

CHAPTER 2: SITE SELECTION AND DESIGN EVOLUTION

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2. Site Selection and Design Evolution

2.1 Introduction

2.1.1 In accordance with the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017¹, this Chapter outlines the reasons for site selection, and provides a description of the environmental and technical factors that have been considered by the Applicant during the site selection and design evolution process for the Proposed Development.

2.2 Site Selection

2.2.1 The Proposed Development, as a wind farm extension sits on adjoining land to the north-west of Achany Wind Farm. It is a site that is well known to the Applicant due to the existing wind farm, which is owned and operated by the Applicant, as well as the previous application seeking consent for Glencassley Wind Farm² in 2012. It is a site that has an excellent and proven wind resource, as well as existing access tracks and other infrastructure connecting into the local road network that would be utilised during the construction and operational phases, thereby considerably reducing requirements for new tracks and other infrastructure. Other wind, hydro and electrical infrastructure is present within the wider area.

2.2.2 An application to construct and operate a 26 turbine wind farm and associated works on Glencassley Estate was submitted to the Scottish Governments Energy Consents Unit (ECU) in 2012. The Highland Council (THC) North Planning Applications Committee recommended to raise no objection to this application in 2013, however, it was refused by Scottish Ministers in 2015, in respect of impacts on the Assynt Coigach National Scenic Area (NSA) and on wild land.

2.2.3 In the context of the Climate Emergency and increased renewable energy generation targets, the Applicant decided to review and optimise the 2012 Glencassley Wind Farm design. The Site offers excellent potential for a wind farm development due to its wind resource and potential to minimise new infrastructure due to its proximity to existing wind farm development. As such, the project proposals have evolved considerably since 2012, taking previous concerns raised about the prominence and proximity of turbines in views from the nearby Assynt Coigach NSA and to wild land, particularly the Reay-Cassley Wild Land Area (WLA), into consideration (discussed further in Section 2.3).

2.2.4 By carefully revising the previous 2012 Glencassley proposal, the Proposed Development could contribute a minimum of 80MW towards realising legislated climate change targets and government policy objectives, set following the Climate Emergency declarations from Scotland's First Minister on 28 April 2019 (as described in Paragraph 1.5.1 – 1.5.6 in Chapter 1: Introduction).

2.2.5 In terms of Planning Policy, the Proposed Development falls predominantly within Group 2 'Areas of significant protection' under Scottish Planning Policy (SPP) Spatial Framework and The Highland Council's Onshore Wind Energy Supplementary Guidance (November,

¹ The Scottish Government, (2017).The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017. Available at: <https://www.legislation.gov.uk/ssi/2017/101/contents/made> (Accessed 19 April 2021)

² The Applicant submitted an application to construct and operate a 26 turbine wind farm and associated works on Glencassley Estate to the Scottish Governments Energy Consents Unit in 2012.

2016) due to its location within the south-eastern tip of Wild Land Area 34: Reay – Cassley (WLA34), and also the potential presence of deep peat. Within Group 2, Para 215 of SPP, it states *“In areas of wild land, development may be appropriate in some circumstances”*; and where *“further consideration will be required to demonstrate that any significant effects on the qualities of these areas can be substantially overcome by siting, design or other mitigation.”*

2.2.6 Other factors leading to the selection of the site for the Proposed Development include:

- The Proposed Development is not situated in any areas designated for nature conservation. There are European and National designations in close proximity, namely the Caithness and Sutherlands Peatlands Special Protection Area (SPA), Special Area of Conservation (SAC), RAMSAR and associated Sites of Special Scientific Interest (SSSI), and the River Oykel SAC. See Figure 2.1: Natural Heritage Designations;
- The Proposed Development is not located within any areas covered by statutory landscape designations. The closest statutory landscape designation is the Assynt Coigach NSA, located approximately 10km to the north-west of the Site; and
- There are no sites designated for cultural heritage within the Site boundary. The nearest site being the Dail Langwell Broch; a Scheduled Monument (SM1852) located approximately 2km south-west of the Site.

