CHAPTER 3: PROJECT DESCRIPTION

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3. PROJECT DESCRIPTION

3.1 Introduction

3.1.1 This Chapter describes the various elements of the works that constitute the Proposed Development for the construction and operation of the proposed 400 kilovolt (kV) transmission connection between the proposed Coire Glas Switching Station and the existing Fort Augustus Substation (via the proposed Loch Lundie Substation). The Proposed Development is shown on **Figures 3.1a-3.1c**.

3.1.2 The Proposed Development would also form part of a wider rationalisation exercise to reduce the overall amount of grid infrastructure in the surrounding area. This would comprise re-routeing of the existing 132 kV Fort Augustus to Fort William overhead line (OHL) and the existing 132 kV Invergarry Tee OHL into the proposed Loch Lundie Substation. Following the construction of the Proposed Development, the existing 132 kV Fort Augustus to Fort William OHL would also be decommissioned and dismantled between the proposed Loch Lundie Substation and the existing Fort Augustus Substation.

3.1.3 Separate consent under the Town and County Planning (Scotland) Act 1997 would be sought by the Applicant for the construction of the proposed Coire Glas Switching Station and the proposed Loch Lundie Substation. The Proposed Development together with these Associated Works form what is referred to as 'The Coire Glas Grid Connection Project'.

3.2 Overview of the Proposed Development

3.2.1 The Proposed Development would primarily comprise the construction and operation of a new double circuit steel structure 400 kV OHL, totalling approximately 13 km in length. The formation of new access tracks would be required to facilitate both the construction and, in places, the maintenance of the Proposed Development. Existing tracks would be utilised where practicable, subject to upgrades where required.

3.2.2 The Proposed Development is located in a rural area of the Scottish Highlands and is routed between Glengarry Forest (at a location approximately 4 km to the west of the village of Invergarry) and the settlement of Auchterawe (located approximately 2 km southwest of the town of Fort Augustus). An overview of the Proposed Development is provided on **Figures 3.1a-3.1c**.

3.2.3 From the proposed location of the Coire Glas Switching Station, the Proposed Development would travel directly through the forestry at White Bridge (part of Glengarry Forest, managed by Forestry and Land Scotland (FLS)) for approximately 2 km before crossing both the River Garry and the A87 to the northeast of Invergarry. After crossing the A87, the Proposed Development would travel through another area of FLS forestry at Munerigie Wood, to reach an elevated area of open moorland to the southwest of Loch Lundie on Aberchalder Estate. The Proposed Development would then continue in an easterly direction to the south of Loch Lundie for approximately 2 km, where it would connect into the proposed Loch Lundie Substation.

3.2.4 From the proposed Loch Lundie Substation, the Proposed Development would travel through Drynachan Forest (a FLS managed commercial forestry to the north of Invergarry) in a north-easterly direction for approximately 1.4 km. After exiting the northern extent of Drynachan Forest, it would continue to travel in a northerly direction through an area of open moorland on Aberchalder Estate for a further 1.3 km (approximately) before entering the forestry at Inchnacardoch Forest. Within Inchnacardoch Forest the Proposed Development would continue in a north-easterly direction for a further 3.4 km (approximately), running broadly parallel to the eastern side of the existing 132 kV Fort Augustus to Fort William OHL (which would be dismantled following the commissioning of the proposed OHL).

3.2.5 The proposed OHL would diverge from the route of the existing 132 kV Fort Augustus to Fort William OHL at Torr Dhuin, near the settlement of Auchterawe. Here, the proposed OHL would enter the area of FLS

commercial forestry to the east of Auchterawe, before changing direction, to approach the southwestern corner of the existing Fort Augustus Substation.

3.2.6 The Proposed Development would be located fully within The Highland Council (THC) local authority boundary.

3.3 Development for which Section 37 Consent and deemed planning permission is sought

3.3.1 The Proposed Development would include the following works, for which section 37 consent under the 1989 Act and deemed planning permission is sought:

- The installation and operation of approximately 13 km of new double circuit 400 kV OHL supported by steel lattice towers. This comprises approximately 4.7 km of OHL from the proposed Coire Glas Switching Station to the proposed Loch Lundie Substation, and approximately 8.5 km of OHL from the proposed Loch Lundie Substation to the existing Fort Augustus Substation. Terminal towers would be required to connect at the switching station and both substations;
- Re-routeing of the 132 kV Fort Augustus to Fort William OHL and the 132 kV Invergarry Tee OHL to turn into the proposed new Loch Lundie Substation; and
- Installation of a new temporary OHL diversion, including the installation of up to eight temporary Trident wood poles, to enable operation of the 132 kV Fort Augustus to Fort William OHL whilst the OHL is rerouted into the proposed new Loch Lundie Substation.

