CHAPTER 3: DESCRIPTION OF DEVELOPMENT

Figures (Volume 3)

Technical Appendices (Volume 4)

3. Description of Development

3.1 Introduction

3.1.1 This Chapter describes the elements that constitute the Proposed Development. It provides a description of the key development components and information regarding the construction, operation and decommissioning phases.

3.1.2 The Proposed Development forms an extension to the operational Achany Wind Farm, located on adjoining land to the north-west of the existing wind farm. The site of the Proposed Development (hereby referred to as 'the Site'), as illustrated by the 'Site Boundary' on Figure 1.1: Location Plan, is approximately 979.76Ha in area and is located 4.5km north of the village of Rosehall and approximately 11km west-north-west of the village of Lairg.

3.1.3 The Proposed Development would include the following key components, which are described in further detail in this Chapter and shown on Figure 3.1: The Proposed Development:

- Up to 20 no. Wind Turbine Generators (WTGs) of up to 149.9m tip height with internal transformers;
- Crane hardstanding and associated laydown area at each wind turbine location;
- On site access tracks (of which approximately 17.3km are new access tracks and approximately 6.6km are existing tracks where upgrades may be required to facilitate delivery of the wind turbine components);
- A new on-site substation, welfare building and store;
- Potential extension to the existing operations building at Achany Wind Farm to accommodate additional staff;
- A network of underground cabling to connect each wind turbine to the on-site substation;
- A LiDAR unit to collect meteorological and wind speed data, and associated hard stand; and
- Any associated ancillary works required.

3.1.4 In addition to the permanent components, the construction phase would comprise the following temporary facilities:

- Site compound areas, including welfare facilities, site cabins, storage and parking;
- Batching plant facilities for temporary concrete batching plants;
- Temporary telecommunications infrastructure; and
- Borrow pits, comprising both new and the reworking of a borrow pit used previously for Achany Wind Farm.

3.1.5 The Proposed Development would utilise existing access tracks constructed for Achany Wind Farm to access the Site, including the Site entrance off the A839.

3.1.6 It is estimated that the maximum permanent development footprint of the Proposed Development would be approximately 13.29Ha. During the construction period it is estimated that a further 10.95Ha would be temporarily required which would be reinstated following completion of the construction works. The anticipated land-take requirements are set out in Table 3.1.

3.1.7 A habitat management plan will be implemented as part of the Proposed Development to compensate for the loss of blanket bog habitat as a result of the Proposed Development. The core aim of the habitat management plan, an outline of which is included in Technical Appendix 8.10: Outline Habitat Management Plan, is to restore and enhance degraded or modified blanket bog and wet heath habitats both within the Site and in other areas of Glencassley Estate.

Table 3.1: Land Use

Wind Farm Component	Temporary Land Use (m^2)	Permanent Land Use (m^2)
Turbines, including adjacent Crane Hardstandings and Laydown Areas	12086.49	36023.89
New Cut Track	4080.05	75371.40
New Float Track	875	9225.00
Passing Places	0.00	2267.38
LiDAR	0.00	36.00
Borrow Pits	62500.00	0.00
Temporary Construction Compounds, including concrete batching plant area	20000.00	0.00
Substation and Operations Building	10000.00	10000.00
Total (m2)	109541.54	132923.67
Total (Ha)	10.95	13.29

3.2 Site Access

3.2.1 Access for the construction and operation of the Site would be from the A839. Access to the Site would be achieved by utilising the existing track infrastructure in place, built as part of Achany Wind Farm, as shown on Plate 3.1. The tracks are typically built to a high standard capable of accommodating construction vehicles and large wind turbine deliveries. The access track layout is shown on Figure 3.1: The Proposed Development.

3.2.2 The preferred access strategy for the delivery of turbine components proposes that all turbine abnormal loads would originate from either Nigg or Invergordon and access the Site via the A9 to Loch Fleet, prior to taking the A839 through Lairg before entering the Site from the east. Further details are provided within Technical Appendix 13.2: Route Survey Report.