2.2.7 The Proposed Development is located within the southern fringes of the Reay-Cassley Wild Land Area (WLA34). WLAs are not designated landscapes, but are given protection within the Planning System through Scottish Planning Policy (SPP) (Scottish Government, 2014). Potential effects on the qualities of the WLA have been given due consideration during the design iteration process, as outlined in this Chapter (see also Chapter 7: Landscape and Visual Assessment, and Technical Appendix 2.1: Design Statement). Other WLAs and some Special Landscape Areas (SLA's)³ are located within the wider area, as discussed within Chapter 7: Landscape and Visual Amenity. See also Figure 2.2: Designated and Protected Landscapes.

2.2.8 Taking cognisance of the Climate Emergency and renewable energy targets, and the location of the Proposed Development on adjoining land to the Applicant's operational Achany Wind Farm, along with good wind resource it was concluded that wind turbines would be the favoured technology choice for the Proposed Development. Developing an extension to the operational Achany Wind Farm is seen as an opportunity to expand an operational wind farm site, increasing operating efficiency whilst minimising additional environmental effects when compared to a new site for a project of a similar size.

2.3 Preliminary Design Considerations

2.3.1 As noted in Section 2.2, following Climate Emergency declarations and increased generation targets, the Applicant decided to review the previous Glencassley Wind Farm proposal and optimise the design to address points raised in the previous decision notice. The starting point for the design evolution process was to take account of the previous concerns and points of objection, whilst also considering the opportunities presented by

³ Landscapes considered to be of regional or local importance by The Highland Council.

moving the Site further from the NSA and towards the existing Rosehall and Achany Wind Farm developments.

- 2.3.2 Initial site optimisation and early design work focused on moving the Site further from the Assynt Coigach NSA towards the southern margins of the Reay-Cassley WLA, with the aim of reducing the potential for significant landscape and visual effects as far as possible and to ensure that the integrity of both the NSA and the WLAs are preserved.
- 2.3.3 An exercise was undertaken to identify a potential optimal layout, with the aim of reducing potential effects on the WLA and NSA. The Reay – Cassley WLA extends 560km² across north-west Sutherland covering the mountain massif area of Ben More Assynt, remote areas around Lochs Glendhu and Glencoul, and elevated plateau areas to the east and west of Glen Cassley. This exercise considered the NatureScot description and key qualities of the WLA and review of the NatureScot Map of Relative Wildness⁴ with a Jenks 8 Classification, as defined in the methodology⁵ for the identification of the WLAs undertaken by NatureScot. The conclusion of this exercise was to confine proposed turbine locations to the south of Beinn na Sgeireach. The Proposed Development would therefore be located just within the southern boundary edge of the Reay-Cassley WLA. By locating turbines within this area, it is considered that the theoretical visibility of the Proposed Development would be largely be limited to areas where there are already existing external influences on the WLA, including existing wind turbines at Achany, Rosehall and Lairg, and existing features within Glen Cassley, including the Duchally and Cassley hydroelectric scheme and associated infrastructure (e.g. dams, intakes, above ground pipes and access tracks) and overhead line connection. As such, and subject to further review through the design evolution process, it was considered that likely significant effects on the WLA could be localised, with the integrity of the WLA being retained, by moving the Site towards the southern margins of the Reay-Cassley WLA.

