Fanellan Hub 400 kV Substation and Converter Station

Environmental Impact Assessment Report

Volume 2 | EIA Report

Chapter 3 - Description of the Proposed Development

February 2025

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OTHER VOLUMES

3. DESCRIPTION OF THE PROPOSED DEVELOPMENT

3.1 Introduction

3.1.1 This chapter describes the elements required for the construction and operation of the Proposed Development. It provides a description of the key components and information regarding the construction, operation and maintenance of the Proposed Development. The Proposed Development, as described within this Chapter and assessed within the technical chapters of this EIA Report, is the construction and operation of the proposed Fanellan Hub and is shown on Volume 3 Figure 3.1 Proposed Development.

3.2 Location of the Proposed Development

3.2.1 The Proposed Development is located at Fanellan in Inverness-shire, within The Highland Council (THC) local authority area. The site boundary is approximately 3.6 km to the south-west of Beauly (See **Figure 3.1 Proposed Development**). The closest proposed building to Beauly is approximately 5 km to the south-west. The Study Area encompasses the Proposed Development Site, which includes both the permanent and temporary construction features. The Study Area covers an area of approximately 223 hectares (ha) and has an elevation ranging from approximately 34.0 metres (m) AOD at its lowest point in the northern end of the Site, rising to approximately 147.5 m in the southern area of the Site.

3.3 Proposed Development Components

3.3.1 The Proposed Development comprises a new 400 kV substation and a new 525 kV 2GW Bi-pole HVDC converter station and would include a number of buildings up to around 27.5 m high. The Proposed Development is to be constructed and operated to connect to four other developments being delivered under SSEN Transmission's ASTI Framework, with the need for these set out in Chapter 2 – Project Need. The developments are as follows:

- The Western Isles HVDC Link
- Beauly-Peterhead 400 kV Overhead Line
- Beauly-Spittal 400 kV Overhead Line
- Beauly-Denny 400 kV Upgrade

The Proposed Development is integral to and requires to be delivered together with these developments and alongside other schemes identified for delivery by SSEN Transmission under the Pathway to 2030 requirements outlined in **Volume2, Chapter 2: Project Need**.

3.3.2 The key components (please refer to the Glossary for a definition of components) of the Proposed Development are shown on **Volume 3, Figure 3.1 Proposed Development** and would consist of:

- 400 kV Substation (Switching Station); and
- 525 kV 2GW Bi-pole High Voltage Direct Current (HVDC) Converter Station.

3.3.3 The visual impacts of the Proposed Development have been considered throughout the design of the development and colours for the buildings have been selected to be sympathetic to the existing background when viewed from the south and south-east. **Volume 2, Chapter 8:** Landscape and visual amenity provides further detail on colours and visual impacts.

3.3.4 After extensive consultation, it was concluded that the optimum solution was to locate both the substation and the converter station on a single, larger site and on a single platform. The total platform size (base of the site) containing both the substation and converter station will be approximately 305 m x 810 m in total and includes a 4.2 m high security fence. Both sites will share common access, security arrangements, site drainage, Sustainable Drainage System (SuDS) basins and landscaping.

400 kV AIS Substation

3.3.5 The 400 kV Substation provides the electrical infrastructure where the four developments identified in 3.3.1 will intersect. Specifically, the substation will include a connection to the HVDC Converter Station to allow electricity to be imported and exported between the Western Isles and mainland UK using the Western Isles HVDC link. Allowing electricity to be transmitted onto the wider 400 kV Transmission network onshore and ultimately onwards to the lower voltage electricity distribution network to supply homes and businesses.

3.3.6 In addition, it is the point at which each of the two circuits being carried by the Beauly-Peterhead, Beauly-Spittal and Beauly-Denny 400 kV OHLs will converge to manage electrical flows and allow the renewable generation that is to be connected to these OHL's to be transmitted to centres of demand.

3.3.7 The substation will comprise of the following:

- a new substation platform, of 305 m x 525 m minimum size, which includes a 4.2 m security fence;
- installation of Air Insulated Switchgear (AIS) switchgear and busbar with a maximum height of 15 m, to connect incoming OHL circuits as well as the HVDC converter station. The infrastructure must be positioned with sufficient clearance between components in order to allow for safe operation and maintenance;
- installation of Step-Down Transformers to provide the site with Low Voltage Alternating Current (LVAC) supply; and
- a new control building of 50 m x 26 m, with a maximum height of approximately 7 m.

