

Design and Access Statement

Sandy Knowe Wind Farm Extension

ERG Holding Ltd



July 2022



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1 Introduction

This Design and Access Statement has been prepared by Atmos Consulting Ltd ('Atmos') on behalf of ERG UK Holding Ltd ('the Applicant') to support an application under Section 36 of the Electricity Act 1989 (as amended) for the construction and operation of a generating station known as Sandy Knowe Wind Farm Extension (The Proposed Development).

Should a Section 36 consent be granted it is requested that deemed planning permission under Section 57 of the Town and Country Planning (Scotland) Act 1997 (the 1997 Act) also be granted.

The Proposed Development is located south-west of Kirkconnel in the Dumfries and Galloway Council (DGC) area and consists of up to six wind turbines (three turbines up to a maximum 125m tip height and three turbines up to a maximum of 149.9m tip height), including battery storage and associated infrastructure including hardstandings, cabling and access roads.

The Proposed Development is an extension to the consented and currently under construction Sandy Knowe Wind Farm and will have an indicative output of 21.6MW from the wind turbines and a battery storage element with an indicative capacity of 28.4MW. The combined capacity of the Proposed Development will not exceed 50MW.

The application is accompanied by an Environmental Impact Assessment Report (EIA Report) prepared in accordance with the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (the EIA Regulations).

The EIA Report presents the findings of the EIA process by describing the Proposed Development, the current conditions at the Proposed Development Site and the likely environmental effects which may result from the construction and operation of Proposed Development.

Where appropriate, mitigation measures designed to avoid, reduce or offset potentially significant effects are proposed and conclusions are presented on residual effects (those effects that are expected to remain following implementation of mitigation measures).

This Design and Access Statement does not form part of the EIA Report but should be read in parallel with it as many of the references in the Design and Access Statement refer to material produced in full in the EIA Report.

The purpose of this Design and Access Statement is to explain the design principles and concepts that have been applied in relation to the Proposed Development. Consideration has been given to Scottish Government Planning Advice Note (PAN) 68: Design Statements, which outlines the key principles and concepts to be considered within a design statement.

1.1 The Applicant

ERG Group is a European renewable power producer, with an office in Edinburgh, which has been operating successfully in the energy sector for 80 years.

In recent years ERG has transformed itself from one of Italy's leading oil and refining companies to one focussed wholly on green power. ERG is active in eight countries —

in the UK, France, Germany, Poland, Romania, Bulgaria, Sweden and Italy, where it is now the leading wind energy operator owning and operating wind farms with a total installed capacity of approximately 2GW.

ERG is constructing wind farms in Scotland and operates wind farms in Northern Ireland.

The Applicant, ERG Holding UK Ltd., is the sole owner of Sandy Knowe Wind Farm Limited and is committed to investing in Dumfries and Galloway through renewable energy projects, with the community benefits and additional outcomes that renewable energy development can bring (including construction and post construction employment).

2 Policy Context

2.1 National Planning Policy

National planning policy is also taken into account within development proposals, specifically:

The National Planning Framework (NPF3):

The National Planning Framework 3 (NPF3) was published on 23 June 2014 and is a long-term strategy for Scotland. It is the spatial expression of the Scottish Government's Economic Strategy and plans for development and investment in infrastructure.

NPF3 acknowledges that whilst good progress is being made in diversifying Scotland's energy generation capacity and lowering the carbon emissions associated with it, more action is needed.

NPF3 is clear that the Scottish Government wants to continue to capitalise on Scotland's wind resource whilst developing a growing focus on marine energy. The policy is clear that onshore wind will continue to make a substantial contribution to diversification of energy supplies.

Scottish Planning Policy (SPP)

This is the Scottish Government's policy on how nationally important land use planning matters should be addressed across the country. The latest SPP was published in June 2014.

SPP sets out to achieve the Scottish Government's Purpose of creating a more successful country, as detailed in the Scottish Government's Economic Strategy. It expresses the need for the planning system to "*support the transformational change to a low carbon economy*".

SPP provides the basis for decision making on development proposals and includes a requirement for planning authorities to set out spatial frameworks to help identify where there is capacity for wind farms. It also sets out what the key considerations for proposals should be. These include net economic impact; the scale of contribution to renewable energy generation targets; effect on greenhouse gas emissions; cumulative effects; impacts on the environment and on communities, including landscape and visual impacts.

The Fourth National Planning Framework (NPF4) Draft

The Draft NPF4 was published in November 2021 (Scottish Government 2021a). Although not finalised, it is an important consideration for the Proposed Development. Once adopted it will replace NPF3 and the SPP.

It sets out increased emphasis on the 'net zero agenda' through four key themes; sustainable places, liveable places, productive places and distinctive places.

The Draft NPF4 acknowledges the need to; "*diversify and expand renewable energy generation*" and states that:

“Additional electricity generation from renewables and electricity transmission capacity of scale is fundamental to achieving a net zero economy and supports improved network resilience in rural and island areas”

2.2 Local Planning Policy

The Local Development Plan for the Proposed Development comprises:

- Dumfries and Galloway Council Local Development Plan 2 (DGC LDP2) (October 2019);
- Supplementary guidance: Wind Energy Development: Development Management Considerations (February 2020a); and
- Supplementary guidance: Part 1 Wind Energy Development: Development Management Considerations Appendix 'C' DGWFLCS (February 2020b).

These have been used to help steer the design of the Proposed Development.

2.3 Climate Change and Energy Policy

Both the UK and Scottish Government have declared a Climate Emergency and climate change has been described as the greatest environmental challenge facing the world today. Dumfries and Galloway Council also declared a climate emergency on 19 June 2019 and noted the urgency to respond to climate change and transition to a carbon neutral region.

