Fanellan Hub 400kV Substation & Converter Design & Access Statement



March 2025

Prepared for Scottish and Southern Electricity Networks Transmission

1. Introduction

- 1.1 This Design and Access Statement (DAS) (incorporating Sustainable Design Statement) has been prepared to support a planning application by Scottish Hydro Electric Transmission plc ("the Applicant"), operating and known as Scottish and Southern Electricity Networks Transmission ("SSEN Transmission"). The application seeks planning permission under Section 28 of the Town and Country Planning (Scotland) Act 1997 (as amended) to construct and operate a new Fanellan Hub 400 kilovolt (kV) Substation and 525 kV 2 GW Bi-pole High Voltage Direct Current (HVDC) Converter Station known as The Fanellan Hub, located at Fanellan, in Inverness-shire, within The Highland Council (THC) local authority area, hereafter referred to as "the Proposed Development". In this DAS, the terms 'Applicant' and 'SSEN Transmission' are used interchangeably unless the context requires otherwise.
- 1.2 The Proposed Development is required as a result of the Scottish and UK Government's Net Zero climate change targets which require notable increases in renewable generation. As such, substantial investment in new transmission network infrastructure to transport renewable energy and reinforce the network is required and is a priority. National Grid ESO was clear that an integrated design for the electricity transmission network is needed to connect the new, large-scale renewable sources of energy. It is crucial that this investment, including the proposed substation and converter station at Fanellan Hub, is delivered in full along with the other elements of the transmission system reinforcement required. Failing to progress any part of this holistic design will lead to 2030 targets being missed.
- 1.3 The Fanellan Hub will be a key node on the proposed new 400 kV overhead line network between proposed hubs at Spittal and Peterhead, in addition to new substations at various locations along the new OHL routes. The Fanellan Hub also provides a point of connection for the HVDC link from the Western Isles and facilitates the uprating of the existing Beauly – Denny overhead line to enable both circuits to operate at 400 kV. The projects set out within the Holistic Network Design that will connect to the Fanellan Hub are:
 - > Beauly Spittal 400 kV Project, comprising proposed new 400 kV substation developments at Carnaig and Banniskirk, with a proposed new 400 kV overhead line linking the Fanellan Hub to these new substations
 - > Beauly Peterhead 400 kV Scheme, comprising proposed new 400 kV substation developments at Longside, Greens and Coachford with a proposed new 400 kV overhead line linking the Fanellan Hub to these new substations.
 - > Beauly Denny 400 kV Upgrade, comprising proposed new 400 kV substations at Cambushinnie and Bingally, with a proposed upgraded 400 kV overhead line linking the Fanellan Hub to these new substations.
 - > Western Isles HVDC Project, comprising proposed new HVDC Converter Stations located near Stornoway and at the Fanellan Hub site, linked by proposed HVDC cable between the Converter Stations.
- 1.4 The energy regulator, Ofgem, approved the need for the Fanellan Hub as part of its Accelerated Strategic Transmission Investment (ASTI) framework decision. The project,



alongside several other major network upgrades planned in the north of Scotland, forms part of a Great Britain wide programme of works that are required to meet UK and Scottish Government energy targets. There is a strong expectation from both Governments and Ofgem, that these projects will be delivered by 2030. Specifically, these projects are needed to deliver the Governments 2030 renewable targets as set within the British Energy Security Strategy (BESS) (April 2022).

- 1.5 SSEN Transmission has a licence obligation to invest in its existing assets to maintain network health and conditions, thereby improving operational flexibility and resilience.
- 1.6 A DAS is required to support the submission of a major planning application as set out in the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013. A DAS has a role in conveying design principles which have determined the design and layout of the development proposed, taking account of specific site and locational circumstances.
- 1.7 This DAS takes into account THC Supplementary Guidance (SG) on Sustainable Design, as some of the guidance entails topics that are relevant to the design of a development. Most notably in 'Using resources efficiently' and 'Minimising the environmental impacts of construction' of the SG. However, given the nature of the Proposed Development as essential infrastructure designed to deliver connection for consented renewable energy transmission to address climate change and net zero, and driven in the main by technical requirements, most of the guidance is not considered applicable / relevant. The design of the substation and converter is covered in this DAS in Section 4 and the consideration of site location, and siting is addressed below (Section 2) and also fully within the accompanying EIA and Planning Statement. Moreover, a checklist for the SG on sustainable Design has been included in Appendix A of this DAS.