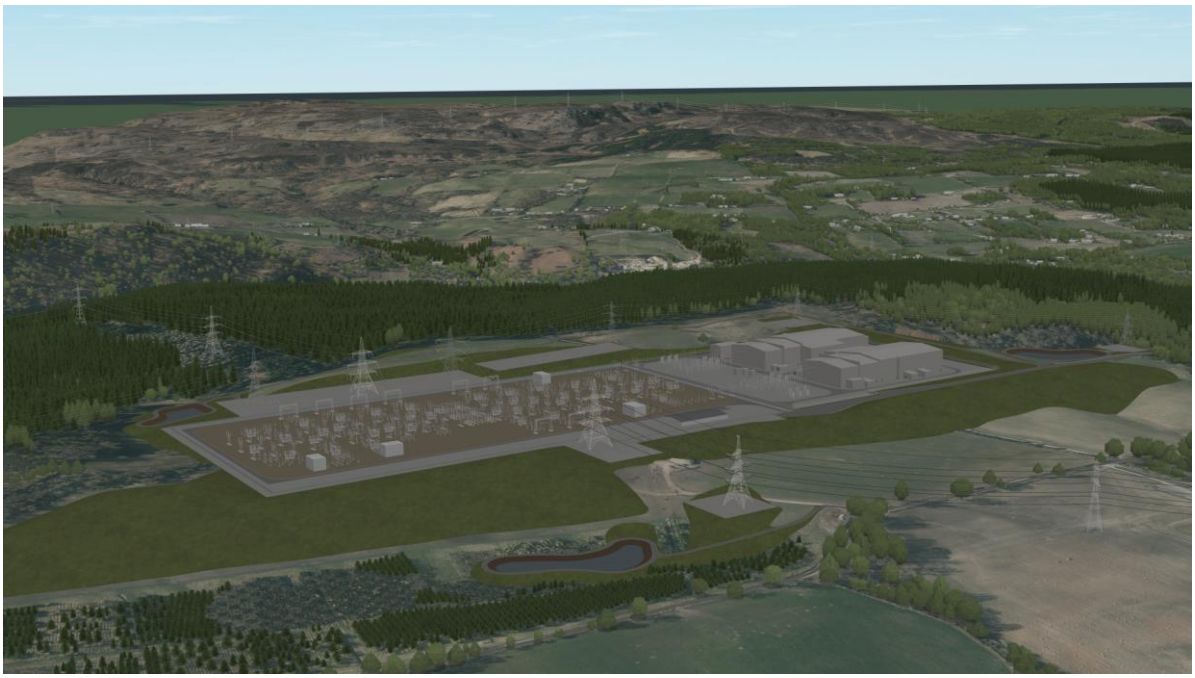

Plate 3 - 1 3D Model showing indicative 400 kV Substation and Converter Station layout

HVDC Converter Station

3.3.8 The HVDC Converter Station is required to connect the HVDC Link from the Western Isles and convert this electricity from Direct Current (DC) to an Alternating Current (AC) at the required voltage to allow connection to the 400 kV Substation and the wider 400 kV Transmission schemes as set out in 3.3.6.

3.3.9 The HVDC converter station at Fanellan will comprise of the following:

- a new converter station platform, approximately 305 m x 285 m, which includes a 4.2 m security fence;
- main HVDC converter station buildings comprising Valve Hall, DC Hall, Reactor Hall, Transformer Hall with adjacent Service and Control Rooms (with the largest building around 160 m x 80 m, 27.5 m high);
- smaller ancillary and support buildings adjacent to the main converter station building;
- a connection to the AC site via overhead busbar;

- connection for the UGC (that will run approximately 80 km from Dundonnell to Fanellan, that forms part of the Western Isles HVDC Link) ; and
- as the site is adjacent to the Fanellan 400 kV substation, both sites will share common access, security arrangements, site drainage infrastructure and landscaping.

Ancillary Construction Development

3.3.10 In addition to the main infrastructure, the following ancillary development is required:

- earthworks – a cut-fill exercise will be undertaken to achieve a level area to construct infrastructure;
- a new access track including a bellmouth from the Fanellan Road to be created for construction activities and retained for operational use;
- temporary access tracks for construction activities;
- temporary construction compounds –as per Drawing FNLN4-LT459-SEBAM-ZZ-EXT-D-C-0155 and FNLN4-LT459-SEBAM-ZZ-EXT-D-C-0156 ;
- temporary storage and laydown areas for topsoil and materials as per Drawing FNLN4-LT459-SEBAM-ZZ-EXT-D-C-0155 and FNLN4-LT459-SEBAM-ZZ-EXT-D-C-0156 –;
- temporary construction drainage arrangements; and
- site clearance activities including some tree felling. The Proposed Development would require 7.09 ha of forestry clearance.

Operational Infrastructure

3.3.11 Given the scale of the developments, a need for the following permanent facilities have been identified to support operational requirements:

- operations depot and store building – (Approx. 124 m x 60 m, 24 m high);
- storage and desk space will be allocated within the control building, and car parking will be allocated for visiting maintenance staff;
- external lighting;
- permanent access – it is anticipated that a new bellmouth and access road to the Proposed Development from the public road (C1106 Fanellan Road) will be constructed which will remain in place permanently following construction for operational use;
- security fencing;
- earthworks – a cut-fill exercise will be undertaken to achieve a level area to construct infrastructure;
- site drainage (SuDS) and water management;
- underground connectors to the buildings for Low Voltage (LV) and communication cabling. The connection with the HVDC site will likely be overground via busbar rather than cabled;
- demolition of existing agricultural and residential buildings within the immediate proximity to the site; and
- landscaping mitigation and biodiversity enhancement.

Operations Depot and Store

3.3.12 The Operations Depot and Store would consist of buildings for offices, training facilities, car parking and storage facilities for strategic spares. The Operations Depot and Store dimensions are a height of approx. 24 m, width of 60 m and 124 m length.

Drainage

3.3.13 A robust drainage system will be provided to maintain existing surface water run off flows as well as accounting for future climatic change risk. The drainage network and attenuation design are in accordance with the SuDS manual and SSEN Transmission specifications. Due to the scale of the platform, it is proposed to separate the

substation and convertor station areas in to separate catchment areas for attenuation. Drainage will include both temporary and permanent features including basins, cut off drains, oily water treatment and foul water treatment.

3.3.14 A surface and foul water drainage strategy (see **Volume 4, Technical Appendix 13.2: Drainage Strategy**) has been prepared for the Proposed Development, which includes SuDS to mimic natural drainage processes to reduce the effect on the quality and quantity of runoff from developments and provide benefit to amenity and biodiversity. The SuDS have been integrated within the landscape proposals to enhance amenity, biodiversity, and habitat, whilst protecting and/or enhancing water quality.

Surface Water Drainage

3.3.15 All surface water generated by the site will be drained using SuDS principles. The development will adopt a series of filter/carrier drains, swales and attenuation basins which will capture, treat and attenuate the surface water generated from its catchment area prior to discharging to the nearest watercourse. This is in accordance with the requirements for SuDS in all new developments in Scotland according to The Water Environment (Controlled Activities) (Scotland) Regulations 2011, and will follow the requirements of the SuDS Manual C753 to meet the following as minimum:

- prevent run-off of water with particular focus on polluted water;
- control the run-off where it occurs (tanks of pipes);
- control the run-off within the development boundary (swales, basins, ponds); and
- control the run-off from several sites within the vicinity of the developments (large wetlands, reservoirs).