Scottish Energy Strategy

The Scottish Energy Strategy (SES): The Future of Energy in Scotland was published in December 2017. The SES sets two new targets for the Scottish energy system by 2030:

- The equivalent of 50% of the energy for Scotland's heat, transport and electricity consumption to be supplied from renewable sources; and
- An increase by 30% in the productivity of energy use across the Scottish economy.

For the longer term the SES states that;

“Scotland's long term climate change targets will require the near complete decarbonisation of our energy system by 2050, with renewable energy meeting a significant share of our needs”

Since the publication of the 2017 strategy, the Scottish Government has brought forward this commitment to achieving net zero greenhouse gas emissions by 2045 and a 75% reduction by 2030, following the Climate Change (Emission Reduction Targets) (Scotland) Act 2019 and the noted in the Scotland's Energy Position Statement (2021b).

Onshore Wind Policy Statement

The Onshore Wind Policy Statement (OWPS) published in December 2017 sets out the Scottish Government's policy position on Onshore Wind and re-affirmed the SES in setting out an important role for onshore wind in achieving Scotland's renewable energy targets.

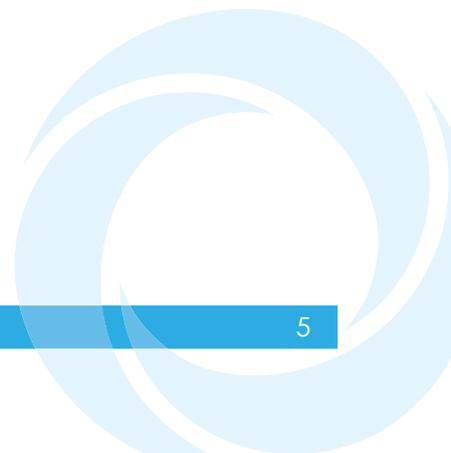
It also recognises the wider economic and industrial opportunity that growing the onshore wind sector represents.

The Onshore Wind Policy Statement Refresh 2021: Consultative Draft, published in October 2021 (Scottish Government, 2021c), revisits the OWPS and sought responses on the Scottish Governments ambitions to secure an additional 8-12 GW of installed onshore wind capacity by 2030.

2.3.1 Other relevant considerations

The Proposed Development has also considered the following in its design:

- The Electricity Act 1989;
- The Town and Country Planning (Scotland) Act 1997;
- Climate Change Act 2008;
- Climate Change (Emission Reduction Targets) (Scotland) Act 2019;
- Committee on Climate Change Sixth Carbon Budget 2020;
- Net Zero Strategy: Build Back Greener;
- Scotland's Climate Assembly: Recommendations for Action (2021); and
- Update to the Climate Change Plan 2018-2032: Securing a Green Recovery on a Path to Net Zero.



3 Site Description and Context

3.1 Site Description

The Proposed Development Site is located on low lying hills to the north of the Southern Uplands hill range, south of the A76 and approximately 2.5km south-west of the town of Kirkconnel and encompasses approximately 300 hectares.

The Proposed Development Site is centred on National Grid Reference (NGR) (approximate) NS 68631 10692 and is illustrated in **Figure 1-1, Site Location, EIA Report Volume 3**.

It lies to the south of the Nithsdale on the lower-lying northern slopes of hills which include High Cairn (553m Above Ordnance Datum (AOD)) and White Hill (418m AOD). The surrounding area is largely characterised by moorland landcover with blocks of coniferous forest.

The area within which the Proposed Development will be located is defined as the 'Proposed Development Footprint'.

This encompasses all the Proposed Development infrastructure including the turbine locations, hardstanding and site access. It also includes areas of the consented Sandy Knowe wind farm and includes consented / constructed infrastructure including tracks, temporary construction compounds, a borrow pit, and substation.

The Proposed Development Footprint is centred on (NGR) (approximate) NS 69292 10825 and is illustrated in **Figure 1-2, Site Layout, EIA Report Volume 3**.

3.2 Surrounding Area

The surrounding area is characterised by open moorland, coniferous forestry plantation and grazing land. The overall site context, as described below, is illustrated in **Figure 1-3, Site Context, EIA Report Volume 3**.

There are a number of operational and consented wind farms in the vicinity with the consented Sandy Knowe Wind Farm itself within the Proposed Development Site. The operational Hare Hill, Hare Hill Extension and Sanquhar wind farms are all within 5km, as well as the consented Magheuchan Rig. Cumulative sites are illustrated in **Figure 5-1-6a, Operational, Consented and Proposed Wind Farms within 40km** and included in the **Cumulative Assessment, EIA Report Volume 4**.

3.3 Landscape Designations

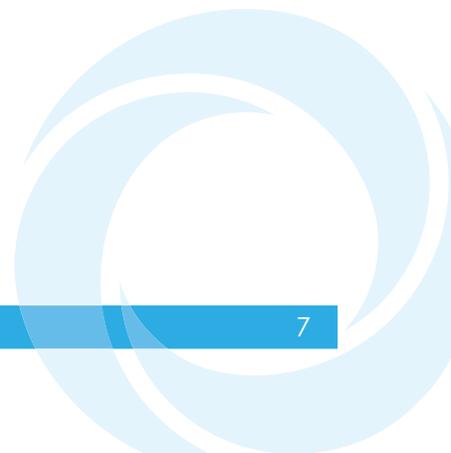
The Proposed Development site does not lie within any landscape designations and no wild land areas would be affected. There are a number of designated landscapes in the wider area. The Southern Uplands Sensitive Landscape Area is located approximately 1km east of the Proposed Development Site boundary at its closest point.

