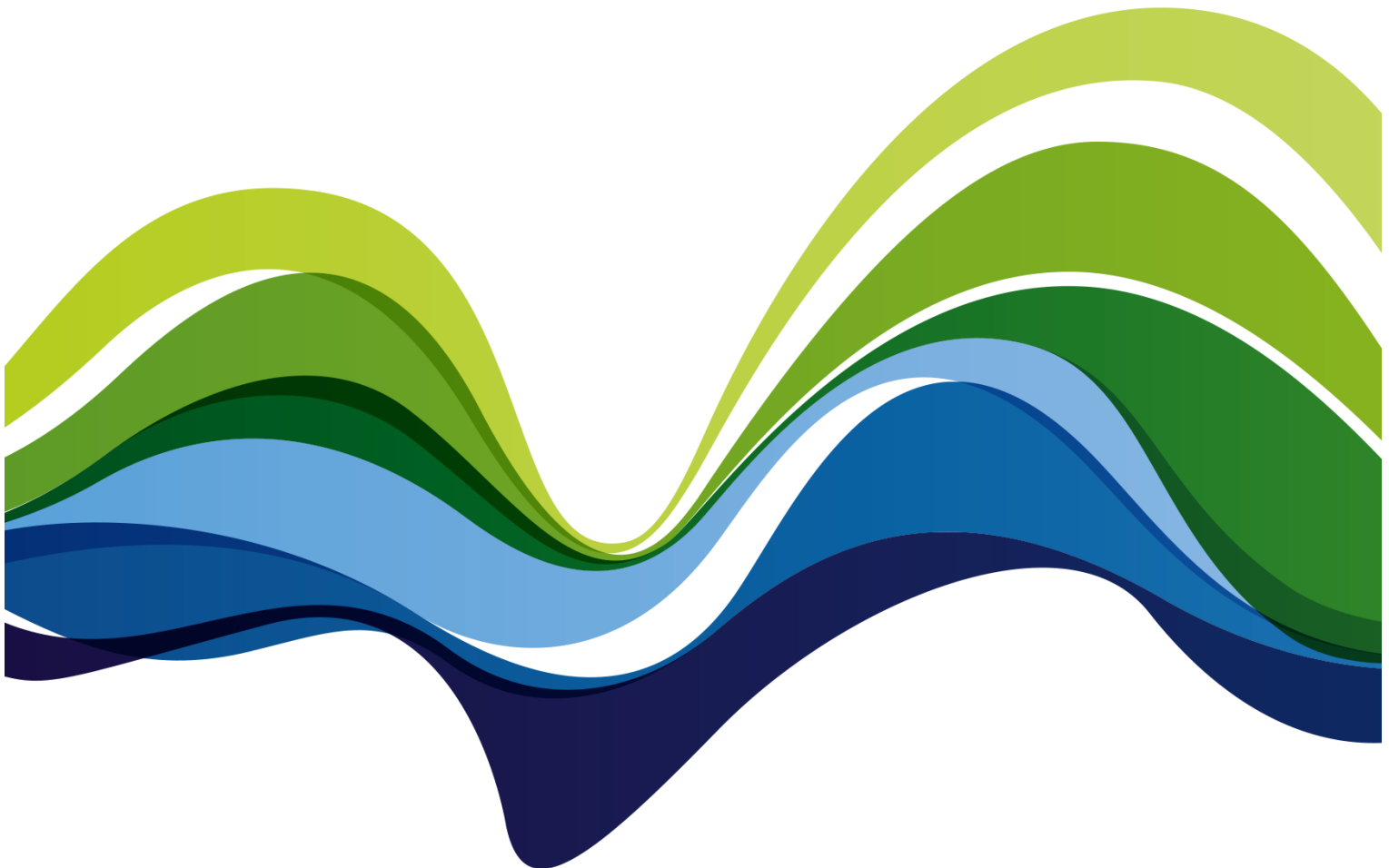




SSSE 4 Penner Road Havant Vertical Axis Wind Turbine Proposals

Design Access Statement



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Introduction

About this document

SSE Plc. is applying for full planning permission to construct four vertical axis wind turbines at its customer service centre and offices at 4 Penner Road, Havant, PO9 1QH.