3.2.3 A Traffic Management Plan (TMP) would be prepared and agreed with The Highland Council (THC) and Transport Scotland prior to works commencing. Full details of the assessment of effects on the local road network are provided in Chapter 13: Traffic and Transport of this EIA Report, and an Outline TMP is included in Technical Appendix 13.1: Transport Assessment.

Plate 3.1: Existing Track Infrastructure, Achany Wind Farm

3.3 Proposed Development Components

Wind Turbines

Turbine Specification

3.3.1 The Proposed Development comprises up to 20 three-bladed horizontal axis WTGs. The WTGs are automatically controlled to ensure each turbine faces directly into the wind. As a result of this, the orientation of the WTGs would alter with changes in wind direction.

3.3.2 The final choice of turbine would be dependent on economics and available technology at the time of construction but would have a maximum blade tip height of up to 149.9m. Figure 3.2: Indicative Turbine Geometry shows indicative dimensions for the proposed turbine envelope. For the purposes of assessment within this EIA Report, where it has been necessary to identify a candidate turbine for assessment of a particular environmental topic (e.g. noise), this is specified within the relevant chapter and summarised in Table 3.2 below.

Table 3.2: Turbine Parameters Assumed for the Purposes of Assessment within this EIA Report

Topic	Indicative Rotor Diameter (m)	Indicative Hub Height (m)	Maximum Tip Height (m)	Turbine Model
General	136	81.9	149.9	Not specified
Landscape and Visual	136	81.9	149.9	Not specified
Ecology	136	81.9	149.9	Not specified

Ornithology	136	81.9	149.9	Not specified
Hydrology and Hydrogeology	136	81.9	149.9	Not specified
Geology and Carbon Balance	136	81.9	149.9	Not specified
Cultural Heritage	136	81.9	149.9	Not specified
Traffic and Transport	136	81.9	149.9	Vestas V136 4.3MW[1]
Aviation	136	81.9	149.9	Not specified
Noise	126	86	149.5	Enercon, E126 EP3[2]
Socio-Economic, Recreation and Tourism	126	86	149.5	Enercon, E126 EP3 4MW[3]

3.3.3 Turbine grid references for each turbine are as listed in Table 3.3.

Table 3.3: Turbine Grid References

Turbine Number	Grid Reference	Turbine Number	Grid Reference
1	245164 911083	**11**	246722 909421
2	244595 910950	**12**	246915 908855
3	245618 910922	**13**	246390 909004
4	245980 910740	**14**	245810 909163
5	244768 910506	**15**	246334 908448
6	246023 910241	**16**	245756 908237
7	245495 910095	**17**	246564 907472
8	244872 910018	**18**	247025 907297
9	245597 909695	**19**	246838 906821
10	246198 909516	**20**	247468 906810

3.3.4 The proposed layout has been informed through detailed engineering assessment work and consideration of environmental constraints. Further detailed topographical and geotechnical surveys would precede the start of construction works. Turbine positions and track routes could be microsited up to 50m where appropriate, in order to avoid or minimise environmental or engineering constraints identified during pre-construction ground investigation, or construction phase excavation works.

[1] Represents the most onerous component dimensions likely to be transported to the Proposed Development.
[2] Identified as the worst-case option in terms of noise of those models likely to be used on site. The parameters of this turbine model result in a slightly reduced tip height compared to other models.
[3] Selected as would result in a minimum capacity of 80MW.

3.3.5 The turbines would generate electricity in wind speeds between approximately 3 and 32m/s (6.7 to 72mph). At wind speeds greater than this the turbines would shut down for self-protection.

3.3.6 The turbine towers would be of tapering tubular rolled steel plate construction. The blades would be made from fibre-reinforced epoxy. The finish of the turbines is proposed to be semi-matt pale grey colour.

3.3.7 A transformer would be required for each turbine, which would be located internally.

3.3.8 Full details of the proposed turbines would be provided to the Energy Consents Unit and THC prior to the commencement of development.

