



TEMPORIS WIND

CHAPEL FARM WIND TURBINE

DESIGN AND ACCESS STATEMENT

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JUNE 2011

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1 INTRODUCTION

This Design and Access Statement has been prepared to accompany an application by Temporis Wind, under the Town and Country Planning Act 1990¹, for permission to construct and operate a single turbine wind energy development, to be known as Chapel Farm Wind Turbine ('the Development'), on land to the north-west of Stocksbridge in South Yorkshire. The site location can be seen in Planning Drawing 001.

The Development will comprise the following:

- One wind turbine (500 kilowatts [kW]) and associated infrastructure including internal control cabinet, turbine foundation, external transformer (see below) and crane hardstanding area;
- An external compact housing (approximately 2 metres [m] x 3 m x 2 m) containing the turbine transformer, low voltage distribution system and medium voltage switchgear assembly with underground cabling from the turbine; and
- Construction of a new access track.

A Supporting Statement accompanies the application to provide Barnsley Metropolitan Borough Council with sufficient information required to determine the planning application.

This Design and Access Statement has been produced with reference to Barnsley Metropolitan Borough Council's website and to the 2006 Commission for Architecture and the Built Environment's (CABE) guide: "Design and Access Statements, How to write, read and use them"². In addition the circular Guidance on changes to the development control system effective from 10th August 2006, sets out the formal requirements for design and access statements to accompany certain planning applications³.

An iterative design process has been integral to the layout of the Development which has been submitted as part of this planning application and this document seeks to demonstrate adherence to this principle, following the guidance detailed above.

¹ The Town and Country Planning Act 1990 [online] Available at: <http://www.legislation.gov.uk/ukpga/1990/8/contents> [Accessed 13/01/2011].

² CABE (2006) *Design and Access Statements, How to write, read and use them*. Commission for Architecture and the Built Environment.

³ Department for Communities and Local Government (12th June 2006) *Guidance on Changes to the Development Control System* DCLG Circular 01/2006, Section 3, coming into force 10 August 2006.

2 DESIGN STATEMENT

There are six design principles that are required to be addressed within the design component of the Design and Access Statement. These are:

- Use - what the development will be used for;
- Amount – how much development is proposed, which is closely related to the capacity of the site;
- Layout – the general arrangement and orientation of the development and any individual components, and how it fits with the surrounding environment;
- Scale – the size and extent of the development and any individual components;
- Landscaping – treatment of private and public land through hard and soft landscaping techniques to enhance or protect the amenity of the development site and surrounding environment; and
- Appearance – measures incorporated into the design of built elements that determines the impression it makes, including its built form, choice of materials, lighting, colour and texture.

2.1 Use

The principle use of the Development is to produce electricity by harnessing energy from the wind, a renewable resource. This electricity will feed into the local grid network.

In accordance with international obligations, the United Kingdom (UK) Government has committed to reduce emissions of greenhouse gases to combat the effects of climate change. In November 2008, the Climate Change Act⁴ was published, which creates a new legal framework for the UK to achieve a mandatory 80 % cut in the UK's carbon dioxide (CO₂) emissions and other greenhouse emissions by 2050 (compared to 1990 levels). When Royal Assent was granted, the UK became the first country in the world to set such a long-term and significant carbon reduction target into law.

In 2002, the UK Government placed a 'Renewables Obligation'⁵ on all UK licensed electricity suppliers to provide 10 % of their electricity from renewable sources by 2010 and 15 % by 2015. This calls on all licensed electricity suppliers in England and Wales to supply a specified and growing proportion of their electricity sold from a choice of eligible renewable sources.

The Renewable Energy Strategy⁶ (that is part of the Overall UK Low Carbon Transition Plan) states that renewables could provide more than 30 % of our electricity by 2020, compared to only around 6.7 % today⁷. Wind energy is seen as the most significant renewable energy source for achieving these targets in the short and medium term and more than two-thirds of the target is expected to come from onshore and offshore wind. Wind power does not create CO₂ emissions during its operational life and displaces other fuel sources which generate greenhouse gas emissions.

The Department of Energy and Climate Change (DECC) Digest of UK Energy Statistics 2010⁸ states that, in 2009, 405 tonnes (t) of CO₂ were released each gigawatt hour (GWh) when generating electricity from gas; this increased to 915 t per GWh when generating from coal. The average CO₂ release from the fossil fuel mix, which also includes oil, was 598 t per GWh.

