Killean Wind Farm

Technical Appendix 2.1: Outline Construction Environmental Management Plan

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Contents

1 Introduction

1.1.1 This outline Construction Environmental Management Plan (CEMP) is submitted by RES Ltd (RES) in support of the EIA Report (EIAR) for the proposed Killean Wind Farm (hereafter referred to as the Proposed Development). The principal objective of this document is to provide information on the methodologies to construct and decommission the Proposed Development.

1.1.2 As the outline CEMP is being prepared as part of the section 36 application, RES Ltd are yet to appoint a wind turbine manufacturer or contractors to undertake the electrical or civil engineering works. The contractor(s) appointed to construct the Proposed Development will prepare detailed method statements to construct the works which will incorporate the details outlined in this outline CEMP.

1.1.3 This outline CEMP sets out the overarching construction management philosophy for the Proposed Development and provides further details on specific activities that will be undertaken on the Proposed Development.

1.1.4 The Figures referenced within the outline CEMP have been produced for the Killean Wind Farm Environmental Impact Assessment Report (EIAR) and to avoid unnecessary duplication they have not been reproduced in this document but signpost to the relevant location within the EIAR.

1.2 Project Development Description

1.2.1 The Proposed Development includes the installation of nine wind turbines with a maximum 180m tip height and associated infrastructure, associated wind turbine external transformers, underground cabling, site entrance, access tracks, turning heads, crane hardstands and substation compound. During construction and commissioning there would be a number of temporary works including construction compounds with car parking, temporary parts of crane hardstands, welfare facilities and borrow pits.

1.2.2 The Proposed Development is detailed in EIAR Figure 1.3.

Table 1.1 Outline Programme

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Mobilisation															
Forestry clearance															
Site entrance and tracks															
Crane hardstands															
Wind turbine foundations															
Substation															
Cable installation															
Turbine deliveries															
Turbine erection															
Operational take over															

1.3 Conditions of Consent

1.3.1 Planning permission for the construction and operation of the Proposed Development is yet to be received. Upon receiving conditions, RES Ltd will provide an updated CEMP to illustrate how applicable conditions will be discharged, aligning current construction methods with relevant legislation and environmental protection practices.

1.4 Community Liaison

1.4.1 Throughout the construction period of the Proposed Development, RES Ltd will maintain an open dialogue with local residents and all other interested parties. RES Ltd will ensure the local community is provided with regular updates on construction progress and upcoming activities through appropriate channels.

1.4.2 A member of staff will be appointed for responsibility of key contact between RES Ltd and the community. This person will be the nominated point of contact for local residents in connection with any issues that may be raised during construction, operation and decommissioning of the Proposed Development.

1.4.3 Any change to the appointed person shall be communicated to the planning authority and the local community representatives as required.

2 General Construction Management Principals

2.1.1 The Proposed Development will be constructed in accordance with the EIAR prepared during its development stage and in line with good practice outlined in the Scottish National Heritage guidance '*Good Practice during Windfarm Construction*' – 4th Edition 2019.

2.1.2 Throughout its development, the aim has been to ensure the design:

- Minimise the extent of infrastructure;
- Avoids sensitive habitats;
- Minimise environmental impacts; and
- Minimise hazards.

2.1.3 Where appropriate and practicable, local plant and materials will be used to maximise the benefit of the Proposed Development to the local economy.

2.2 Environmental Management and Pollution Prevention

2.2.1 Specific procedures to ensure that the local environment is protected during construction works are managed through RES management system procedures and policies which is certified to ISO 14001.

Contractors Requirements

2.2.2 Details of the environmental management and emergency procedures to be adopted by contractors during the construction phase are contained within the RES management system procedure '*Safety and Environmental Requirements of Contractors – 01059R00038*'.

Surface and Ground Water Management

2.2.3 A sustainable drainage system (SuDS) will be implemented to provide surface water management techniques to mitigate any adverse impact on the hydrology within the Proposed Development Area.

2.2.4 The SuDS will be developed and included as part of a greater Pollution Prevention Plan, to be included within the update to the CEMP prior to construction. This Pollution Prevention Plan will be submitted to the Scottish Environment Protection Agency (SEPA) included within an application for a Complex License under The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR)

Water Quality Monitoring

2.2.5 Any potential pollution incident on-site that may impact water quality will be dealt with in accordance with the Pollution Prevention Plan, to be developed prior to construction.