3.4 Ancillary Development for which Deemed Planning Permission is sought

3.4.1 The following ancillary works would be required as part of the Proposed Development, or to facilitate its construction and operation:

- The formation of access tracks (permanent, temporary, and upgrades to existing tracks) and the installation of bridges and culverts to facilitate access;
- The upgrade of existing, or creation of new, bellmouths at public road access points;
- Establishment of temporary measures to protect road and water crossings (e.g. scaffolding);
- Working areas around infrastructure to facilitate construction;
- Tree felling and vegetation clearance to facilitate construction and operation of the Proposed Development, to comply with the Electricity Safety, Quality and Continuity Regulations (ESQCR) 2002; and
- Decommissioning and dismantling of a section of the existing 132 kV steel lattice Fort Augustus to Fort William OHL between the proposed Loch Lundie Substation and the existing Fort Augustus Substation.

3.4.2 These different forms of ancillary development are described in further detail in this Chapter.

3.5 Associated Works

3.5.1 Other associated works are required to facilitate construction of the Proposed Development or would occur as a consequence of its construction and operation. These works, listed below, do not form part of the description of the Proposed Development and are therefore not included in the application for statutory consents. On that basis they are therefore not assessed in detail in this EIA Report. However, further detail on some of these elements is provided where available, as noted within the relevant appendices to this Chapter. The associated works are:

- Borrow pits and quarries would be required to source stone for the construction of access tracks. Separate planning applications for these works would be sought by the Principal Contractor;
- Temporary construction compounds would be required along the route of the Proposed Development to facilitate its construction. The final location and design of temporary site compounds would be confirmed by the Principal Contractor and separate planning permissions would be sought as required;

- Modification of the existing 33 kV distribution network in some areas to accommodate the new OHL. These works are likely to comprise short sections of undergrounding within the vicinity of the Proposed Development and would be undertaken by Scottish Hydro Electric Power Distribution (SHEPD). Consent would be sought by SHEPD as required;
- A new 400 kV switching station located within Glen Garry Forest near White Bridge (hereafter referred to as 'the Coire Glas Switching Station'). Separate consent under the Town and County Planning (Scotland) Act 1997, as amended, would be sought by the Applicant for this development; and
- A new 400 kV / 132 kV substation near Loch Lundie, Invergarry (hereafter referred to as 'the Loch Lundie Substation'). Separate consent under the Town and County Planning (Scotland) Act 1997, as amended, would be sought by the Applicant for this development.

3.6 Limits of Deviation

3.6.1 In general terms a Limit of Deviation (LOD) defines the maximum extent within which a development can be built. In the case of the Proposed Development, an LOD is required for each of the key components of the project i.e. each of the new steel lattice towers being installed and access track routes.

3.6.2 The horizontal LOD, for which consent is sought is typically as follows:

- OHL (Steel Lattice) – 200 m LOD (100 m either side of the centre line);
- Temporary diversion and rerouted section of the 132 kV Fort Augustus to Fort William OHL - 200 m LOD (100 m either side of the centre line);
- Rerouted section of the Invergarry Tee OHL - 200 m LOD (100 m either side of the centre line);
- New Access Tracks – 60 m LOD (30 m either side of the centre line); and
- Existing Access Tracks - 30 m LOD (15 m either side of the centre line).

3.6.3 Where the OHL alignment passes close to the Torr Dhuin Scheduled Monument near Auchterawe, the OHL LOD has been amended to extend to 50 m to the south of the centre line and 150 m to the north of the centre line to avoid the OHL being positioned too close to this sensitive receptor, as illustrated on **Figures 3.1a and 3.1b**.

3.6.4 An operational corridor is required through areas of woodland and commercial forestry to ensure the safe operation of the OHL (discussed further in paragraphs 3.8.12-3.8.13). The width of the operational corridor would be variable depending on the nature of the woodland or forestry but would typically require a distance of 45 m either side of the OHL (from the outer limit of the OHL phase conductors). Therefore, in areas of woodland or commercial forestry, a 45 m extension to the OHL LOD would be required for felling operations. Similarly, for new tracks (temporary or permanent) a 10 m wayleave corridor is required either side of the track. As such, a 10 m extension would be required around new access track LOD's in areas of commercial forestry or woodland for felling operations.

3.6.5 A vertical LOD, i.e. the maximum height of a pole or tower above ground level, is also sought to allow a height increase or decrease of 9 m on the proposed tower height for the 400 kV OHL as presented within **Technical Appendix 3.1**. The 9 m variation is consistent with the extensions to which steel lattice towers are designed, and therefore any increase or decrease of steel lattice towers would be no greater than 9 m. A vertical LOD is also sought to allow a height increase or decrease of 6 m on the proposed height for the new 132 kV steel lattice towers and Trident steel poles for the rerouted sections of the 132 kV Fort Augustus to Fort William OHL and the 132 kV Invergarry Tee OHL.

3.6.6 Where there is a requirement to vary the location (or height) of infrastructure within the LODs, the relevant environmental information within the EIA Report would be reviewed to establish any potential constraints or adverse change in effect. Further advice on LOD changes would be sought from environmental specialists, and

where relevant consultation would be sought from The Highland Council (as local authority) and any relevant statutory consultees as required.