2. The Site and Site Selection

Site Location and Setting

- 2.1 The Proposed Development would be located on land at Fanellan, with the settlement of Beauly located approximately 3.6 km to the northeast of Site, and approximately 18.3 km southwest from the centre of Inverness, in The Scottish Highlands. Beauly Substation is located approximately 2.3 km to the northeast of the Site, along the existing 400 kV Beauly to Denny OHL. There is an active forthcoming application under Section 37 of the Electricity Act 1989 to divert the OHL in order to accommodate the Proposed Development and tie the diverted OHL into the Proposed Development.
- 2.2 The Proposed Development Site (the Site) covers an area of approximately 223 hectares (ha) and comprises arable land at Fanellan. There are several fields with associated boundaries of hedging and fencing, access roads and overhead lines that are located within the Proposed Development area, with further areas of open agricultural land, with existing buildings and infrastructure, within the Red Line Boundary (RLB). The Site (which includes both the permanent and temporary construction features) 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.
- 2.3 Within and surrounding the Site are existing field boundaries with an agricultural land use. Ruttle Wood is to the west and an agricultural building is located to the south east. Further residential buildings, as well as a registered accountancy firm, are further to the southeast. Beyond the northern periphery the Site boundary consists of forested land with numerous narrow rural roads and footpaths. There are no Core Paths within this area. Within the forested land is a waterbody and course that feeds into the River Beauly. As such, the wider site setting is similar in character to the Site, comprising agricultural land with small pockets of residential and agricultural buildings.



- 2.4 There are two notable exceptions to the general character of the wider landscape. These are Breedon Beauly Quarry, approximately 1.6 km northeast, with its associated industrial infrastructure, and the existing Beauly Substation located approximately 2.3 km northeast of the Site, along with the four existing OHLs connecting the Beauly Substation with substations along the Western Isles, Spittal, Peterhead, and Denny OHLs.
- 2.5 The Proposed Development is located approximately 1.7 km to the west of a junction on the A831 which would be used to access the Site via the C1106 Fanellan Road. Please see Section 5 for further information on site access.

Site Selection

2.8

2.9

- 2.6 Studies that informed the Electricity System Operator's (ESO's) Pathway to 2030 Holistic Network Design, identified the requirement to reinforce the onshore corridors between Beauly and Peterhead in Aberdeenshire, Beauly and Spittal in Caithness, as well as an offshore subsea cable link between Spittal and Peterhead. As a result, and in conjunction with the points in paragraph 2.8 below, a search area of 10km radius surrounding Beauly Substation commenced to find a suitable site for a new Substation and Converter. After a lengthy site selection process as outlined below, it was determined that site option 7 would be the preferred site.
- 2.7 A detailed, two-stage site selection process was undertaken to determine the location of The Fanellan Hub, following the Applicant's internal guidance. The objective of this process is:

"To facilitate the design, consenting and operation of new substations in a manner that is technical, feasible and financially viable which causing, on balance, the least disturbance during construction and operation to the environment and the people who live, work and use it for recreation."

SSEN Transmission require a new substation to meet the following requirements:

- Proximity to the existing 400 kV OHL network to minimise the amount of new OHL or cabling required to connect to the network. This was set nominally at 10 km for an effective Search Area, taking account of the local topographical and physical constraints;
- Ideally large enough to accommodate the proposed individual or combined 400 kV substation / HVDC converter station footprints, together with associated landscaping, contractor compounds, access and new connection routes (or provide two sites within 1 km of each other);
- > In areas which do not contain environmental designations and minimise impacts on local communities and environmental receptors;
- Enable feasible connection routes for the proposed new 400 kV OHLs from Spittal and Peterhead and HVDC cable from the Western Isles; and
- > Provide sufficient space for known future connections."
- Following the first site selection stage, five sites, out of an initial sixteen, were considered for assessment in Stage 2. These five sites underwent an environmental and technical constraint appraisal to determine the site to be the most technically feasible, economically viable and environmentally acceptable option. These sites are named as:
 - > Option 4;
 - > Option 7;
 - > Option 9;
 - > Option 11; and
 - > Option 11A.



