baseline).

1.2.3 One of the financial incentive mechanisms to encourage uptake of small scale renewable electric technologies, such as that proposed at Hargate Hill, is the Feed in Tariff (FiT) which was introduced in April 2010 the aim being to facilitate the reduction of greenhouse gas emissions.

1.3 Site Assessment

Physical

1.3.1 The site is used for arable farming and is located approximately 800 m to the north of Great Houghton in the Barnsley Metropolitan Borough Council (BMBC) area (see Figure 1).

1.3.2 The site is immediately bound on all sides by arable fields with Moor Lane (B6273) to the west. The topography of the site is gently sloping at 95 to 100 m AOD.

1.3.3 The site is accessed *via* Moor Lane, which is located approximately 300 m to the west of the proposed turbine site. Moor Lane provides access to the wider highway network.

1.3.4 Land use in the vicinity of the site is dominated by agricultural fields bordered by hedgerows with some trees and woodland.

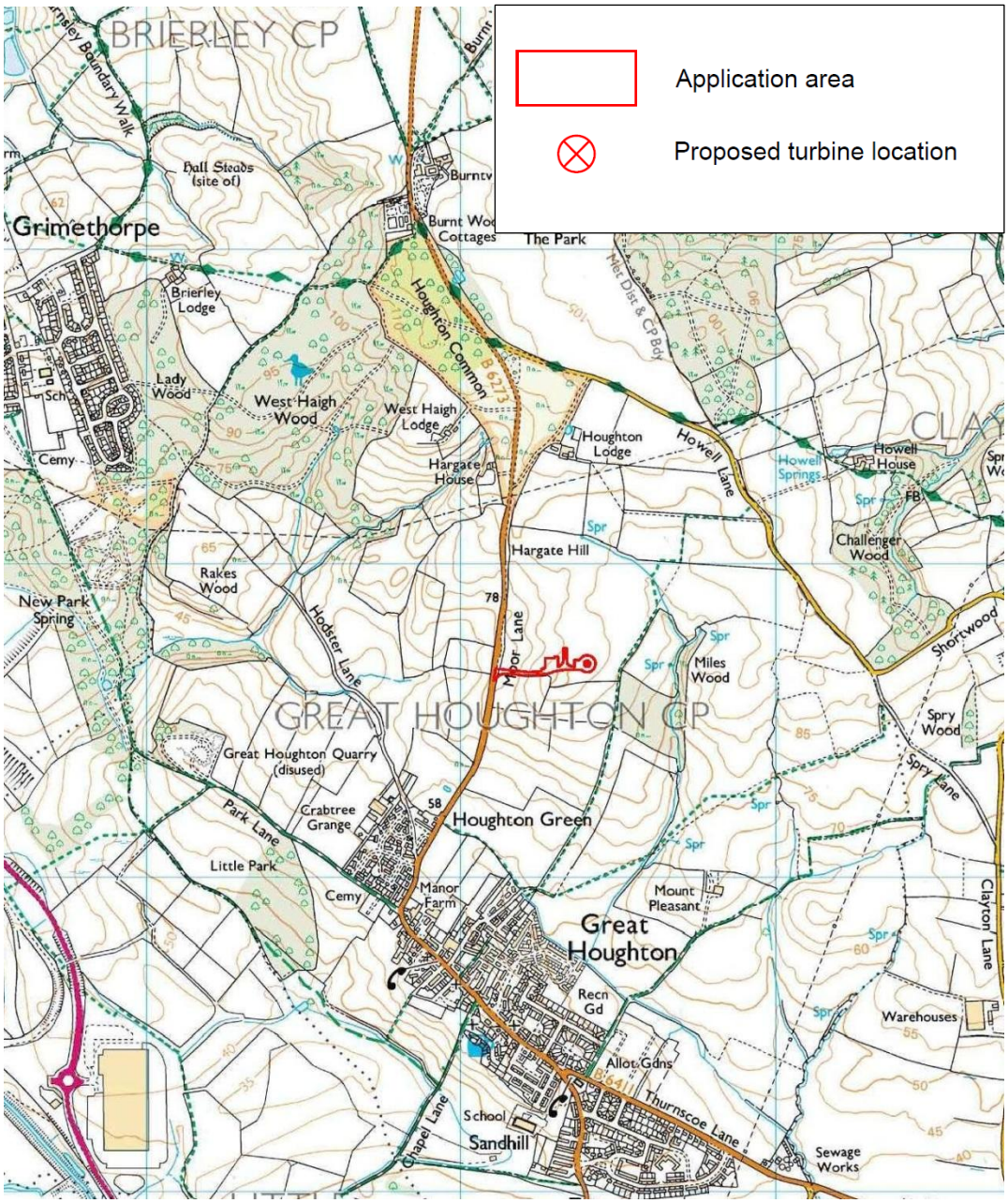


Figure 1: Site Location

Social

1.3.5 There are relatively few properties in the immediate vicinity of the proposed wind turbine. The nearest residential dwellings are:

- Houghton Lodge, approximately 670 m to the N;
- House to the north of 135 Moor Lane, approximately 680 m to the SW;
- Hargate House, approximately 690 m to the NW;
- Most northerly house on Garraby Close approximately 730 m to the S;
- Mount Pleasant approximately 820 m to the SE, and
- Howell House Farm, approximately 995 m to the NE.

1.3.6 The village of Great Houghton is located approximately 800 m to the south of the site.

1.4 Involvement

1.4.1 By virtue of the scale of the proposed development no public consultation has taken place regarding this proposal.

2. Design

2.1 Use

The Proposed Development

Wind Turbine

2.1.1 The final selection of wind turbine would be subject to a competitive tendering process following the grant of planning permission. However, the site has been designed to accommodate a turbine with a generation capacity of up to 500 kW. The proposed wind turbine would have an overall height to blade tip not exceeding 87 m, and a maximum hub height of 60 m. The turbine would be of a typical modern design incorporating a tubular tower and three blades attached to a nacelle housing the generator, gearbox and other operating equipment (see Photograph 1 below).



Photograph 1: Typical modern wind turbine

On-site Access Tracks and Crane Hard standing Area