3.7 Description of Overhead Line Infrastructure

The proposed new 400 kV Steel Lattice OHL

3.7.1 The steel lattice towers to be used for the new 400 kV OHL element of the Proposed Development would be constructed from fabricated galvanised steel and would be grey in colour. The towers would likely comprise a 'SSE400 series' of steel lattice tower and are described below:

- suspension towers: these are used for straight sections of OHL where there is no need to terminate the conductor. There are 28 suspension towers proposed;
- angle / tension towers: these are typically used where there is a need to change the orientation of the OHL. There are 12 angle / tension towers proposed; and
- terminal towers: where the OHL terminates at a substation or switching station. There are 6 terminal towers proposed.

3.7.2 Towers would carry two circuits, each with six conductors supported from glass insulators attached to the horizontal cross arms on both sides of each steel lattice tower. An Optical Ground Wire (OPGW)[1] would be suspended between tower peaks, above the conductors.

3.7.3 The span length (distance between towers) would vary slightly depending on topography and land usage. Typically, span lengths would be approximately 350 m. Tower heights would also vary, depending on local topography, but would typically be in the region of 46 m to 59 m in height. A tower schedule is included in **Technical Appendix 3.1**.

The existing 132 kV Fort Augustus to Fort William OHL (to be rerouted and partially decommissioned and dismantled)

3.7.4 The existing 132 kV double circuit steel lattice OHL from Fort Augustus to Fort William would be diverted into the proposed Loch Lundie Substation by installing a new angle structure (anticipated to be a steel lattice tower). The OHL would then be transferred onto three new structures, anticipated to be steel lattice towers, and terminated onto a gantry within the substation. The new rerouted section of the OHL would be approximately 0.8 km in length and the new steel lattice towers would be up to 28 m in height. The redundant structures from the route between the proposed Loch Lundie Substation and Fort Augustus Substation would then be dismantled and removed from site (approximately 8.9 km). The existing steel lattice towers to be dismantled range between 27 m and 30 m in height. The rerouteing of the existing 132 kV steel lattice Fort Augustus to Fort William OHL is illustrated on **Figures 3.1a and 3.1b.** A methodology for dismantling the existing OHLs is provided in **Technical Appendix 3.5.**

3.7.5 To install a new steel lattice tower on a double circuit, there will be a requirement to install a temporary OHL diversion so that one circuit can remain in operation while the new tower is constructed. The temporary OHL diversion would be approximately 0.7 km in length and would be routed to the east of the existing 132 kV Fort Augustus to Fort William OHL near the proposed Loch Lundie Substation. The diversion would also require the installation of up to eight temporary Trident wood poles, as illustrated on **Figures 3.1a and 3.1b**.

The existing 132 kV Invergarry Tee OHL (to be rerouted and partially decommissioned and dismantled)

3.7.6 The existing 132 kV steel lattice Invergarry Tee OHL is a single circuit route which runs from Invergarry Substation, located at Invergarry Power Station and connects into the existing 132 kV Fort Augustus to Fort

[1] Optical Ground Wire is a dual functioning cable, providing a 'shield' to conductors from lightning, whilst also comprising optical cables for telecommunication purposes.

William OHL. The Invergarry Tee OHL route would be diverted into the proposed Loch Lundie Substation by installing a new angle structure (anticipated to be a Trident steel pole). The OHL would then be transferred onto two new structures, anticipated to be Trident steel poles, and terminated onto a gantry within the proposed Loch Lundie Substation. The new rerouted section of the OHL would be approximately 0.4 km in length and the Trident steel poles would be up to 15 m in height. The redundant structures from the route would then be dismantled and removed from site (approximately 0.7 km). The existing steel lattice towers to be dismantled range between 27 m and 30 m in height. The rerouting of the existing 132 kV Invergarry Tee OHL is illustrated on **Figures 3.1a and 3.1b.** A methodology for dismantling the existing OHLs is provided in **Technical Appendix 3.5.**

3.8 Typical Construction Activities for Overhead Line Infrastructure

3.8.1 High voltage OHL construction typically follows a standard sequence of events as follows:

- Phase 1 – enabling works (as described in paragraphs 3.8.3 to 3.8.14 below);
- Phase 2 – OHL construction (as described in paragraphs 3.8.15 to 3.8.26 below);
- Phase 3 – OHL commissioning (as described in paragraph 3.8.27 below); and
- Phase 4 – re-instatement (as described in paragraphs 3.8.28 to 3.8.35 below).

3.8.2 The Proposed Development would also have an additional phase to dismantle the existing 132 kV Fort Augustus to Fort William OHL and the exiting 132 kV Invergarry Tee OHL, as follows:

- Phase 5 - Diversion, Rerouting, Decommissioning and Dismantling of the existing 132 kV OHLs (as described in paragraphs 3.8.36 to 3.8.52 below).

Phase 1 - Enabling works

Distribution Infrastructure

3.8.3 Works would be required to the existing 33 kV distribution network infrastructure within some areas to facilitate safe working and operating conditions given the proximity of the distribution network to the new 400kV overhead line. It is anticipated that these distribution network assets would be realigned or undergrounded to make way for the Proposed Development. These are associated works and do not form part of the consent application. This will allow the new OHL to be constructed without infringing safety clearances (see Section 3.4 of this Chapter).

Construction Access

3.8.4 Typically, construction access would be established through a combination of:

- Existing tracks, to be upgraded where required;
- Installation of new temporary stone tracks; and
- Installation of new permanent stone tracks.