- 2.10 A comprehensive appraisal of these sites can be found in Chapter 4 of the EIA report. In summary however, all options were relatively comparable from an environmental perspective, with site option 7 rated the more favourable with regards to cultural and natural heritage, as well as in terms of its current land use and planning. Despite site options 7 and 9 having greater visibility due to topography of the respective sites compared to site options 4/11 and 11/11A it was noted landscape screening would be possible, and connection to and from the sites were deemed an important part of the overall consideration. Site options 4/11 and 11/11A would considerably increase the amount of new overhead line infrastructure required for the diversion of the existing Beauly to Denny 400 kV OHL and the Spittal to Beauly 400 kV OHL, while site options 7 and 9 would not.
- 2.11 Site option 7 (the Proposed Development Site) was identified as the preferred Site despite the greater landscape and visual impacts as the site also provides opportunity for new hard and soft landscaping mitigation.
- 2.12 Site option 7 was also the preferred site from an engineering perspective due to favourable connectivity and footprint requirements. In addition, the site allows for the least amount of rerouting of the Beauly to Denny OHL with the site topography and area allowing for a single HVDC converter station platform with opportunity to lower the site platform and screen the site further using won material and provide suitable routing for future connections.
- 2.13 Overall, site option 7 was considered the best on balance due to the reduced engineering complexities and cost of siting the Proposed Development whist also offering the best opportunity to limit overall environmental impacts.
- 2.14 A Consultation Document was produced in September 2023 which described the stages of the site selection process and the site options identified. The report stated how there were six further site options considered, however site option 7 was still scored highest in the SSEN Transmission substation site requirements. Please see the Consultation Document on SSEN Transmission website for further detail on site selection.

Stakeholder Engagement and Consultation

- 2.15 SSEN Transmission undertook initial public consultation on the site selection and preferred site option in March 2023, as well as direct engagement with statutory and non-statutory consultees, community councils, elected representatives, and landowners and occupiers. Public events were attended by members of the SSEN Transmission project team and appointed consultants.
- 2.16 SSEN wanted to gather feedback from the relevant stakeholders regarding the preferred site as well as any other potential considerations.
- 2.17 Please see the Report on Consultation December 2023 on SSEN Transmission website which summarises the feedback from initial consultation and confirms the preferred site option 7 would be taken forward for planning application.
- 2.18 A Pre-Application Advice Request was submitted to THC in Autumn 2023 with a written response from the council received on the 14th November 2023, including responses from statutory consultees.

PAN and Pre-application Consultation (PAC)

- 2.19 A PAN was submitted to The Highland Council on 21 February 2024 triggering the beginning of the statutory consultation period. The PAN provided the Council with an outline of the application details, dates of public events, publicity arrangements, and confirmation of the site location.
- 2.20 Statutory pre-application consultation events were subsequently held in March 2024 and June 2024.



2.21 The common themes of feedback from all the consultations were:

- > Site location;
- > Visual impact;
- > Impacts on quality of life; and
- > Environmental impacts.
- 2.22 The Feedback was considered throughout the design of the development, and the colours of the buildings have been selected to be sympathetic to the existing background when viewed from the south and southeast. Moreover, 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. Both sites will share common access, security arrangements, site drainage, SuDS basins and landscaping.
- 2.23 Further responses to the feedback can be found in the PAC report submitted along with this application.