2.2.6 Water quality monitoring will be undertaken on discharge waters during the construction phase to ensure that the Proposed Development does not impact on local watercourses and rivers.

2.2.7 A bespoke Water Quality Monitoring Plan will be prepared and implemented by a specialist consultant, detailing monitoring locations, sampling frequency and the methodology for chemical and biological analyses. Site sensitivity will be considered when deciding the level and frequency of sampling and the Water Quality Monitoring Plan discussed and agreed with the relevant authorities prior to implementation.

2.2.8 The exact location of each sampling point will be determined during a walkover survey and will reflect the point on all relevant controlled waters closest to the Proposed Development. Sampling points up- and down-stream of the construction activity will be selected to provide a full profile of the controlled waters.

2.2.9 A baseline report will be prepared following initial pre-construction water quality monitoring. This report will provide details of any contamination concentrations recorded and will be used to depict “uncontaminated background pollution levels” for the Proposed Development.

2.2.10 In the event of a potential pollution incident, all relevant monitoring points would be visited and re-sampled to determine any changes relative to the baseline data. A report detailing the findings would be prepared for each incident and recommendations provided for further monitoring and / or requisite mitigation measures.

2.2.11 Following completion of construction, all sample points will be revisited, re-sampled and analysed for a full suite of analytical parameters and a further report prepared discussing any impacts upon water quality arising from the construction process. Foul Water Management

2.2.12 Foul drainage will be provided in agreement with the relevant authorities and most likely be drained to a sealed tank and routinely removed from site (i.e. there shall be no discharge on the Proposed Development Area).

Noise Management

2.2.13 The sources of construction noise are temporary and vary in location, duration, and level as the different elements of the Proposed Development are constructed. Construction noise arises primarily through the operation of large items of plant and equipment such as excavators, diesel generators, vibration plates, concrete mixer trucks, rollers etc. Noise also arises due to the temporary increase in construction traffic near the Proposed Development.

2.2.14 BS 5228-1:2009 *'Noise control on construction and open sites; Part 1 – Noise'* is identified as being suitable for the purpose of giving guidance on appropriate methods for minimising noise from construction activities.

2.2.15 For all activities, measures shall be taken to reduce noise levels with due regard to practicality and cost as per the concept of 'best practicable means' as defined in Section 72 of the Control of Pollution Act 1974.

2.2.16 It is proposed the following noise mitigation measures will be implemented where appropriate and in line with further guidance from BS 5228-1:2009+A1:2014

- Consideration will be given to noise emissions when selecting plant and equipment to be used. Where appropriate, quieter items of plant and equipment will be given preference.
- All equipment should be maintained in good working order and fitted with the appropriate silencers, mufflers or acoustic covers where applicable;
- Stationary noise sources shall be sited as far as reasonably possible from residential properties and, where necessary and appropriate, acoustic barriers installed to further reduce the impact;
- The movement of vehicles to and from the Proposed Development will be controlled; and
- Employees will be instructed to ensure compliance with the noise control measures adopted.

2.2.17 Should it be considered necessary to further reduce noise levels, mitigation measures would be considered, and appropriate measures will be undertaken.

2.2.18 There are many strategies that could be employed to reduce construction noise levels; BS 5228-1:2009+A1:2014 also states that the 'attitude to the contractor' is important in minimising the likelihood of complaints and therefore consultation with the local community should occur. Non-acoustic factors such as mud on roads and dust generation, which can also influence the overall level of complaints, will also be controlled as detailed elsewhere in this document.

2.2.19 In the event that noise complaints are received, the RES on-site staff member will contact the complainant and if required, visit the property to discuss the complaint and subjectively assess the noise levels. If the noise complaint is found to be merited, additional mitigation measures will be adopted.

2.2.20 In the event a resolution cannot be reached between RES and the complainant, the planning authorities will be informed in order that they can carry out their own subjective assessment and if required agree any additional mitigation.

2.2.21 All noise complaints will be recorded alongside actions taken to resolve the issue. These records will be available to the planning authorities on request.

Dust Management

2.2.22 The potential issue of dust creation during construction will be weather and season dependant, therefore detailed dust management methods will be subject to the works programme and contractor working methods.

2.2.23 Dust management will be continuously undertaken in accordance with industry best practice to ensure that any local sensitive receptors are not affected by nuisance levels of dust from the works.

