VOLUME 1: CHAPTER 3: THE PROPOSED DEVELOPMENT

Figures (Volume 2 of this EIA Report)

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3. THE PROPOSED DEVELOPMENT

3.1 Introduction

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

3.2 Overview of the Proposed Development

3.2.1 The Proposed Development is driven by the need to connect the consented Strathy South Wind Farm[1] (and subsequently, as part of shared infrastructure, the consented Strathy Wood Wind Farm and operational Strathy North Wind Farm) to the electricity transmission network at Connagill 275/132 kV substation.

3.2.2 The Proposed Development described within this Chapter and assessed within the technical chapters of Volume 1 of this EIA Report, comprises the Proposed Alignment (see **Figure V1-1.1: Overview of the Proposed Development**). As outlined in **Volume 1: Chapter 1 – Introduction and Background**, the Applicant is also presenting an Alternative Alignment as part of the consent application. The Alternative Alignment is discussed and assessed within Volume 5 of this EIA Report, and cross reference is made to this Chapter within **Volume 5: Chapter 3 – The Proposed Development - Alternative Alignment,** where elements of the Alternative Alignment are as described in general terms for the Proposed Development.

3.2.3 The Proposed Alignment would comprise approximately 10.5 km of 132 kV double circuit overhead line (OHL) supported by steel lattice towers from Strathy North 'T' (near Dallangwell) to a new cable sealing end (CSE) compound, prior to connecting into Connagill 275/132 kV substation via two short sections of single circuit 132 kV underground cable (UGC). To allow for futureproofing, it is proposed that a section of the Proposed Alignment would be capable of operating at 275 kV in the future, if required.

3.2.4 Redundant parts of the existing Strathy North 132 kV trident 'H' wood pole OHL would be dismantled and removed (see Section 3.13).

3.3 Development for which Section 37 Consent is sought

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

- The installation and operation of approximately 10.5 km of double circuit 132 kV OHL supported by steel lattice towers. Approximately 8.3 km of proposed OHL (between Towers 29[2] and Tower 64) would be constructed so that it would be capable of operating at 275 kV in the future, if required.

3.3.2 The works associated with the Alternative Alignment for which section 37 consent and deemed planning permission is sought are discussed in **Volume 5: Chapter 3**.

[1] Received consent from the Scottish Government in November 2021 (ECU Ref: 00002133)

[2] Tower 29 is within proximity of the optimal site of the proposed Strathy Switching Station which once built, would allow the OHL to be operated at 275 kV. The Applicant would seek consent for the switching station under the Town & Country Planning (Scotland) Act 1997 (as amended). In tandem, the Applicant would seek consent under section 37 of the Electricity Act 1989 to accommodate the proposed double circuit 132 kV OHL teeing into the switching station.

3.4 Ancillary Development for which Deemed Planning Permission (as part of the application for section 37 Consent) is sought

3.4.1 Deemed planning permission under section 57(2) of the Town and Country Planning (Scotland) Act 1997 is sought (as part of the application for section 37 consent under the 1989 Act) for the following works that would be required as part of the Proposed Development, or to facilitate its construction and operation:

- The construction of a CSE compound to facilitate the transition between OHL and UGC[3] to be situated at approximate Ordnance Survey (OS) grid reference NC 903120, 59541 which is positioned to the south-west of the existing Connagill 275/132 kV substation;
- The formation of access tracks (permanent, temporary and upgrades to existing tracks) and the installation of culverts to facilitate access and ongoing maintenance where required;
- Working areas around infrastructure (i.e. around individual tower foundations) 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[4];
- Temporary measures to protect water crossings (e.g. scaffolding and temporary bridges); and
- Redundant parts of the existing Strathy North 132 kV trident 'H' wood pole OHL would be dismantled following completion and commissioning of the Proposed Development. A Dismantling Plan explaining the works involved is provided in **Volume 4: Appendix V1-3.7: Dismantling Plan** to this Chapter.

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

3.4.3 Additional ancillary development for which deemed planning permission is sought for the Alternative Development are discussed in **Volume 5: Chapter 3**.

3.5 Development which falls under the Town and Country Planning (General Permitted Development) (Scotland) Order 1992

3.5.1 The following works would fall under the Applicant's permitted development rights:

- The construction of two single-circuit 132 kV UGC connections[5], each circuit comprising three cables per phase, is required.

3.5.2 Deemed Planning Permission (as part of the application for the section 37 consent) is not sought for the UGC as the installation of the UGC falls under the Town and Country Planning (General Permitted Development) (Scotland) Order 1992.

3.5.3 These works are described in further detail in Section 3.10 of this Chapter and the environmental effects of the installation of the UGCs are considered within this EIA only for completeness and ease of reporting and presenting of those effects.

[3] UGC elements are classed as permitted development under Class 40 1(a) of The Town and Country Planning (General Permitted Development) (Scotland) Order 1992.
[4] The Electricity Safety, Quality and Continuity Regulations (2002), available at https://www.legislation.gov.uk/uksi/2002/2665/contents/made [Accessed November 2024]
[5] The UGCs would be capable of operating at 275 kV in the future, if required.