On this basis the Development would displace between 477 and 1,078 t of CO₂ emissions each year from entering the atmosphere. The actual savings will depend on which source of electricity generation the Developments generating capacity is displacing at any given time.

⁴ Office of Public Sector Information (2008) *The Climate Change Act 2008* [online] Available at: http://www.opsi.gov.uk/acts/acts2008/pdf/ukpga_20080027_en.pdf. [Accessed 13/01/2011].

⁵ The Renewables Obligation Order (2002) The Stationery Office Limited.

⁶ HM Government. (July 2009) *The UK Renewable Energy Strategy*, July 2009. Surrey: OPSI.

⁷ DECC (2010) *Digest of UK Energy Statistics 2010* (DUKES). Available online at: <http://www.decc.gov.uk> [Accessed 22/09/2010].

⁸ DECC (2010) *Digest of UK Energy Statistics 2010* (DUKES) Chapter 5 Electricity, Table 5A. Figures for 2009 [online] Available at: <http://www.decc.gov.uk/en/content/cms/statistics/publications/dukes/dukes.aspx> [Accessed on 03/08/2010].

2.2 Amount

The proposed application site covers approximately 0.47 hectares and consists of a wind turbine measuring up to 78 m to the blade tip in the vertical position. The Development has an output power capacity of up to approximately 500 kW. The site is currently agricultural land and the operational Development would occupy only a minor proportion of this. Land-take would be required for an access track, turbine foundation and other areas of hardstanding and would amount to only 0.28 ha. During operation, the agricultural function of the majority of the site would be retained.

Infrastructure associated with the Development is described in Section 1 of this Statement.

The capacity of the site to accommodate the Development has been considered throughout the design process, taking account of particular technical, environmental and more aesthetic issues relating to landscape and visual impacts.

In technical terms, a number of factors were initially considered which included:

- Topography – the steepness of the land determines which parts of the site are most suitable for erecting a turbine;
- Existing infrastructure – local roads, Rights of Way, overhead or underground services, *etc.*, that pass in close proximity to the Development site, or through it, that require to be protected or safeguarded during construction and in the unlikely event of a structural failure during operation;
- Access – the means of accessing the site via the local road network can influence the size of turbine that can be accommodated;
- Grid connection capacity and location – the means of carrying the power off-site and the electrical power that can be accommodated by the grid network in the area; and
- Proximity to housing – to safeguard the amenity of nearby properties from the potentially intrusive effects of the turbine, both visually and noise related.

In environmental terms, the capacity of the site may be further affected by areas of sensitivity, which may limit or even preclude development. Issues considered at the Development site included:

- Ecology and ornithology – valuable habitats and protected species of plants, animals and birds that may be present on the site, including the flight path of birds and bats;
- Cultural heritage – archaeological features that may be present on the site. There are no known designated or potential for unknown archaeological features at the site; and
- Other features – field boundaries, drainage ditches / watercourses. The site comprises arable fields separated and bounded by dry-stone walls.

The Development is not sited within any international or national designations, although it falls within an area of Borough Landscape Value and Greenbelt, as designated by BMBC. There are some predicted effects upon the Peak District National Park which lies to the west of the Development site, however, these are judged to be not significant. Similarly, whilst effects on the area of Borough Landscape Value and Greenbelt are anticipated, they will be localised and confined to the close vicinity of the wind turbine. The Development is therefore considered to follow guidance given in PPS22.

2.3 Layout

Layout is a key element of the design of the Development and is considered throughout the assessment process, with the findings feeding back into the design process. The final site layout can be seen in Planning Drawing 002 Site Layout.

After the overall landscape and visual objectives for the Development had been set out, and a suitable turbine option selected (described in Section 2.4) a more detailed, layout design exercise was carried out, in conjunction with other environmental and technical studies. This layout design review considered several different turbine height options and turbine locations on the site, using software to visualise the landform of the site and the turbine location in

relation to other environmental constraints. A number of landscape and visual design objectives were set out to guide the design process, as follows:

- Turbine position within the site should respond to prevailing wind resource;
- Turbine position within the site should relate to landform features, contours and boundaries in order to provide a landscape basis for a wind energy development;
- The Development should respond to the scale of the landform and be appropriate for the overall landscape scale;
- The Development should respond to the local landscape context, so that when it is seen, it forms a positive image, with a clear rationale for the turbines position, particularly from key local receptors (*e.g.* Footpaths, Carr Head Farm, other isolated farm dwellings and Stocksbridge);
- The turbine should be sited as far from local residential properties as practicable, whilst avoiding topographical constraints and seeking to minimise environmental effects on the wider landscape; and
- The overall visual intrusiveness of the Development should be minimised.