2.2.24 The following methods of dust suppression will be considered during the construction phase as required:

- Access tracks to be damped down using bowser or other suitable system;
- Road sweeper to be used to remove loose material from adjacent public roads during construction;
- Cleaning of vehicles, including provision of waterless wheel washing facilities, prior to exiting site onto the public road;
- Soil erosion control measures;
- Speed limits to be put in place to ensure low vehicle speeds;
- Vehicle loads to be covered;

- Damping of dry excavations and cutting activities which generate dust; and
- Sequencing of works to minimise the time that soils are exposed.

Spoil Management Bunds

2.2.25 Excavated peat, topsoil and subsoil are expected to be reused within the Proposed Development Area either as part of backfilling or reinstatement operations or used to form landscaping bunds. Materials will generally be stockpiled close to the location of reuse to limit vehicle movements on-site. Details of peat and soil stripping at the site and the proposed use and placement of peat, topsoil and subsoil is detailed in Chapter 9: Geology, Hydrology and Hydrogeology and Technical Appendix 9.2: Peat Management Plan within the EIAR.

On-Site Fuel and Chemical Storage

2.2.26 All fuel and chemicals will be stored within appropriately specified containers and within specifically designed stores / storage areas and shall include appropriate measures to avoid spillages in line with the relevant legislation. Further information on the fuel and chemical storage will be provided within the Principal Contractor's Construction Phase Plan prior to the construction phase of the Proposed Development.

2.3 Temporary Lighting

2.3.1 Temporary lighting will be required at the construction compound for security purposes and to ensure that a safe working environment is provided to construction staff. In addition, temporary lighting may be required to ensure safe working conditions at access tracks, hardstands and compounds during construction.

2.3.2 All temporary lighting installations will be downward facing, and all lights will be switched off during daylight hours. The Ecological Clerk of Works (as discussed below in section 2.8) shall supervise the use of temporary lights to ensure that protected species are not impacted, see Chapter 7: Ecology of the EIAR for further details.

2.4 Peat Slide Risk and Slope Stability

2.4.1 A Peat Landslide Hazard and Risk Assessment (PLHRA) has been undertaken as part of the EIAR (see Technical Appendix 9.2) and the design of infrastructure has considered the findings of the assessment. The recommendations highlighted will be followed.

2.4.2 Prior to construction commencement, detailed method statements will be prepared to address the working methods to be used. Additionally, a "toolbox talk" will be provided by the site management team to highlight possible events causing slope instability and provide guidance on best practice when operating in areas identified as at risk.

2.5 Post Construction Restoration and Reinstatement

2.5.1 During construction of the infrastructure elements (detailed in section 3), the vegetated layer will be stripped from the excavation area and stored locally with the growing side up. The remaining organic topsoil and subsoils will be excavated down to formation level, or a suitable stratum, and again will be stored local to the point of excavation but shall remain segregated to avoid mixing of materials.

2.5.2 Temporary storage areas shall take consideration of all identified buffer areas and be stripped of vegetation prior to stockpiling in line with best working practices. As construction is progressed the effectiveness of the buffer zones will be reviewed and if necessary adjusted. Alternatively, the construction procedure may be reviewed and altered, or additional control measures put in place.

2.5.3 Post-construction reinstatement will be undertaken as work progresses to minimise the period any organic material is stockpiled. Subsoils shall be used in landscaping and backfilling around structures while the vegetated layer and/or topsoil will be used to reinstate storage and working areas, track verges, drainage swales and embankments. In addition, following the completion of the works, a final inspection of the Proposed Development will be undertaken and in circumstances where reinstatement using vegetation and/or topsoil is unsuccessful alternative methods will be considered.

2.5.4 Upon completion of all construction works, all temporary structures and construction equipment will be removed and the granular material that forms the hardstands will be moved to areas agreed with the landowner or removed from site. Following this, the areas will be backfilled with material stripped and stored during the construction and reseeded as required.

2.5.5 In line with construction best practice and to suit the ground conditions anticipated on-site, the track and hardstand design has endeavoured to minimise spoil generated during construction.

2.6 Traffic Management

2.6.1 Details of the proposed traffic management arrangements will be contained in a Traffic Management Plan (TMP). Any operations not covered by the TMP will be performed in accordance with local and national standards and specifications. All abnormal load movements associated with the Proposed Development will be performed in accordance with the delivery route shown in EIAR Technical Appendix 10.1: Abnormal Loads Route Assessment.