3.3.16 Further principles are noted below to ensure the safe operation of the final development:

- removal of surface water from the access roads and hardstanding areas within site as quickly as possible to provide safety and to minimise potential for off-site nuisance to the travelling public;
- provision of effective sub-surface drainage to maximise longevity of hardstanding areas and associated earthworks;
- minimisation of the impact of the runoff on the receiving environment in terms of flood risk and water quality;
- poofs, earthworks, access roads and other associated features are effectively drained;
- consideration is given to future maintenance and operation of the systems;
- climate change and possible changes in impermeable areas is accounted for; and
- the generation of waste during construction and operation is minimised.

3.3.17 The drainage design parameters follow the guidance set out in SuDS Manual, Sewers for Scotland V4.0 and SSEN specific guidance.

Foul Water Drainage

3.3.18 The foul water generated from toilets and washing facilities provided within the Proposed Development will be treated and discharged to Packaged Treatment Plants on site. This is due to the absence of Scottish Water foul or combined sewers within the vicinity of the scheme. The design proposals for the Packaged Treatment Plants will adhere to British Water Flows and Loads - 4 Code of practise for Industrial sites and SEPA WAT-RM-03 regulations. It is assumed that usage will be low, but any overflow discharges will be subjected to SEPA approvals process. The foul network will be limited, and the divergent nature of the system means that cross contamination of surface water sewers from foul sewers is very unlikely.

Oil Pollution Control

3.3.19 The Site will have many components which use or store oil-based products. It is proposed that where oil is stored, bunds will be used to contain any spillage or seepage. When a leak is detected, an alarm system will

alert the sub-station personnel who will begin operating systems to direct the discharge of any contaminated water into any of the surface water drainage systems. Firstly, the contaminated water will be discharged to an above ground oily water mitigation system where it will undergo one level of treatment. The treated water will then pass through filtration treatment and attenuation within a SuDS basin to remove remaining oil pollutants. For an extra level of protection, all outfalls from SuDS basins will have penstocks and oil traps prior to discharging into the water environment.

Lighting

3.3.20 Substations are not generally illuminated. Floodlights would be installed but would only be used in the event of a fault during the hours of darkness; during the over-run of planned works; or when sensor activated as security lighting for night-time access. The access roads would not be lit under normal operation. The perimeter fence would use infra-red lighting (this would only switch to white light if the fence alarm were activated to allow night-time cameras to work better). A light would also be provided permanently at access gates.

Security Fencing

3.3.21 The operational fence line will be Centre for the Protection of National Infrastructure (CPNI) approved SSEN Transmission fencing, inclusive of a minimum 2.4 m high security palisade fencing to span between posts. The palisade fencing is to have enhanced security in the form of extended anti climb posts with electrified fencing to meet CPNI rated sites, providing an overall fence height of 4.2 m. Vehicle and pedestrian access gates will be incorporated within the fence in locations shown on proposal layouts. The enhanced fencing will extend the full perimeter of the proposed platform.

3.3.22 Permanent stock / deer fencing will be provided for the wider site boundaries in the form of 2.4 m high posts with maximum mesh size of 200 x 300 mm and double width netting, and associated field gates to site in accordance with the Landowner Commitment Register and associated plans.

3.3.23 Stockproof fencing and field gates will be installed around all SuDS basins and integrated into the wider site boundary deer fencing.

Underground Connectors

3.3.24 Underground connectors to the buildings will be installed for Low Voltage (LV) and communication cabling.

Car Parking

3.3.25 A limited number of car parking spaces will be provided for visiting staff.

Design and Access

3.3.26 This section provides a summary of key design and access requirements, and further details are provided in the Design and Access Statement, which accompanies the planning application for the Proposed Development.

3.3.27 The design principles of the Proposed Development have been driven by a combination of technical requirements, and adopted design principles to ensure the Proposed Development is sensitively sited and designed (see **Volume 2, Chapter 4 Site Selection and Alternatives**). Mitigation, in the form of landscape planting and landscape forms has been included in the final design (see **Volume 3, Figure 8.11: Landscape Mitigation Plan**) to provide habitat biodiversity and minimise potential landscape and visual impacts where possible.

3.3.28 A new access track is proposed to the east of the Site, extending from the substation platform to Fanellan Road by the forming of a new junction complete with associated public road improvement works. This access track will remain in place permanently for operational use. The alignment of the access road has been designed to

prevent direct views of the Proposed Development as far as possible. There is also a requirement for public road improvements within and outwith the Red Line Boundary.

Earthworks

3.3.29 The proposed permanent earthworks will extend over the greater extent of the Site. In general, unnecessary earthworks have been avoided where possible so there is a considerable extent of land that will remain unworked within the Red Line Boundary, mainly towards the north/eastern boundary of the Site where the permanent offline access road extends towards the proposed junction, tying into Fanellan Road. The ground levels will be changed, predominantly within the substation platform, to flatten it for the proposed structures and operational access provisions and to cut it in to the land. The accesses and visual screening landforms, will be graded to create profiles that are sloped . The infrastructure has been designed to be as tightly configured as possible, while maintaining the required separation distances to minimise the extent of the earthworks.

3.3.30 All hardcore and earthworks materials for the construction of the Proposed Development would either be won on site, through cutting of the existing surface to construct the platforms or imported locally. The cut material would generally be sourced from the creation of the substation platforms, predominantly from the converter station footprint, and the recycled material would be used as fill to construct the landscape bunds, form the construction of the access tracks and roads, as well as forming temporary platforms for welfare and other localised areas found elsewhere on the Site. Cut material would also be generated during the construction of the attenuation basins and during the excavation of the internal non-public access roads which serve the platforms. The temporary construction compound and laydown areas will require cut, which would be reinstated in line with the landscaping strategy post construction. It is anticipated that surplus topsoil following the earthworks, would be used as part of the landscaping strategy. The Site has been designed to have a cut and fill balance to minimise the amount of imported material required and in turn minimise the construction traffic volumes.