3.8.5 In general, proposed construction access would be taken via the existing public road network and would make use of existing forest and estate tracks as far as practicable, upgraded as required. Existing bellmouths would be utilised where possible, subject to improvements. New bellmouths at junctions would be required at a number of locations, as shown indicatively by 'Access Junctions' on **Figures 3.1a-3.1c**

3.8.6 It is anticipated that access would mainly be achieved through upgrade of existing and installation of new tracks, both temporary and permanent. Floating stone road or trackway panel construction (typically a short-term solution) may be installed in sensitive areas such as over deeper areas of peat. All new tracks would be constructed in accordance with best practice construction methods, and with reference to NatureScot's good practice guide on constructing tracks in Scottish uplands Where new watercourse crossings are required, the

design of the crossing would be in accordance with best practice guidelines and taking account of any ecological or hydrological constraints. The design of crossings would be agreed with the Scottish Environment Protection Agency (SEPA) prior to construction and be regulated by the Water Environment (Controlled Activities) (Scotland) Regulations 2011[2] (CAR). A watercourse crossing schedule for permanent watercourse crossings is provided in **Technical Appendix 10.4: Schedule of Permanent Watercourse Crossings**.

3.8.7 **Table 3.1** sets out the approximate length of access track requirements across the project.

Table 3.1: Access Track Requirements

Access Track Type	Approximate length required across the project (km)
Existing access tracks	16.27 km
Existing access tracks to be upgraded	11.56 km
New permanent access tracks	3.18 km
New temporary access tracks	9.54 km

3.8.8 Access tracks (and their related LODs) are shown on **Figures 3.1a-3.1c**. Track widths during construction are typically expected to have a running width of 6 m, with an overall construction corridor of approximately 8 m to allow for suitable drainage and pollution prevention measures.

3.8.9 Operational access to the Proposed Development would be required. This is essential for the maintenance and repair of the OHL and to ensure the Applicant comply with their legislative obligations, particularly in relation to the Health and Safety at Work Act 1974[3] and Construction (Design and Management) Regulations 2015[4].

3.8.10 Where operational access is required, this would likely range from use of all-terrain vehicle (ATV) routes with no formal track to a stone road suitable for 4x4 vehicle access, approximately 2.5 m in width. The selection of the type of track required depends on the proximity to a public road, structure type and potential maintenance activities / vehicles required in future to a given location (taking legal health and safety requirements into account).

3.8.11 There will be opportunities to use existing borrow pits or quarries in the surrounding areas to source stone for the construction of access tracks. These are associated works and do not form part of the consent application (see Section 3.4 of this Chapter). A review of potential borrow pit and quarry locations has been undertaken to establish indicative locations, likely yield and potential environmental effects.

Forestry Clearance and Vegetation Management

3.8.12 Whilst the design of the Proposed Development has sought to minimise impacts on woodland and commercial forestry plantations where possible, some felling during construction, and to create an operational wayleave corridor, is required. The width of the Operational Corridor (OC) would be variable depending on the nature of the forest or woodland. Within areas of commercial forestry the OC would require a distance of 45 m either side of the OHL, whilst in areas of native woodland the OC can be reduced (e.g. to 25 m either side of the OHL). Further detail on proposed felling requirements is set out within the Forestry Chapter (see **Chapter 14: Forestry**) and woodland reports (See **Technical Appendix 14.1: Woodland Reports**). Overall, the project would require 58.18 hectares (ha) of commercial woodland and 7.64 ha of ancient and semi-natural woodland to be felled to create an OC. In addition, some more minor vegetation management and felling may be required around the existing access track network in order to provide sufficient width.

[2] Water Environment (Controlled Activities) (Scotland) Regulations 2011, available at https://www.legislation.gov.uk/ssi/2011/209/contents/made [Accessed November 2021]
[3] https://www.legislation.gov.uk/ukpga/1974/37/contents - accessed 08/07/2022
[4] https://www.legislation.gov.uk/uksi/2015/51/contents/made - accessed 08/07/2022

3.8.13 The Applicant is committed to making arrangements to plant off-site the equivalent area of woodland as Compensatory Planting, meeting the Scottish Government's Control of Woodland Removal Policy objective of no net loss of woodland. On this basis, the Applicant will replant the 65.82 ha of woodland removed for the Proposed Development and this will be achieved within the regional land boundary of The Highland Council, of where the Proposed Development is geographically located.

Site Compounds

3.8.14 It is anticipated that temporary construction compounds would be required within the vicinity of the Proposed Development to facilitate its construction. These are associated works and do not form part of the consent application (see Section 3.4 of this Chapter). The location of site compounds would be confirmed by the Principal Contractor.