2.4 Design Evolution

- 2.4.1 Following the initial design evolution exercise, the layout became more clearly defined through a rigorous and iterative process by the EIA and technical teams, taking cognisance of the constraints and opportunities present at the Site. A number of design workshops were held, and particular attention paid to minimising impacts on sensitive habitats, avoiding deeper areas of peat, ornithological sensitivities, and minimising landscape and visual effects as much as possible. Peat depth and vegetation surveys (including a National Vegetation Survey (NVC), Peatland Condition Assessment and Phase 1 and Phase 2 peat probing), a hydrology site walkover and technical analysis of engineering constraints were undertaken to inform this process.
- 2.4.2 During this process, careful consideration was also given to the height of turbines, particularly in relation to landscape and visual matters, and likely significant effects on the qualities of the NSA and WLAs. Although turbines of up to 200m were considered, there would be a requirement for a visible lighting scheme under the Civil Aviation Authority (CAA), which would have the potential for increased landscape and visual effects at night. Therefore, during the design evolution process, the maximum turbine tip

⁴ NatureScot, Natural Spaces (2021). NatureScot Map of Relative Wildness and Attribute Mapping datasets [online]

⁵ NatureScot/SNH (2014), SNH's Mapping of Scotland's Wildness and Wild Land: Non-technical Description of the Methodology

height of 149.9m was selected, meaning that no visible lighting would be required and infrared lighting could be installed to meet CAA requirements⁶.

- 2.4.3 The series of design workshops allowed the project team to discuss and develop the evolving layout, to ensure that site specific constraints were fully considered, reviewed and revisited over a period of 10 months. This extensive process ensured that likely significant environmental effects were minimised as far as practicable, prior to reaching a design fix in March 2021.
- 2.4.4 Further information on the design evolution process is provided in Table 2.1 and in the Design Statement (included as Technical Appendix 2.1 to this EIA Report). Plates 2.1 to 2.6 provide an illustration of the evolving layout during the design evolution process.

Table 2.1: Design Evolution

Design Iteration	Number of Turbines	Height of Turbines	Date	Description
1	Not Defined	Up to 200m	August 2019	Scoping feedback was reviewed and the Proposed Development Area defined, but no turbine layout. Approximately 1.94km of emergency 4x4 track, included previously for emergency access, was removed, following consultee feedback.
2	20	Up to 200m	May 2020	Preliminary technical layout, based on initial constraints identified, available turbine options and wind analysis. See Plate 2.2.
3	15	Up to 200m	June 2020	Review of preliminary layout and suggestions for modification with primary focus on landscape and visual considerations, and in particular the concerns and points of objection that led to the refusal of the 26 turbine application in 2012. This layout was based on a range of turbines, with potential effects from the requirement for a visible lighting scheme as a result noted. In parallel, transport studies were being undertaken to establish potential constraints in the delivery of turbines at up to 200m, to the Site. See Plate 2.3.
4	15 (plus additional)	149.9m	August 2020	Based on Design Iteration 3, a review was undertaken to optimise the layout from a technical and wind resource perspective. This review also gave consideration to the potential for additional turbines. Subsequent preliminary review of these additional turbine locations from a landscape and visual perspective sought to identify and confirm their potential

⁶ CAA (2016), CAP 764 Policy and Guidelines on Wind Turbines, Version 6

Design Iteration	Number of Turbines	Height of Turbines	Date	Description
				<p>acceptability for inclusion, subject to further review and refinement.</p> <p>At this stage, the decision was made to retain the maximum tip height of turbines at 149.9m. This decision was made to ensure potential effects on the integrity of the NSA and WLAs, as well as likely significant effects on other landscape and visual receptors, were minimised as far as practicable.</p> <p>Preliminary consultations were held with statutory consultees as the layout evolved, mainly to provide project updates and confirm approach to certain surveys and assessments.</p>
5	20	149.9m	September 2020	<p>Design workshop including input from technical and environmental disciplines to review the layout.</p> <p>Modifications were suggested at the workshop to optimise the layout from an environmental and wind resource perspective, based on the survey data and assessment work undertaken to date (see Plate 2.4).</p> <p>Consideration of the access track layout was also undertaken at this stage.</p> <p>A decision by the Applicant was taken at this time to change the name of the Proposed Development from Glencassley Wind Farm to Achany Extension Wind Farm.</p> <p>The name change reflected the movement of turbine locations closer to the existing Achany Wind Farm, forming a natural extension to the existing wind farm.</p>
6	20	149.9m	September and October 2020	<p>Two follow up design workshops were held shortly after Design Iteration 5 to review further modifications to the turbine layout.</p> <p>A key focus of these layout reviews was on minimising infrastructure on areas of continuous, good quality blanket bog and deeper areas of peat, and maintaining sufficient buffers to natural watercourses, whilst also considering potential landscape and visual effects, and effects on ornithology, protected species and cultural heritage.</p> <p>Where modifications to the layout were made, they were reviewed at and following the workshops from key viewpoints to ensure potential landscape and visual effects were minimised as far as practicable, and a balanced layout was maintained.</p> <p>It was recognised at this stage that further review of NVC survey data, a peatland condition</p>