Environment Statement (ES)

An Environment Statement (ES) has been also prepared and provides additional information in support of this application. The proposed site of the four wind turbines hereafter referred to as the 'Proposed Development' is located at OSGB 471221.61, 105306.52 which is the approximate centre of the main SSE Penner Road office grid reference.

The Site upon which the Proposed Development is being considered has sufficient capacity for four wind turbines and associated infrastructure. Each turbine will have a vertical axis arrangement and a tubular demountable tower. The overall height will not exceed 18m and will not impose on the local topography. The site has been carefully considered to provide a safe and suitable location to not impact on the surrounding locality as explained in the ES.

The Proposed Development will also comprise underground cabling, crane hard standings, temporary lay-down areas, and the installation of electrical inverters and gear to connect the three wind turbines directly into the building electrical supplies. The electrical generation is expected to be used primarily to offset the energy use of the building with only a small export expected at office closure periods.

This design access statement provides a summary of issues concerning the Proposed Development and reference has been made to the latest planning guidance.

This design access statement and has been prepared in conjunction with the site specific mapping, turbine drawings and all supporting documents that have been submitted with this planning application.

The statement explains and justifies the proposed development in the context of the application site.

This proposal has been drawn up having regard to the need for good design, and the following general design principals have been taken into account in respect of the proposed small scale vertical wind axis turbine s proposed:

- The scale, massing and height of the proposed wind turbines have been considered in relation to that of nearby properties, the topography, views and landmarks.
- A proper assessment of the character of the surrounding area.
- The changing need for clean, renewable sources of energy production in a sustainable manner.

Application Proposals

The planning application proposes the erection of four 18m high small scale free standing columns mounted vertical axis wind turbine.

The applicant wishes to erect the small scale vertical axis wind turbines turbine to provide a clean, renewable and sustainable form of electricity production.

Further location details of the Proposed Development have been included in the Environment Statement and the 1:1250 plan submitted as further supporting information associated with this planning application. The electricity generated by the wind turbine would be used on-site to power existing operations on the clients site

and any additional electricity generated will be fed back into the National Grid therefore reducing there carbon footprint of the main SSE office building adjacent the wind turbine proposed location.

Electricity generated by the turbines will feed back into the office main electrical distribution.

The electricity generated will be metered to measure the benefits of the installation. The metering will be compliant with OFGEM metering guidance for the purposes of feed in tariff and also reporting of renewable emissions as mandatory requirements of the Carbon Reduction Commitment (CRC).

Penner Road Offices Main Entrance and Solar PV Electric Vehicle Car Port



The use of renewable generation technologies by SSE across assets and properties forms part of a strategy of increasing use of low or zero carbon technologies as part of SSE's commitments to reduce energy use in its own buildings

SSE's internal target has been to commit to an absolute reduction in energy use of 15% across its call centres, depots and office buildings against a 2012 baseline. The vertical axis wind turbine technology has been selected as part of this reduction strategy at Penner Road, Havant.

The small scale wind turbines selected have been chosen due to their safer Environment credentials when compared to the usual blades. The vertical axis wind turbines proposed have the following characteristics that can be viewed as advantageous when compared to standard bladed turbines in a semi- urban environment:

- Elegant aesthetically pleasing swept blade design
- Compact and easy to integrate
- Revolutionary blade tip designed to shed noise

- Unique aero-elastic blade design captures turbulent wind and absorbs vibration
- Power regulation
- In built safety mechanisms – auto emergency shutdown
- Operating wind speeds: start up 4.5 m/s – safety cut-out > 25 m/s
- Design life of over 30 years

The rating of the VAWT's proposed is a maximum 7.5kW per turbine.