Turbine Installation

3.3.9 Turbine components including towers, blades, drivetrains, hubs and nacelles are likely to be transported from the port of entry (see Section 3.2) to the Proposed Development using suitable abnormal load vehicles.

3.3.10 On arrival onto the Site, the wind turbine components would be delivered and offloaded at the hardstanding of the wind turbine to be erected.

Turbine Bases

Foundations

3.3.11 Dependent on the ground conditions at each wind turbine location, a piled or gravity foundation would be used to support the wind turbines. An indicative foundation arrangement showing a gravity foundation solution is shown on Figure 3.3: Indicative WTG Foundation, although these would vary depending on the final turbine selection, the applied loads from the wind turbine and ground conditions at each turbine location. Piled foundations may also be used dependant on site ground conditions. Site-specific designs would be developed once the turbine is selected and detailed intrusive ground investigations are undertaken during the detailed design phase.

3.3.12 Construction of a gravity foundation would generally require the excavation of subsoil and rock to a specified sub-formation level, usually up to 5m below existing ground level. The depth of the excavation would depend on the depth to a competent bearing stratum with the excavation slopes graded to a safe angle to ensure they remain stable during construction. The sub-formation would then have a layer of structural fill placed across it to create a level platform, prior to the in-situ casting of a steel-reinforced concrete foundation. Foundations would likely be circular and consist of a main base section with a smaller pedestal section cast above this. The foundations would have a diameter of approximately 23m.

3.3.13 Where a piled foundation is required, the construction process follows that of the gravity base, with the pile group installed following the completion of the structural fill platform. The construction process would then be completed as per the gravity base.

3.3.14 Each foundation would require approximately 700m^3 of concrete and 100 tonnes of steel reinforcement.

3.3.15 Dependent on the wind turbine selected, the fixings used between the wind turbine and foundation can vary. Possible solutions include cans, pedestal length bolts and full-length bolts. Cans and pedestal bolts would be cast into the foundation pedestal, full length bolts would extend through the pedestal and into the main base section. The construction

process would be as per the above for gravity and piled bases with the connection piece placed at the appropriate stage during the process.

3.3.16 The foundation excavation would be backfilled with compacted layers of suitable graded material. The finished surface around the turbines would be capped with graded, crushed rock to allow for safe personnel access to each turbine via the hardstanding.

3.3.17 Plate 3.2 to Plate 3.6 display the general construction process for wind turbine foundations.

Plate 3.2: Example Turbine Foundation Construction – Excavation

Plate 3.3: Example Turbine Foundation Construction – Formation

Plate 3.4: Turbine Foundation Construction – Steel Reinforcement

Plate 3.5: Turbine Foundation Construction – Concrete Pour

Plate 3.6: Turbine Foundation Construction – Completed Foundation (to be backfilled)

3.3.18 Electrical cable ducts and other ancillary services would be installed into the foundations as required.

Hardstandings

3.3.19 As shown on Figure 3.6: Indicative Crane Hardstanding Detail, the turbine foundations would be surrounded by a hardstanding. It is anticipated an area of approximately 3,000m² would be required for the hardstanding at each turbine. The hardstanding areas would accommodate the cranes required for construction and maintenance, and provide a laydown area for temporary storage of components adjacent to each turbine location.

3.3.20 Crane hardstandings would be constructed level to ensure the safe operation of the cranes. The final detail of the crane hardstandings would depend on the exact specification of the wind turbine supplier. It is anticipated that a large crawler or wheeled / mobile crane (up to 1,000 tonne capacity) would be required for turbine erection, with one smaller erector crane assisting with the lift procedure.

3.3.21 Hardstanding construction would involve stripping the topsoil (and peat where present) to expose a suitable bearing stratum on which to build the hardstanding. The hardstanding would then be constructed by placing and compacting suitable crushed rock (obtained from suitable on-site borrow pits) to the required level. The upper soil / peat horizon, together with any vegetation, would be suitably stored on site for reinstatement, if appropriate. A Peat Management Plan (PMP) for the Proposed Development will be prepared by the Principal Contractor appointed by the Applicant prior to construction (a draft PMP is included in Technical Appendix 11.3).