Design Iteration	Number of Turbines	Height of Turbines	Date	Description
				<p>assessment and further peat depth surveys would be required in order for additional micro-siting to take account of habitat and peat depth constraints.</p> <p>A further review of access tracks and other infrastructure, including potential borrow pit locations, was also undertaken at this stage.</p>
7	20	149.9m	November 2020	<p>Following survey work and analysis of data noted above, further refinements were made to the layout (see Plate 2.5). The additional habitat survey effort enabled a better understanding of habitat types and condition, as well as further peat depth probing. This in turn allowed micro-siting of the layout to focus infrastructure away from good quality blanket bog and deeper areas of peat, as much as possible and where steep topography allowed. These changes were in general minor, but enabled the layout to be micro-sited to avoid deeper pockets of peat, and sensitive habitats, minimising the likelihood for significant effects on habitats and peat.</p> <p>Maintaining sufficient separation distances between turbines in accordance with manufacturers guidance was also an important consideration at this stage.</p> <p>A thorough review of the siting of access tracks and other infrastructure, including borrow pits, was also undertaken. Minimising new infrastructure and maximising use of existing infrastructure / borrow pit locations from Achany Wind Farm was a key focus.</p> <p>All changes were considered with respect to landscape and visual effects, and the potential effects on the integrity of the NSA and WLAs.</p> <p>During this period, a Scoping Refresh exercise on the project was undertaken which included the layout at this time.</p>
8	20	149.9m	January 2021	<p>A final review of the turbine and infrastructure layout, taking into account the updated scoping feedback from consultees, was undertaken by the project team during January 2021 and final minor refinements made.</p> <p>Consultation with the ECU, THC and NatureScot was undertaken at this time⁷.</p>

⁷ Consultation material was also prepared to issue to SEPA, however SEPA were unable to receive or respond to consultation at this time due to an ongoing cyber-attack.

Design Iteration	Number of Turbines	Height of Turbines	Date	Description
9	20	149.9m	March 2021	The Applicant met with ECU and engaged with THC to discuss the progress made, receive feedback and confirm cumulative detail and other matters. The design was fixed and impact assessments to inform the EIA Report were progressed. See Plate 2.6.