The Quiet Revolution Vertical Axis Wind Turbine was designed as the next generation of helical VAWT offering improved power generation, increased swept area whilst retaining the intrinsic beauty of the original design.

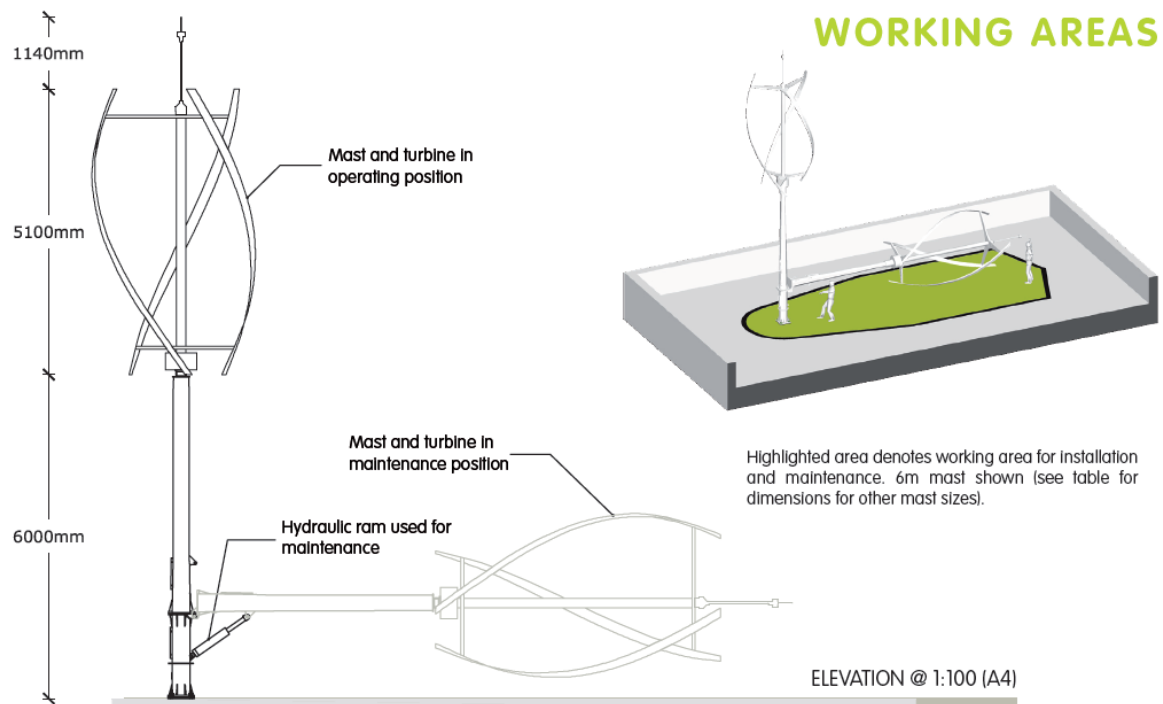
The blades, spokes and torque tube are made of advanced composite materials including carbon fibre for weight, reduction, stiffness and longevity. The brakes are modified with enhanced anti – corrosive properties, increased power despite decreased energy consumption.

The turbine blades are military grade marine rating for aggressive environments. The model proposed for the semi urban environment has been successfully utilised in a similar environment with some examples of installations in car parks and close to office buildings providing a good level of reassurance. The VAWT turbines have also been utilised in areas close to where large volumes of pedestrians can be expected to be in close proximity to the columns.