Access Tracks

3.3.22 The access track layout[4] is shown on Figure 3.1: The Proposed Development. From the Site entrance on the A839, access to the Site would be achieved by utilising the existing tracks developed as part of Achany Wind Farm.

3.3.23 Existing tracks are typically constructed to a high standard with a running width of around 4.5-6m. Approximately 6.6km of the existing tracks would be utilised to access the Proposed Development. Localised widening of the existing tracks may be required to facilitate the delivery of the wind turbine components dependent on the wind turbine chosen to be used on the Proposed Development.

3.3.24 Approximately 17.3km of new tracks would be constructed as part of the Proposed Development. New access tracks would have a minimum 4.5m wide running surface, plus 0.5m shoulders each side, as illustrated in Figure 3.4: Indicative Access Track Details. Some localised widening on corners of the existing access tracks would also be required to access the turbines during both construction and operation. The access tracks would be designed to incorporate passing places that would be suitable for construction plant and 4x4 traffic (approximately 35no. at 25m x 3m).

[4] Subject to a 50m micrositing limit subject to approval of specialist advisers.

Access Track Construction

3.3.25 It is anticipated that site access tracks would be constructed with locally (on site) won graded rock from borrow pits[5] and, where necessary, geotextiles with the surface course comprising of a durable unbound graded rock surfacing material.

3.3.26 Depending on local ground conditions, access tracks would be constructed using a combination of 'floating track' or 'cut track' designs:

- Generally, a 'floating track' design does not involve excavation and would be utilised on the Site in areas where peat depth is greater than 1m, where practical[6]. Geotextile material is laid onto the unbroken existing surface at a width to suit the track. Layers of crushed stone would then be laid on the geotextile to form a track capable of supporting the turbine delivery vehicles and construction plant. This type of track construction is typically used in peaty areas across Scotland including other constructed wind farm developments and public roads. The benefits of the floating track design are that it allows access track construction on soft terrain and does not require excavation of deep peat as the surface layer is not broken, resulting in reduced peat volumes for re-use across the Site. There is minimal disruption of the sub-surface flow of water within the peat body, and no new channels are formed (i.e. no associated drainage) by which water can drain from the peat mass.
- In areas of shallow or no peat (0-1m), a 'cut track' design would be utilised for which the topsoil and peat would be stripped to expose a suitable bearing stratum on which to build the track. The track would then be constructed by placing and compacting suitable crushed rock (obtained from suitable on-site borrow pits) to the required level. Where site topography is variable or undulating, earthwork cuttings and embankments would be necessary to achieve the required gradients for tracks and crane hardstandings. The upper soil / peat horizon, together with any vegetation, would be suitably stored on site for reinstatement, if appropriate.

3.3.27 It is anticipated that approximately 15.23km of cut track and 2.02km of floating track design would be utilised for the Proposed Development (see Figure 3.1).

3.3.28 Where appropriate, peat and soil from excavations on site would be utilised for reinstatement along both sides of the track verges and allowed to regenerate naturally. Further details are provided in Technical Appendix 3.1: Outline CEMP.

Access Track Drainage

3.3.29 Construction of site access tracks requires robust drainage. Run-off from the access tracks would be shed via a crossfall into track side ditches and settlement lagoons / ponds to attenuate flows and remove sediments before discharging to land. Further details are provided in Technical Appendix 3.1 Outline CEMP. Existing drainage infrastructure would be utilised where possible.

[5] Where the borrow pits do not yield suitable material for certain construction operations such as concrete batching or access track capping, it may be necessary to import material to the Site. This would be determined following detailed ground investigation works.
[6] This is not always feasible due to peat stability risk associated with a combination of peat depth, gradient and underlying soil parameters. In addition, consideration will be given to the transition lengths between floating and founded track construction where a proportion of this transition may be in areas where the peat is in excess of 1m. Where isolated pockets of peat are greater than 1m in depth it may not be possible to transition from a cut track to a floated track due to the length of transition required.