2.1.2 An access track will be created to provide access to the turbine. The access track would be approximately 5 m wide during the construction phase, with widening on bends, and formed of crushed and graded stone (see Photograph 2 below).

2.1.3 The turbine would be erected using a large mobile crane. This would be positioned on a permanent hard standing (crane pad) measuring circa 30m x 24m and would be located adjacent to the turbine base.

2.1.4 The track and crane hard standing area would be used by both construction and maintenance vehicles and would be required throughout the life of the wind turbine.



Photograph 2: Typical wind turbine stone access track

Foundation Construction

2.1.5 The foundation for the wind turbine would typically be circular with a diameter of 10 – 12 m and a depth of approximately 2.4 m, although the final dimensions and form will depend on ground conditions and turbine specifications. The foundation hole would be excavated using a mechanical excavator, following which reinforced steel would be assembled in the hole. Once the steel is fixed, concrete would be poured over a period of 2 – 3 days. The foundation would then be left for approximately one month to allow the concrete to cure before the turbine is brought to site and installed.

2.1.6 The excavation of the turbine foundation is the only stage of the construction that may result in the production of waste material. Excess topsoil or subsoils that need to be removed from site would be transported to a licensed waste management facility to be re-used where possible.

Grid Connection & Sub-Station

2.1.7 A transformer and associated electrical equipment would be contained within a sub-station cabin located at the base of the wind turbine. An underground cable would connect the transformer with a substation building located close to the proposed turbine. The substation would contain the switchgear and metering equipment required to connect the wind turbine to the overhead electricity distribution network. The substation building would be approximately 8.3 x 5.2 m in plan and would have a height of up to 3.92 m. The final design of the sub station would need to be confirmed with the Distribution Network Operator following determination of the planning application. It is anticipated that the proposed wind turbine will be connected to the grid via a new connection with the existing nearby 11 kV network.

Operation

2.1.8 The wind turbine would be operated remotely by a central computer. Consequently the site would not be permanently manned but there would be a requirement for operations and maintenance personnel to visit the site on average between 8 and 12 times per year.