3.6 Associated Works

3.6.1 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. The associated works are:

- Wider elements associated with the Connagill Cluster Grid Connections and Strathy Switching Station. Separate consents would be sought by the Applicant for these developments, as set out in **Table V1-1.1** of **Volume 1: Chapter 1**. These developments are considered where relevant in the EIA Report within the cumulative assessments.
- Borrow pits which 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 which would be required to facilitate construction of the Proposed Development. 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; and
- Modification of the existing distribution network in some areas to accommodate the new OHL. These works are likely to comprise the diversion of short sections of UGC's within the vicinity of the Proposed Development and would be undertaken by the electricity Distribution Network Operator, Scottish Hydro Electric Power Distribution (SHEPD). Consent would be sought by SHEPD as required.

3.7 Limits of Deviation

3.7.1 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, UGCs, CSE compound and access track routes.

3.7.2 It should be noted that the design of the Proposed Development described within this EIA Report has been established following the identification of detailed environmental and technical considerations. The design process has included the appointment by SSEN Transmission of an OHL Contractor to inform the design process and the constructability of the Proposed Development, covering overhead elements of the project, and access tracks. This has involved carrying out ground investigation works along much of the route to determine ground conditions as well as peat probing along the full extent. There is therefore a high degree of certainty with respect to the location of infrastructure, as presented within this EIA Report. Nevertheless, it is possible that further micro-siting may be required during the construction process to reflect localised land, engineering and environmental constraints, and therefore the LoD provides some flexibility in this regard.

3.7.3 The horizontal LoD for which consent is sought would be as follows:

- OHL (Steel Lattice Tower) – 100 m LoD (50 m either side of the centre line);
- UGC – 100 m LoD (50 m either side of the centre line);
- CSE Compound – 100 m LoD from the edge of the CSE compound; and
- Access Tracks (new permanent and new temporary) – 50 m LoD (25 m either side of the centre line). There are instances however, where the LoD for the access track would need to be extended to the edge of the boundary of the OHL LoD. This is to account for the possible movement of the OHL within their respective LoDs that the access would still need to serve.

3.7.4 In some areas, the LoD is increased or decreased to account for local constraints or known engineering challenges and environmental sensitivities. These can be seen on **Figure V1-3.1**.

3.7.5 An operational corridor (OC) is required through areas of woodland and commercial forestry to ensure the safe operation of the OHL and access tracks. The width of the OC would be variable depending on the nature of the woodland or forestry and the design of steel lattice tower proposed, as set out in paragraph 3.9.2. For example, in areas of productive conifer, the OC would typically require a distance of 42.5 m either side of the OHL for the standard L8c tower. Therefore, an extension of 42.5 m to the OHL LoD would be required for felling operations in areas of productive conifer. Similarly, for new tracks (temporary and permanent) a 12.5 m wayleave corridor is required either side of the track. As such, a 12.5 m extension would be required around new access track LoD's in areas of commercial forestry or woodland for felling operations.

3.7.6 A vertical LoD, i.e. the maximum height of a tower above ground level, is also sought to allow a height increase or decrease of 3.2 m on the proposed tower height of the L7c series of tower design and 4 m on the proposed tower height of an L8c series of tower design. The tower numbers and tower design types are presented in **Volume 4: Appendix V1-3.1: Indicative Tower Schedule – Proposed Alignment** and illustrated on **Volume 2: Figure V1-3.1**.

3.7.7 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 planning authority) and any relevant statutory consultees as required.

3.8 Description of Overhead Line Infrastructure

3.8.1 The 46 steel lattice towers that form part of the Proposed Alignment would be constructed from fabricated galvanised steel and would be grey in colour. The towers would likely comprise a combination of 'L7c' and 'L8c' series of steel lattice towers (example schematics are shown in **Volume 4: Appendix V1-3.2: Further Engineering Design Information**). Three types of tower are proposed to be used, as described below:

- Suspension towers: these are used for straight sections of OHL where there is no need to terminate the conductor. There are 30 suspension towers proposed;
- Angle / tension towers: these are typically used where there is a need to change the orientation of the OHL. There are 15 angle / tension towers proposed; and
- Terminal towers; where the OHL transitions to UGC, via a CSE. There is 1 terminal tower proposed, where the OHL transitions to UGC.

3.8.2 The towers would carry two circuits, each with three conductors supported from either glass, porcelain, or composite insulators attached to the horizontal cross arms on both sides of each steel lattice tower. An Optical Ground Wire (OPGW)[6] would be suspended between tower peaks, above the conductors.