3.4 Associated Development

3.4.1 Associated developments 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 planning permission. They are, however, assessed in this report (where practicable) as part of the cumulative effects assessment. The associated works are:

- Temporary and permanent diversion of a section of the Beauly-Denny OHL. These proposed works do not constitute EIA development and any forthcoming application for consent (under section 37 of the Electricity Act 19891) does not require to be accompanied by a full EIA Report, as agreed in the screening opinion (26th April 2024) issued by The Scottish Ministers. These works are being appraised under a separate Environmental Appraisal (EA) and planning application; and

3.5 Typical Construction Activities

3.5.1 Key activities during construction of the Proposed Development are:

- enabling works and site clearance including earthworks and felling of trees;
- creation of a level platform upon which the substation and HVDC converter station will be installed;
- potential for rock blasting and rock crushing on site;
- installation of security fencing;
- public road improvements, delivery of materials and vehicle movements;

[1] Scottish Government's Energy Consents (Updated July 2022). Good Practice Guidance for Applications under Section 36 and 37 of the Electricity Act 1989. Available at: https://www.gov.scot/publications/good-practice-guidance-applications-under-sections-36-37-electricity-act-1989/documents/ [Accessed: May 2024].

- laying of foundations, including construction of site drainage;
- construction and installation of buildings;
- installation of electrical plant including busbar to connect the substation and the HVDC converter station;
- construction of SuDS and planting of screening / BNG vegetation;
- structure demolition;
- commissioning; and reinstatement and planting.

Enabling Works

3.5.2 The enabling works will include (but not be limited to) existing utilities diversions, installation of new temporary and permanent water, electrical and telecommunication services public road improvements and establishment of a temporary construction compound including welfare facilities and laydown areas.

3.5.3 Additional works include construction compounds, forestry clearance, and the delivery of structures and materials.

Site Clearance & Demolitions

3.5.4 Where required, vegetation would be carefully removed from within the Site, including trees and hedgerows subject to any ecological considerations relating to timing and method of working. Where possible, existing vegetation would be retained. The following buildings will require to be demolished to facilitate construction of the proposed development:

- existing agricultural yard and structures associated with Fanellan Farm; and
- two residential dwellings at Upper Fanellan Cottages.

3.6 Construction Phases

Phase 1 – Enabling Works

Public Road Improvements and Access

3.6.1 Public road improvements (PRI) have been identified (see **Volume 4, Appendix 12.3 Abnormal Load and Construction Traffic Assessment Report**) and designed at Early Contractor Engagement stage.

3.6.2 Access proposals will be reviewed by the Principal Contractor during detailed design and further developed where necessary. These works will be agreed with THC roads department. In general, based on desk study analysis and preliminary walkover inspections, access will be established through a combination of:

- installation of bellmouth junction on the C1106 Fanellan Road for access to the Site and to reduce the extent of public road use. This access will remain in place permanently following construction for operational use;
- installation of temporary bellmouth junctions on C1106 Fanellan Road;
- installation of new bound access road within the Site;
- installation of temporary new stone tracks; and
- installation of permanent new stone tracks.

3.6.3 The list of PRI identified and the associated drawings submitted as part of the planning application for the Proposed Development are:

- LT459-SWE-XX-XX-D-H-0101 – A831 Junction Improvements: It is proposed to provide hardened verges on the A831 and C1106 at the junction area to allow the AIL to turn into the C1106 to head south over the Black Bridge;
- LT459-SWE-XX-XX-D-H-0102 – A831 / A862 Junction Improvements: Minor amendments are required to some road side furniture to allow the AIL to negotiate the junction.

- LT459-SWE-XX-XX-D-H-0103 – A862 / B9169 Junction Improvements: Minor amendments required to one existing traffic sign.
- LT459-SWE-XX-XX-D-H-0104 – A9 North Kessock Junction: Minor amendments required to one existing Diagram 610 bollard.
- LT459-SWE-XX-XX-D-H-0105 – Millbank Roundabout Improvements: A number of modifications are required to some of the existing roadside furniture including lighting columns and traffic signals to allow the AIL to pass.
- LT459-SWE-XX-XX-D-H-0106 – A831 to Fanellan Sheet 1 of 3: The C1106 is proposed to be formally widened to a 6.5m cross section. Upon completion of the works and delivery of the AIL, the road will have a new surface course overlaid.
- LT459-SWE-XX-XX-D-H-0107 - A831 to Fanellan Sheet 2 of 3: Continuation of widening the C1106 to a 6.5m cross section and applying a new overlaid surface.
- LT459-SWE-XX-XX-D-H-0108 - A831 to Fanellan Sheet 3 of 3: Improvements to the existing junction with the C1106 and U1604 to widen out the carriageway and upgrade the initial section of Fanellan Road to a 6.5m cross section for two way traffic and provide curve widening.
- LT459-SWE-XX-XX-D-X-0103 – Details of the outline sub-station access road junction with the C1106 Fanellan Road to facilitate construction and operational access.
- FNLN4-LT459-SEBAM-ZZ-EXT-D-H-0941 – Temporary junction improvements at the U1604 / C1108 junction to allow for AIL turning radius

Temporary Drainage During Construction

3.6.4 Temporary drainage of surface water during construction will incorporate numerous features such as cut-off and pre-earthwork ditches. These have been permanently designed into the final drainage network to reduce the quantity of temporary drains required. These ditches will be hessian lined or grassed where there is excess sediment predicted. Temporary drainage also comes in the form of filter drains which are to be used where ditches are unsuitable due to site levels. These will treat and convey water. Sedimentation lagoons are to be used before discharging back into the environment. These will store run-off and allow the settlement of sediments. Flood risk will be reduced by controlling discharge rates into the downstream watercourse. All works will be supervised and inspected by SSEN to ensure compliance with detailed design drawings, eliminating the possibility of cross contamination between foul and surface water networks during construction.