2.7 Health and Safety Management

2.7.1 The Principal Contractor will be responsible for ensuring that a Construction Phase Plan is prepared and implemented on-site. All work will be carried out in accordance with:

- The Health and Safety at Work etc. Act 1974;
- The Construction (Design and Management) Regulations 2015; and
- All applicable third-party safety guidelines.

2.8 Environmental

2.8.1 An Ecological Clerk of Works (ECoW) will be appointed, and will be fully engaged in preparatory works undertaken, with their terms of appointment extended throughout the construction period into the operational period. The agreed terms of appointment, to be agreed with the relevant authorities, will be provided prior to construction.

2.8.2 The provision of an Archaeologist will be implemented during any excavation works, in agreement with the relevant authorities, and a Written Scheme of Investigation will be provided, agreed and applied to all applicable areas of work.

3 Design Philosophy and Construction Methods

3.1 Micro-siting of infrastructure

3.1.1 During the detailed design phase, the location of the Proposed Development may need to be micro-sited though at this stage in the design process there is no planned micro-siting of infrastructure.

3.2 Site Entrance

3.2.1 Construction traffic will access the Proposed Development from the A83 using the existing site entrance to the west of the Proposed Development Area. Due to the constrained nature of the turn, it has been determined that the field to the west of the A83 will be utilised to allow loads to turn. Utilising the field will minimise tree felling and restructuring of existing embankments to the east side of the A83 and will provide sufficient turning area for AIL vehicles so that they can approach the existing haul road/ Kintyre way track suitably aligned. The proposed turning area will be circa 1350m2 and will comprise a heavy-duty cellular paving system, such as grasscrete/truckpave. The proposal forms a semi tear drop shape that it is sympathetic to its surroundings and gently extends west of the A83. The wider section of the proposed turning area is opposite to the existing junction itself providing a notion of balance to either side of the A83. A 1m berm is provided along the permitter of the turning area linking the turning area and the 1 in 3 earthworks slope which addresses the level difference of approximately 1.9, at its maximum height between the turning area and adjacent field.

In order to minimise the visual impact of the turning area it is proposed to retain the existing hedgerow along the western edge of the A83 where possible. The hedgerow removal will be split between each end of the turning area. Wheel cleaning facilities will be set up at the existing site entrance to remove mud from the wheels of vehicles leaving the Proposed Development Area. Public roads will be inspected daily, and a road sweeper will be employed to remove any mud or debris transferred onto the roads from site activities.

General Construction Method

3.2.2 The site entrance will be constructed in accordance with the design drawings as follows:

- Traffic management to be installed;

- Topsoil shall be removed and carefully stockpiled;
- New drainage shall be installed taking care to ensure that existing drainage will not be compromised;
- Road pavement works to be completed to the design requirements;
- Line marking, signage, fencing and vehicle restraint systems required as part of the design will be installed;
- Upon completion of the construction works the site entrance will be reinstated to reduce the extent of hardstand back to its original pre-construction state. Any trees and hedgerows removed will be replanted.

3.3 Temporary Construction Compounds, Access Tracks and Crane Hardstands

Temporary Compounds

3.3.1 Temporary compounds are required for the provision of site offices, welfare facilities and storage arrangements for materials, plant and equipment. There is one temporary construction compound required for the construction phase of the Proposed Development.

3.3.2 The temporary compounds will be constructed at the locations indicated on Figure 1.3.

3.3.3 Initial welfare provision will be made for use during construction of the access tracks to the temporary construction compound. This will likely be a single unit for use by a small workforce tasked with the enabling works.

3.3.4 The temporary construction compound will be the main compound for the Proposed Development with welfare facilities at this location.

3.3.5 An area will be assigned for the storage of fuels and chemicals, ensuring any spillage is captured and appropriately dealt with.

Access Tracks

3.3.6 The running width of the access tracks will be typically 4.5 m on straight sections with 0.25 m (0.50 m for floating tracks) shoulders on each side resulting in 5 m access track width in total (5.5 m for floating tracks). Shoulders are likely to increase at corners and passing places to accommodate the swept path of wind turbine delivery vehicles. The access track working area will be kept to the minimum required allowing for safe access, drainage and electrical works.

3.3.7 Access tracks will consist of compacted stone. Where access tracks cross over services such as gas pipelines or electricity cables, they will be designed in consultation with the relevant authority and accordance with their specific requirements.