3.8.3 The span length (distance between towers) would vary slightly depending on topography, weather conditions and land usage. Typically, the span lengths for the L7c standard tower are between approximately 200 - 250 m and for an L8c standard tower are between approximately 220 - 275 m. Tower heights would also vary, depending on local topography, but would typically be in the region of approximately 31 m for an L7c standard tower and 48.5 m for an L8c standard tower. Schematics of the L7c and L8c steel lattice towers are provided in **Volume 4: Appendix V1-3.2.**

3.9 Typical Construction Activities for Overhead Line Infrastructure

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

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

- Phase 1 – Enabling Works;
- Phase 2 – OHL Construction Works;
- Phase 3 – Commissioning; and
- Phase 4 – Re-instatement.

Phase 1 – Enabling Works

Forestry Clearance and Vegetation Management

3.9.2 Whilst the design of the Proposed Development has sought to minimise impacts on woodland and forestry where possible, some felling during construction to create an operational corridor (OC) for the OHL and access tracks is required. The width of the 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 42.5 m either side of the OHL for the L8c standard tower and 36 m either side of the OHL for the L7c standard tower. Whilst in areas of native woodland the OC can be reduced (e.g. to 30 m either side of the OHL for both the L7c and L8c standard towers). Further detail on proposed felling requirements is set out within **Volume 1: Chapter 12 - Forestry**. Overall, the Proposed Development would require 5.75 hectares (ha) of 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.

3.9.3 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 (CoWRP)objective of no net loss of woodland. On this basis, the Applicant will replant the 5.75 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.

Distribution Infrastructure

3.9.4 Works would be required to the existing distribution network infrastructure within some areas to facilitate safe working and operating conditions given the proximity of the distribution network to the existing (and proposed) 132 kV network. It is anticipated that these underground distribution network assets would be realigned to make way for the Proposed Development. These are associated works and do not form part of the consent application (see Section 3.6 of this Chapter).

Site Compounds / Borrow Pits and Quarries

3.9.5 As stated in Section 3.6, temporary construction compounds, laydown areas and borrow pits would be required to facilitate construction of the Proposed Development. The final location and design of these would be confirmed by the Principal Contractor and separate planning permissions / applications would be sought as required.

Road Improvements and Access

3.9.6 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.

3.9.7 Delivery of all construction materials and components for use at the Proposed Development would be delivered from the east, anticipated to be via the A9 and A836 public road network. Proposed construction access would make use of existing tracks as far as practicable, upgraded as required. Existing bellmouths would also be utilised where possible, subject to improvements. The construction of one new bellmouth would be required off the A897 to access the terminal tower and CSE compound. The locations of the proposed and improved bellmouth works for the Proposed Alignment are shown on **Volume 2: Figure V1-3.1**.

3.9.8 As set out in **Volume 1: Chapter 11: Traffic and Transport**, The Highland Council / private landowners may require an agreement to cover the cost of abnormal wear and tear on existing tracks and site access junctions used during construction of the Proposed Development.

3.9.9 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[7]. Indicative access track cross sections are included in **Volume 4: Appendix V1-3.3: Access Track Schematic**. For the purposes of this EIA, it has been assumed for worst case, that all new access tracks would be constructed on formation.

3.9.10 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 Scottish Environment Protection Agency (SEPA) prior to construction and would be regulated by the Water Environment (Controlled Activities) (Scotland) Regulations 2011[8] (CAR). A watercourse crossing schedule for the Proposed Alignment is provided in **Volume 4: Appendix V1-9.3: Schedule of Watercourse Crossings**.

3.9.11 **Table V1-3.1** sets out the approximate length of access track requirements across the Proposed Alignment.

Table V1-3.1: Access Track Requirements

Access Track Type	Approximate length required across the project (km)
Existing access tracks	5.7
Existing access tracks to be upgraded	13.33
New permanent access tracks	7.38
New temporary access tracks	5.81

3.9.12 Access tracks (and their related LoDs) are shown on **Volume 2: Figure V1-3.1**. Deemed planning permission would be sought for these access tracks and access points as part of the section 37 consent application.

3.9.13 During construction, the proposed new permanent access tracks are typically expected to have a running width of 5 m, with an overall construction corridor of 6.5 m to allow for suitable drainage and pollution prevention measures. To minimise longer term impacts, the width would be reduced to approximately 3.5 m, with an overall corridor of 5 m to allow for suitable drainage and pollution prevention measures, for the operational period, with track-side habitat reinstated.

[7] Constructed tracks in the Scottish Uplands (Updated September 2015), Scottish Natural Heritage.

[8] Water Environment (Controlled Activities) (Scotland) Regulations 2011, available at https://www.legislation.gov.uk/ssi/2011/209/contents/made [Accessed November 2024]

3.9.14 The proposed new temporary access tracks are typically expected to have a running width of 3.5 m, with an overall construction corridor of 5 m to allow for suitable drainage and pollution prevention measures. The temporary tracks would be reinstated post construction.

Phase 2 – OHL Construction Works

Tower Foundations

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

3.9.16 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 type foundations may be required where low strength ground conditions exist, particularly where peat is encountered at over 1 m depth.