3.4 Heritage Designations

There are no designated heritage assets within the Proposed Development Footprint. There are six Listed Buildings and six Non-Statutory Register (NSR) sites within 1km.

3.5 Ecology Designations

There are no statutory designated sites within the Proposed Development Site. There are two Sites of Special Scientific Interest (SSSI) within 10km: Muirkirk Uplands at 4.2km northeast; and Back Wood at 9.1km east, each of which are also within the Muirkirk and North Lowther Uplands Special Protection Area (SPA). The Upper Nithsdale Special Area of Conservation (SAC) is located 9.1km east.



4 Site Selection and Design Evolution

4.1 Site Selection

Since the consented Sandy Knowe Wind Farm's project inception in 2011, high wind speeds have been continuously observed onsite. Through environmental and technical studies, the Applicant has found limited amounts of sensitive environments and species in the area.

As such, the Applicant has identified an opportunity to extend the Sandy Knowe Wind Farm to utilise the existing available grid capacity.

Scottish strategy and policy support the extension of already consented / existing wind farms, in particular, the Scottish Energy Strategy (Scottish Government, 2017) and the Draft National Planning Framework (NPF4, Policy 19a, 19b) (Scottish Government, 2021a).

The Proposed Development Site has been selected as suitable by the Applicant because it met the following criteria:

- There is a commercially viable grid connection and the Proposed Development would maximise the available capacity of the connection already installed for Sandy Knowe Wind Farm;
- Strong wind speeds are present at the site;
- The Proposed Development location is in proximity to existing operational wind farms of similar scale and forms an extension to the in construction Sandy Knowe Wind Farm;
- The location is distant from nearest residential properties and settlement, and is compatible with residential receptor distribution;
- The Proposed Development Site has an established road access and access track network; and
- The Proposed Development Site itself does not support, nor is in close proximity to, international or national, landscape or cultural heritage designations.

In accordance with Regulation 5(2)(d) and Schedule 4(2) of the EIA Regulations, reasonable alternatives (in terms of project design, technology, location, size and scale and characteristics) of the Proposed Development should be considered. However, the rationale for site selection of the Proposed Development was as an extension to Sandy Knowe Wind Farm based on spare grid capacity and infrastructure sharing being achieved. Therefore, alternative locations have not been considered.

As part of the development process the Applicant has reviewed and discounted alternative infrastructure siting (turbines, sections of new access track and access) due to a variety of factors including environmental, planning, technical and commercial constraints.

4.2 Design Principles

The design principles of the Proposed Development carry forward the principles applied to site selection through establishing a design that meets the objective of capturing the maximum wind energy whilst minimising the effects on the environment.

Wherever possible, enhancement measures (particularly habitat and biodiversity measures) have been incorporated, with the design adapted to maximise the benefits.

The locations of the turbines and proposed infrastructure have been designed to avoid where possible identifiable onsite environmental constraints including gradient, watercourses and sensitive peat and remain an appropriate distance away from residential properties to reduce potential effects from noise and residential amenity.

The layout within this application therefore presents an informed and refined proposal that has evolved through an iterative design process as information has come to light through the various supporting assessments.

4.3 Design Evolution

The design of the Proposed Development has been driven by the objective of positioning the turbines and associated infrastructure so that it captures the maximum wind energy possible within a suitable area determined by environmental and technical constraints.

The key constraints to site design, which were assessed during the design and scoping process, included:

- Landscape character and visual amenity;
- Ground conditions, topography and peat;
- Presence of protected habitats (including Groundwater Dependant Terrestrial Ecosystems (GWDTE)) and species;
- Proximity to noise sensitive receptors;
- Presence of watercourses, private water supplies and related infrastructure;
- Presence of sensitive ornithology receptors;
- Presence of sensitive cultural heritage features; and
- Proximity to suitable grid connection.

These constraints are discussed more in their relevant chapter within the EIA.

Appendix A sets out the key design iterations that have taken place since pre-application (Scoping Layout), receipt of the scoping opinion (Design Chill) and final layout (Design Freeze). The Design Evolution Layouts are shown on **Figures 3-2a to 3-2c, Design Evolution, EIA Report Volume 3**.

4.3.1 Design Iteration 1 (Scoping Layout)

In May 2021, as part of a request for an EIA Scoping Opinion, the Applicant submitted an indicative turbine layout for the Proposed Development comprising of six turbines with proposed tip heights of 149.9m.

This design was based on an initial feasibility considering preliminary environmental and technical constraints with the intention of sharing infrastructure components with Sandy Knowe Wind Farm in order to minimise the potential impact on sensitive receptors.

Through desktop studies it had been identified that two telecommunication links cross the Proposed Development Site. These are owned and operated by Vodafone which serve the operational Hare Hill Wind Farm located to the south west of the Proposed Development site. Vodafone requested that the wind turbine layout be designed around these two telecommunication links and that a buffer of 50m from the first Fresnel

Zone must be included as a buffer from the turbine rotors. This buffer was applied to the Scoping Layout resulting in a layout with no turbines within the excluded areas.

At this stage in the design process, it was considered that the Site could accommodate six turbines up to a 149.9m maximum tip height.

The Scoping Layout is shown on **Figures 3-2a, Design Evolution, EIA Report Volume 3**.

Design Iteration 1 (Scoping Layout) – Consultation

The following comments, set out in Table 1, were received from the Energy Consents Unit (ECU) and consultees on the design of the Scoping Layout.