Land Use Policies

National Energy Policy

2.1.9 The Energy Review of 2006 established that the Government is committed to ensuring that renewable energy has an important part to play in helping the United Kingdom meet its future energy needs. As part of the review, the Government introduced a 'Renewables Statement of Need' which confirms that renewable energy, including onshore wind, is central to reducing emissions and maintaining the reliability of UK energy supplies. The Statement also states that the wider benefits of renewables to society and the economy as a whole should be given significant weight by decision makers in the planning process (BERR, The Energy Challenge, Annex D, July 2006).

2.1.10 The White Paper 'Planning for a Sustainable Future' published in 2007 identifies the need to install renewable energy within the UK in order to meet a target of 20 % of energy from renewable sources by 2020.

2.1.11 In November 2008 the Climate Change Act came into force. The Act provided for legally binding targets for the reduction of greenhouse gas emissions of 80 % by 2050 and reductions of carbon emissions of 26 % by 2020 (against a 1990 baseline). The carbon reduction targets were subsequently increased in the Carbon Budget of April 2009 to a 34 % reduction by 2018 – 2022 (against a 1990 baseline).

2.1.12 In 2009 the Government published the UK Renewable Energy Strategy which sets out the path for meeting carbon reduction targets agreed in an EU Renewable Energy Directive. The target for the United Kingdom is to produce 15 % of all energy from renewable sources by 2020. The key scenario within the Strategy states that:

"…*by 2020 about 30 % of more of all our electricity (about 117 TWh) – both centralized and small-scale generation - could come from renewable sources, compared to around 5.5 % today*".

2.1.13 The Strategy envisaged that the majority of the growth in renewable generation would come from wind power.

2.1.14 The Renewable Energy Strategy is an integral part of the UK Government's overall Low Carbon Transition Plan (July 2009), which sets out a route map for the reduction of carbon emissions by 34 % on 1990 levels by 2020. The Plan seeks to ensure that the UK will get 40 % of electricity from low carbon sources by 2020, with policies to produce approximately 30 % of electricity from renewables by 2020, in line with the Renewable Energy Strategy, by increasing the requirement for electricity suppliers to sell renewable energy.

2.1.15 In July 2011 the Government published a new Electricity White Paper and a Roadmap for Renewables to 2020. The Renewables Roadmap, which was updated in December 2012, sets out a comprehensive action plan to accelerate the deployment and use of renewable energy in the UK. It identifies the technologies, including onshore wind, that have either the greatest potential to help the UK meet

the 2020 target in a cost effective and sustainable way, or offer great potential for the decades that follow.

2.1.16 The Carbon Plan 'Delivering our low Carbon Future' in December 2011 sets out the government's plans for achieving reductions committed to in the first four carbon budgets for the period 2008 to 2027. In addition the Carbon Plan sets out how the UK will achieve decarbonisation within the framework of the Government's overall energy policy and states that:

"*if we are to cut emissions by 80% by 2050, there will have to be major changes in how we use and generate energy…. electricity will need to be decarbonized through renewable and nuclear power, and the use of carbon capture and storage (CCS)*".

2.1.17 The Annual Energy Statement was published in November 2012 and with regard to renewable energy states:

"…*increasing the amount of renewable energy deployed in the UK will diversify our energy supply and improve our energy security by reducing our exposure to fossil fluctuations".*

2.1.18 In addition, the Statement confirms that increasing the supply of renewable energy is also critical to keeping the UK on a low carbon pathway helping the Country to meet legally binding carbon targets as well as the EU legal commitment to source 15% of energy from renewable sources by 2020.

2.1.19 The Energy Statement is an important material consideration as it sets out current Government policy. This policy is unambiguous and is underpinned by an objective to address climate change and to move the UK electricity generation sector to one which has renewable energy as a key component.

National Planning Policy Framework

2.1.20 In respect of renewable energy developments, the core planning principles of the NPPF state that planning should:

"...*encourage the use of renewable resources (for example, by the development of renewable energy)*".

2.1.21 In relation to meeting the challenge of climate change, paragraph 93 states that:

"*planning plays a key role in helping shape places to secure radical reductions in greenhouse gas emissions, minimising vulnerability and providing resilience to the impacts of climate change, and supporting the delivery of renewable and low carbon energy and associated infrastructure*."