Temporary Site Compounds

3.6.5 Temporary site compounds would be required during construction, located within the red line boundary. Areas for the compounds have been identified, as shown on **Volume 3, Figure 3.1: The Proposed Development.** The compounds would provide office and welfare facilities for site staff, parking, laydown areas and holding and servicing space for construction plant.

Forestry Clearance

3.6.6 Construction would require the removal of approximately 7.09 ha of forestry. Felling will consist the removal of individual trees and groups of trees within agricultural land. In addition, a small section of Ruttle Wood would be removed as well as approximately half of the young woodland block at Bredaig. Full details of the tree felling required can be found in **Volume 2, Chapter 15: Forestry**. This would be undertaken in consultation with Scottish Forestry and the affected landowner(s). The Landscape Mitigation Plan (**Volume 3, Figure 8.11**)

indicates the existing hedgerows and trees that would be retained on Site together with new planting of trees. The intention is to retain as much of the perimeter trees and vegetation as possible within the technical requirements of the Proposed Development. Opportunities for reforestation or compensatory planting will be explored in consultation with Scottish Forestry and other relevant stakeholders to offset the loss and support ecosystem restoration. This approach aligns with national forestry policies and sustainability goals. A Compensatory Planting Management Strategy is provided as a supporting document to this EIA.

3.6.7 After felling, any timber removed that is commercially viable would be sold and the remaining forest material would be dealt within in a way that delivers the best practicable environmental outcome and that is compliant with waste regulations.

Phase 2 – Construction Works

3.6.8 This phase would comprise:

- Creation of a level platform;
- Installation of security fencing;
- Laying of foundations, including construction of site drainage;
- Erection of control buildings;
- Installation of electrical plant; and
- Construction of SuDS and planting of screening / BNG reinstatement vegetation

Phase 3 – Commissioning

3.6.9 The Proposed Development would 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 the substation and converter station. It is important to note that commissioning for the substation is likely to take place ahead of commissioning for the converter station and there may be a significant period of time between the two. The circuits would then be energised so the Proposed Development can be connected to the National Grid.

Phase 4 – Reinstatement

3.6.10 Following commissioning of the Proposed Development, all temporary works areas would be reinstated to an agreed standard with landowners for future use. Reinstatement will form part of the contract obligations for the Principal Contractor and will include the removal of all temporary works areas. Reinstatement would seek to involve topsoil re-spread and the areas sown with suitable wildflower grass meadow with shrub and tree planting, where applicable and where agreement can be reached with the landowner. Reinstatement principles are detailed in SSEN Transmissions General Environmental Management Plan (GEMP) for Restoration TGN-NET-ENV-522 (see Technical Appendix 3.1)

3.7 Construction Programme, Employment and Working Hours

3.7.1 It is anticipated that construction of the project would take approximately three years from the issue of consent, with a further two years to commission and reach full energisation, although detailed programming of the works

would be the responsibility of the Principal Contractor in agreement with SSEN Transmission. The project is required to be operational by 2030.

3.7.2 Every effort would be made to cause least disturbance to landowners and local residents during construction by providing regular updates on works via the on-site Construction Manager and Community Liaison Officer.

3.7.3 The Applicant takes community responsibilities seriously. The delivery of a major programme of capital investment provides the opportunity to maximise support to local communities. Employment of construction staff will be the responsibility of the Principal Contractor, but SSEN Transmission encourages the Principal Contractor to make use of suitable labour and resources from areas local to the location of the works.

3.7.4 It is envisaged that there will be a number of separate teams working at the same time at different locations within the Proposed Development construction area. The resource levels will be dependent on the final construction sequence and will be determined by the Principal Contractor.

3.7.5 At an earlier time in the project development different construction hours were anticipated. However, as the construction phase has been refined it has been necessary to now proceed on the basis of working hours of 07:00 to 19:00 over 7 days a week January to December, in order to deliver this critical national infrastructure within the delivery programme for Pathway to 2030 projects. For heavy goods vehicle traffic hours will be restricted to Monday to Friday: 08:00 – 19:00; and Saturday: 08:00 – 13:00. The EIAR assessments are predicated on this basis.

3.7.6 Any out of hours working would be agreed in advance with The Highland Council. During the commissioning phase of the Proposed Development, there may be requirement for 24 hours a day, seven days a week working and potential for out of hours working. These working hours are subject to approval from THC.

3.8 Construction Traffic

3.8.1 Construction of the Proposed Development will give rise to regular, numbers of staff transport movements, with work crews travelling to work site areas. The Principal Contractor has identified the main compound area(s), with a safe area for parking, in the South East of site, away from the public road network.

3.8.2 Vehicle movements to the site from the local road network will be required to deliver construction plant materials and infrastructure components. They will also be required to remove any surplus earthworks materials from the site (See **Figure 1.1. Site Location Plan**).

3.8.3 An Outline Construction Traffic Management Plan (CTMP) has been prepared by the Early Contractor Engagement contractor and will be reviewed and updated where relevant by the Principal Contractor prior to any works commencing, in consultation with THC and Transport Scotland, as required. The final CTMP will describe all mitigation and signage measures that are proposed on the public road network. The Outline CTMP is provided in **Volume 4, Technical Appendix 12.1: Outline Construction Traffic Management Plan**. 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 including public road improvements, is provided in **Volume 2: Chapter 12 - Traffic and Transport**, which is supported by the Outline CTMP and the Abnormal Load and Construction Traffic Assessment Report which is included in **Volume 4, Appendix 12.3** of the **Volume 4, Appendix 12.1: Outline Construction Traffic Management Plan**. Additional information will also be included in **Volume 4, Appendix 12.2: Transport Assessment**.