3. The Proposed Development

- 3.1 The Proposed Development comprises of a new 400 kV substation and a new 525 kV 2 GW Bi-pole HVDC converter station and would include a number of buildings up to a height of approximately 27.5 m. The key components of the Proposed Development would consist of:
 - > 400 kV Substation (Switching Station); and
 - > 525 kV 2GW Bi-pole High Voltage Direct Current (HVDC) Converter Station.
- 3.2 The substation will comprise of:
 - > a new substation platform;
 - > installation of Air Insulated Switchgear (AIS) AIS switchgear and busbar;
 - > installation of Step-Down Transformers to provide the site with Low Voltage Alternating Current (LVAC) supply; and
 - > a new control building.
- 3.3 An Air Insulated Switchgear (AIS) substation is constructed with switchgear which relies on open air components. The infrastructure must be positioned with sufficient clearance between components in order to allow for safe operation and maintenance.
- 3.4 The HVDC Converter Station will consist of the following:
 - > a new converter station platform;
 - main 525 kV 2 GW Bi-pole HVDC converter station buildings comprising Valve Hall, DC Hall, Reactor Hall, Transformer Hall with adjacent Service and Control Rooms;
 - > smaller ancillary and support buildings adjacent to the main converter station building;
 - > a connection to the AC site via overground busbar;
 - > Connection for the UGC (that will run approximately 80km from Dundonnell to Fanellan, that forms part of the Western Isles HVDC link); and
 - > as the HVDC Converter Station is adjacent to the Fanellan 400 kV substation, the converter station will share common access, security arrangements, site drainage infrastructure, landscaping etc.



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

- > earthworks;
- > a new access point including a bellmouth from Fanellan Road would be created for construction activities and retained for operational use;
- > temporary access tracks for overhead line tie-in construction activities;
- > temporary construction compounds;
- > temporary storage and laydown areas for topsoil and materials;
- > temporary construction drainage arrangements; and
- site clearance activities including some tree felling and building demolition. The following buildings are proposed to be demolished:
 - Existing agricultural yard and structures associated with Fanellan Farm; and
 - two residential dwellings at Upper Fanellan Cottages.

3.6 Operational infrastructure will include the following:

- > Operations depot and store;
- Car parking;
- > External Lighting;
- > Permanent access –a new bellmouth and access road from the C1106 Fanellan Road will be built for construction and operational use;
- > Security fencing;
- > Earthworks;

3.7

- > Site drainage (SuDS) and water management;
- > Underground connectors to the buildings for Low Voltage (LV) and communication cabling. The connection with the HVDC part of the 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.
- A more detailed description of the Proposed Development is contained in Chapter 3 of the EIA Report. Information on drainage, surface and foul water, oil pollution control, lighting, security and earthworks are all included within Chapter 3. Please see Figure 3.1 below for the Proposed Layout.







4. Design

Key Design Principles and Objectives

- 4.1 Design principles have been adopted to ensure the Proposed Development is sited and designed as sensitively as possible, taking into account the environment and the context in which it sits.
- 4.2 Legislation and standards drive the basic design with the functionality of each Substation / Switching Station / Converter Station required by the Applicant as an Electricity Undertaker, and this is prescribed within the National Electricity Transmission Security and Quality of Supply Standard. The Applicant prepared a layout for the Fanellan Hub as determined by these system requirements.
- 4.3 The basic layout requirements for the Proposed Development dictate the amount of space required. In this case, the size required was then examined relative to the land available at the determined location and then an optimal orientation of the main development components was determined, taking into consideration the following factors:
 - > Access and connectivity;
 - > Footprint requirements;
 - > Hazards;
 - > Environmental considerations;
 - > Natural heritage designations;
 - Cultural heritage designations;
 - > People;
 - > Land use and topography;

- > Screening opportunities; and,
- > Planning regulations.
- 4.4 The optimal design and orientation of development components with the lowest risk of impacts on potential sensitive receptors was chosen. The layout and design of the Proposed Development has sought to minimise the potential permanent effects.
- 4.5 Key design principles and objectives followed in the design evolution of the Proposed Development included:
 - > Optimise the development 'footprint' within the Site to limit the area required for development, to minimise visual impact in the wider landscape and to utilise existing screening afforded by forestry and landform.
 - > Minimise the disturbance or displacement of protected species.
 - > Minimise need for land take with regard to reducing potential disturbance on natural and human environment.
 - > Creation of a new temporary and permanent accesses from Fanellan Road to minimise traffic along that road required during construction and operationally.
 - > Minimise the potential impact on nearby sensitive human receptors during construction and operation.
 - > Propose appropriate architectural form, colour and materials.
 - > Maximise available land for additional planting and landscape forms to improve screening and provide habitat and biodiversity enhancement.
 - > Take advantage of and minimise changes to the existing ground form and levels.