Plate 2.1: 2012 Glencassley Wind Farm Layout

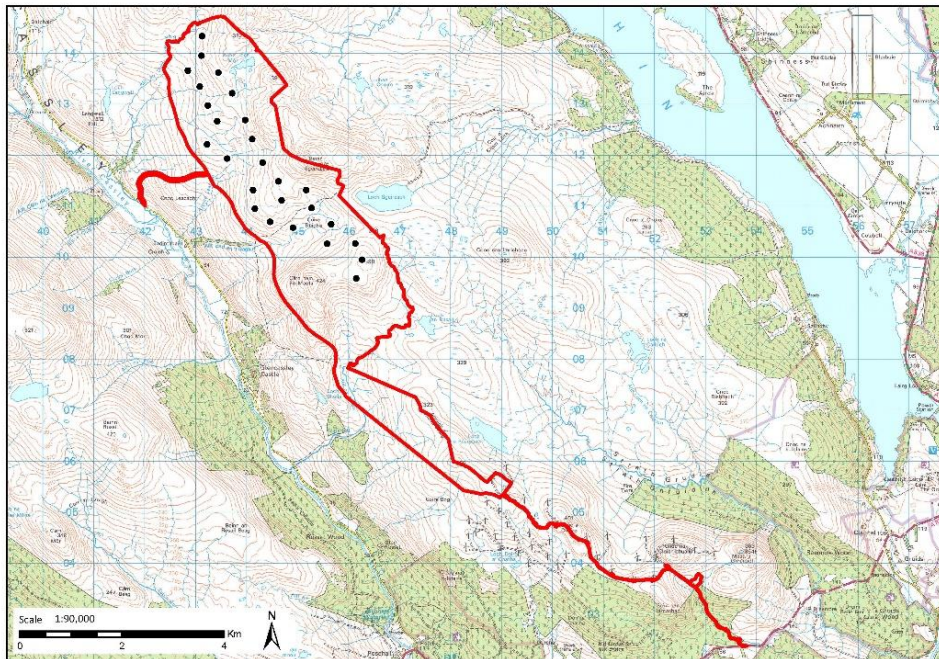


Plate 2.2: Design Iteration 2 - Preliminary Technical Layout (May 2020)

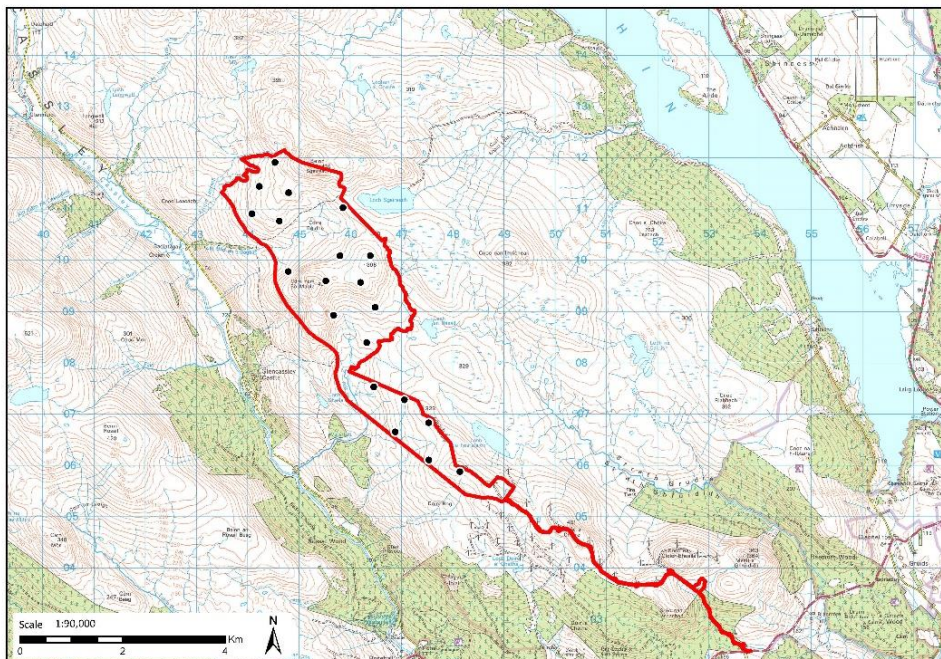


Plate 2.3: Design Iteration 3 – Review of Preliminary Technical Layout (June 2020)