2.1.22 The NPPF identifies from the outset that the purpose of planning is to contribute to the achievement of sustainable development. The deployment of renewable energy is therefore consistent with a key aspect of Government advice.

2.1.23 Paragraph 97 of the NPPF provides that:

"*to help increase the use and supply of renewable and low carbon energy, local planning authorities should recognise the responsibility on all communities to contribute to energy generation from renewable and low carbon sources*."

2.1.24 Paragraph 98 of the NPPF states that when determining applications for renewable and low carbon energy development local planning authorities should approve the application if its impacts are, or can be made, acceptable.

National Energy Policy Statements

2.1.25 A suite of national policy statements on energy were designated by Parliament on 19 July 2011. National Policy Statement: Overarching National Policy Statement for Energy - EN-1 confirms the Government's commitment to meeting the binding targets to cut greenhouse gas emissions and reiterates that the Government is committed to increasing dramatically the amount of renewable generation capacity. National Policy Statement for Renewable Energy Infrastructure EN-3 sets out technical considerations when determining applications for renewable energy infrastructure. EN-1 confirms that the National Policy Statements are likely to be a material consideration in considering applications under the Town and Country Planning Acts. This is confirmed in the NPPF which states that EN-1 and EN-3 are directly applicable sources of guidance to decision makers addressing onshore wind energy proposals.

Yorkshire and Humber Plan Regional Spatial Strategy

2.1.26 The Yorkshire and Humber Plan Regional Spatial Strategy was formally abolished on 22 February 2013 and does not form part of the Local Development Framework for Barnsley.

Saved Policies of the Barnsley Unitary Development Plan

2.1.27 The Barnsley Unitary Development Plan (UDP) was adopted in 2000. It is being replaced by the Barnsley Local Development Framework (LDF). There are no saved policies specific to the consideration of the proposed wind turbine development; all such policies have been superseded by policies of the Core Strategy of the LDF, which was adopted in 2011.

Local Development Framework

2.1.28 The Planning and Compulsory Purchase Act 2004 requires that all local planning authorities prepare Local Development Frameworks to replace Local Plans. The Barnsley Local Development Framework is at an advanced stage; and will replace the Barnsley UDP. The Local Development Framework includes a Core Strategy document that was adopted in 2011, containing planning policies that supersede the majority of those contained within the UDP, including all those that are relevant to this Application.

Summary

2.1.29 In summary, there is clear policy guidance that supports the deployment of renewable energy schemes, including small scale single wind turbine developments.

Existing Uses

2.1.30 Wind turbine developments take up very little land space allowing farming to continue largely unaffected. During construction, the area typically disturbed to create the foundation of a 500 kW turbine is about 20 m x 20 m which is accompanied by a hard standing area for a crane of around 24 m x 30 m in total area. Once complete, however, the foundation area is backfilled and in most cases grass or crops can then be re-seeded close to the base of each tower (see Photograph 3).

2.1.31 Access tracks and wind turbine layouts are determined in consultation with the landowner. At the Hargate Hill site, new tracks are to be provided in order to accommodate the heavy construction vehicles and large vehicles required to transport turbine components to the site.

2.1.32 High voltage cables would run underground from the wind turbine to the grid connection point. Cables normally follow access tracks, and are buried below the depth of normal agricultural cultivation.

2.1.33 The wind turbines themselves are inherently safe by design and pose very little risk to passers-by or those working nearby.



Photograph 3: Post construction restoration of turbine foundation.

Access Needs

2.1.34 Access requirements would be different for each phase of the development. During the construction and decommissioning phases, access would be required for abnormal loads, including turbine components and cranes, as well as standard heavy goods vehicles and staff. When the wind turbine is operational, access would be required for operations staff and maintenance personnel and equipment. Generally during the operational phase only light/medium goods vehicles would be used by site maintenance personnel, although there may be an occasional requirement for cranes and heavy goods vehicles to access the site.

2.1.35 Access for vehicles delivering turbine components, such as tower sections and blades would be via the A1(M) junction 37 along the A635 to the south of the site and then north on the A6195 to wards Great Houghton. To the north of Great Houghton the route would turn north along the B6273 to the site entrance. Temporary works will be required including removal of some street furniture, central island kerbing and lighting through Hickleton, at the Fields End, Hollygrove and Cathill roundabouts and on the B6273 through Great Houghton.