Phase 2 – Construction works

Tower Foundations

3.8.15 Different approaches to forming foundations for steel lattice towers may be used, subject to ground conditions at each tower location. These are likely to comprise either pad and column, micro pile or rock anchor foundation solutions, as described below:

- Pad and column: Prior to construction, a 50 m x 50 m (approximately) compound is established complete with stone access and laydown area for welfare, plant and materials. Each tower foundation (4 no. per tower) is excavated to a typical depth of 4 m with temporary shoring installed to allow for safe working. On average, dimensions for each foundation are approximately 4 m x 4 m x 0.5 m. Major items of plant required to construct the foundations typically include a 20 tonne excavator in order to excavate to formation and place the shoring system, and concrete wagons to supply the concrete.
- Micro Pile: Often utilised in areas of deeper peat. Prior to construction, a stone piling pad will be required, typically 625 m² in area providing a stable working platform for the piling rig. Major items of plant required to install the piles include a 20 tonne excavator and vibrating roller for the piling pad and a 14 tonne piling rig with a supply of cement and potable water to form the piles. A 20 tonne excavator will then be required to excavate and allow construction of the pile cap. Concrete is supplied via concrete wagons.
- Rock Anchor: Rock anchors are considered if suitable hard rock is encountered up to a depth of 2.5 m and is proven to have sufficient frictional and lateral resistance. Beyond this depth, pad and column foundations are typically utilised. A similar working area is required to that of micro piling, however in this instance the area is excavated down to rockhead and an access ramp formed with a nominal layer of stone placed to create a level working platform. Major items of plant required to install the anchors include a 20 tonne excavator and vibrating roller for the piling pad and a 14 tonne piling rig with a supply of cement and potable water to form the piles. A 20 tonne excavator will then be required to erect formwork and place concrete for the construction of the pile cap. Concrete is supplied via concrete wagons.

3.8.16 Foundation types and designs for each tower would be confirmed by the Principal Contractor following analysis of detailed geotechnical investigation at each tower position.

3.8.17 Dimensions of each foundation would be confirmed following micrositing. For the purposes of this assessment however it has been assumed that each foundation would be buried to depths estimated up to 2.5 m below ground level (bgl) although extending up to 4 m depth where ground conditions require. They would extend over an area suitable to deliver the loading characteristics required (which would be a function of the underlying

ground conditions and the weight of the structures to be supported). Piled foundations may be required where low strength ground conditions exist, particularly where peat is encountered at over 1 m depth.

3.8.18 For the purposes of the EIA Report it has been assumed that a working area of approximately 2500 m² (50 m x 50 m) would be required around each individual tower foundation and associated construction activities. The exact dimensions of the working area around each tower will be confirmed following micrositing but would typically be no greater than 2500 m².

3.8.19 Where encountered, top soil (including peat) would be stripped from the tower working area to allow installation of tower erection pad(s) as necessary in order to accommodate construction plant. Concrete is likely to be brought to site ready-mixed with no requirement for concrete batching at individual tower locations. Once the concrete has been cast and set, the excavation would be backfilled, using the original excavated material where possible.

3.8.20 It is anticipated that formation of each tower foundation would take approximately 4 weeks. **Plate 3.1** provides and illustrative image of tower foundation construction.

Plate 3.1: Illustrative Image of Tower Foundation Construction

Tower Construction

3.8.21 Tower construction can typically commence two weeks after the foundations have been cast, subject to weather conditions and concrete curing rates. Tower steelwork would be delivered to each tower construction site either as individual steel members or as prefabricated panels, depending on the method of installation and the available access, and placed within dedicated laydown areas ready for assembly. Sections are then assembled on the ground in preparation for sequential lifting operations. The tower sections are lifted into position with a 360 Roto telehandler. For sections of the tower that a 360 Roto cannot erect, an all-terrain mobile crane is deployed to complete the tower erection. A telehandler would be utilised for moving tower sections in to place for the crane and assisting in tandem lifts. A 360 telehandler and typically an 80 tonne all-terrain mobile crane would then be required to erect the tower. **Plate 3.2** provides an example of tower construction.

3.8.22 Major items of plant required for erection would also include a flatbed wagon to transport the steelwork to location.

Plate 3.2: Illustrative Image of Steel Lattice Tower Construction

Conductor Stringing

3.8.23 Prior to stringing the conductors, temporary protection measures, (normally netted scaffolds) would be required across public roads and existing access tracks.

3.8.24 Conductor stringing equipment (i.e. winches, tensioners and ancillary equipment) are set out at either end of pre-selected sections of the OHL.

3.8.25 Prior to wiring operations, Equi-Potential Zones (EPZ) pulling positions need to be established. The typical size of a working area required for an EPZ pulling location is approximately 8 m x 12 m. This would likely be set up on trackway panels. As conductors are required to be pulled in opposite directions, two EPZ 8 m x 12 m trackway panelled pulling locations are required at each respective pulling tower (one on the upside and one on the downside of the tower).

3.8.26 Pilot wires would be pulled through the section to be strung. These would be hung on blocks (wheels) at each suspension tower and connected to a winch and tensioner at the respective end of the section. The winch, in conjunction with the tensioner is used to pull the pilot wires between the structures. The conductor is pulled via the pilot wires through the section under tension to avoid contact with the ground and any underrunning obstacles. Once the conductor has been strung between the ends of the section it is then tensioned and permanently clamped at each tower.