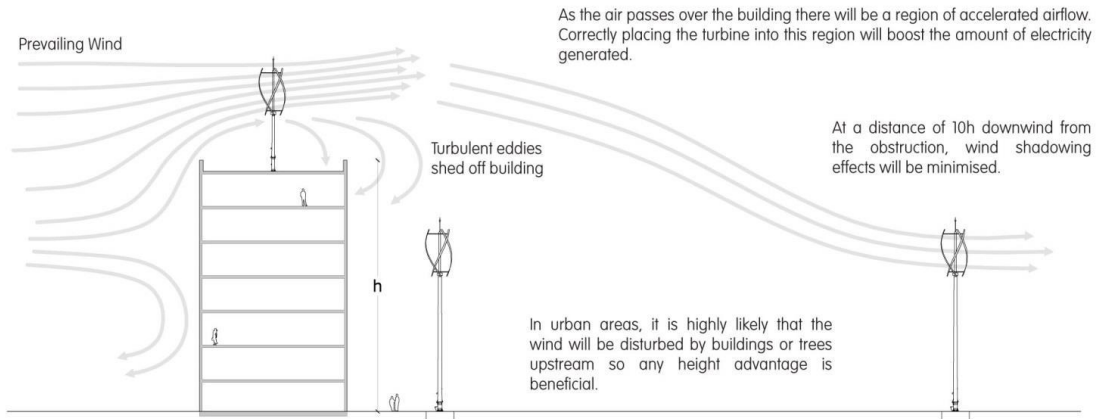
Wind Turbine Details

The wind turbines have been selected to be small and compact and have been split into three separate loads therefore allowing size and flexibility for installation.

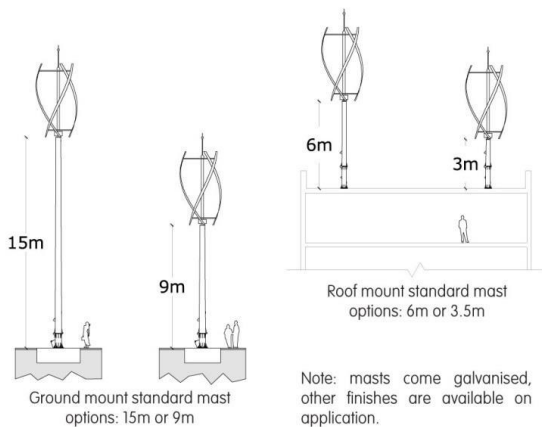


Wind Turbine Installation Options

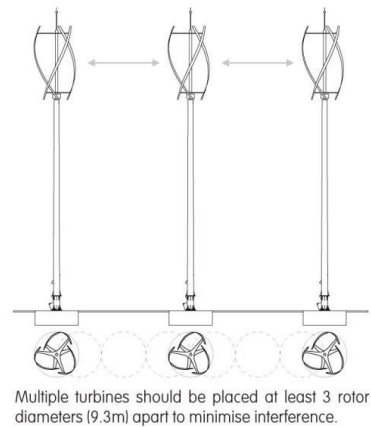
Optimising Wind Energy in the Urban Environment