2.1.36 General construction traffic would be able to use either the same route as abnormal loads or alternatively could access the site from the north to minimise impacts associated with the use of a single route.

2.1.37 Operations staff would use the same access point. The number of vehicles traveling to and from the wind turbine would be small during the operational phase of the development. The crane hard standing area would be used by operations staff for parking and it is not anticipated that off-site parking will be necessary.

Public Access

2.1.38 The access track along with the wind turbine and grid connection substation would be closed to the general public under normal circumstances.

2.2 Amount of Development

Constraints on Wind Farm Development

2.2.1 The wind turbine siting criteria outlined in Table 1 below have been used in the development of the scheme layout.

Building Amount

2.2.2 Wind turbines and their associated infrastructure typically occupy no more than 2 – 3 % of a site.

Occupancy

2.2.3 Operation of the wind turbine would be automatic and visits to the site by operations staff would only be required between 8 and 12 times a year which equates to once a month or less for scheduled services. Longer visits for servicing, typically every six months, would be required to check and inspect blades, fastenings and oil quality. Occupancy of the site by wind farm personnel would therefore be very low and the scheme would have no significant effect on the way existing activities in the general area work.

Table 1: Outline Turbine Siting Criteria

Factor	Criteria	Comments
Inter turbine spacing	6 rotor diameters in prevailing wind direction 4 rotor diameters in crosswind direction.	Not applied as the development would be a single turbine site.
Ownership boundaries	No turbine closer than 0.5 x rotor diameter of any land ownership boundary.	The blade of a turbine cannot pass over the land of any non-involved person without consent. The proposal complies with this siting requirement.
Public highways Roads & footpaths	No turbine closer than 1x toppling distance from roads and no blade over sail of	Toppling distance specified in Planning for Renewable Energy, A Companion Guide to PPS22. The proposal

Factor	Criteria	Comments
	footpaths.	complies with this siting requirement.
Bridleways	No turbine closer than 200 m.	Minimum separation distance recommended by British Horse Society. The proposal complies with this siting requirement (no bridle ways are located near the proposed turbine).
Power lines	No turbine closer than 1.5 x toppling distance.	Distance that should be maintained between live conductors and the arc of the falling structure. The proposal complies with this siting requirement.
Protected species	No turbine closer than 50 m to a hedge or watercourse.	Natural England siting guidelines for single turbines to protect bats. The proposal complies with this siting requirement.
Neighboring properties	Turbine exclusion zone of 400 m around non-involved residential properties for 500-850 kW wind turbines.	To minimize amenity impacts on neighbors. The closest residential property is 670m to the north of the turbine site
Buildings and obstructions	No turbine closer than 20 x height of building(s).	Not applicable at the Hargate Hill site.
Topography	Make use of topography to shield turbine for sensitive views.	Topography is gently sloping with little scope for terrain screening.
Existing tracks	Make use of existing tracks and infrastructure as much as possible.	Not applicable at the Hargate Hill site.
Telecommunications	Maintain adequate separation distance from existing telecoms links.	Consultations with telecoms operators have been undertaken to identify suitable buffers.

Off-site Requirements

2.2.4 During the operational phase of the wind turbine, off-site requirements would be minimal and significant changes to local services would not be required.

2.3 Layout

Design Development

2.3.1 At the start of the development process Lantanier Ltd required that the following landscape and visual considerations were incorporated into the draft layout for the proposed development:

- The proposed layout should minimise potential losses of existing landscape features and impacts on the fabric of the landscape.
- Where possible the placing of the turbine close to non-involved properties and settlements should be avoided.

General Scheme Layout

Turbine Siting

2.3.2 The location of the proposed turbine has been selected following an assessment of the constraints identified and is shown on Figure 2 below.



Figure 2: Constraints Plan

Access

2.3.3 Access to the site has been selected to allow safe movement of construction vehicles, plant and turbine components to the site whilst minimize disruption to existing road users and nearby residents. The proposed development would require

a new access point from Moor Lane, approximately 300 m west of the turbine location.