3.9.17 For the purposes of the EIA, the following working areas and associated construction activities have been assumed around individual tower foundations, as indicated on **Volume 4: Appendix V1-3.1**:

- L7c and L8c suspension tower – 2,500 m^2 (50 m x 50 m);
- L7c angle / tension tower - 4,900 m^2 (70 m x 70 m); and
- L8c angle / tension / terminal tower - 6,400 m^2 (80 m x 80 m).

3.9.18 The exact dimensions of the working area around each tower would be confirmed following micrositing.

3.9.19 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.

3.9.20 It is anticipated that formation of each tower foundation would take approximately four weeks. **Plate V1-3.1** provides and illustrative image of tower foundation construction.

Plate V1-3.1: Illustrative Image of Tower Foundation Construction

Tower Construction

3.9.21 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 telehandler 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 Roto telehandler and typically an 80 tonne all-terrain mobile crane would then be required to erect the tower. **Plate V1-3.2** provides an example of tower construction.

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

Plate V1-3.2: Illustrative Image of Steel Lattice Tower Construction

Conductor Stringing

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

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

3.9.25 Prior to wiring operations, Equi-Potential Zones (EPZ)[9] pulling positions need to be established. The typical size of a working area required for an EPZ pulling location is approximately 18 m x 36 m for an L7c standard tower and 30 m x 60 m for an L8c standard tower. This would likely be set up on trackway panels. As conductors are required to be pulled in opposite directions, each pulling location would require two EPZ (dimensions as stated above for each tower specification) at each respective pulling tower (one on the upside and one on the downside of the tower).

3.9.26 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.

[9] EPZs are areas where the electrical potential (voltage) is uniform, meaning there is no difference in voltage between any two points within that zone. In such zones, there is no risk of electric shock because current cannot flow between points of the same potential. EPZs are critical in electrical safety, particularly in environments where high-voltage equipment is present.

Phase 3 – Commissioning

3.9.27 The OHL and support towers would then be subject to an inspection and snagging process. This allows the Principal Contractor and SSEN Transmission 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. The circuits would then be energised from the substations.

Phase 4 – Reinstatement

3.9.28 Following commissioning of the Proposed Development, it is anticipated that all areas disturbed during construction would be reinstated. Reinstatement would form part of the contract obligations for the Principal Contractor and would include the removal of all temporary access tracks, all work sites around the tower locations and the re-vegetation of laydown areas to recreate the former habitat as far as possible. Reinstatement is described further in Section 3.15 of this Chapter and **Volume 4: Appendix V1-3.6: Outline Site Restoration Plan**.

3.10 132 kV Underground Cable Installation

3.10.1 As referenced in Section 3.5, the installation of two separate single circuits of 132 kV UGC, that would be capable of operation at 275 kV in the future if required, would fall under the Applicant's permitted development rights but are considered within this EIA for completeness.

3.10.2 As illustrated on **Volume 2: Figure V1-3.1**, these works would include:

- Approximately 350 m of single circuit UGC (built at 275 kV and operated at 132 kV[10]) to link the Strathy Wood circuit between the terminal tower (within the CSE compound) to Connagill 275/132 kV substation; and
- Approximately 430 m of single circuit UGC (built at 275 kV and operated at 132 kV[109]) to link the Strathy South circuit between the terminal tower (within the CSE compound) to Connagill 275 / 132 kV substation.

3.10.3 The overall cable construction corridor would typically be 40 m wide (based on two cables per phase) for each circuit, to accommodate excavation and cable installation equipment and store excavated materials during construction for reinstatement once the installation process is complete. The general working arrangements for installation of high-voltage UGC via open cut trench is provided in **Volume 4: Appendix V1-3.2**. A photograph showing an UGC being laid as part of a single circuit installation is included in **Plate V1-3.3**.

3.10.4 During construction the cable would be accessed via the existing Connagill 275 / 132 kV substation access track and the proposed permanent track leading to the CSE compound and terminal tower.

[10] The UGC would be operated at 275 kV upon commissioning of the proposed Strathy Switching Station.