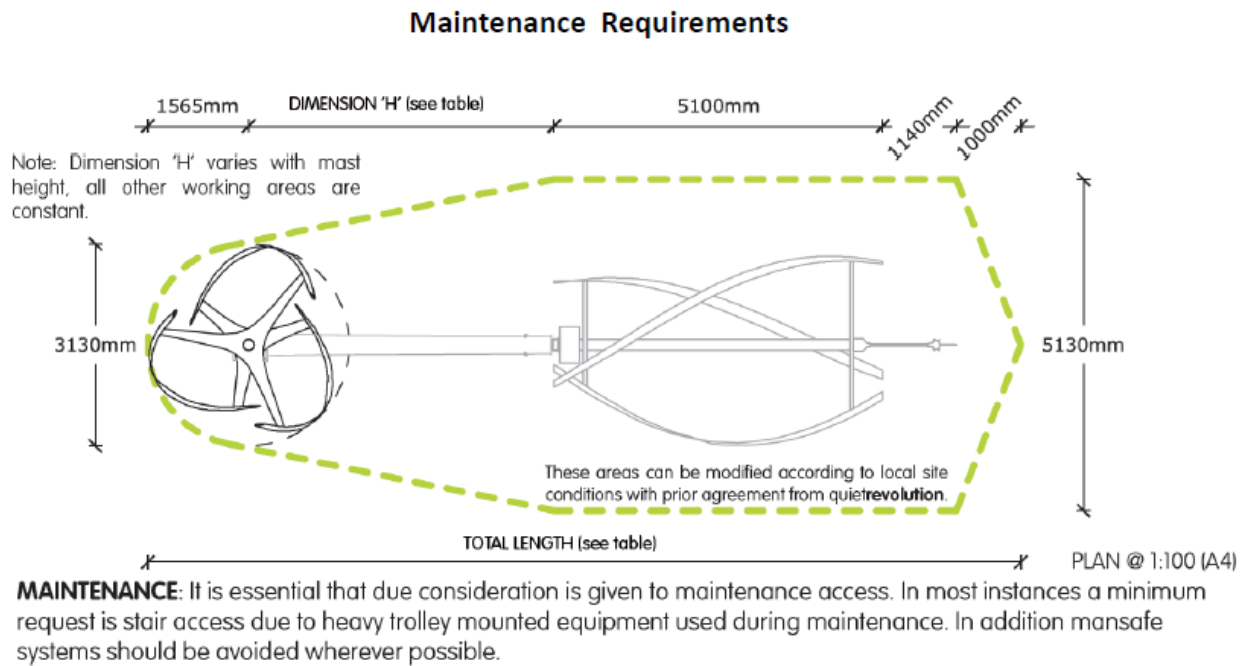
Installation Options



Turbine Spacing



Maintenance Requirements



The overall height of the column and plant is proposed to be up to 18m.

Design Access Statement

Site Selection

The wind turbine manufacturer undertook an analysis to establish the suitability of the site using the national Geographic Information Systems (GIS). The use of GIS enabled objective and consistent treatment of the whole country. The key factors included in the GIS modelling are listed below:

- Relevant national/local planning policy and renewable energy suitability studies;
- Wind speeds;
- Outside Areas of Outstanding Natural Beauty (AONB), National Parks, European and
- internationally designated sites such as RAMSAR, Special Areas of Conservation (SAC)
- and Special Protection Areas (SPA);
- Discretionary consideration of Site of Special Scientific Interest (SSSI), National
- Nature Reserve (NNR) and Environmentally Sensitive Area (ESA) designated sites;
- The location of residential dwelling and local settlements;
- Good site access;
- Reasonable distance to grid connection;
- Radar and aerodrome operations;
- Flood risk zones;
- Gas pipelines and overhead lines; and
- Telecommunications and microwave links.

The selected site is located in a suitable location with regards these impacts.

In response to the results of GIS modelling, initial site visits, and advice from the wind turbine manufacturer (Quiet Revolution) staff and consultants concluded that the Proposed Development site was considered suitable to investigate in more detail. SSE subsequently entered into discussions with Quiet Revolution to formalise a feasible proposal for the Penner Road site and the subsequent location of the turbines is the safest and least impact locations.

The site has been investigated further by SSE and a separate Environment Statement has been submitted as part of the planning application submissions.

Havant Borough Council – Sustainable Energy

Havant Borough Council has published a report on sustainable energy opportunities dated 2005. A section from the report is included for information:

Wind energy

“In appropriate locations, wind turbines can serve a significant landmark role. Their height and movement, clean, green, futuristic image and abstract sculptural qualities provide a means of marking out a place and distinguishing it from its neighbours.

An opportunity for such development might exist in Langstone, on the southern edge of Havant's mainland portion. Wind speeds in this location are thought to average c. 6.5 metres per second, within the margins of viability for wind energy development. The area is close to the A27 and is dominated by industrial development and the Budd's Farm wastewater treatment works. It is suitably remote from housing to avoid amenity issues such as noise and shadow flicker. The locality includes a strategic regeneration site in which SEEDA has taken an interest.” – From Overview of sustainable energy opportunities in Havant Final Report August 2005.