The exact location and extent of the Development and the dimensions of the turbine used has been determined to a large degree by landscape and visual objectives, visibility of the site from external viewpoints. However other environmental and technical constraints at the site have also influenced the layout and design of the Development, such as the presence of important flora or fauna, requirements to meet acceptable noise levels at nearby residential properties by maximising the distance from properties, the location of drainage ditches and field boundaries and ensuring at least topple height from surrounding roads.

An initial layout was developed, in advance of any detailed environmental studies at Chapel Farm, on the basis of preliminary environmental constraints and known technical constraints. In response to technical information gathered during the preparation of the Supporting Statement, the final turbine location and turbine size was selected.

The final iteration and submitted layout identifies the layout that is considered most suitable for the Development as the development of this layout will reduce negative visual effects on receptors (whilst also considering visibility from elsewhere) while also avoiding other identified environmental constraints.

2.4 Scale

The scale of the Development in terms of the height of the turbine proposed has also been considered as part of the design process. The proposed turbine will have a maximum hub height of 50 m and rotor diameter of 56 m giving an overall height to blade tip of 78 m. Turbines are large structures and will almost inevitably be seen from an area around the Development and in glimpsed views from further away as well. However, the scale of the turbine must be considered in order that the visibility of the wind energy development does not result in unacceptable landscape and visual impacts on the surrounding area.

The crane hardstanding would be 55 m x 42 m (2,310m²). The external switchgear housing has dimensions of approximately 2 m height x 3 m length x 2 m width. Access tracks would generally be 5 m in width depending on ground conditions.

2.5 Landscaping

New tree and hedgerow planting measures are often incorporated into a new development, partly to compensate for the removal of any existing vegetation but also to help screen the development from the surrounding area, reducing its landscape and visual impact. In the case of wind energy developments, new planting is not always a particular requirement since loss of vegetation is generally minimised by the small footprint occupied by a wind turbine, external switchgear and access track. Additionally, any new planting is often largely ineffectual at screening a wind turbine from a wide range of locations.

Landcover across the site and within the immediate surrounding area is predominately arable and is dominated by a strong geometric pattern of small to medium sized fields enclosed by

dry stone walls. Vegetation by way of woodland and trees is present giving a relatively sheltered environment. There are no proposals to introduce new tree and hedgerow planting as part of the wind farm development.

The current agricultural use of the site will be maintained during the lifetime of the Development. The access track, external switchgear and turbine have all been carefully positioned to minimise effects on the physical fabric of the site. Areas of farmland that are temporarily disturbed during the construction and decommissioning of the Development will be reinstated on completion of these phases.

2.6 Appearance

The appearance of wind energy developments, particularly the turbine type, location and layout, is of great importance in terms of minimising landscape and visual impacts. This has generally been covered in Sections 2.3 and 2.4. Key viewpoints have been used in designing the appearance of the site. The selection of these key viewpoints is discussed in Section 2.1.2.1 *Landscape* of the accompanying Supporting Statement.

For this development a PowerWind500 turbine is proposed. An illustration of the PowerWind500 is provided in Planning Drawing 003. It comprises a three-bladed type machine mounted on a tapering cylindrical tubular steel tower. Subject to agreement with Barnsley Metropolitan Borough Council, the finish and colour of the turbine is likely to be pale grey with a semi-matt finish to reduce glare.

While the turbine constitutes the most apparent visible feature of the Development, the appearance of the site infrastructure is also considered in the design of the Development.

The external switchgear housing would be painted a mid green colour in order to blend better into the landscape, however this will be agreed with Barnsley Metropolitan Borough Council.

A new access track will need to be constructed off Tofts Lane into the field where the turbine is proposed to be sited. Given the relatively short length of road that needs to be constructed (approximately 80 m), this will minimise disruption, visual appearance and construction operations. The section of new track that requires to be built will be constructed using locally-sourced material. Any excavated material will be spread alongside the track and re-graded to the existing ground levels and reseeded to minimise the visual impact.