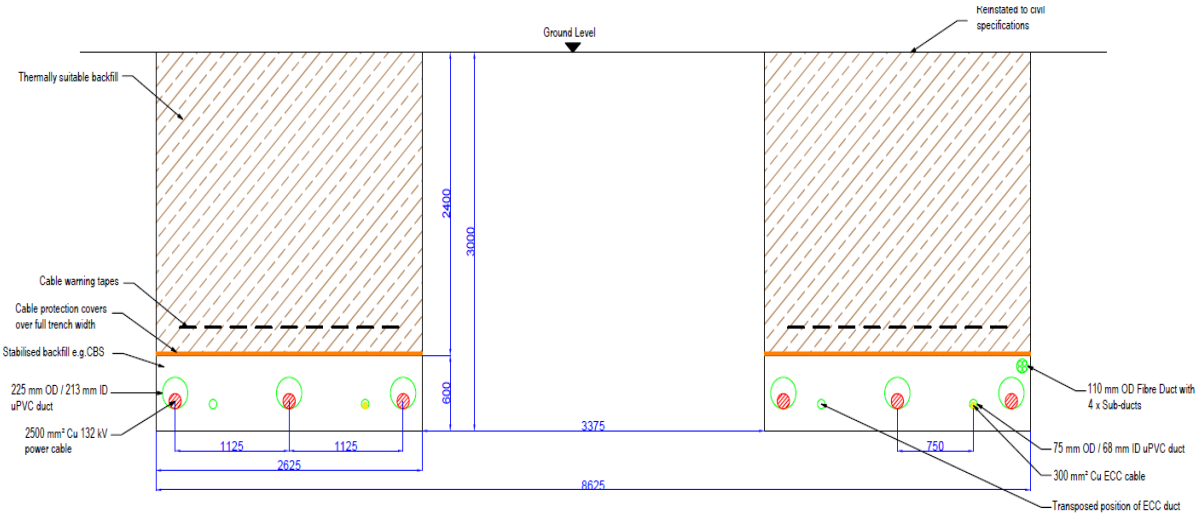
Plate V1-3.3: Photograph of Underground Cable Installation

3.10.5 To enable a more efficient installation process, cables would be installed via ducts in open-cut trenches, each approximately 3 m deep and 8.7 m wide. These trenches would be backfilled to reduce the need for open-cut trenching over long distances. The plastic ducts would be installed before the cable pulling begins to minimise open ground works and excavations. Typically, joint bays are placed at the ends of cable spans, but with the current design, no joint bays are anticipated. Consequently, no link pillars would be installed outside the boundaries of the CSE compound and Connagill 275/132 kV substation.

3.10.6 Once all trenching has been complete, the ducting installed and backfilled, the cable installation process can begin. The cable is coiled onto a cable drum to allow for transportation from the manufacturing plant to the site location. This drum is then loaded onto a cable installation trailer which allows the drum to rotate and the cable to be pulled from the drum. The drum is placed at either end (substation or CSE compound), while a winch is set up at the opposite end. A steel wire would be connected to the winch and pulled through the duct until it reaches the far end (i.e. substation or CSE compound), where the drum is positioned. After completing pre-installation checks, the cable can then be pulled through the duct.

3.10.7 It is anticipated that the UGC connection would comprise two banks in one trench for each cable circuit installed in a flat duct formation, as illustrated on **Plate V1-3.4** and **Volume 4: Appendix V1-3.2.** These would be installed within two separate trenches. A fibre optic duct along with Distributed Temperature Sensing (DTS) duct and cable would also be installed within each trench for monitoring purposes.

Plate V1-3.4: Illustration of Flat Duct Formation



3.10.8 The watercourse crossing method for UGC installation would be trenched within the watercourse channel and backfilled. As the size of the watercourse to be crossed is relatively small, the crossing would be performed using the open-cut method, with the cables placed beneath the bed of the watercourse.

3.10.9 Excavations would be kept free from water by use of mobile pumps, with water pumped to a suitable location as agreed on site by the Environmental Clerk of Works (EnvCoW) and in accordance with the Applicant's General Environmental Management Plans (GEMPs) (see Section 3.15 of this Chapter and **Volume 4: Appendix V1-3.4**). Drainage design measures to ensure the discharge would not result in pollution to surface water will be set out in the Construction Environmental Management Plan (CEMP) (see **Volume 4: Appendix V1-3.8: Outline CEMP**).

3.10.10 All excavated material would be carefully stored a minimum of 10 m from, and downslope of, any adjacent watercourse, with particular care taken to prevent any risk of runoff or windborne dry sediment being discharged into the watercourses.

3.10.11 Engineered backfill would be placed around the cable ducts in appropriate layers to protect the cable from accidental damage, and to ensure the desired cable rating is achieved. A 75 mm minimum bedding layer of stabilised backfill would be laid in the trench to provide bedding for the ducts. Marker boards would then be placed on top of the engineered fill. Excavated material would then be placed on top of the marker board and compacted in place.

3.10.12 Reinstatement of the surface layers would be completed by returning the remaining excavated material to the trench in layers, in reverse order with the existing vegetation placed on the trench where possible. The reinstatement process is discussed in paragraphs 3.15.12 to 3.15.13 below (see also **Volume 4: Appendix V1-3.6**).

3.11 Description of Cable Sealing End Compound

3.11.1 One CSE compound would be required to facilitate the transition from OHL to UGC and vice versa. This would be located approximately 215 m to the south-west of Connagill 275 / 132 kV substation at approximate OS grid reference NC 903120, 595414 (see **Volume 2: Figure V1-3.1**).

3.11.2 The compound would be anticipated to be approximately 50 m x 55 m. Ground works, including a cut-fill exercise, would be required at the proposed site to achieve a level area of this size. Due to the hazards associated with live electricity, the compound would be secured by installing fencing and gates around its perimeter, usually of 2.4 m in height. Within the CSE compound there would be a terminal tower, and associated gantry infrastructure. A permanent access track would also be required.