3.3.30 Where practical, interceptor (cut-off) ditches would be formed on the upslope side of the track to collect and divert clean water away from the access tracks.

3.3.31 Cross drains would be installed at regular intervals to prevent flooding / surcharging of trackside drainage and maintain hydraulic pathways. As far as possible, these would coincide with naturally occurring drainage channels.

Access Track Watercourse Crossings

3.3.32 The proposed routes for the Site tracks have been designed to minimise watercourse crossings by a combination of avoidance and by using existing crossings wherever possible. A total of seven new natural watercourse crossings, and 25 new crossings of ephemeral streams (formed by surface water runoff accumulation or saturated peatland soils) would be required for the Proposed Development (see Technical Appendix 10.2: Watercourse Crossing Assessment). An appropriate crossing would be designed, in consultation and agreement with the Scottish Environment Protection Agency (SEPA), to suit each location, dependent on the width of the crossing, the nature of the substrate, local conditions and the amount of traffic that would use it. Crossings (and culverts) will be designed to ensure protection of the existing channel and substrate, allow free passage of fish and include provision of suitable ledges or mammal crossings to ensure free passage to otters during periods of high water-flow. These crossings would be designed based on best practice, including:

- SEPA (1998): Policy No 26: Policy on the Culverting of Watercourses;
- Scottish Executive (2000): River Crossings and Migratory Fish: Design Guidance;
- The Water Environment (Controlled Activities) Regulations (Scotland) 2011, as amended;
- Construction Industry Research and Information Association (CIRIA) (2015): C741: Environmental Good Practice on Site, 4th edition; and
- CIRIA C689 Culvert Design and Operation Guide.

3.3.33 Further details of the proposed watercourse crossings and the environmental controls afforded by the above legislation and guidance are included in Chapter 10: Hydrology and Hydrogeology and Technical Appendix 3.1 Outline CEMP.

Temporary Construction Compounds

3.3.34 Temporary construction compounds containing welfare; offices; parking for cars and plant; and storage facilities, would be required for construction workers at the locations shown on Figure 3.1: The Proposed Development. An indicative layout of a construction compound is provided in Figure 3.7.

LiDAR

3.3.35 A single permanent Light Detection and Ranging (LiDAR) station would be constructed to collect meteorological data for the operational life of the Proposed Development and has been located to ensure it obtains the best quality data for the Site. Figure 3.1: The Proposed Development indicates its location, and an indicative plan and elevation are shown on Figure 3.5: Indicative LiDAR. It is assumed that the LiDAR would have a maximum reinforced concrete foundation of 4.7m x 3.7m.

3.3.36 The inclusion of a LiDAR station would negate the requirement for a permanent or temporary meteorological mast for the Proposed Development. No changes are proposed to the operational and installed Achany Wind Farm wind measuring devices.

Substation

3.3.37 The Proposed Development would connect to the electricity transmission network using a new on-site substation, as shown on Figure 3.1: The Proposed Development. A typical plan and elevation of the substation is shown on Figure 3.8a and 3.8b respectively.

Operations and Welfare

3.3.38 An operations and welfare facility would be provided within the substation compound area, as shown on Figures 3.9a and 3.9b Indicative Operations and Welfare Building. Alternatively, an extension to the existing operations building at Achany Wind Farm is proposed incorporating a store and additional office space, indicative details of which are provided on Figures 3.10a and 3.10b. If this option is exercised, then a smaller operations and welfare facility without a store or office would be constructed at the location shown in Figure 3.9a Indicative Operations and Welfare Building. This decision is dependant on the requirements of the Wind Turbine Supplier who would be appointed post consent.

On-site Electrical Cabling

3.3.39 Turbines are likely to be connected by electrical circuit 'arrays', with the output connecting to the new on-site substation. The cabling for this would be laid in trenches of varying width (depending on the number of cables) and approximately 1m in depth alongside the Site access tracks where suitable, or otherwise in agreement with THC in consultation with SEPA and the appointed Ecological Clerk of Works (ECoW). These trenches would also carry earthing and communications cables.