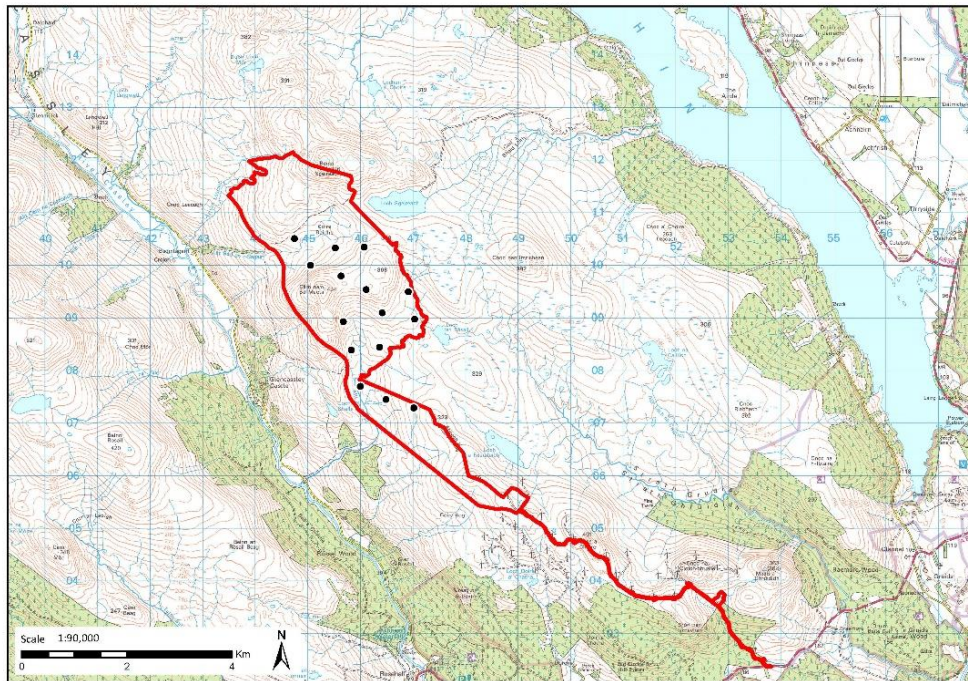


Plate 2.4: Design Iteration 5 – Design Workshop Layout (September 2020)

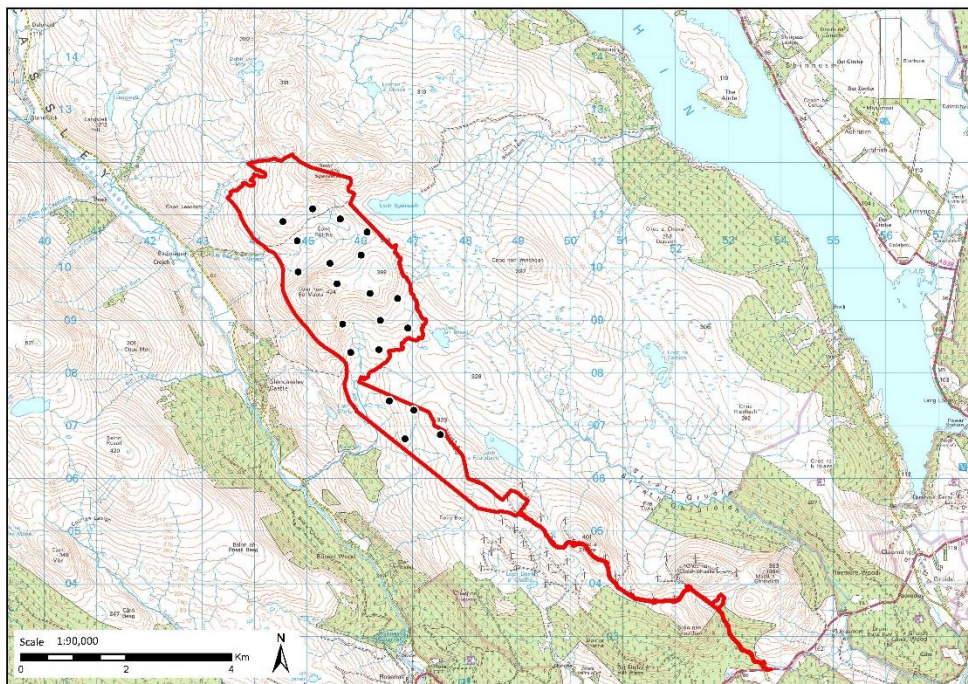


Plate 2.5: Design Iteration 7 – 2020 Scoping Refresh Layout (November 2020)