The location of the Penner Road site on the Havant southern margin bordering Langstone is suitable for sea breezes and this opportunity has been identified by the report writers commissioned by Havant Borough Council. SSE hopes the proposals for wind turbines can be viewed as an opportunity with limited impact to the local community especially housing amenity issues.

Sustainability – National and Local Level

A policy overview has been outlined in the ES submitted with this planning application.

Environmental Sustainability

In consideration of building regulation policies and recommendations to consider the impact of large structures, SSE has proposed that as part of this development the turbines are split into smaller units that will have the least visual and environmental impact and are a better option than a larger, more visible structure. The 7.5 kW turbines will provide enough generation to offset the energy use of the offices by approximately 45 tonnes of carbon or about 2% of the energy requirements of the call centre.

The project will be a useful example of a semi-urban wind generation technology that could be utilised across other sites or across the city.

The project will provide Havant and SSE alike with an example or a small scale wind turbine that can be used safely on other new buildings and sustainable building developments.

Targets for renewable generation in new buildings have relied for the most part on PV installation. A wind turbine with appealing visual impact and low environmental impact does have advantages in diversifications of options in sustainable building developments and meeting BREEAM targets. For SSE the installation will reduce operational running costs of the site and the business case return on the investment has been calculated at 8.8 years. This low return is due to pre-fabrication and off site casting of foundations that will save on site installation costs.

The installation will contribute towards local authority goals and SSE company targets and values. SSE has a current absolute reduction target of a 15% reduction in carbon emissions across operational buildings by 2018. The UK has a renewable energy target of 15% renewable generation by 2020. The SSE target is externally audited and verified by independent agencies. A project that is both sustainable (creating no waste and with no detrimental impact to the surroundings) and saves energy is a good sustainable addition to a range of measures that SSE is currently employing across its buildings.

At the Penner Road SSE site projects to reduce the carbon footprint have already been concluded including the addition of a free cooling model, the installation of LED lighting.

Sustainability – Materials

The installation has a long plant life span of 30 years. The turbines will be easily maintained over this period due to the unique and safe joint at the base of the wind turbine columns. This will enable replacement with little disruption at the end of its life easily with demountable columns that will not require excavation or disruption. The plant life cycle costs are low and the installation is viewed as a sustainable option with little impact to the site both presently and in the future.

The materials used in the design of the vertical axis wind turbines are mainly formed of galvanised steel and can be recycled at the end of the project if not required. The life span of galvanised steel is long and this will extend the life cycle of the plant. The waste generated by the Proposed Development is therefore planned to be as close or near to zero. The system columns will be reutilised and turbine blades replaced at end of life with new blades which again can be recycled.

The bases of the columns are pre-formed on site so only a minimum of disruption will occur at site local level. These pre-cast solutions will remove the risk of building waste and mitigate further the waste transfers required. Removal of the requirement for on site casting of foundations will be built into the project plans and method statements to assure a sustainable and low impact design solution.

Photo 1 – Pre-Cast Foundation (other site example)



Photo 2 – Pre-Cast Foundation (other site example)



Character and Design

The proposed vertical axis wind turbines have been selected mainly due to their aesthetic appeal. The models proposed have also been utilised in a semi-urban environment near large volume of pedestrians and have a proven track record in similar environments where members of the public can pass safely close and next to the system columns and turbines. The design of the turbine blades and its low environmental impact make it a very suitable solution as part of a strategy of integrating wind generation technology into building low carbon development with a safe and low impact outcome.

The design of the models proposed could be seen to enhance the appearance of the site and the pleasant design will appear to most as architecturally pleasing.

VAWT Design Benefits

Vertical Axis Wind Turbines rotor can use wind from all directions, unlike traditional HAWT turbines which need to track the wind – therefore maximising efficiency

A VAWT for the same swept area has a smaller plan area than a HAWT, making it more space efficient. An important consideration when siting on or close to buildings

Acoustics – Design Advantages

The aerodynamic helical blade design results in smooth, quiet operation.