Table 1: EIA Scoping Opinion – Design

Consultee	Scoping Comment	Applicant Response
ECU	Scottish Ministers request SEPA's advice provided in the Scoping Opinion is reviewed with regards to the proposed site layout	SEPA's advice has been taken into account in the design iteration process (refer to Section 4.3.2) and has been presented within the EIA report (Chapter 3 Description of Development).
SEPA	New turbines and associated infrastructure in the western portion of the site would be on an area of peat bog and marshy grassland. The applicant should give consideration to how the site can be designed to avoid direct impacts. SEPA also note that the road between T7 to T1; the road from T2 to T3, and T3 itself all appear to be on peat of about 2m depth. They suggest these pieces of infrastructure should be removed or moved onto less valuable areas.	This feedback has been taken into account in the design iteration process (refer to Section 4.3.2) and is presented within the EIA Report (Chapter 3 Description of Development).
NatureScot	NatureScot note that T3 is in an area of deep peat, therefore advise that micro-siting T3 to avoid disturbance of deep peat is prioritised.	This feedback has been taken into account in the design iteration process (refer to Section 4.3.2) and is presented within the EIA Report (Chapter 3 Description of Development).
ScotWays	Extract from the Welsh Assembly Government's Technical Advice Note on Renewable Energy (TAN 8) Proximity to Highways and Railways: "It is advisable to set back all wind turbines a minimum distance, equivalent to the height of the blade tip, from the edge of any public highway (road or other public right of way) or railway line." ScotWays is likely to object to any proposal where the above principle is not followed.	This has been considered as part of the design process. No turbines are within 149.9m of any public highway (road or other public right of way).

4.3.2 Design Iteration 2 (Design Chill)

Design Iteration 2 (Design Chill) represents a substantial change in the design process for the Proposed Development. This was informed by environmental and technical considerations such as:

- Extended Phase 1 and National Vegetation Classification (NVC) surveys;

- Presence of protected habitats (including Groundwater Dependant Terrestrial Ecosystems (GWDTE)) and species;
- Landscape character and visual amenity;
- Ground conditions, topography and peat;
- Proximity to noise sensitive receptors;
- Presence of watercourses, private water supplies and related infrastructure;
- Presence of sensitive ornithology receptors; and
- Presence of sensitive cultural heritage features.

All turbine IDs were renumbered to sequentially follow the Sandy Knowe turbine numbering. Therefore:

- Turbine 1 (T1) of the Scoping Layout became T25;
- T2 of the Scoping Layout became T26;
- T3 of the Scoping Layout became T27;
- T4 of the Scoping Layout became T28;
- T5 of the Scoping Layout became T29; and
- T6 of the Scoping Layout became T30.

Turbine 25

This turbine was moved due to being on steep gradients that may have been challenging for the turbine, hardstand and access tracks. This turbine was moved to the opposite side of the communication link constraint and in shallower peat based on the interpolated range surface. The new location also increased the distance from potentially highly GWDTE.

Turbine 26

Due to the movement of T25, T26 required to be moved to maintain optimum turbine spacing. This turbine was moved approximately 30m north east to shallower gradients and peat based on the interpolated range surface, while avoiding an additional watercourse crossing and being located within the same NVC habitat type.

Turbine 27

SEPA and NatureScot noted in their Scoping Response (Table 1) that T27 (formerly T3) itself appeared to be on peat approximately 2m in depth and advised removal or micro-siting. T27 was therefore moved to a small pocket of shallower peat (0.6-1m) based on the interpolated range surface. This was taken forward as a key consideration for T27 moving forward to the final design phase.

Turbines 28, 29 and 30

In order to reduce the perceived visual effects of the Proposed Development and to blend these turbines into the consented Sandy Knowe Wind Farm design., the Maximum tip heights for Turbines 28, 29 and 30 (the front facing turbines when viewing from the the A76) were reduced from 149.9m to 125m.

Specifically for T29, this turbine was moved south to increase the distance from residential receptors, to increase distance from a sensitive ornithology constraint and to avoid peat >0.5m based on the interpolated range surface.

Hardstands

Hardstands were introduced to the Design Chill layout and positioned to

- Avoid deeper areas of peat based on the interpolated range surface;
- Minimise cut and fill requirements based on slope gradient;
- Avoid potentially highly GWDTE; and
- Maintain a minimum buffer of 50m from watercourses.

Access Tracks

Track between T25 (formerly T3) and Sandy Knowe Wind Farm infrastructure has been re-routed to avoid deeper peat based on the interpolated range surface.

Given the movement of T25, and the comments received by SEPA, the track between T25 and T26 was redesigned to avoid deeper peat where possible based on interpolated range surface.

The track between T26 and T27 has been routed on <0.5m peat depth based the interpolated range surface.

Track west of T27 on the approach to T28 has been routed to maintain a maximum buffer of 50m from identified cultural heritage assets.

To avoid M6 habitat, the three-way junction on the track approaching T29 and T30 has been removed and the track to T29 realigned to avoid the M6 habitat. Turning heads were then introduced at each turbine location at T29 and T30.

Battery Storage

Battery storage was considered as part of the design chill layout, to be located in the area of the existing Temporary Construction Compound at Sandy Knowe Wind Farm.

The Design Chill Layout is shown on **Figures 3-2b, Design Evolution, EIA Report Volume 3**

4.3.3 Design Iteration 3 (Design Freeze / Final Design)

A more detailed infrastructure-specific phase two peat probing regime was undertaken, comprising 25m sampling grids for hardstandings and 50m spacings with 10m offsets along proposed access tracks. Coring was undertaken at each turbine location.

Phase one and two peat probing data was interpolated to provide a more accurate representation of peat depths in proximity to the proposed infrastructure. Peat depth therefore was the primary constraint to be considered for minor changes from Design Chill.