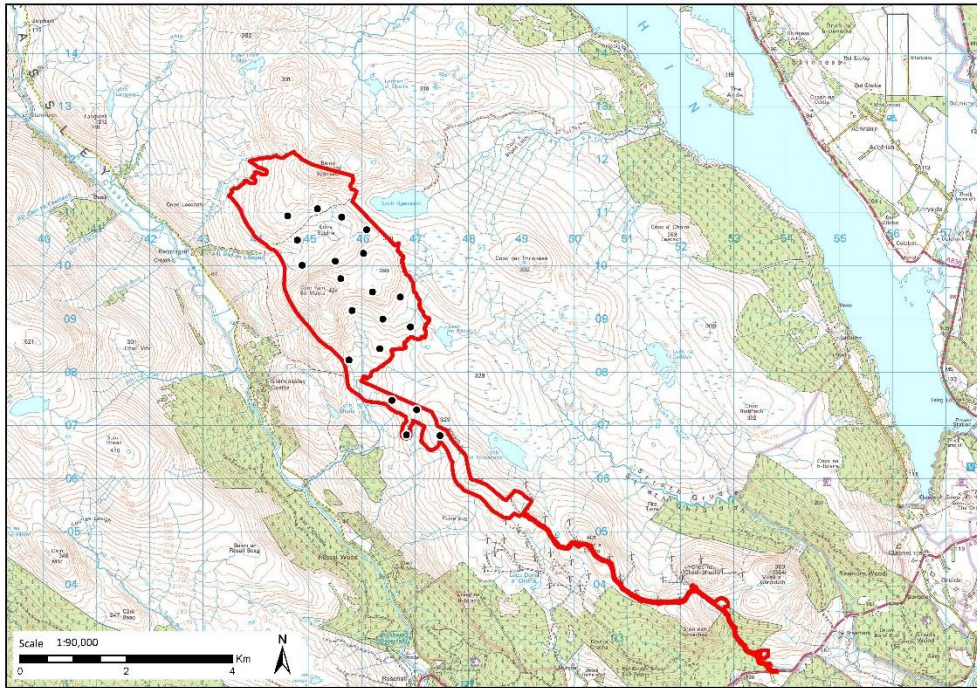
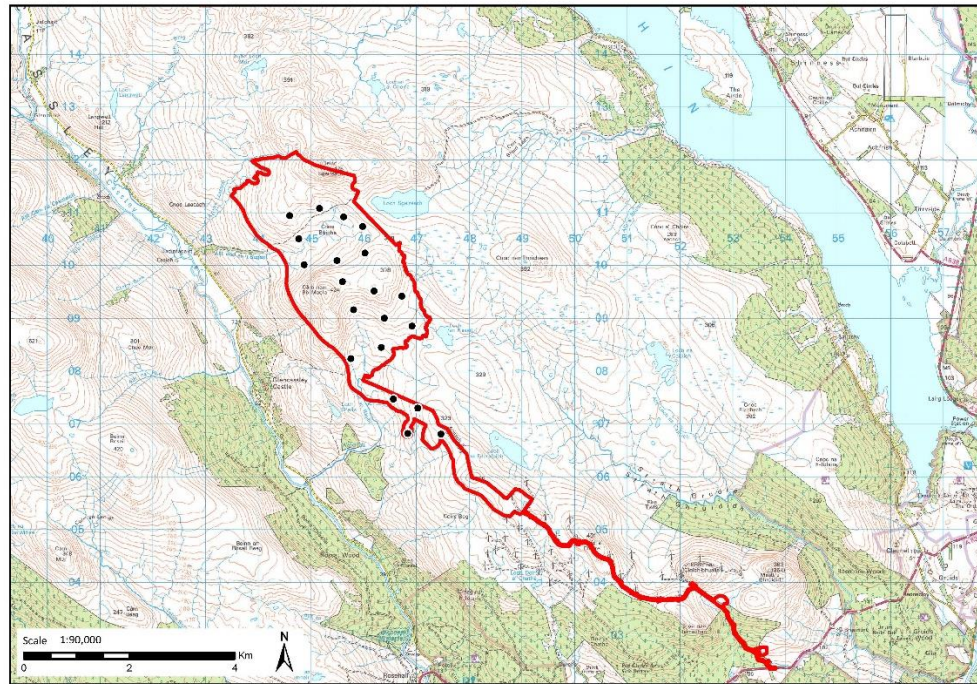