Phase 3 - Commissioning

3.8.27 Once constructed, the OHL and support towers would be subject to an inspection and snagging process. This allows the Principal Contractor and the Applicant to check that the works have been built to specification and are fit to energise. The Proposed Development would also go through a commissioning procedure for the switchgear, communications and protection controls through connecting substations and switching station. The circuits would then be energised from the substations and switching station.

Phase 4 - Reinstatement

3.8.28 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. Such works would involve the reinstatement of areas disturbed during the construction phase.

3.8.29 A site reinstatement and restoration plan has been prepared to describe the principles and best practice guidance and measures that would be followed in the reinstatement and restoration of disturbed ground. This is included in **Technical Appendix 3.4** and would be developed by the Applicant, the Principal Contractor and consenting authorities as required prior to construction commencing.

3.8.30 The following paragraphs provide a summary of the working areas that would be reinstated, and typically how this would be achieved.

Reinstatement of Access Tracks

3.8.31 As shown in **Figure 3.1a-3.1c: The Proposed Development,** permanent and temporary tracks are required to facilitate construction and operation of the Proposed Development. Tracks to be retained would be partially reinstated on commissioning of the OHL to reduce their width to approximately 2.5 m for use by the Applicant for maintenance access. Other tracks noted as temporary would be removed and the land reinstated.

3.8.32 Reinstatement would involve replacement of subsoil, then topsoil, grading and installation of drainage as required with turves replaced vegetation side up. Where there are insufficient turves the ground would be allowed to vegetate naturally, although some seeding may be required to stabilise sites and prevent erosion, or where landowner requirements dictate otherwise. Methods for the reinstatement of peat would be set out in the Peat Management Plan (see **Technical Appendix 10.1: Peat Management Plan**).

Reinstatement of Work Areas around Towers

3.8.33 Soil would be stored within the working area for each element of the work during construction. Subsoils and topsoil removed to enable the construction of the foundations, or excavation of trenches would be temporarily stockpiled in separate bunds within the working area or corridor, with stripped turves stored on top of the bunds.

3.8.34 Reinstatement would involve replacement of subsoil, then topsoil with turves replaced vegetation side up. Where there are insufficient turves the ground would be allowed to vegetate naturally, although some seeding may be required to stabilise sites and prevent erosion, or where landowner requirements dictate otherwise.

Reinstatement of Construction Compound(s)

3.8.35 At the end of construction all materials, buildings, and temporary compounds would be removed. Where required the land would be regraded with subsoil put down first, then topsoil with turves replaced vegetation side up. Where there are insufficient turves the ground would be allowed to vegetate naturally, although some seeding may be required to stabilise sites and prevent erosion, or where landowner requirements dictate otherwise.

Phase 5 - Diversion, Rerouting, Decommissioning and Dismantling of the existing 132 kV OHLs

3.8.36 As part of a rationalisation exercise to reduce the overall amount of grid infrastructure in the area, it is proposed that the existing 132 kV Fort Augustus to Fort William OHL and the existing 132 kV Invergarry Tee OHL would be connected into the proposed Loch Lundie Substation (as described in paragraphs 3.7.4 - 3.7.6). At this point the capacity of these circuits would be diverted and accommodated within the new 400 kV OHL circuit (i.e. the Proposed Development), meaning that the 8.9 km (approximately) section of the 132 kV Fort Augustus to Fort William OHL between the proposed Loch Lundie Substation and the Fort August Substation could be decommissioned and dismantled. A 0.7 km (approximately) stretch of the 132 kV Invergarry Tee OHL would also be decommissioned and dismantled as part of these rationalisation works. The rerouting of both of these OHLs is illustrated on **Figures 3.1a and 3.1c.**

3.8.37 The diversion, rerouting, decommissioning and dismantling of the existing 132 kV Fort Augustus to Fort William OHL and 132 kV Invergarry Tee OHL process would follow a standard sequence of events as follows:

- Phase 5.1 – enabling and rerouting works;
- Phase 5.2 – conductor and insulator removal;
- Phase 5.3 – lattice tower / wood pole and foundation removal; and
- Phase 5.4 – re-instatement.

3.8.38 Phase 5.1 would take place in parallel with the construction of the 400 kV OHL, whilst Phases 5.2 - 5.4 would take place once the 400 kV OHL has been constructed and commissioned (following the completion of Phase 3).

Construction of the Temporary 132 kV Wood Pole Diversion (Phase 5.1)

3.8.39 Enabling and rerouting works would include the installation of a temporary 132 kV wood pole diversion to facilitate the works to reroute the 132 kV Fort Augustus to Fort William OHL into the proposed Loch Lundie Substation, as described in paragraph 3.7.5. To construct the temporary wood pole diversion, materials would be moved into position via tracked machines. The wood poles would then be assembled adjacent to where they will be installed. Once assembled, the wood poles would be lifted into position using excavators.

3.8.40 It is not anticipated that any new temporary or permanent access tracks would be required to construct the temporary 132 kV wood pole diversion. Vegetation management and temporary access arrangements to facilitate the construction work would utilise existing access routes and tracks where possible. Access will typically use low ground pressure tracked machines, excavators, small dumpers and ‘Hagglund’ type tracked personnel carriers.