Turbine 25

T25 was repositioned approximately 5m southeast to marginally shallower peat.

Turbine 25 – Hardstand

Hardstanding moved slightly southeast to keep temporary working areas outside GWDTE.

Turbine 26

There were no movements required for T26.

Turbine 26 – Hardstand

Hardstanding mirrored to place track on northwestern side of the hardstand area. This allows track alignment to avoid GWDTEs north and south of T26.

Turbine 27

T27 was repositioned 25m west to allow a better alignment of the hardstand while still in shallow peat following detailed peat probing.

Turbine 27 – Hardstand

Installation area rotated to avoid crossing watercourse whilst avoiding cultural heritage feature.

Turbine 28

T28 was repositioned 15m southeast to shallower peat following detailed peat probing.

Turbine 28 – Hardstand

Installation area rotated to be slightly closer to orientation of contours without entering deeper peat.

Turbine 29

T29 was repositioned 28m southwest to take into consideration hardstand area movement.

Turbine 29 – Hardstand

Hardstanding mirrored to place track on northeastern side of the hardstand area and locate hardstanding on shallower peat.

Turbine 30

A minor movement of T30 was undertaken to take into consideration hardstand area movement.

Turbine 30 – Hardstand

Rotated the boom assembly points and reorientated hardstanding slightly (this required a 2m change to the turbine coordinate) to locate on locally shallower peat whilst avoiding sensitive habitats.

Access Tracks

Track between T27 and T28 has been realigned to further avoid deeper areas of peat. The track between T27 and T28 also includes a section of floating track over peat greater than 2m depth to minimise peat excavation in this area.

This movement impinges slightly on a 20m cultural heritage receptor buffer zone (Sheepfold, Asset 20, see Chapter 10 Cultural Heritage). This asset is of low or negligible

importance, however, provision for fencing/demarcation under archaeological supervision prior to construction commencing will be in place during the construction of the Proposed Development to mitigate potential effects.

A junction between T29 and T30 has been relocated to shallower peat.

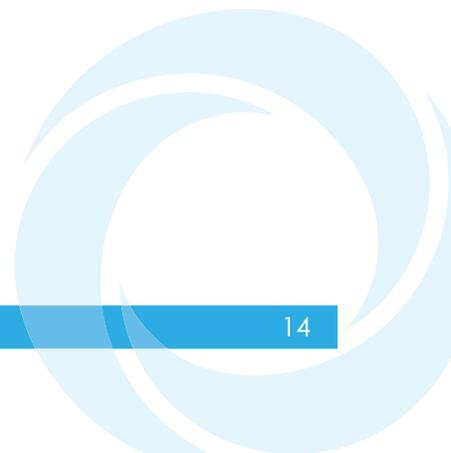
Battery Storage

There were no amendments for the battery storage location from Design Chill.

Borrow Pit

The existing borrow pit that is used for the construction of Sandy Knowe Wind Farm has been considered as part of Design Freeze. The existing borrow pit is proposed for the excavation of on-site aggregate to be used in the construction of the Proposed Development and for peat reinstatement as it is considered there is sufficient space within its footprint to accommodate the residual peat excavated for the Proposed Development.

The Design Freeze / Final Design Layout is shown on **Figures 3-2c, Design Evolution, EIA Report Volume 3**, and on **Figures 3-1a to 3-1c, Site Layout Overview, EIA Report Volume 3**.



5 Final Design Overview

The Proposed Development **consists of three turbines up to a maximum 125m tip height; three turbines up to a maximum tip height of 149.9m; battery storage; and associated infrastructure.**

The associated infrastructure includes:

- Use of existing, consented / under construction access tracks;
- New access tracks;
- Construction of turbine foundations and crane hardstandings;
- Underground cabling;
- Use of an existing borrow pit for the excavation of on-site aggregate to be used in the construction of the Proposed Development and for peat reinstatement. Any extraction of aggregate will be within the existing boundaries of the Borrow pit (EIA Volume 1 Chapter 3 Project Description);
- Reuse of two consented temporary storage compounds; and
- Three watercourse crossings.

The wind turbine generators will have an indicative output of approximately **21.6MW** and the battery storage an **indicative storage capacity of 28.4MW. The combined export capacity will not exceed 50MW.**

The Proposed Development has been designed with an operational life of 40 years at the end of which it will be decommissioned unless further consents are granted.

It is anticipated that approximately 3km of new track is likely to be required to service the turbines and associated infrastructure. No upgrades are proposed on the consented / constructed Sandy Knowe Wind Farm access tracks.

The Proposed Development components are summarised in **Figures 3-1a to 3-1c, Site Layout Overview, EIA Report Volume 3.** "Permanent Infrastructure" in the context of this EIAR means infrastructure that will be in place for the operational life of the Proposed Development. Following expiry of planning permission, the decommissioned above ground infrastructure will be removed and reinstated in an environmentally sensitive way agreed with statutory consultees. The above ground infrastructure is permanent only for the duration of the planning permission.

Once the turbines have been installed, the crane hardstand area around the turbines will remain in place as permanent infrastructure. The boom assembly areas, temporary track and hardstand working areas will be restored using the retained topsoil or turf.