3.3.40 Cables would be laid directly in trenches with a sand surround and then backfilled with excavated sub-soil and peat topsoil. Alternatively, cable ducts could be installed underground. Backfill materials would be as per those aforementioned, and the cables pulled through following completion of the duct installation or cables could be installed directly into the ground by use of cable ploughs. Earthing cables and communications cables would be included in the same trench.

Grid Connection

3.3.41 The grid connection from the on-site substation to the National Grid would be subject to a separate consent application by the Network Operator (Scottish and Southern Electricity Networks). Details of the grid connection are undefined at this time but it is anticipated that the grid connection would connect to Shin Substation.

3.4 Associated Development Components

Concrete Batching

3.4.1 It is anticipated that concrete batching would be undertaken on site. The proposed location of the batching plant is shown on Figure 3.1: The Proposed Development. The batching facility would comprise batching towers and a number of feeder hoppers used to store the constituent parts (water, fine and course aggregates and cement), which are mixed to form concrete.

Borrow Pits

Predicted Aggregate Requirements

3.4.2 It is estimated that approximately 250,000m³ of stone would be required for construction of the Proposed Development (including access tracks, structural fill beneath turbine foundations, and hardstandings at turbine bases and compounds).

Borrow Pit Locations

3.4.3 Stone required during construction is expected to be obtained from new borrow pits located in close proximity to the proposed new turbines, as well as reworking existing borrow pits used during the construction of Achany Wind Farm (as shown on Figure 3.1: The Proposed Development). Where the borrow pits do not yield suitable material for certain construction operations such as concrete batching or access track capping, it may be necessary to import material to the Site. This would be further informed following detailed ground investigation works but only defined following the opening up of and excavation from the onsite borrow pits.

3.4.4 It is anticipated that 250,000m³ of suitable quality rock is required during construction of the Proposed Development. Anticipated volumes of stone from each borrow pit is included in Technical Appendix 11.2: Borrow Pit Assessment, subject to detailed ground investigation and design during the pre-construction design phase. The borrow pits would require the use of plant to both win, crush and screen the resulting rock to the required grades. It is anticipated that rock would be extracted by breakers and some blasting may be required.

Borrow Pit Reinstatement

3.4.5 Following construction, the borrow pits would be reinstated with a suitable restoration profile (refer to Technical Appendix 11.1: Borrow Pit Assessment).

3.5 Construction Programme

3.5.1 It is expected that many of the above operations would be carried out concurrently, although predominantly in the order identified in Table 3.5, to minimise the overall length of the construction programme. A typical construction period for a wind farm of this size is estimated to be approximately 18 months. The indicative construction programme is illustrated in Table 3.5, with the final period dependent on weather and ground conditions experienced at the Site.

3.5.2 Site reinstatement would be programmed and carried out to allow rehabilitation of disturbed areas as early as possible in order to minimise storage of excavated material on vegetation. Details on reinstatement would be provided within the CEMP, an outline of which is included as Technical Appendix 3.1.

Table 3.5: Indicative Construction Programme

Quarter	1	2	3	4	5	6
Site Establishment						
Borrow Pit Operation						
Access Track Construction						
Turbine Bases and Hard Standings						
Concrete Works						
Cable Delivery and Installation						
Turbine Delivery and Erection						
Wind Farm Commissioning						
Reinstatement / Restoration						

3.5.3 Site compound areas would be required during construction. The Site compounds would include site cabins and welfare facilities for construction workers and could also be used as laydown areas for the delivery of some materials. A temporary construction compound and a security and storage area would also be required at the Site entrance.

3.5.4 All statutory legislation would be fully complied with during construction and other best practice guidance (e.g. SEPA Pollution Prevention Guidelines and Good Practice during Wind Farm Construction (Version 4), Scottish Renewables et al, (2019)) would be adhered to.

Working Hours

3.5.5 Construction activities are anticipated to be between 07.00 and 19.00 hours Mondays to Fridays, and 07.00 to 14.00 hours on Saturdays. No working activities would be planned on Sundays. In the event of work being required outwith these hours, e.g. abnormal load deliveries, commissioning works or emergency mitigation works, the Planning Authority would be notified prior to these works taking place, wherever possible.