3.3.8 A number of access track designs may be utilised at the Proposed Development which will be determined during detailed design, dependent on the ground conditions encountered on-site and include:

- Excavated track, founded on suitable load bearing strata;
- Floating Track, laying a suitable membrane directly on existing ground level and constructing off that layer;

3.3.9 Access track drainage will be incorporated within the design in accordance with sustainable drainage design principles. Where the track alignment crosses existing drainage channels, crossings appropriate to the location will be designed in accordance with the relevant guidelines.

3.3.10 A buffer zone in accordance with the relevant guidance from SEPA will be maintained around watercourses. The exceptions to these buffers will be where the existing tracks are located within the buffer zone and where there are watercourse crossings. Site personnel will be made aware of the buffer zones through the site induction and specific toolbox talks.

Excavated Track

3.3.11 Excavated track construction may be used in areas identified where the thickness of soft soils is low, and the underlying layer has adequate load bearing properties. This system will likely consist of a suitable capping layer and then a suitable running layer.

Floating Track

3.3.12 Floating track construction may be adopted where the ground conditions require. This system involves installing geo-grid directly onto the organic or exposed soil layer and placing layers of suitable stone and additional geo-grid (as required) above until the track design level is achieved. If a contractor decided to use timber in the design, there may be an opportunity for re-use of forestry materials.

3.3.13 Typical access track construction is detailed in Figure 2.4a & 2.4b

Crane Hardstands

3.3.14 The main crane hardstand area is anticipated to be 55m x 35m. There may be additional temporary hardstand areas required for the erection of the main crane, lay down of materials and wind turbine components.

3.3.15 The main crane hardstand area will be uncovered for the operational phase of the Proposed Development in line with good practice outlined in the Scottish National Heritage guidance *'Good Practice during Windfarm Construction'* – 4th Edition 2019. Any temporary crane hardstand elements will be reinstated post construction.

3.3.16 All crane hardstands will consist of a compacted stone structure bearing directly on a suitable formation strata.

3.3.17 Typical crane hardstand arrangements are detailed in Figure 2.3

General Construction Method

3.3.18 Where competent soils exist close to the existing ground level the following construction method will typically be followed:

- Access track and crane hardstand alignments will be established from the construction drawings and marked out with ranging rods, timber posts or steel pins;
- Access track corridors and crane hardstand locations shall be pegged out 500 - 1000m in advance of operations;
- Where possible, upgraded access tracks will re-use the structure of the existing track to reduce construction requirements;
- Drainage swales will be excavated adjacent to the access tracks where required. Surface water runoff will not be allowed to discharge directly into existing watercourses but will be routed through SuDS;

- A surface water cut off ditch may be installed on the slope above the earthworks footprint where achievable given the topography;
- Material will be excavated and stored;
- Excavated track construction will be used where shallow soils are identified. This excavated track system will likely consist of a suitable layer of crushed stone, either spread by a dozer or placed by hydraulic excavator, prior to being compacted in layers by vibratory rollers. If ground conditions dictate, a geotextile membrane will be applied;
- Crane hardstand construction will follow the same construction method as excavated track;
- Floating track construction may be adopted where the ground conditions dictate. This system involves installing a geogrid membrane directly onto the organic vegetated layer and placing layers of suitable stone and additional geogrid layers (if required by the design) above;
- Where the access track alignment crosses existing drainage channels, crossings appropriate to the location will be designed in accordance with the relevant guidelines;
- Depending on depth and type of material, adjacent slopes are anticipated to be between 1:1 to 1:3.
- Post-construction reinstatement shall be in line with the details of Section 2.5.

3.3.19 Where the load bearing properties of the underlying soils are determined to be insufficient, ground stabilisation may be carried out to provide adequate bearing capacity of the formation level. Due to the variable nature of the ground at the site, specific construction methods shall be selected at detailed design stage in consultation with specialist contractors. Such methods may consist of:

- Compaction of the existing in situ soils;
- Lime/cement stabilisation of the existing in situ soils; or
- Installation of stone or concrete columns to provide adequate support.

3.4 Wind Turbine Foundations

3.4.1 Foundations will be designed as a steel reinforced concrete slab, in accordance with the relevant design standards, specific turbine supplier load information and ground conditions. Due account will be taken of guidance provided in appropriate codes and standards such as Eurocodes, British Standards and other specialist design documents.