3.11.3 The plant required to facilitate the transition between UGC and OHL is shown in **Plate V1-3.5**, and a photo of a CSE compound is shown in **Plate V1-3.6**.

Plate V1-3.5: Overhead Line to Cable Transition

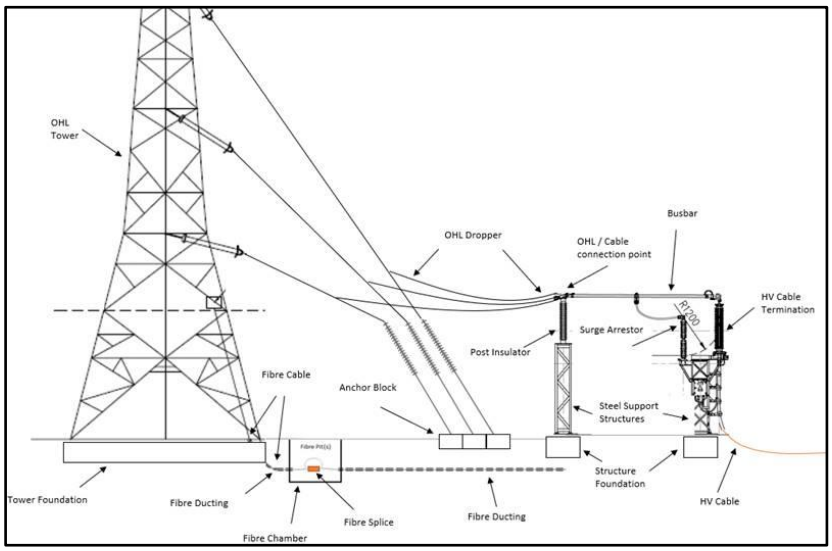


Plate V1-3.6: Example of a Cable Sealing End Compound

3.12 Land Take for Construction and Operation of the Proposed Development

3.12.1 Areas of agricultural land are classified by The Macaulay System (now Hutton Institute) of Land Capability for Agriculture[11]. Based on this data most of the land within the vicinity of the Proposed Development is Class 5.3: land capable of supporting improved grassland and Class 6.3: land capable of only rough grazing. Other common land uses within the vicinity of the Proposed Development include shooting estate land, and electrical infrastructure including the operational Strathy North Wind Farm, the existing Strathy North 132 kV trident 'H' wood pole OHL, Connagill 275/132 kV substation and Beauly to Dounreay 275 kV steel lattice OHL.

3.12.2 **Table V1-3.2** summarises the indicative land take associated with the Proposed Alignment.

Table V1-3.2: Indicative Land Take for Construction and Operation of the Proposed Development

Activity	Quantum	Construction (ha) (Temporary Land Take)	Operation (ha) (Permanent Land Take)
Access Track (existing)	5.7 km	None – tracks are already present	None – tracks are already present
Access Track (Upgrade)	13.33 km	8.66	6.67
Access Track (Temporary)	5.81 km	2.91	None – all temporary land take would be reinstated post-construction
Access Track (Permanent)	7.38 km	4.80	3.69
Temporary Construction Working Area at towers	30 steel lattice suspension towers (including 6 no. x L7c towers and 24 no. x L8c towers) 15 steel lattice angle/ tension towers (including 4 no. x L7c towers and 11 no. x L8c series) 1 steel lattice terminal tower (L8c tower)	17.14	None – all temporary land take would be reinstated post-construction
Cable Sealing End (CSE) Compound	1	0.3	0.3
Permanent Land Take for 132 kV towers (excluding terminal tower which is within the CSE Compound)	45	0.24 (relates just to tower feet)	0.24 (relates just to tower feet)
Underground Cable (Permanent)	780 m	3.12	None – all temporary land take would be reinstated post-construction

[11] The James Hutton Institute. (2020). *Land Capability for Agriculture in Scotland*. [online] Available at: https://www.hutton.ac.uk/land-capability-for-agriculture-lca/ [Accessed November 2024].

3.12.3 Land use impacts associated with the Proposed Development are anticipated to be minimal. The construction works may result in some temporary loss of land or access restriction; however, it is considered that this can be adequately managed through wayleave agreements with the relevant landowners. Dialogue would be maintained by the Applicant and the Principal Contractor with landowners throughout the construction period to ensure any potential disruption as a result of the proposed works is kept to a minimum. The permanent loss of land to tower locations, CSE compound and permanent access tracks would be negligible and it would remain possible for grazing to continue around and under towers during their operational lifetime.

3.13 Dismantling of the Existing OHL

3.13.1 As mentioned in paragraph 3.2.1, following construction and commissioning of the proposed 132 kV double circuit OHL, it would act as 'shared infrastructure' for the consented Strathy South and Strathy Wood wind farms and the operational Strathy North Wind Farm, transporting electricity generated by these wind farms to Connagill 275 / 132 kV substation. Redundant parts of the existing Strathy North 132 kV trident 'H' wood pole OHL would be dismantled and removed. The dismantling works are ancillary works for which deemed planning permission under Section 57(2) of the Town and Country Planning (Scotland) Act 1997 is sought.