The layout, including the permanent and temporary infrastructure, of the Proposed Development is shown on **Figures 3-1a to 3-1c, Site Layout Overview, EIA Report Volume 3.**

Table 2: Proposed Development Components

Proposed Development Components- Indicative Parameters	
Turbines	
Three wind turbines up to 125m to tip height and three turbines up to 149.9m, (with a rotor diameter of approximately 112m). The maximum rated output is approximately 21.6MW	
Permanent Infrastructure	
New Access track, including 9 passing places (3 per	[3098m x 5.5m] + [9 x 20m x 5.5m] (18,029m ²)

km)	total)
Turbine Foundation (6 No.)	25m x 25m area (3,750m ² total)
Crane Hardstanding (6 No.)	62.5m x 25m ((1,320m ² per hardstand, 7,920m ² total – this excludes the turbine foundation but includes the area around it, please see Figure 3-4)
Hardstanding for Battery Storage Compound	105m x 30m (3,150m ² total)
Temporary Infrastructure	
Boom assembly areas, Hardstand working areas and Temporary Track (12)	155m ² (1,860m ² total)
Turning Heads (4)	542 (2,168m ² total)
Total permanent land take	32,849m²
Total temporary land take	4,028m²
Total Length of reused access tracks	6,500m

6 Access

6.1.1 Site Access

All construction traffic (including abnormal loads) will access the site via the existing Sandy Knowe Wind Farm north-western access point directly off the A76, while all other vehicles during operation will access the site from the existing/constructed north-eastern access via the Heads of the Valley Road.

Given that the length of the longest blade of the Proposed Development is the same as Sandy Knowe Wind Farm, the route for abnormal load vehicles will utilise the same route as Sandy Knowe Wind Farm.

The vehicles will travel south along the A74(M) and M6 to junction 44, then turning back north along the M6 to exit at junction 22 of the A74(M). The vehicles will then travel along the A75 and A76 to the Proposed Development Site.

A final Abnormal Loads Assessment complete with swept path plans for pinch points along the route will be undertaken for the final selected turbine in advance of deliveries commencing. It is noted that any abnormal loads related to the original Sandy Knowe development have been delivered to the site without issue, so this assessment would look at any changes made to the proposed delivery route between the original Sandy Knowe development and the proposed extension.

There are no proposals to upgrade the access to the Proposed Development Site.

Site access is discussed further in **Chapter 9 Transport and Access EIA Report Volume 1**.

6.1.2 Access Track

New Access Track

Approximately 3km of new access track will be constructed to the specification required by the wind turbine supplier. These will have a total width of up to 5.5m. The tracks will be designed to have sufficient radii for turning of the construction vehicles, abnormal loads and plant. The access track layout has been designed to avoid sensitive features.

The access tracks will be constructed using 'cut track' design. Topsoil is stripped to expose a suitable rock or sub-soil horizon on which to build the track. The track is then built up on a geotextile layer by laying and compacting crushed rock to a depth dependent on ground conditions and topography. Generally, the surface of the track will be flush with or raised slightly above the surrounding ground level.

An indicative track construction design is shown in **Figure 3-7 Indicative Access Track, EIA Report Volume 3**.

Where the presence of peat has been identified to be greater than 2m in depth, floating tracks are proposed to be used at the location(s) (see **Figure 8.2.3 Peat Depth, EIA Report, Volume 2**).

A layer of crushed stone (0.5m – 1m, dependant on ground conditions) will be laid on geotextile/geogrid reinforcement to form the track, which results in the site track being

raised above the peat surface. The tracks will be slightly wider as 1m verges will be required.

Soils removed from excavated areas will be stored separately in piles, no greater than 3m in height, directly adjacent to, or near the tracks on ground appropriate for storage of materials i.e. relatively dry and flat ground, a minimum of 50m away from any watercourses. Wherever possible, reinstatement will be carried out as track construction progresses.

Prior to the commencement of site construction, detailed engineering specification for the access track design will be submitted to the planning authority as part of a Planning Conditions Compliance Statement, which will include Construction Method Statements for all aspects of construction.

6.1.3 Watercourse Crossings

The Proposed Development has been designed to minimise works in the vicinity of mapped watercourses and to minimise the need for new water crossing in order to reduce the risk of pollution and changes to watercourse morphology.

Three watercourse crossings will be required for the proposed new access tracks within the Proposed Development Footprint: one within Polhote Burn (W1) and two tributaries to the Polhote Burn (W2 and W3). These locations are shown in **Figures 3-1a and 3-1b, Site Layout Overview, EIA Report Volume 3**.

The three watercourse crossings will be constructed by installing an arch/ bottomless culvert at each location. **Figure 3-8a to 3-1c, Indicative Bottomless Culvert, EIA Report Volume 3** shows an indicative plan of this type of structure.

It is proposed that the requirements for the final solution and detailed design for all water crossings will be addressed through an appropriately worded condition.

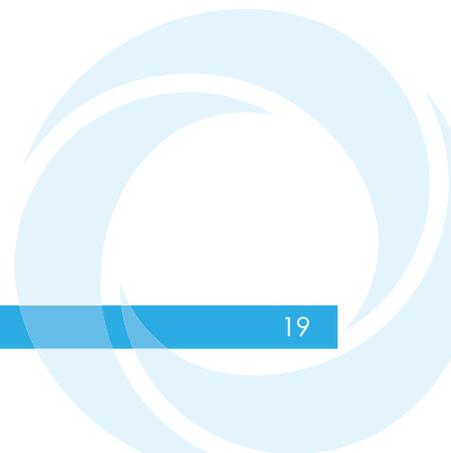
7 Construction Programme

Subject to receipt of consent and deemed planning permission and agreement of pre-commencement conditions, construction works are anticipated to commence in 2024 with a total duration estimated at approximately 12 months. The work would proceed in four phases as summarised in Table 3.4.