Sensitive Receptors

4.6

The layout and design of the Proposed Development has been strongly influenced by the potential impacts on sensitive receptors and features within the surrounding environment. This information has been embedded into the iterative design process to minimise the potential for permanent effects. Potential sensitive receptors within the study area are those where physical or perceptual effects may result as a consequence of the Proposed Development. These receptors can be defined from the following measures:

- > Physical Features: perceptible physical features (e.g. topographic features; woodland, hedgerows, field enclosure) which could be lost or altered through the introduction of the Proposed Development.
- > Landscape:
 - Landscape Character Types (LCTs) which display both physical and perceptual characteristics which could be affected by the Proposed Development.
 - Designated Landscape Areas: Areas of landscape which are principally designated for their scenic quality or rarity and considered of particularly increased value. Often defined by a number of key characteristics and/or special qualities informed by the underlying character of the landscape, consideration is given to how these may be affected and how the designated area may be altered by the Proposed Development.
- > Ecology:
 - Direct and indirect effects during construction and operation on protected and notable species as a result of loss or fragmentation of habitats, specifically pine marten, red



squirrel, water vole, mountain hare, brown hare, hedgehog amphibians and reptiles this could be via lighting, noise, pollution or visual disturbance.

Noise impact on residential receptors during construction and operation of the Proposed Development. The closest Noise Sensitive receptor (NSR) is Fanellan Farm House, approximately 0.3 km to the south. The nearest cluster of residential NSRs are to the west of the Site namely a cluster consisting of Fanellan Crofthouse, Allordale, Lower Fanellan and Forest Lodge, approximately 0.6 – 0.7 km, with 3 Fanellan (single dwelling) approximately 0.3 km. Other NSR are located to the north of the Site namely Teanassie Lodge and Dun Fion, approximately 1.1 km. These NSRs are deemed to be representative of nearby residences in the Study Area. If the noise criteria can be met at the closest NSRs, then any property at a greater distance will also meet the criteria as noise will reduce to a smaller value at a greater distance.

Design Considerations

- 4.7 The substation design has evolved through a series of iterations, integrating ongoing work to optimise electrical, civil engineering, and environmental features. The design aims to minimise significant environmental impacts of the Proposed Development through embedded mitigation, considering site topography, slope, drainage, existing land uses, and vegetation. Figure 3.1 above illustrates the Proposed Development design.
- 4.8 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. Chapter 8 (landscape and visual) provides further detail on colours and visual impacts.
- 4.9 Landscape design has been designed to help better integrate the Proposed Development into the landscape, in particular screening the Proposed Development from the surrounding visual receptors. The proposed landscape design, illustrated in Figures 4.1 and 4.2, includes landscape forms (earthworks), SuDs ponds, and various new plantings to enhance visual screening and biodiversity. The design incorporates the topography levels to create the development platforms and a series of landforms. These would extend over the greater extent of the Site to accommodate the platforms as well as respond to the natural contours of the rural landscape for screening purposes.
- 4.10 Where new proposed OHL lines are shown, no landscaping bunds or vegetation of substantial height would be included. This is to ensure that the minimum safety standards for clearances beneath OHL are maintained and to ensure that mature vegetation does not pose a safety risk should trees fall.
- 4.11 The new landforms and detention basins that will be created would be vegetated by sowing wildflower meadows or planted with occasional shrubs, hedgerows and woodland plantations. The woodland would be native broadleaved woodland. Some low-lying areas such as the base of landforms, ditches and detention basins would be allowed to regenerate naturally.
- 4.12 Any unnecessary earthworks have been avoided so there is a considerable extent of land that will remain unworked within the Red Line Boundary (outside of the proposed land ownership boundary that will only be needed during construction), mainly towards the north / eastern boundary of the Site where the permanent access road would extend towards the proposed junction. The infrastructure has been designed to be as tightly configured as possible, while maintaining the required separation, to minimise the extent of the earthworks.
- 4.13 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 Proposed Development platform, and the recycled material would be used as fill to construct the landscape forms, the construction of the access tracks and roads, as well as forming



temporary platforms for welfare facilities. The proposed landform is in keeping with the existing natural landform contours and would restrict visibility of the Proposed Development.