3.13.2 The section of existing 132 kV trident 'H' wood pole OHL to be dismantled and removed would extend from Pole 128A[12] (within the vicinity of Strathy North Substation (near Dallangwell)) at NGR NC 82656, 59851 to Pole 48[13] (to the north of the Achridigill Burn) at NGR NC 87794, 62462, as illustrated on **Volume 2: Figure V1-3.2**.

3.13.3 The initial section of the existing 132 kV trident 'H' wood pole OHL (between Pole 136 and 129A[1211]) would be retained to allow the operational Strathy North Wind Farm to connect onto the proposed double circuit 132 kV OHL for onward transmission to Connagill 275/132 kV substation. The final section of the existing 132 kV trident 'H' wood pole OHL (between Pole 48 and Pole 1) would remain in place and would be repurposed for future grid connections.

3.13.4 To dismantle the existing 132 kV wood pole OHL, access to each pole would be required. The Applicant intends to use the same access arrangements that were used during construction of the wood pole OHL. The new permanent and temporary access tracks proposed as part of the Proposed Development would also be available to be used during dismantling works. Where existing and proposed tracks do not extend to each individual pole location, the use of tracked vehicles may also be required. It is not anticipated that any new access tracks would be required to facilitate dismantling.

3.13.5 A dismantling plan has been prepared for these works and is included in **Volume 4: Appendix V1-3.7: Dismantling Plan**.

3.14 Construction Programme, Employment and Hours of Work

3.14.1 It is anticipated that construction of the project would take place over a 15-month period, following the granting of consents, although detailed programming of the works would be the responsibility of the Principal Contractor in agreement with SSEN Transmission. A further six months (approximately) would be required for dismantling works associated with the existing 132 kV wood pole OHL.

[12] Pole 128A and Pole 129A are proposed as part of the Strathy Wood Wind Farm Grid Connection section 37 submission and are not yet consented or built.

[13] For clarity, Pole 48 of the existing Strathy North 132 kV trident 'H' wood pole OHL would remain *in situ*

3.14.2 Construction activities would in general be undertaken during daytime periods. Weekend working would also be proposed with timings to be confirmed by the Principal Contractor in due course. Working hours are anticipated 7 days a week between approximately 07.00 to 19.00 March to September and 07.30 to 17.00 (or within daylight hours) October to February. Working hours would be confirmed by the Principal Contractor and agreed with The Highland Council as planning authority. As working hours would be during daytime periods only, any external lighting requirements during construction are anticipated to be minimal.

3.14.3 SSEN Transmission considers it important to act as a responsible developer with regards to the communities which host the construction works. The delivery of a major programme of capital investment provides the opportunity to maximise support of local communities. Employment of construction staff would be the responsibility of the Principal Contractor; however, the Applicant would encourage the Principal Contractor to make use of suitable labour and resources from areas local to the Proposed Development where possible.

3.15 Environmental Management During Construction

3.15.1 Best practice construction measures would be implemented during the construction work. All works will be carried out in accordance with the following (as well as industry best practice construction measures, guidance and legislation, all as detailed in the following):

GEMPs

3.15.2 General Environmental Management Plans (GEMPs) have been developed by the Applicant. The GEMPs considered relevant for this project are identified in **Volume 4: Appendix V1-3.4**.

SPPs

3.15.3 Species Protection Plans (SPPs) have been developed by the Applicant and have been agreed with NatureScot. These can be found in **Volume 4: Appendix V1-3.5**.

CEMP

3.15.4 A contractual requirement of the Principal Contractor would be the development and implementation of a Construction Environmental Management Plan (CEMP). It is anticipated that the implementation of a CEMP would be a condition within any grant of consent. The CEMP would be developed for the project and adopted by the successful contractor during the construction phase. The principal objective of this document is to provide information on the proposed infrastructure and to aid in avoiding, minimising and controlling adverse environmental impacts associated with the Proposed Development. An Outline CEMP is included as **Volume 4: Appendix V1-3.8**.

3.15.5 Furthermore, this document would aim to define good practice as well as specific actions required to implement mitigation identified in the EIA, the planning process and / or other licencing or consenting processes. **Volume 1: Chapter 13 – Schedule of Mitigation** of this EIA Report provides a summary of all mitigation measures identified within this EIA, and this will be updated as required following further consultation and consent conditions. The CEMP would be updated during the pre-construction phase and would form part of the contractor documents between the Applicant and the appointed Principal Contractor.

3.15.6 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 Environmental Clerk of Works (EnvCoW), with support from other environmental professionals as required. SSEN Transmission would undertake monthly inspections and quarterly audits to ensure compliance with the CEMP.

Reinstatement

3.15.7 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.