Access during Construction

3.8.4 Vehicles will primarily access the 400 kV Fanellan Substation and Converter Station by a new permanent access road which will connect to the C1106 via a priority junction on the eastern portion of the site. It is anticipated that the majority of construction traffic will use the C1106 to the east, when entering and leaving the

Site. In accordance with the CTMP included in **Volume 4, Appendix 12.1: Outline Construction Traffic Management Plan**, the preferred route to the Site from the Trunk Road Network is identified as: A9 -> A832 -> B9169 -> A862 -> A831 -> C1106 -> before entering the offline access road to site (Site Access).

3.8.5 It is noted in the CTMP (**Volume 4, Appendix 12.1: Outline Construction Traffic Management Plan**) that this preferred route utilises the C1106 section of road over 'Black Bridge' which has been identified in a Structural assessment to require to be replaced prior to its use for heavy loads construction traffic.

3.8.6 The existing structural issues associated with Black Bridge will result in a requirement for construction traffic including HGVs to initially access the site from the A833 via Kiltarlity and the C1108 and U1604 until such time as the Black Bridge has been replaced, at which time, construction traffic will switch to using the preferred route described in 3.8.4 and 3.8.5 above.

Construction Traffic Numbers and Traffic Management

3.8.7 An estimate of the type and volume of site traffic anticipated for the Proposed Development is included in the Transport Assessment (see **Volume 2 Chapter 12: Traffic and Transport**).

3.8.8 The Principal Contractor, once appointed, will review and update the Outline Construction Traffic Management Plan in consultation with SSEN Transmission, THC and Transport Scotland, as required. An Outline CTMP is provided in **Volume 4, Appendix 12.1: Outline Construction Traffic Management Plan**.

Delivery of Structures and Materials

3.8.9 All materials would be delivered to the construction compounds. Concrete would be delivered to site pre-mixed or would be batched onsite. Hardcore and earthworks materials for the construction of the Proposed Development would be a combination between site won, through cutting of the existing surface to construct the platforms and locally imported materials. Site won materials would be prioritised over imported materials to reduce the impact on the local roads and the environment.

3.8.10 All materials would be delivered to the construction compound, and it is anticipated that concrete would be delivered to site pre-mixed.

3.8.11 The largest plant items for the substation would be the 7 no. 290 tonne HVDC transformers. There will also be smaller plant items as follows:

- 2 no. transformers and 2 no. shunt reactors for the substation (approximately 8 m x 3 m x 5 m tall); and
- 12 no. Phase reactors for the HVDC Converter Station (approximately 3 m diameter x 2.6 m tall).

3.8.12 Whilst the transformer manufacturer is not fully confirmed, it is anticipated that these items would be classed as abnormal loads. Indicative dimensions of the largest HVDC transformers are anticipated to be approximately 8.7 m long, 4.1 m wide and 4.8 m tall. A Route Feasibility Report has been included in the **Volume 4, Appendix 12.3 Abnormal Load and Construction Traffic Assessment Report Appendix E**.

3.8.13 It is anticipated that there would be several abnormal load deliveries to the Proposed Development during the duration of the construction works (see **Volume 2, Chapter 12: Traffic and Transport**).

3.9 Environmental Management during Construction

The assessment in the EIA Report will be carried out on the basis that standard mitigation measures, as set out in **Chapter 19: Schedule of Environmental Mitigation**, will be implemented during the construction work, including compliance with both project wide and site-specific environmental management procedures.

General Environmental Management Plans

3.9.1 All works will be completed in accordance with the General Environmental Management Plans (GEMPs and the SSEN Transmission's Species Protection Plans (SPPs) (Volume 4, Technical Appendix 3.1). General Environmental Management Plans (GEMPs) and Species Protection Plans (SPPs) have been developed by the Applicant, with SPPs agreed with NatureScot (formerly Scottish Natural Heritage (SNH)). The GEMPs and SPPs considered relevant for the Proposed Development are identified in **Volume 4, Technical Appendix 3.1: General Environmental Management Plans (GEMPs) and Species Protection Plans (SPPs)**.

Construction Environmental Management Plan

3.9.2 A contractual requirement of the Principal Contractor would be the development and implementation of a Construction Environmental Management Plan (CEMP) 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. This will be further addressed in **Chapter 19: Schedule of Environmental Mitigation**. 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.

3.9.3 It is not proposed to submit a draft CEMP alongside the EIA Report, instead the mitigation measures and management procedures outlined in the SSEN Transmission GEMPS and SPPs will be referred to, with specific mitigation detailed within the Schedule of Mitigation (see **Volume 2**, **Chapter 19: Schedule of Environmental Mitigation**).

3.9.4 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. The Applicant would carry out regular inspections and audits to monitor the implementation of the CEMP.

Controlled Activities

3.9.5 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.

3.10 General Construction Mitigation Proposals

3.10.1 The general mitigation measures for the different elements of construction that will be employed are set out below in **Table 3-1**:

3.10.2 These are included in **Volume 2, Chapter 19: Schedule of Environmental Mitigation** together with all identified mitigation measures to reduce the potential environmental effects of the Proposed Development.

Table 3-1 – General Construction Mitigation Measures

ID	Title	Description
General Mitigation Measures		
GE 1	Construction Neighbour and Community Liaison	Local residents bounding the works site will be notified of work timings and general site delivery windows as far as practicable. Any one-off significant deliveries that impact out with standard working hours and delivery hours shall be notified in advance.