3.5.6 Any blasting on site shall only take place between the hours of 10.00 to 16.00 on Monday to Friday inclusive and 10.00 to 12.00 on Saturdays with no blasting taking place on a Sunday or on National Public Holidays, unless otherwise approved in advance in writing by the Planning Authority.

3.6 Environmental Management during Construction

3.6.1 Prior to construction works, sensitive ecological areas, and other specific sensitive locations (e.g. cultural heritage assets, watercourses) would be marked out as appropriate on site by specialist advisers (e.g. the ECoW) in order to avoid unnecessary encroachment and protect sensitive areas during construction. The Principal Contractor

would ensure that no vehicle movements or other activities take place outwith the approved working area.

Micrositing

3.6.2 There may be a requirement to microsite elements of the Proposed Development as a result of additional constraints encountered during site works. Turbines, access tracks, underground cables and crane hard standing areas may be microsited within 50m of the positions shown on Figure 3.1: The Proposed Development. Beyond this, agreement would be sought from the Planning Authority in consultation with SEPA. Any micrositing would require agreement of the specialist advisors (e.g. the ECoW) as appropriate.

Construction Environmental Management Plan (CEMP)

3.6.3 A Construction Environmental Management Plan (CEMP) would be prepared for the Proposed Development. The CEMP would be submitted to THC (in consultation with NatureScot and SEPA as required) outlining site specific details of all on-site construction works, reinstatement, drainage and mitigation, and any post construction reinstatement works together with details of their timetabling. An outline CEMP is provided in Technical Appendix 3.1 of this EIA Report.

Site Environmental Management

3.6.4 The Principal Contractor would have overall responsibility for environmental management on the Site. The services of specialist advisors, such as the project ECoW, would be retained as appropriate to be called on as required to advise on specific issues. The Principal Contractor and the Applicant would ensure construction activities are carried out in accordance with the mitigation measures outlined in this EIA Report and those detailed in the Approved CEMP. A summary of mitigation measures is included as Chapter 18: Schedule of Mitigation.

3.6.5 Contractors would be required to adhere to the following in order to reduce or mitigate the environmental effect of the construction process:

- the conditions of any granted consent;
- relevant environmental regulations; and
- any other relevant mitigation measures identified in this EIA Report (see Chapter 18: Schedule of Mitigation).

3.6.6 A copy of any conditions of consent and the CEMP would be incorporated into tender documents and form part of the contract between the Applicant and the Principal Contractor. The selection criteria for the Principal Contractor would include their record in dealing with environmental issues, and provision of evidence that they incorporate all environmental requirements into their method statements.

Waste Management

3.6.7 Waste management is addressed in detail in the Outline CEMP (Technical Appendix 3.1). It is not anticipated that any excavated waste materials would be generated during the works, as all would be re-used on site, as described within Technical Appendix 11.3: Draft Peat Management Plan. Any materials to be removed from site (packaging etc.) would be segregated on site and removed to suitable recycling facilities or disposed of to a suitably licensed waste management facility, in accordance with current waste management regulations.

3.6.8 Demolition material removed from site during decommissioning would also be disposed of as above and recycled where possible. All material would be disposed of in accordance with the waste regulations and best practice applicable at the time.

3.6.9 A Waste Management Plan would be provided by the Contractor as part of the CEMP.

Health and Safety Related Issues

3.6.10 Health and safety would be initially addressed as part of the Pre-Construction Information Pack prepared by the Principal Designer for the project under the Construction (Design and Management) Regulations 2015. The Principal Contractor would be required to prepare a Construction Phase Health and Safety Plan and forward information to the Principal Designer during the works to enable the Health and Safety File to be completed.

3.6.11 Turbines are designed to be safe and are built to withstand extreme wind conditions. The turbines selected for the Proposed Development would have the appropriate health and safety certification.