3.15.8 An Outline Site 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 **Volume 4: Appendix V1-3.6**, and would be developed by the Applicant, the Principal Contractor and consenting authorities as required prior to construction commencing. In more sensitive areas, further site-specific measures are required to ensure successful reinstatement, including site specific soil and peat management measures, and the employment of specialist advisers (i.e. Ecological Clerk of Works (ECoW)). Such measures are set out in **Volume 4: Appendix V1-3.6.**

3.15.9 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

3.15.10 As shown in **Volume 2: Figure V1-3.1,** new permanent and new temporary tracks are required to facilitate construction and operation of the Proposed Development, and dismantling of the existing OHL. Tracks to be retained would be partially reinstated on commissioning of the OHL to reduce their width to approximately 3.5 m (plus 1.5 m to allow suitable drainage and pollution prevention methods) for use by SSEN Transmission for maintenance access. Other tracks noted as temporary would be removed and the land reinstated.

3.15.11 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 **Volume 4: Appendix V1-9.2: Outline Peat Management Plan**).

Reinstatement of Work Areas (Towers and Underground Cable)

3.15.12 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 and would be temporarily stockpiled in separate bunds within the working area or corridor, with stripped turves stored on top of the bunds.

3.15.13 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. Methods for the reinstatement of peat would be set out in the Peat Management Plan (see **Volume 4: Appendix V1-9.2**).

SSEN Transmission's Biodiversity Ambition

3.15.14 Biodiversity Net Gain (BNG) is a process which leaves nature in a better state than before development work started. SSEN Transmission has developed a BNG toolkit based upon Natural England Biodiversity Metric[14, 15] (in the absence of an agreed Scottish metric) which aims to quantify biodiversity based upon the value of habitats for nature. It is an efficient and effective method for demonstrating whether development projects have been able to maintain or increase the biodiversity value of a development site after construction works.

3.15.15 The scope of the BNG assessment is to quantify the overall potential biodiversity impacts for the Proposed Development; this includes a biodiversity baseline assessment, quantification of habitat losses due to temporary works and permanent structures, and analysis of biodiversity gains following reinstatement of habitats in areas of temporary construction work and additional habitat enhancement and creation (whether onsite and/or offsite).

3.15.16 SSEN Transmission is committed to protecting and enhancing the environment by minimising the potential impacts from their construction and operational activities. As part of this approach, SSEN Transmission has made commitments to ultimately ensure a minimum of 10% net gain for biodiversity in line with the Applicant's biodiversity ambition and environmental legacy commitments[16], Sustainability Strategy[17] and Sustainability Plan[18]. New infrastructure projects must:

- Ensure natural environment considerations are included in decision making at each stage of a project's development;
- Utilise the mitigation hierarchy to avoid impacts by consideration of biodiversity in project design;
- Positively contribute to the UN and Scottish Government Biodiversity strategies by achieving an overall Net Gain; and
- Work with their supply chain to gain the maximum benefit during asset replacement and upgrades.

3.15.17 The design and evolution of this project has been carried out in line with these commitments, and the Applicant is committed to delivering a 10% net gain for biodiversity following implementation of the Outline Habitat Management Plan (HMP) (see **Volume 4: Appendix V1-7.8**).

3.16 Operation and Maintenance

3.16.1 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.

3.16.2 During the operation of the Proposed Development, it may be necessary to manage vegetation to maintain required safety clearance distances from infrastructure.

[14] Natural England (2019) The Biodiversity Metric 2.0: auditing and accounting for biodiversity value. User Guide (Beta Version, July 2019). http://publications.naturalengland.org.uk/file/5366205450027008 [Accessed November 2024]

[15] Further versions of the Natural England Biodiversity Metric have since been published. SSEN Transmission are in the process of incorporating this into their guidance and toolkit.

[16] SSEN Transmission (2023). Delivering a positive environmental legacy. https://www.ssen-transmission.co.uk/globalassets/documents/sustainability-and-environment/environmental-legacy-booklet [Accessed November 2024]

17 Delivering a smart, sustainable energy future: The Scottish Hydro Electric Transmission Sustainability Strategy (2024) ssen-transmission.co.uk/globalassets/documents/new-sustainability-documents-2024/strategies/ssen-transmission-sustainability-strategy-2024 [Accessed November 2024]

18 Our Sustainability Plan: Turning Ambition into Action. (2019) SHE Transmission. https://www.ssen-transmission.co.uk/media/3215/our-sustainability-plan-consultation-report.pdf [Accessed November 2024]

3.17 Decommissioning the Proposed Development

3.17.1 If the Proposed Development were to be decommissioned all components of the OHL, inclusive of steel from the towers, conductors and fittings, would be removed from site and either recycled or disposed of appropriately.

3.17.2 A method statement would be agreed with The Highland Council setting out the detail of the decommissioning process for OHL.

3.17.3 Efforts would be made to repurpose the Proposed Development for future connections prior to any decommissioning. Consent to be applied for is therefore in perpetuity.

3.17.4 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.