ID	Title	Description
GE 2	Best Practice Construction Measures, GEMPs and SPPs	All works would be carried out in accordance with industry best practice construction measures, guidance, and legislation, together with General Environmental Management Plans (GEMPs) and Species Protection Plans (SPPs) that have been developed by the Applicant (**Volume 4, Technical Appendix 3.1: General Environmental Management Plans (GEMPs) and Species Protection Plans (SPPs)**).
GE 3	Construction Environmental Management Plan (CEMP)	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 practice and guidance. The CEMP would also include the following specific measures: • Erection of tree protection fencing around retained trees at the Site in accordance with BS5837:20122 and as deemed relevant by the Arboricultural Clerk of Works. These are shown in **Volume 3: Appendix 15.2** and also in **Chapter 19 – Schedule of Mitigation**. (see Mitigation Measure ID F3 for detail) • Any excavations to be back-filled or covered overnight, or a 45-degree ramp will be left to allow wildlife to escape should they fall in and become trapped. A ramp will only be on one side for uncovered excavations. • Storage of materials, waste, plant, and vehicles to be a minimum of 30 m from the watercourses. • Dampening down of potential sources of dust. • Pollution prevention measures which align to best practice e.g., Guidance for Pollution Prevention documents3 including specific protocols for construction of the outfalls (e.g., enhanced silt protection). • General compliance measures for working in adverse weather conditions – particularly for works associated with the surface water outfalls. • Specific roles, responsibilities, and reporting requirements. • The materials and waste associated with construction activities will be captured and managed through a Materials Management Plan and Site Waste Management Plan. They will detail the material, efficient use of material to minimise waste, and other waste management measures.
GE 4	Restoration and Reinstatement	All temporary work areas would be reinstated to an agreed standard with landowners for future use. Reinstatement would form part of the contract obligations for the Principal Contractor and include the removal of all temporary works areas. Some temporary areas of hardstanding would be required, reinstatement would involve topsoil re-spread and the areas sown with suitable wildflower grass meadow with shrub and tree planting, where applicable.
GE 5	Environmental Manager	An Environmental Manager would be appointed by the Principal Contractor for the duration of the construction phase. Their role would include coordinating input from specialists, reviewing incoming information from additional surveys, and coordinating any subsequent recommendations of mitigation measures and licensing requirements. The Environmental Manager would be responsible for continued review of incoming information

[2] British Standards Institution (2012) BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations. British Standards Institution, London.

[3] NetRegs. Guidance for Pollution Prevention (GPP) documents. [Online] Available at: https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/ (Accessed: August 2024).

ID	Title	Description
		and coordinating any additional specialist input to meet the Proposed Development's environmental obligations.
GE 6	Environmental Clerk of Works (EnvCoW)	Environmental Clerk of Works (EnvCoW) would be appointed by the Principal Contractor to monitor, report and advise on the environmental compliance of the construction works. The EnvCoW would report to the Environmental Manager. The EnvCoW would be competent, demonstrated by relevant experience and accreditations.
GE 7	Outdoor Access Plan	Where there may be interactions with recreational users during the construction of the Proposed Development, an Outdoor Access Plan would be prepared as part of the Principal Contractor's CEMP (GE3), and signage would be erected at suitable locations to warn of construction traffic.

3.11 Landscape Mitigation Measures and Biodiversity Enhancement

3.11.1 Landscape mitigation measures will be considered to provide partial visual screening and help assimilate the Proposed Development into the surrounding landscape. Such measures will also seek to support habitat biodiversity and provide opportunities for enhancement.

3.11.2 Landscape mitigation measures have been proposed for the Proposed Development to mitigate potential adverse effects on local landscape character and visual amenity. The objective for landscape mitigation is to use landform and planting to minimise potential impacts. A series of development platforms have been designed to sit within the landscape, partially hiding the Proposed Development from surrounding visual receptors. Working with the levels to create the development platforms the predicted fill generated has been used within the design to create a series of landforms that respond to the natural contours of the rural landscape to partially screen potential views from surrounding residential properties, public highways and footpath routes.

3.11.3 An environmental colour study has been undertaken to identify the natural hues and tones found within the local landscape. Photographs were used from winter months at selected viewpoints to test and identify an appropriate colour strategy to be adopted as part of a Design Code for the final design. The objective of the colour strategy is to reduce the scale of the mass of built form and to marry the buildings into the natural characteristic hues and tones of the rural landscape. A range of styles were used to test various colour patterns with a range of colours found naturally within the locality.

3.11.4 Once created the new landforms and detention basins would then be vegetated by sowing with wildflower meadow or planted with occasional shrubs, hedgerows and woodland plantations. The woodland would vary in type from a mixed conifer/deciduous woodland to broadleaved woodland to wet woodland on low-lying areas. Some low-lying areas such as the base of landforms, ditches and detention basins would be allowed to regenerate naturally.

3.11.5 The proposed planting and reinstatement works would be designed to create a variety of natural habitats, characteristic of this part of The Highlands with the intention to improve the biodiversity of the Site. Local types of habitat were identified with an emphasis on delivering target habitats considered desirable such as wetland and broadleaved and mixed woodland. Native hedgerows are present locally but often infrequent and gappy.

The proposed landscape strategy would fill hedgerow gaps, creating a series of natural wildlife corridors to assist in movement across the Site and connecting with the surroundings.

3.11.6 Further details on the landscape mitigation strategy are provided in **Volume 2, Chapter 8 Landscape and Visual Impact**, and a plan showing indicative landscaping measures is included in **Volume 3, Figure 8.11: Landscape Mitigation Plan.**

3.11.7 Visualisations of the Proposed Development have been produced from 14 locations within the vicinity of the Site and are included in **Volume 3, Figures 8.12 to 8.39**. The visualisations provide post mitigation photomontages and photowires, illustrating the Proposed Development at Year 1 and at Year 15 when operational, with the establishment of the proposed planting.