3.4.2 Due to the anticipated load bearing capacity of the near surface soils, gravity base turbine foundations are expected to be used to support the wind turbine.

3.4.3 Typical turbine foundation arrangements are detailed in Figures 2.2a and 2.2b.

General Gravity Base Construction Method

3.4.4 The gravity base foundation general construction method would generally be as follows:

- A surface water cut off ditch may be installed on the slope above the earthworks footprint where achievable given the topography;
- The topsoil will be excavated and stored to one side for reuse during the landscaping round the finished turbine;
- Excavation will be undertaken to competent material. Excavated subsoil material may be stockpiled temporarily adjacent to the excavation for later use as backfill or stored elsewhere on-site. Temporary & permanent drainage shall be installed at the same time as the excavated works;
- Where competent material is lower than the required formation level the foundation will likely be over-excavated to competent material and compacted engineering fill placed to the required level;
- Where excavation is required to extend below the water table or in material which does not drain freely, temporary pumping will be employed to keep the excavation dry. Water pumped from an excavation shall be adequately treated in line with the SuDS philosophy, before being discharged directly into any watercourse;
- A layer of concrete blinding will be laid directly on top of the newly exposed formation, finished to ensure a flat and level working surface;
- Steel reinforcement, the turbine anchorage system and cable ducts will be fixed in place and formwork erected around the steel cage;

- Concrete will be placed using a pump, or other suitable device, and compacted using vibrating pokers;
- Following the settling process, the foundation will be backfilled with suitable material, and landscaped using vegetated soil layer set aside during the initial excavation; and
- A gravel path will be built leading from the access track or crane hardstand to the turbine door or access steps and around the turbine for maintenance.

3.5 Wind Turbines and Transformers

Turbines

3.5.1 The wind turbine will typically be supplied with a light grey semi-matt finish (RAL colour 7035) and installed with a height not exceeding 180m measured from ground level to the blade tip in the vertical position.

3.5.2 The wind turbines shall not carry any symbols, logos or other lettering except where required under other legislation. However, RES proposes to add turbine numbers to the base of each tower to aid service engineers during the operational phase of the wind farm.

3.5.3 In line with health and safety best practice, turbine manufacturers have indicated a preference to locate a passive infra-red (PIR) detector and light above each turbine door. It should be noted that this lamp will not be permanently lit and would only be switched on by the PIR when personnel approach a particular turbine.

3.5.4 Specific locations for the turbines are as per Figure 1.3.

General Turbine Erection Method

3.5.5 The following general steps will be undertaken to erect the turbines on-site:

- Turbine components will be lifted by adequately sized cranes (one main crane and one smaller tail crane) and positioned on the foundations/ other turbine sections until the turbine is erected;
- Upon completion of the erection all fasteners will be tightened and the internal fit out of the turbines undertaken;
- The turbines will then be connected to the wind farm substation; and finally
- Turbine testing and commissioning will be undertaken before the turbines will be handed over as complete.

Turbine Transformers

3.5.6 Depending on the model of turbine finally chosen for the Proposed Development, turbine transformers will either be placed internally, or externally in close proximity to the turbine.

3.5.7 Oil cooled transformers will be supplied full of oil and will not require topping up on-site. The transformers will be sealed and will be inspected for any damage prior to offloading. Air cooled or cast resin transformers do not require cooling oil.

3.5.8 Exterior transformers will be located within enclosures which shall be locked, accessible by trained and authorised personnel only, and displaying appropriate warning signs.

3.6 Substation Compound

3.6.1 Cables will transfer power from the wind turbines to the substation compound before being transferred to the National Grid. The location of the substation compound is shown on Figure 1.3 and an indicative layout and elevation is shown on Figures 2.9a & 2.9b.

3.6.2 The control buildings have been designed, sized and positioned to be sympathetic with the surroundings. The building typically contains the following rooms; control room, switch room, SCADA room, and equipment store and welfare facilities.

3.6.3 The detailed design of the foundations for the building will be based on the Site Investigation reports and building requirements, and will ensure loads associated with the building are transferred to the appropriate bearing layer in the sub-surface.

3.6.4 Foul drainage will be provided in agreement with the relevant authorities and most likely involve Foul effluent disposal via chemical facilities with periodic tankered removal by a licensed waste haulier for licensed offsite disposal (i.e. there shall be no emission on site).