- 4.14 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 platform. The Site will seek to achieve a cut and fill balance as far as practicable during detailed design, to minimise the amount of exported material and in turn minimise the construction traffic volumes.
- 4.15 Where required, vegetation would be carefully removed from the Site, including trees and hedgerows (subject to ecological considerations). After felling, any timber that is commercially viable will be sold, with the remaining material to be dealt with in the best practicable environmental outcome and compliant with waste regulations.
- 4.16 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. Detailed visualisations in the form of photomontages are included in Volume 2, Chapter 8 Landscape and Visual Amenity together with the Colour Assessment which demonstrate illustrate how the Proposed Development will sit within the landscape.



Figure 4.1 Landscape and Biodiversity Mitigation Plan (Figure 1 of 2)





Figure 4.2 Landscape and Biodiversity Mitigation Plan (Figure 2 of 2)

Substation platform and HVDC platform

- 4.17 A level platform for the substation will be created by excavating into the site's slope. Excavated material will be used to form the platform where the site slopes away and to create screening landscape forms around the platform's perimeter. The platform will be a flat, rectangular area accommodating the electrical and built infrastructure, by 305 m x 525 m minimum size and would include a 4.2 m security fence.
- 4.18 HVDC Converter Station platform will be approximately 305 m x 285 m and will be located adjacent to the substation. The HVDC will comprise of a Valve Hall, DC Hall, Reactor Hall, and a Transformer Hall that will have adjacent Service and Control Rooms. Further buildings that will be constructed include smaller ancillary and support buildings which will be adjacent to the main converter station building. A connection to the AC will be via the overground busbar.
- 4.19 Please see drawings in the planning application for detail on the substation and converter station floorplans, elevations and designs.

Building Design and Form

- 4.20 As an Air Insulated Switchgear substation, the majority of the electrical plant and machinery on the platform will be out in the open. On the substation platform, the Proposed Development will also contain a steel-framed and cladded control building to house equipment for monitoring, controlling, and protecting electrical systems. This single storey building would have a maximum dimensions of 50 m x 26 m, with a maximum height of 7 m. SSEN Transmission would use this facility to manage the substation's maintenance and operation.
- 4.21 There are two HVDC buildings for pole 1 and pole 2 (due to the nature of the 2GW Bi-Pole Converter Station). Both Pole 1 and Pole 2 buildings will mirror each other. There will also be four smaller buildings for service and operations. The Proposed Floor and Roof Layout of the HVDC infrastructure is included in the planning application.



4.22	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 colour scheme would be confirmed in consultation with THC.
4.23	Air Insulated Switchgear and busbar will be installed with a maximum height of 15m, to connect incoming OHL circuits as well as the HVDC converter station and to facilitate the cable connection from the HVDC converter station. Please see drawing in planning application.
	Temporary construction compound and welfare area
4.24	A temporary construction compound and welfare area is required as per the Health and Safety logicilation and the CDM Regulations for welfare facilities on site. The Principal

- 4.24 A temporary construction compound and weitare area is required as per the Health and Safety legislation and the CDM Regulations for welfare facilities on site. The Principal Contractor (PC) will be responsible for the design and construction of hardstanding areas that obtain sufficient load-bearing capacity. If deemed necessary, a geo-textile layer will also be included within the design to facilitate effective stone removal upon the compound's dismantling.
- 4.25 The PC will provide a plan showing the location of the compound area which would also be displayed in the Site office. This compound area will provide adequate space for the facilities listed below and parking for employees and visitors.
- 4.26 Facilities to be provided in the temporary Site compound will typically include the following:
 - > Site office, of portacabin type construction;
 - > First aid facilities;
 - > Employee parking;
 - > Potable water supply;
 - > Bunded fuel storage area;
 - > Water tanker;
 - > Contractor lock-up facility; and
 - > Toilets.
- 4.27 These temporary facilities will be removed on completion of the construction phase and the areas will be reinstated to comply with the proposed site layout plan and landscaping plan.