The concrete foundation required to support the turbine (generally 8 m x 8 m but dependent upon ground conditions) will also be set below the finished soil level in order to minimise visual appearance and to minimise land take on the agricultural land use. Cabling leading from the turbine to the external transformer housing will be buried below ground which will minimise visual effects of the associated infrastructure. However the grid connection point and arrangement and whether it will be overhead or underground will be determined by the local electricity network provider.

3 ACCESS STATEMENT

This part of the statement must address two inter-related issues:

- General movement to and through the site and its structures; and
- How all members of society will be able to use the site

The CABE⁹ guidance provides a range of questions in relation to safe and inclusive access. These are aimed primarily at other forms of development with a specified end user. Although wind energy developments are not classed as engineering operations, their characteristics are similar in terms of societal access. They are generally not developments which are widely accessed by the public. As a result, this access statement focuses on the movement of vehicular traffic on-site during the construction and operation of the Development. Other route users are specifically considered with respect to existing public access routes and potential impacts of the Development on these.

3.1 Movement To and Through the Site and Its Structures

3.1.1 Site Access

The proposed turbine location is located approximately 80 m south-west of Tofts Lane. Access to the Development will be taken from Tofts Lane to the north-east of the Development (at approximate national grid reference SE 262 001).

The site will be approached as follows:

- Exit the M1 at Junction 36 onto the A61 through Tankersley. At the roundabout follow the A616 westbound. At the next roundabout follow the A628 eastbound. At the next junction continue eastward onto Hartcliffe Road, onto Hartcliffe Hill Road, onto Mossley Road, onto Cranberry Road, onto Salter Hill Lane and eventually onto Tofts Lane before turning southwards onto a new access track into the field where the turbine will be located. The new access road will be constructed on land owned by the Applicant.

Adequate space exists at all junctions and turnings to accommodate the swept path of construction vehicles and Heavy Goods Vehicles. This route has also been selected as it means HGVs maximise travel on 'A' roads and does not pass through any settlements.

The site access point will meet the requirements of the Highway Authority in terms of visibility, construction materials, surface water drainage, gradient and safety of other road users. Temporary standard safety signs will be provided during construction on Tofts Lane and on either side of the proposed access point onto site, to warn other road users that heavy vehicles may be turning.

3.1.2 Turbine Delivery

The turbine components are of sufficiently small size that they would be transported on vehicles with dimensions similar to those of conventional heavy goods vehicles (HGVs), and therefore do not constitute 'abnormal loads' in terms of length. Transportation of the PowerWind500 wind turbine requires roads, bridges and access roads to site being able to withstand the transportation of heavy loads up to a maximum axle load of 12 t and a maximum overall weight of 96 t with a useful width of carriageway of approximately 4 m.

3.1.3 Movement of Construction and Operational Vehicles to Site

Movement to site is largely a construction consideration as the operational traffic generation of the proposed wind energy development is very small.

During the construction period vehicular access to site will be required for:

⁹ CABE(2006) *Design and Access Statements, How to write, read and use them.* Commission for Architecture and the Built Environment.

- Low loaders and tipper lorries transporting excavators, and removing spoil;
- Low loaders and flat-bed lorries to deliver rebar, equipment, plant and electrical components;
- Tipper lorries delivering and moving material and stone for access tracks;
- Concrete trucks delivering ready mixed concrete for turbine and transformer foundations;
- HGVs delivering turbine components;
- Crane (500 t telescopic crane) delivered as mobile unit and / or on low loaders and 5 trucks to transport crane accessories; and
- Construction worker vehicles.

There will be approximately 8 HGV deliveries to site associated with delivery of turbine components (consisting of loads carrying tower sections, nacelle and blades).

Once operational the Development is not manned and it is envisaged that the amount of traffic associated with the Development would be minimal. The traffic generated by the Development once operational would involve service, maintenance and emergency trips. These would comprise routine service and maintenance team visits, together with the occasional need to access the site for more extensive maintenance, repair or management purposes. Routine maintenance and servicing is likely to be carried out two to four times per year.

The vehicle used for the majority of these visits is likely to be a small four wheel drive vehicle, however, there may be an occasional need for an HGV / road-going crane or similar to access the site for heavier maintenance and repairs.

3.1.4 Access Track Design and Layout

Access to the Development will be from Tofts Lane to the north of the proposed turbine. Approximately 80 m of new access track will need to be constructed. The track would have a nominal width of 5 m.