Due to the vertical axis geometry of the rotor, the blade tips are close to the axis of rotation and travel a shorter distance per revolution. This results in a lower blade tip speed further reducing noise levels.

Revolutionary blade tip designed to shed noise.

Unique aero-elastic blades design captures turbulent wind and absorbs vibration.

Operating wind speeds – Design Advantages

Cut in at sustained 4.5 m/s, safety cut out at 25 m/s

Survival wind speed 52.5 m/s

Rotor Speed 100 – 260 RPM

Minimum recommended annual mean wind speed 5.0 m/s

Accessibility

End Users and Visitors

The chosen site was evaluated to ensure no loss of site accessibility. There is no requirement for staff or visitors to require access to the turbines or the column towers.

There is no change to allocated numbers of long term parking spaces at the site and able, less able, visitor's car parking space numbers and cycling space numbers will not be changes.

There will be no impact on pedestrian routes and nearby rights of way and no changes will be required to the rights of way during the period of the installation or afterwards.

Movement to, from and within the development

Parking spaces for all users will not be impacted by the Proposed Development. The locations of the turbines have been selected to ensure that there is no impact to the movement from and within the development for all modes of transport including buses, mini buses, car drivers and cyclists.

Local bus routes exist in the area including a staff bus. None of these are located in the Proposed Development Area and no local bus routes will be impacted or require notices of change by the Proposed Development.

Community Safety - How the scheme is designed to create a safe environment

The site has been selected to ensure no impact to the surroundings and to provide a safe space and working environment.

No machinery or plant will be located above the pedestrian right of way and all plant and equipment i.e. the whole Proposed Development will be located within the site boundary.

Maintenance

Quiet Revolution turbines are designed specifically to be easily demountable and easily installed. A pre-fabricated joint is to be included in the column design that will allow accessible maintenance at end of life and turbine repair.

Unique base provides for a safer and organised installation



Access Route

The turbines will be pre-assembled off site. Deliveries of the columns will require careful planning as part of project detail method statements and will be planned to ensure no disruption to the site, operations or the community. The column deliveries and installation of the columns will be carried out when the site is closed at a weekend during daylight hours only. The delivery vehicles will not require any special access arrangements both at site and in the local area.

A barrier shall be installed around the site during the installation of the columns. As noted this will require a short term one way route within the site boundary that will be managed by the SSE site facilities team.

Public Access, Safety, Recreation and Rights of Way

There will be no requirement for any new roads as the site has good road access suitable for the deliveries of the wind turbines and columns. The wind turbines are to be sited adjacent the SSE Penner Road car park and the site is suitable for large vehicle access. The turbines will be installed over a 3 day period.

Post construction, access to the wind turbines should only be required for routine maintenance. Access will be via the current standard entrance.

The wind turbines are to be sited in the proposed location noted in the planning application submissions, it is thought unlikely to require access from any of the emergency services.

The land is currently used for no other purpose than car parking for offices and no car parking spaces are to be lost under the scope of this project. The land will remain useable right up to the edge of the turbine column foundations after installation.

Rights of pedestrian way exist within the local area but there are no rights of way across the application site. All components and turbine blades will be located as to not over hand or impact the public right of way adjacent the site.

Construction and Infrastructure Impacts

These are outlined in the Environment Statement submitted with this application.

Landscape and Visual Impacts

These are outlined in the Environment Statement submitted with this application.

Ecological and Ornithological Impacts

These are outlined in the Environment Statement submitted with this application.

Sustainability - Materials

The materials used for the design of the columns and turbines are galvanised steel that will reduce corrosion.

Hydrological impacts, groundwater protection

These are outlined in the Environment Statement submitted with this application.

Archaeological Impacts

These are outlined in the Environment Statement submitted with this application.

Shadow Flicker

These are outlined in the Environment Statement submitted with this application.

Electromagnetic Interference and Air Safeguarding

These are outlined in the Environment Statement submitted with this application.