3.8.41 Where ground conditions are particularly wet and boggy it may be preferable to install a temporary track to avoid excessive ground damage. Bog mats (long timber sleepers) can be used in the majority of tower locations, however, where required, imported stone may be used to form a temporary running track. The temporary access tracks would remain in place until the 400 kV OHL has been commissioned and the existing 132 kV Fort Augustus to Fort William OHL decommissioned, at which point the access tracks would be removed and the ground reinstated.

3.8.42 Once the temporary diversion is in place, the 132 kV Fort Augustus to Fort William OHL would be rerouted into the new substation as described below.

Rerouting of the 132 kV Fort Augustus to Fort William OHL (Phase 5.1)

3.8.43 Enabling and rerouting works would also include the rerouting of the existing 132 kV Fort Augustus to Fort William OHL into the proposed Loch Lundie Substation. As described in paragraph 3.7.4, the OHL would be diverted into the proposed Loch Lundie Substation by installing a new angle structure (anticipated to be a steel lattice tower). The OHL would then be transferred onto three new structures, anticipated to be steel lattice towers, and terminated onto a gantry within the new substation.

3.8.44 The construction of the new 132 kV steel lattice OHL would largely follow the same process as Phase 1 - Phase 4 for the 400 kV steel lattice towers (as described in paragraphs 3.8.3-3.8.36). However, for the purposes of the EIA Report it has been assumed that a working area of approximately 1600 m² (40 m x 40 m) would be required around each individual 132 kV tower foundation and associated construction activities. The exact dimensions of the working area around each tower will be confirmed following micrositing but would typically be no greater than 1600 m². Vegetation management and temporary access arrangements to facilitate the construction work, would utilise existing access routes and tracks where possible. However, new temporary access tracks would be required to access each new tower location. These access tracks would be reinstated following construction.

3.8.45 It is anticipated that formation of each 132 kV tower foundation would take approximately 2 weeks.

Rerouting of the 132 kV Invergarry Tee OHL (Phase 5.1)

3.8.46 Enabling and rerouting works would also include the rerouting of the existing 132 kV Invergarry Tee OHL into the proposed Loch Lundie Substation. As described in paragraph 3.7.6, the OHL would be diverted into the proposed Loch Lundie Substation by installing a new angle structure (anticipated to be a Trident steel pole). The OHL would then be transferred onto two new structures, anticipated to be Trident steel poles, and terminated onto a gantry within the proposed Loch Lundie Substation. To construct the steel poles, materials would be moved into position via tracked machines. The steel poles would then be assembled adjacent to where they would be installed. Once assembled, the steel poles would be lifted into position using excavators.

3.8.47 Access requirements for the rerouting of the 132 kV Invergarry Tee OHL would be similar to those described for the temporary 132 kV wood pole diversion in paragraphs 3.8.39-3.8.40. Should temporary tracks be required to avoid damage in areas where ground conditions are particularly wet and boggy, these tracks would be removed and the ground reinstated immediately after the construction works had been completed.

Dismantling of the existing 132 kV OHLs (Phases 5.2-5.4)

3.8.48 Once the 400 kV OHL has been constructed and commissioned, the redundant sections of the existing 132 kV steel lattice OHL and the 132 kV temporary wood pole diversion will be decommissioned and dismantled.

3.8.49 Vegetation management and temporary access arrangements to facilitate the dismantling work, would utilise existing access routes and tracks where possible. Access will typically use low ground pressure tracked machines, excavators, small dumpers and ‘Hagglund’ type tracked personnel carriers.

3.8.50 Where ground conditions are particularly wet and boggy it may be preferable to install a temporary track to avoid excessive ground damage. Bog mats (long timber sleepers) can be used in the majority of tower locations, however, where required, imported stone may be used to form a temporary running track, which will be removed immediately after the dismantling work.

3.8.51 Following the enabling work, the conductor would be removed and collected using winch and cable drum, either by:

- unclamping, lowering to the ground and winching where there are no ground based constraints; or
- by installing rollers (running out blocks) at each tower, unclamping the conductor and placing the conductor in the rollers prior to winching.

3.8.52 Following the removal of the conductor and insulators, the 132 kV steel lattice towers and temporary wood poles would be removed by either felling or crane removal and, where agreed, the tower foundations would be removed up to 1.2 m below ground level and the ground would be reinstated as described under 'Phase 4 - Reinstatement' (see paragraphs 3.8.28-3.8.35). All other recovered materials would be removed from the site.

3.9 Land Use

3.9.1 **Table 3.2** summarises the indicative land take associated with the Proposed Development.

Table 3.2: Indicative Land Take for Construction and Operation of the Proposed Development

Activity	Construction	Operation
New Access Track (Temporary)	76,320 m^2	N/A
New Access Track (Permanent)	25,440 m^2	7,950 m^2
Temporary Construction Working Area around 400 kV Steel lattice towers (50 m x 50 m)	110,000 m^2	N/A
Temporary Construction Working Area around 132 kV Steel lattice towers (40 m x 40 m)	6,400 m^2	N/A
Temporary Land Take for the temporary diversion to the 132 kV Fort Augustus to Fort William OHL	64 m^2	N/A
Permanent Land Take from the rerouting of the 132 kV Fort Augustus to Fort William OHL	N/A	9.6 m^2
Permanent Land Take for the rerouting of the 132 kV Invergarry Tee OHL	N/A	7.2 m^2
Permanent Land Take for 400 kV towers	N/A	132 m^2
Area of Operational Corridor within Woodland	65.29 ha	65.29 ha

3.10 Construction Programme

3.10.1 It is anticipated that construction of the project would take place over a 40-month period (approximately), following the granting of consents and discharge of pre-commencement conditions. A further 4 months (approximately) would be required for dismantling works associated with the existing 132 kV OHLs.