2.3.4 Access will require temporary loss of small sections of ecologically and historically important hedgerows which will be re-planted using native hedge species following construction with the exception of the hedgerow removal for the site entrance off Moor Lane. Following decommissioning all hedgerows will be re-instated using locally appropriate native species of UK provenance.

Track Layout

2.3.5 The on-site tracks would be as short as possible in order to minimize the amount of ground disturbance and loss of agricultural land (see Figure 3).

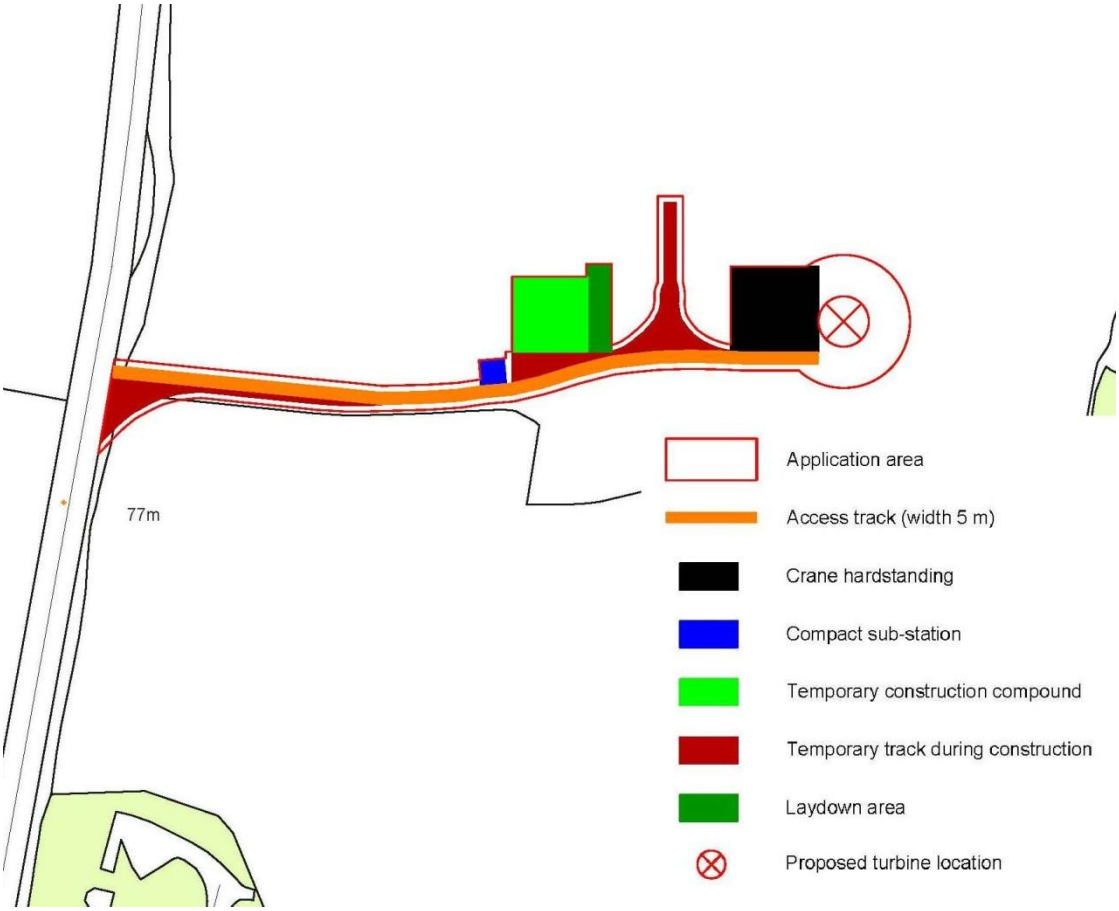


Figure 3: Site Layout

Existing Farm Activities

2.3.6 Existing farm operations can continue during the construction and operation of the wind turbine and access for farm vehicles will not be significantly affected by the development.

Inclusive Access

2.3.7 Access to the wind turbine and substation would be limited to appropriately qualified staff and contractors only. Access to the turbine would be via a steel door accessed from steps from ground level which would give access to the turbine control panel and tower.