Table 3: Construction Programme

Phase	Summary of Works
Phase 1 (month 1); Enabling/Access Works;	Construction of new access routes from existing access tracks to the turbine locations.
Phase 2 (month 2 to 10); Development (Main Site)	Establishment of site facilities, turbine foundation and turbine cabling. Delivery of turbine components & installation with cranes.
Phase 3 (month 10 to 11); Testing and Commissioning	Testing and commissioning equipment and turbines.
Phase 4 (month 11 to 12); Reinstatement and Restoration	Removal of temporary facilities and reinstatement of temporary working areas. Restoration of working areas as set out in the Schedule of Mitigation and CEMP.

The proposed normal hours of operations for construction activity are between 07:00 - 19:00 Monday to Saturday, with deliveries on a Saturday restricted to the hours of 07:00 to 12:00. During the installation phase, there may be a requirement for extended working hours as some critical elements of installation cannot be stopped once started such as concrete pouring, this will be agreed in advance with Dumfries and Galloway Council.

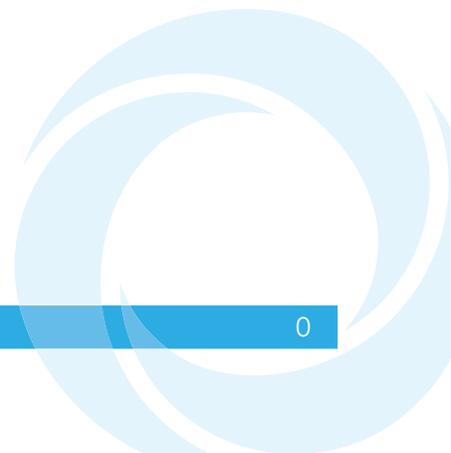


8 Conclusion

This document provides an overview of the design process undertaken by the Applicant. The careful placement of the proposed turbines within the Proposed Development Site has facilitated effective mitigation of the majority of potentially significant effects through the design process.

This document has described the principles that have shaped and influenced the design of the Proposed Development and how issues of access have been dealt with.

In general terms the Proposed Development reads as a small extension to Sandy Knowe Wind Farm, visual effects are no greater than moderate and contained to within 6km. The proposed turbine size has been selected to reflect the height of the turbines in Sandy Knowe Wind Farm. The greater offset of the three taller turbines from more sensitive lower lying receptors in Nithsdale, to the north, helps to mask the increased height of these turbines.



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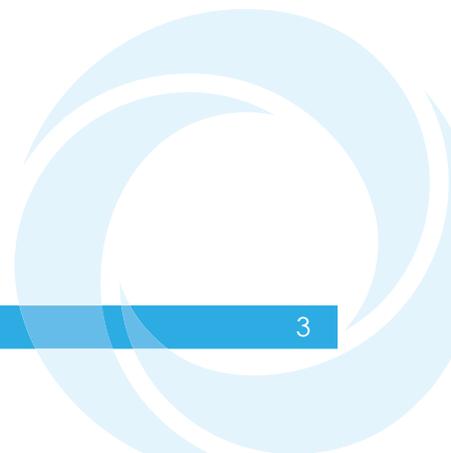
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Appendix A. Turbine Layout Design Iterations

Layout	No. of Turbines	Tip Height (m)	Design Changes
1 (Scoping Layout)	6	149.9m	Initial feasibility based on preliminary environmental and technical consideration with the intention of sharing infrastructure components with Sandy Knowe Wind Farm where practicable in order to minimise the potential impact on sensitive receptors.
2 (Design Chill)	6	125m to 149.9m	<p><u>Turbines</u></p> <p>All turbine IDs renumbered to sequentially follow the Sandy Knowe turbine numbering.</p> <p>T25 (previously T1)</p> <ul style="list-style-type: none"> - Moved to shallow gradients on opposite side of communication link constraint - Moved to shallower peat based on interpolated range surface - Moved within broadly similar NVC habitats (M20a), but the new location increases the distance from highly GWDTE <p>T26 (previously T2)</p> <ul style="list-style-type: none"> - T25 has been moved to the opposite side of the communication link constraint therefore T26 required to be moved to maintain optimum turbine spacing - Moved east to shallower gradients and avoiding additional watercourse crossing (with limited space for turbine construction area outside watercourse buffers) - Moved to slightly shallower peat based on interpolated range surface - Moved within same habitat type (M20a) <p>T27 (previously T3)</p> <ul style="list-style-type: none"> - Moved to small pocket of shallower peat (0.6-1m) based on interpolated range surface - Moved to small strip of semi-improved grassland / non-qualifying NVC habitat <p>T28 (previously T4)</p> <ul style="list-style-type: none"> - Maximum tip height reduced from 149.9m to 125m to blend visually with consented development. <p>T29 (previously T5)</p> <ul style="list-style-type: none"> - Moved south to increase distance from residential receptors and avoid peat >0.5m based on interpolated range surface - Maximum tip height reduced from 149.9m to 125m to blend visually with consented development. - Moved further south to increase the distance from a sensitive ornithology constraint <p>T30 (previously T6)</p>