3.11.8 In addition, the Applicant will develop a long-term Habitat Management Plan (HMP) to ensure measures are in place for the long-term maintenance of the proposed planting, habitat and biodiversity enhancement measures.

3.12 Biodiversity Net Gain

3.12.1 Biodiversity Net Gain (BNG) is a process which leaves nature in a better state than it started. SSEN Transmission has developed a BNG toolkit based upon the Natural England metric[4], 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. SSEN Transmission use their BNG approach as a valid method to demonstrate positive effects for biodiversity as required under NPF4. Please see **Biodiversity Net Gain Assessment** for further information on the assessment methods, results, and how the Proposed Development would comply with NPF4 Policy 3 Biodiversity.

3.12.2 For BNG to be used appropriately and to generate long-term gains for nature, the good practice principles established by the Business and Biodiversity Offset Programme (BBOP)[5] have been followed. These principles have been established in the context of UK development by the CIRIA, the Chartered Institute for Ecology and Environmental Management (CIEEM) and the Institute of Environmental Management and Assessment (IEMA).

SSEN Transmission's Biodiversity Ambition

3.12.3 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 deliver a minimum 10% Biodiversity Net Gain on all new projects gaining consent from May 2023[6], in addition to their previous Sustainability Strategy (2018)[7], Sustainability Plan (2019)[8] and RIIO-T2 Business Plan, for new infrastructure projects to:

- 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;

4 Natural England Biodiversity Metric 3.1. [Online] Available at http://publications.naturalengland.org.uk/publication/6049804846366720 [Accessed: February 2024].

5 Guidance Notes to the Standard on Biodiversity Offsets (2012). Business and Biodiversity Offsets Programme (BBOP). [Online] Available at https://www.forest-trends.org/wp- content/uploads/imported/BBOP_Standard_Guidance_Notes_20_Mar_2012_Final_WEB.pdf [Accessed: February 2024].

6 SSEN Transmission, (2023). Delivering a positive environmental legacy - SSEN Transmission. [Online] Available at https://www.ssen-transmission.co.uk/globalassets/projects/kintore---tealing-400kv-ohl-downloads/new-delivering-a-positive-environmental-legacy-booklet---no-bleed.pdf.

7 Delivering a smart, sustainable energy future: The Scottish Hydro Electric Transmission Sustainability Strategy (2018). [Online] Available at https://www.ssen-transmission.co.uk/media/2701/sustainability-strategy.pdf [Accessed: February 2024].

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

- deliver a minimum 10 % biodiversity net gain on all projects gaining consent from May 2023 onwards; and
- work with their supply chain to gain the maximum benefit during asset replacement and upgrades.

3.12.4 BNG compensatory habitat creation/ enhancement will predominantly be delivered off-site due to space constraints on site. and an option has been identified close to the site. These works do not form part of the description of the Proposed Development and are therefore not included in the application for detailed planning permission. On that basis they are therefore not assessed in detail in this EIAR.

3.12.5 The construction and operation of the Proposed Development will be carried out in line with these commitments.

Operation and Management of the Proposed Development

Life of the Proposed Development

3.12.6 It is anticipated that the Proposed Development will be operational for at least 40 years and consent is being sought in perpetuity.

Maintenance

3.12.7 Regular inspections of equipment will be undertaken to identify any deterioration of components, and these parts will be replaced or repaired where needed (usually every 6 months).

3.12.8 A comprehensive Habitat Management Plan would be formulated to ensure the delivery of the landscape mitigation and biodiversity enhancement works which form part of the Proposed Development.

3.12.9 A full SuDS maintenance plan would be produced as part of the detailed drainage design. The maintenance of the site drainage will be the responsibility of SSEN Transmission.

Residues and Emissions

3.12.10 Due to the nature of the Proposed Development, no significant production of residues or emissions are anticipated during the operational phase beyond small amounts of waste e.g. packaging materials and the potential for small spillages of fuel and oils during routine maintenance and repair of the electrical infrastructure and housing. Some operational noise is anticipated from the HVDC converter station and substation, which is assessed in Volume 2, **Chapter 14 - Noise and Vibration**.

3.12.11 During construction, residues and emissions are anticipated to be consist primarily of construction noise, and any potential fuels/ oils/ waste generated during construction works. Currently there is a material excess, but the Principal Contractor will assess the quantities of materials that may be available at the Site and identify any further potential for re-use within the Proposed Development. The Principal Contractor will adhere to construction good practices that help to minimise the use of raw materials and maximise the use of secondary aggregates and recycled or renewable materials within the Site. Final design will demonstrate whether additional material will be required / generated, and where it is proposed to be temporarily or permanently stored. Final design should look to achieve a cut and fill balance on or in the immediate vicinity of the Site to avoid haulage via the local road network where possible. Residues and emissions are assessed in Chapter 12 - Hydrology, Hydrogeology, Geology and Soils and Chapter 13 - Noise and Vibration respectively. Some potential sources of residues and emissions such as operational phase Electromagnetic Fields (EMF) have

been scoped out of this EIA. More information is provided in Chapter 6 Section 6.5 - Issues Scoped out of Assessment.

3.12.12 Decommissioning

3.12.13 The Applicant is seeking planning permission in-perpetuity for the Proposed Development. In the event of decommissioning, or replacement, it is anticipated that the level of effect would be similar but less than during construction. Decommissioning would be undertaken in line with the best practice processes and methods at that time and managed through a Decommissioning Environmental Management Plan agreed with the relevant authority. No separate assessment of decommissioning is presented in this EIAR. Should the Proposed Development be decommissioned the site would be restored as follows:

- the Proposed Development infrastructure would be removed;
- where removal of infrastructure such as foundations would result in more damage than leaving them in place, they would be left in-situ; and
- disturbed ground would be reinstated.

3.12.14 Full details of the decommissioning plan would be agreed with the appropriate authorities and the landowners prior to any decommissioning works commencing.