3.6.5 Communications to the site is anticipated to be provided via direct cable connection with the service provider.

General Construction Method

3.6.6 The control building and substation compound will generally be constructed in accordance with the following:

- A surface water cut off ditch may be installed on the slope above the earthworks footprint where achievable given the topography;
- The plan area of the substation control building and compound will be set out and the topsoil stripped and removed to a temporary stockpile;
- The building foundations will be excavated and concrete poured;
- The building structure will be constructed from the foundations, in accordance with current practice and specific designs; and
- The internal fit out of the building including installation of services will be completed.

3.7 Cabling Works

3.7.1 All electricity and other service cables between the turbines and the substation will be placed underground.

3.7.2 The detailed construction and trenching specifications will depend on the ground conditions encountered but typically cables will be directly buried inside a trench, except at track crossings when cables will be ducted.

3.7.3 Specific cable layout plans will be provided prior to construction.

General Construction Method

3.7.4 The following construction method will typically be used:

- Trenches will be excavated and a suitable bedding material placed to lay the cables upon. The ground is trenched typically using a mechanical digging machine;
- The cables shall be laid directly onto the bedding material;
- The trench will be backfilled and compacted with suitable material up to the required level and finished with a layer of topsoil to reinstate the trench;
- A suitable marking tape is installed between the cables and the surface; and
- The cables are terminated on the switchgear at each turbine and the substation.

4 Outline Decommissioning Plan

4.1.1 Prior to decommissioning, a detailed site restoration scheme will be provided to the relevant authorities for written approval.

4.1.2 Outlined in the following sections are the general procedures to be followed in the decommissioning of the Proposed Development based on current knowledge.

4.2 Site Track & Hardstand Areas

4.2.1 New site tracks and hardstand areas constructed during development of the wind farm will be reinstated to the approximate pre-wind farm condition, unless otherwise agreed with the Landowner and/or Local Planning Authority. Areas to be reinstated would be treated in the following way:

- The material used to construct the tracks will be taken up and removed to areas identified in the site restoration scheme;
- The areas will be backfilled with suitable fill material, covered with topsoil and reseeded as required;
- Backfilling of access tracks will be carefully planned to avoid unnecessary plant and equipment movement on freshly reinstated land; and
- Any tracks which were upgraded during the development of the wind farm would be left unchanged from the conditions used during the operation of the wind farm.

4.3 Wind Turbines

4.3.1 The decommissioning of the wind turbines will be the reverse of the erection process involving similar lifting plant and equipment:

- Wind turbines will be disconnected from the cabling and internal components stripped and taken off site;
- It is anticipated that the turbine nacelle would be taken down and loaded straight onto the back of transport vehicles and removed from site for reconditioning or scrap; and
- The turbine towers and blades would be taken down and either transported directly off site or broken down into smaller components if required.

4.4 Turbine Foundations

4.4.1 It is widely accepted that there is no appreciable effect on the local environment from buried reinforced concrete structures left in-situ due to the inert state of concrete. Therefore, the foundations will be reinstated as follows:

- Following the removal of the wind turbine, topsoil and subsoil will be excavated to expose the top of the foundation and stored for reuse;
- The reinforced concrete foundation will then be broken out to an agreed depth below existing ground level and the material will be removed as identified in the site restoration scheme; and
- The excavation will be backfilled with suitable fill material, covered with topsoil and reseeded as required.

4.5 Control Building and Substation Compound

4.5.1 The control building and substation compound will be decommissioned by disconnecting and dismantling all the surface plant. Solid structures such as the building and equipment plinths will be demolished and the foundation will be removed to an agreed depth below ground level. Ducting and cabling that is within the depth to be cleared will be removed.

4.5.2 The fence surrounding the compound will be removed and the area landscaped so it can revert to its original state.

4.6 Electrical Equipment

4.6.1 The electrical equipment will be decommissioned in the reverse of the installation method involving similar plant. The equipment will be dismantled, removed from site and disposed of in an appropriate manner.

Cabling

4.6.2 Cables will be removed if it is deemed that removal would not be detrimental to the local environment. If removed, trenches will be backfilled with material removed during the cable removal process, covered with topsoil and reseeded as required.

5 Records

Records, as-built drawings, specifications, operational maintenance manuals and residual risks will be collated and filed in the health & safety file based upon the requirements of CDM Regulations 2015.