Plate 2.6: Design Iteration 9 – Final Layout (March 2021)



2.5 Other Site Infrastructure

Access Tracks

2.5.1 As noted in Table 2.1, following the initial design, a review of the early track layout was undertaken, and continued in parallel to the latter stages of the design evolution process. Much like the identification of turbine locations, the refined track layout has minimised effects on sensitive habitats and areas of deeper peat, drawing on habitat and peat depth

data and consideration of steep topography, in order to achieve this. The track layout has also sought to maximise existing track infrastructure as far as practicable. Approximately 6.6km of existing track (where upgrades may be required to facilitate turbine delivery) is proposed to be utilised to access the Site from the local road network.

- 2.5.2 The 2019 Scoping Report included the provision of an emergency access and egress 4x4 track to the north-west of the Site. However, following internal discussions, review and consideration of advice from SEPA in relation to ensuring minimising unnecessary track, approximately 1.94km section of this track was removed from the design.

Substation

- 2.5.3 The location of the on-site substation was largely driven by technical requirements and the wind turbine layout, albeit this was undertaken in parallel with the consideration of environmental constraints, such as sensitive habitats, peat depth, steep topography and maintaining sufficient distance to watercourses. The aim was to position it sensitively and practically, whilst minimising the amount of on-site electrical cabling and maintaining a safe distance from wind turbines.

Operations Building

- 2.5.4 Due to distance from the existing welfare building (approximately 9.8km), along with the possibility of procuring turbines from a different turbine manufacturer, an operations and welfare facility is proposed within the substation compound area. This would provide necessary meeting, welfare and storage facilities for operational workers.
- 2.5.5 Depending on the requirements of the wind turbine supplier, an alternative option to constructing an operations building within the new substation compound area would be to extend the existing operations building at Achany Wind Farm. As this decision would not be confirmed until the detailed design stage, both options have been included in the consent application.

Construction Compounds

- 2.5.6 The location of the main construction compound, adjacent to the proposed on-site substation, was selected as it is centrally located and close to the main access route for the Site. It is also a relatively flat area which has been reviewed during the design evolution process to ensure potential environmental effects are minimised, and sufficient distances to watercourses are maintained.
- 2.5.7 It is also proposed to utilise an existing hard standing area close to the Site entrance as a site security and temporary construction compound and storage area.

Borrow Pits

- 2.5.8 It is proposed to rework one of the borrow pits used during the construction of Achany Wind Farm. The proposed borrow pit locations for the Proposed Development have been driven primarily by technical requirements, but consideration has also been given to environmental constraints, such as minimising disruption to sensitive habitats, avoidance of deeper areas of peat, steep topography, watercourses and the potential landscape and visual effects from the wider area.

2.6 References

The Highland Council, (2016). *Onshore Wind Energy Supplementary Guidance*. Available at:

https://www.highland.gov.uk/downloads/file/16949/onshore_wind_energy_supplementary_guidance-_nov_2016 (Accessed 16 April 2021);

The Scottish Government, (2014). *Scottish Planning Policy*. Available at:

<https://www.gov.scot/publications/scottish-planning-policy/> (Accessed 16 April 2021);
and

The Scottish Government, (2017). *The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017*. Available at:

<https://www.legislation.gov.uk/ssi/2017/101/contents/made> (Accessed 19 April 2021)