Layout	No. of Turbines	Tip Height (m)	Design Changes
2 (Design Chill)	6	125m to 149.9m	<ul style="list-style-type: none"> - Moved east to avoid flush habitat whilst maintaining distance to sensitive residential receptors; now located on modified bog. - Maximum tip height reduced from 149.9m to 125m to blend visually with consented development. <p><u>Hardstands</u></p> <p>T25 (previously T1)</p> <ul style="list-style-type: none"> - Hardstand area introduced and positioned to avoid highly GWDTE and deeper areas of peat based on interpolated range surface - Positioned cross slope to minimise cut and fill requirements <p>T26 (previously T2)</p> <ul style="list-style-type: none"> - Hardstand area introduced and positioned to avoid highly GWDTE. - Positioned to minimise cut and fill requirements based on slope. - Positioned to maintain a maximum buffer of 50m from watercourses. <p>T27 (previously T3)</p> <ul style="list-style-type: none"> - Hardstand area introduced and positioned to avoid highly GWDTE and deeper areas of peat based on interpolated range surface. - Positioned cross slope to minimise cut and fill requirements. <p>T28 (previously T4)</p> <ul style="list-style-type: none"> - Hardstand area introduced and positioned to avoid highly GWDTE and deeper areas of peat based on interpolated range surface. - Positioned cross slope to minimise cut and fill requirements. <p>T29 (previously T5)</p> <ul style="list-style-type: none"> - Hardstand area introduced and positioned to avoid deeper areas of peat based on interpolated range surface. - Positioned cross slope to minimise cut and fill requirements. <p>T30 (previously T6)</p> <ul style="list-style-type: none"> - Hardstand area introduced and positioned to avoid deeper areas of peat based on interpolated range surface. <p><u>Access Tracks</u></p> <p>Track between T25 and Sandy Knowe Wind Farm infrastructure has been re-routed to avoid deeper peat based on interpolated range surface.</p>

Layout	No. of Turbines	Tip Height (m)	Design Changes
2 (Design Chill)	6	125m to 149.9m	<p>Given the movement of T25, the track between T25 and T26 was redesigned to avoid deep peat where possible based on interpolated range surface.</p> <p>The track between T26 and T27 has been routed on <0.5m peat depth based on based on interpolated range surface.</p> <p>Track west of T27 on the approach to T28 has been routed to maintain a maximum buffer of 50m from identified cultural heritage assets.</p> <p>To avoid M6 habitat, the three-way junction on the track approaching T29 and T30 has been removed and the track to T29 realigned to avoid the M6 habitat. Turning heads were then introduced at each turbine location at T29 and T30.</p> <p><u>Battery Storage</u></p> <p>Battery storage was considered as part of the design chill layout to be located in the area of the existing Temporary Construction Compound at Sandy Knowe.</p>
3 (Design Freeze)	6	125m to 149.9m	<p><u>Turbines</u></p> <p>T25</p> <ul style="list-style-type: none"> - Moved approximately 5m southeast to marginally shallower peat <p>T26</p> <ul style="list-style-type: none"> - No design iterations noted <p>T27</p> <ul style="list-style-type: none"> - Moved 25m west to allow a better alignment of the hardstand while still in shallow peat following detailed peat probing <p>T28</p> <ul style="list-style-type: none"> - Moved 15m southeast to shallower peat following detailed peat probing - Turning head moved into shallow peat following detailed peat probing <p>T29</p> <ul style="list-style-type: none"> - Moved turbine 28m southwest to allow for the hardstand realignment <p>T30</p> <ul style="list-style-type: none"> - Slight movement to take into consideration of the hardstand area movement <p><u>Hardstands</u></p> <p>T25</p> <ul style="list-style-type: none"> - Hardstanding moved slightly southeast to keep temporary working areas outside GWDTE

Layout	No. of Turbines	Tip Height (m)	Design Changes
3 (Design Freeze)	6	125m to 149.9m	<p>T26</p> <ul style="list-style-type: none"> - Hardstanding mirrored to place track on NW side of the hardstand area. This allows track alignment to avoid GWDTEs north and south of T26 - Tracks and turning head moved onto shallower peat areas following detailed probing <p>T27</p> <ul style="list-style-type: none"> - Installation area rotated to avoid crossing watercourse whilst avoiding cultural heritage feature <p>T28</p> <ul style="list-style-type: none"> - Installation area rotated to be slightly closer to orientation of contours without entering deeper peat <p>T29</p> <ul style="list-style-type: none"> - Hardstanding mirrored to place track on NE side of the hardstand area and locate hardstanding on shallower peat <p>T30</p> <ul style="list-style-type: none"> - Rotated the boom assembly points and reorientated hardstanding slightly (this required a 2m change to the turbine coordinate) to locate on locally shallower peat whilst avoiding sensitive habitats <p><u>Access Tracks</u></p> <p>Tracks between turbines micrositied onto locally shallower peat where possible following detailed peat probing.</p> <p>Track between T27 and T28 has been realigned to avoid deeper areas of peat, including a section of floating track over peat greater than 2m depth. This impinges slightly on the 20m cultural heritage receptor buffer zone. This asset is of low or negligible importance, however, provision for fencing/demarcation under archaeological supervision prior to construction commencing will be considered in Chapter 10 Cultural Heritage</p> <p>T29 – T30 junction relocated to shallower peat</p> <p><u>Borrow Pit</u></p> <p>The existing borrow pit that is used for the construction of Sandy Knowe Wind Farm has been considered as part of Design Freeze. It is proposed to use the existing borrow pit for extracting stone and peat reinstatement as part of the Peat Management Plan for</p>

Layout	No. of Turbines	Tip Height (m)	Design Changes
3 (Design Freeze)	6	125m to 149.9m	<p>the Proposed Development. This will be considered as part of Chapter 8 Hydrology, Hydrogeology and Soils.</p> <p><u>Battery Storage</u> There are no amendments for battery storage.</p> <p><u>Application Boundary</u> The Application boundary was modified to include the consented Sandy Knowe boundary ('The Proposed Development Site'). For the purpose of describing the Proposed Development, baseline conditions and survey extents, an area has been illustrated as the "Proposed Development Footprint" which encompasses the proposed infrastructure which includes any land used for turbines, hardstanding, site access or where construction work is carried out. It also includes areas of Sandy Knowe such as consented / constructed tracks, temporary construction compounds and substation.</p>