3.6.12 In accordance with Sections 6(1)(g) and (h) of the Land Reform (Scotland) Act 2003, access rights are not exercisable while building or civil engineering works, or working of minerals, are being carried out. This will be applied throughout the construction working area for health and safety reasons. A draft Outdoor Access Plan is included as Technical Appendix 14.1.

3.6.13 An Operations and Maintenance Manual for the design life of the wind farm would be prepared, which would cover all operational and decommissioning procedures.

Site Reinstatement

3.6.14 Reinstatement works are generally undertaken during construction (and immediate post-construction phase) and aim to address any areas of ground disturbance and changes to the landscape as part of the construction works. Reinstatement is undertaken as soon as practical following the construction works in each area, such as the re-dressing of road and track verges (and other areas that may be disturbed as a result of the construction process).

3.6.15 Such works would involve the reinstatement of areas disturbed during the construction phase. This would be undertaken to provide a natural ground profile with non-geometric surfaces and tie-ins with existing undisturbed ground levels to prevent the collection of surface water. It would in all instances be undertaken at the earliest opportunity to minimise storage of turf and other materials and to provide completed reinstatement at the earliest opportunity. Typical reinstatement works are outlined in the Outline CEMP (see Technical Appendix 3.1).

3.6.16 Site tracks and hardstanding areas at each turbine location would be retained for use in ongoing maintenance operations (including component replacement) and decommissioning of the wind farm. The edges would as far as possible be blended to the adjacent contours, with natural vegetation being allowed to re-establish.

3.6.17 Any other temporary hardstanding areas would be re-graded with peat or soil to a natural profile and reinstated as appropriate.

3.6.18 All construction equipment and other temporary infrastructure would be removed from site and the temporary storage areas would be reinstated.

Consultations with the Local Community during Construction

3.6.19 Consultation with the local community during the construction of the Proposed Development would be an important consideration for the Applicant and the Principal Contractor. A community liaison group would be set up to provide the local community with information about key construction activities and a mechanism by which concerns from within the local community could be shared and discussed.

Site Operation and Maintenance

3.6.20 Once commissioned, it is expected that the Proposed Development would require the continued use of the current existing infrastructure within the Site.

3.6.21 Routine maintenance, inspections and servicing would be carried out on each turbine as required at the Proposed Development, including major component and blade inspections. Appropriate maintenance works would be carried out routinely, and immediately following any unexpected events on site, such as failure of a generator or gearbox.

Track Maintenance

3.6.22 Frequency of track maintenance depends largely on the volume and nature of the traffic using the track, with weathering of the track surface also having an appreciable effect. Heavy plant is particularly wearing and on-going track maintenance would be undertaken as necessary throughout the year. Safe access and management of silt run off from weathered track material would be maintained all year round.

3.6.23 There would be no public vehicular access to the Site.

Site Decommissioning

3.6.24 The decommissioning period for a wind farm of this size is estimated to be 12 months.

3.6.25 Detailed decommissioning proposals would be established and agreed with relevant authorities prior to commencement of decommissioning activities.

3.6.26 Decommissioning of the wind farm would be undertaken at the end of its operational lifespan, anticipated to be 50 years. This is anticipated to involve:

- Decommissioning and removal of the turbines and site substation;
- Removal of concrete to 1m below ground level of the turbine foundations;
- Removal of substation building foundations; and
- Re-instatement of all land affected, in accordance with best practice at the time.

3.6.27 At present it is not anticipated that the access tracks or underground cabling would be removed and would remain in-situ.

3.6.28 Typically, the turbines would be decommissioned and removed from the Site in a manner similar to that of their erection. Cranes would normally be used to split the turbines into sections which would then be transported from the Site.

3.6.29 It is anticipated that turbine foundations would be broken out to a level of 1m below the final ground level. Typically this would involve the removal of the upstand pedestal to the top surface of the main foundation base. All material arising from demolition would be disposed of responsibly and in accordance with relevant waste management regulations prevailing at the time.

3.6.30 All buildings and equipment would be removed including removal of fencing and of building foundations. All material arising would be disposed of responsibly.

3.7 References

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