2.3.8 There would be no fencing around the wind turbine or substation.

Conflicting Pressures

2.3.9 The purpose of a wind turbine is to generate electricity from the movement of the wind. It is important therefore to site wind turbines in areas of optimum wind resource and the process of turbine selection and location is a balance between maximizing wind yield and minimizing environmental effects, such as landscape and visual impact, ecological and ornithological effects, local amenity and noise.

2.3.10 In developing the layout of the proposed scheme, priority has been given to minimizing the environmental effects as far as is practicable whilst maintaining a commercially viable scheme.

2.4 Scale

2.4.1 At the start of the proposed scheme the site was assessed as able to accommodate three wind turbines with a blade to tip height of up to 125 m. However to minimise environmental impact a single smaller wind turbine was selected.

2.4.2 A turbine with a maximum height to blade tip of up to 87 m has been selected for the site and this would not be exceeded. Wind speed increases with height above ground level and the amount of energy available in the wind varies in general with the cube of the wind-speed. Larger rotor diameter rotors take more energy from the wind than smaller ones. Therefore, the hub height and rotor diameter of the wind turbine will have a direct effect on the amount of electricity produced and the carbon dioxide savings resulting from the project. However, the larger the tower and rotor diameter of the turbine the greater the potential visual impact, so an appropriate balance has to be found between the environmental and visual impact and the size of the turbine.

Relationship with Prominent Buildings and Structures

2.4.3 There are no prominent buildings or structures within or in the immediate vicinity of the application site. Electricity pylons are present to the west of the site, but a 1.5x toppling distance has been maintained between live conductors and the arc of the falling structure.

Balance of Features

2.4.4 The proportions of blade length relative to tower height should be such that they create a balanced and harmonious profile, avoiding towers that may appear over tall or too squat.

2.4.5 The ratio of blade length to hub height for the proposed wind turbine would be approximately 0.5. The turbine would not therefore appear over tall or squat.

2.5 Landscaping

2.5.1 The nature and scale of the wind turbine means there is limited opportunity for substantial mitigation of potential landscape and visual impacts. However, a number of landscaping measures are proposed to ameliorate the potential landscape and visual effects of the wind turbine.

Landscape Mitigation Measures

Access Tracks

2.5.2 The layout of the proposed access tracks has been carefully designed to minimise track length and sterilisation of agricultural land.

2.5.3 Re-instatement of the track shoulders using stored topsoil and re-seeding would be undertaken following installation of the wind turbine.

Temporary Construction Areas

2.5.4 The crane hard standing would be left in place during the operational phase of the development. Once the wind turbine has been erected, topsoil could be spread over most of the hard standing area and the surface re-seeded with an appropriate grass mix. A small area of hard standing would be left as a turning and parking space for operations vehicles.

2.5.5 The temporary construction compound and area of temporary track way required for turning of low loaders would be removed and the areas re-instated using stored sub-soil and topsoil and retuned to agricultural use.

2.6 Appearance

2.6.1 The wind turbine would be three bladed, horizontal axis machines with a hub height of up to 60 m and a height to blade tip of up to 87 m. The turbine would be painted a semi-matt (non-reflective) light grey colour corresponding to RAL 7035 (see Photograph 4) below.

2.6.2 No prominent symbols, signs or other lettering would be displayed on any part of the wind turbine other than statutory safety signs and a turbine number painted on the access door.



Photograph 4: Beinn Ghlas wind turbine (colour light grey RAL 7035)

2.7 Access

2.7.1 The wind turbine site would be accessed via a stone track from Moor Lane which is located approximately 300 m to the west of the proposed turbine site. Moor Lane would provide access to the highway network.

2.7.2 The proposed site entrance would be designed to accommodate heavy construction vehicles and wind turbine delivery traffic to access the proposed development site safely and without causing disruption to other road users.

2.7.3 When the wind turbine is operational the site entrance would also be used by maintenance vehicles to access the turbine and the compact grid connection substation. The access points to the site would be closed to the general public.

2.8 Design of substation

2.8.1 It is envisaged that the external substation will measure up to 8.3 x 5.2 m, 3.92 m high. The detailed design of the substation will be confirmed following receipt of planning consent in consultation with the DNO.