3.11 Construction Employment and Hours of Work

3.11.1 The Applicant takes community responsibilities seriously. The delivery of a major programme of capital investment provides the opportunity to maximise support of local communities.

3.11.2 Employment of construction staff would be the responsibility of the Principal Contractor but the Applicant encourages the Principal Contractor to make use of suitable labour and resources from areas local to the location of the works.

3.11.3 Construction working is likely to be during daytime periods only. Working hours are anticipated to be Monday to Friday between approximately 07.00 to 19.00 March to September and 07.30 to 17.00 (or within daylight hours) October to February. Weekend working could also be proposed with slightly reduced working hours (i.e. works to cease at 16.00). Working hours would be confirmed by the Principal Contractor and agreed with The Highland Council as local authority.

3.12 Construction Traffic and Site Compounds

3.12.1 During construction, access to the Proposed Development would be taken from the upgrade of existing, or creation of new, bellmouth junctions at up to six public road access points, as illustrated by the 'Access Junctions' on **Figures 3.1a - 3.1c**. Further details are provided within **Chapter 12 - Traffic, Access and Transport.**

3.12.2 Construction of the Proposed Development would give rise to regular numbers of staff transport movements, with work crews travelling to work site areas from site compound areas within the vicinity of the Proposed Development.

3.12.3 Vehicle movements would be required to construct access tracks; deliver the foundation and relevant components and conductor materials to site; and deliver and collect materials and construction plant from the site compounds to work areas. No Abnormal Indivisible Loads (AIL) are associated with the Proposed Development infrastructure. Construction access routes are discussed within **Chapter 12 - Traffic, Access and Transport.**

3.12.4 A Traffic Management Plan would be prepared by the Principal Contractor, in consultation with the Applicant, The Highland Council and Transport Scotland. The Traffic Management Plan would describe all mitigation and signage measures that are proposed on the public road network. An Outline Traffic Management Plan is provided in **Technical Appendix 12.1: Transport Assessment**. Further detail on the anticipated traffic movements associated with construction of the Proposed Development, and an assessment of the likely effects and suggested mitigation measures, is provided in **Chapter 12 - Traffic, Access and Transport** and **Technical Appendix 12.1: Transport Assessment**.

3.13 Environmental Management during Construction

3.13.1 The assessment in this EIA Report has been carried out on the basis that all works would be carried out in accordance with industry best practice construction measures, guidance and legislation, together with the following documents and procedures:

GEMPs

3.13.2 General Environmental Management Plans (GEMPs) have been developed by the Applicant. The GEMPs considered relevant for this project are identified in **Technical Appendix 3.2.**

SPPs

3.13.3 Species Protection Plans (SPPs) have been developed by the Applicant and have been agreed with NatureScot (formerly Scottish Natural Heritage (SNH)). These can also be found in **Technical Appendix 3.2.**

CEMP

3.13.4 A contractual management requirement of the Principal Contractor would be the development and implementation of a Construction Environmental Management Plan (CEMP). This document would detail how the Principal Contractor would manage the site in accordance with all commitments and mitigation detailed in the EIA Report, statutory consents and authorisations, and industry best practise and guidance. **Technical Appendix 3.3** provides a summary of all mitigation measures included in this EIA Report.

3.13.5 The CEMP would also reference the aforementioned GEMPs and SPPs. The implementation of the CEMP would be managed on site by a suitably qualified and experienced Ecological Clerk of Works (ECoW), with support from other environmental professionals as required. The Applicant would carry out regular inspections and audits to monitor the implementation of the CEMP.

3.13.6 An Outline CEMP is included in **Technical Appendix 3.6**.

3.13.7 Authorisation would be required and obtained from SEPA in accordance with the Controlled Activity Regulations (CAR) prior to any construction works commencing on site. This would specify the controls and measures that would be used at site to safeguard the water environment.

3.14 Operation and Maintenance

3.14.1 In general, OHLs require very little maintenance. Regular inspections are undertaken to identify any unacceptable deterioration of components, so that they can be replaced. From time to time, inclement weather, storms or lightning can cause damage to either the insulators or the conductors on OHLs. If conductors are damaged, short sections may have to be replaced.

3.14.2 During the operation of the Proposed Development, it would be necessary to manage vegetation along the OC to maintain required safety clearance distances.

3.15 Decommissioning the Proposed Development

3.15.1 The Proposed Development would not have a fixed operational life. The effects associated with the construction phase can be considered to be representative of worst-case decommissioning effects, and therefore no separate assessment on decommissioning has been undertaken as part of this EIA Report.