Access tracks will comprise a geotextile base with crushed stone on top, to a depth appropriate for the ground conditions to which a running surface of higher quality finer graded stone will be applied. The bellmouth of the site entrance would be suitably surfaced.

A permanent crane hard-standing / turning area will be constructed at the turbine location as appropriate to allow adequate working space for turbine erection and the safe movement of vehicles in forward gear across the site. The hardstanding area will be constructed in the same way as the access track.

The access track will be reduced in width following construction by laying topsoil on the shoulders of the tracks. The operational width of the tracks will be approximately 3 m which is adequate for ongoing maintenance.

Crane hard-standings / turning areas will also be covered with topsoil and allowed to re-vegetate naturally or returned to agricultural use. A geotextile separator would be used between the surface of the stone and the topsoil to minimise cross contamination between soil fines and stone which could weaken the strength of the compacted stone.

The access track has been designed to ensure the safe movement of vehicles in and around the site during construction and ongoing maintenance throughout the lifespan of the Development.

3.2 How All Members of Society Will Use the Site

Wind energy developments are electricity generating stations, but unlike more traditional fossil fuel power stations, their location is dictated based on the availability of adequate wind resource. In this respect, turbines are generally sited in open countryside and do not pose the same safety risks associated with public access. As highlighted previously, the purpose and characteristics of the Development are such that on-site access to infrastructure for those not associated with the Development is not a key feature of the design process.

There are no rights of way which pass through the site, the nearest is approximately 160 m north-east of the site.

A Companion Guide to PPS 22¹⁰ states that it is advisable to achieve a set-back from roads of fall over distance to achieve maximum safety. It goes on to state that there is no statutory separation between wind turbines and rights of way but advises that topple distance or as a minimum that turbine blades do not oversail public rights of way is advised. These separation distances are achieved as the turbine (with a blade tip height of 78 m) is located:

- Approximately 160 m from the nearest right of way
- Approximately 80 m from the nearest minor road (Tofts Lane); and,
- Approximately 700 m from the nearest 'A' or 'B' road, the A616.

All statutory requirements with regards to public safety would be implemented during the construction phase of the Development. Potentially hazardous areas, such as excavations and electrical installation works, would be fenced off. During operation the turbine tower door is securely locked and the turbine transformer is contained within a secure locked housing.

The Development will not directly affect any public rights of way, roads or other routes during the operation phase, although users of the public rights of way in the vicinity, Tofts Lane to the north, A616 to the south, and users of other surrounding routes would be able to view the turbine in certain locations and hence would be aware of it for a short period of time while walking/driving/travelling along routes near to the development.

The Companion Guide to PPS 22 also contains generic comment on wind turbines and driver distraction. It advises that:

"Drivers are faced with a number of varied and competing distractions during any normal journey, including advertising hoardings, which are deliberately designed to attract attention. At all times drivers are required to take reasonable care to ensure their own and others' safety. Wind turbines should therefore not be treated any differently from other distractions a driver must face and should not be considered particularly hazardous. There are now a large number of wind farms adjoining or close to road networks and there has been no history of accidents at any of them."

In 2004, Faber Maunsell undertook a research project on behalf of the Highways Agency reviewing accident records surrounding windfarms¹¹. The result showed no significant increase in the number of accidents before and after the construction of the windfarm.

The site would operate to the British Wind Energy Association (BWEA now Renewable UK) 'Guidelines for Health and Safety in the Wind Energy Industry'¹².

¹⁰ ODPM (2004) *Planning for Renewable Energy: A Companion Guide to PPS 22*. Office of the Deputy Prime Minister, pp 171.

¹¹ Faber Maunsell (2004). Review of Accident Data Surrounding Wind Farms across the UK. Produced on behalf of the Highways Agency.

¹² BWEA (2008). Guidelines for Health & Safety in the Wind Energy Industry October 2008. [online] Available at: <http://www.bwea.com/pdf/HSGuidelines.pdf>. [Accessed 24/092010].

4 SUMMARY

This Statement has summarised the key design and access issues considered as part of the design process for a wind energy development.

It has provided details of the main elements of the Development with regard to:

- Use;
- Amount;
- Layout;
- Scale;
- Landscaping; and
- Appearance.

The vehicular access arrangements, on and off site are outlined including the implications of the Development on public access, on and off site, and a summary of any changes to the current access arrangements at the site.