5. Access

- 5.1 A DAS is a single document combining the Design Statement which addresses the design of the development and an Access Statement which demonstrates observance of the equal opportunities' requirements. The Statement should explain and justify the accessibility of the proposals. Accessibility to major infrastructure is fundamentally different by virtue of health and safety and operational regulations, than to that of a public or commercial building. The following section provides an overview of how the site has been designed to facilitate access for maintenance and operation only, and to ensure that the site is secure from intruders. Thereafter a summary discussion on the design of site access (externally and internally) follows to complete the design approach discussion and demonstrate that accessibility has been considered relative to specific infrastructure requirements.
- 5.2 For safety reasons, once the Proposed Development is operational, only authorised personnel will be allowed to access the Site for maintenance and inspection purposes only. It is assumed this would be required at regular intervals (monthly) however this will be dependent on specific operational requirements. Maintenance on the bays is likely to be



required annually in some form and this would require presence on Site for the duration of one week.

- 5.3 Given the nature of the Proposed Development, once operational access to the Site will be limited to authorised persons only and access by members of the public will not be permitted. As required by regulation, the Site has been designed to ensure security from all unauthorised persons including the use of palisade fencing around the platforms. The wider Site will be surrounded by a post and wire perimeter fence and would be controlled at the Site entrance by gate access, to prevent unauthorised vehicle access across the Site. Further measures of installing sensor activated lighting will also be carried out to ensure that the Site access is adequately lit when required.
- 5.4 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 priority junction. The site would therefore be accessed from this new permanent access road including new bellmouth which would connect with the C1106 Fanellan Road via a priority junction located approximately 100m to the west of the C1106 Fanellan Road junction with the U1604 Kiltarlity Road, to reduce the extent of public road use. This access track will remain in place permanently for operational use, Figure 5.1 The alignment of the access road has been designed to prevent direct views of the Proposed Development as far as practicable. The on-site access track layout has been designed to connect the various Proposed Development elements, whilst minimising hardstanding and maximising available land for landscape landform and planting. There is a temporary site access being formed to the south (and additional temporary access within the Site) but these will be removed on completion of works and reinstated back to landscaping.
- 5.5 Further access infrastructure includes modifications to the Black Bridge over the River Beauly which would be required to allow heavy vehicle access including the largest Abnormal Indivisible Loads (AILs) to site. The access routes to the site are in two phases, with the second utilising the Black Bridge modifications once completed. Details of the access routes can be found on the Outline Construction Traffic Management Plan (Outline CTMP) submitted with this application, and are summarised below:
 - > Access Phase 1: Route to Fanellan via Kiltarlity.
 - From September 2025, the A862 to the A833 would be used.
 - > Access Phase 2: Route to Fanellan via the Black Bridge.
 - Upon completion of the modification works to Black Bridge in August 2027, the A831 to the C1106 would then be used.
- 5.6 An AIL assessment has been prepared and submitted along with this application. The assessment concludes that road networks to both Invergordon and Nigg require minor horizontal improvements to facilitate the transportation of the AIL. Improvements are also required to the C1106 and corresponding junctions to allow the volume of HGVs to access the site without causing issues for other road users. These improvements will allow traffic to pass each other in different directions safely and avoid the need for stoppages on the road network.
- 5.7 It was overall considered that the most suitable means of getting the AIL to the site at Fanellan is via the A831 to the Black Bridge. This route would ensure all construction traffic minimises disruption in the surrounding minor roads.





Figure 5.1 Proposed Access Road and Junction

6. Conclusions

- 6.1 The Applicant has given careful consideration to the siting, design, layout and access of the Proposed Development to ensure it is designed sensitively for the surroundings. The proposal seeks to fit a functional development which avoids significant impacts on nearby receptors. The design has been progressed to fit sustainably into the environment in which it sits whilst satisfying technical requirements and functionality. The Proposed Development as a whole seeks to deliver sustainable development via facilitating net zero targets and increased transmission of renewable energy.
- 6.2 Unauthorised access to infrastructure sites of this nature is prohibited. The site has been designed to reflect the function and technical requirements of an operational substation and relevant health and safety features thereof. Access is strictly controlled and limited but has been designed such that all users can be accommodated. The primary access to the Site will be taken from Fanellan Road by the forming of a new priority junction on the C1106, with operational material deliveries originating from the A831 corridor located to the east.
- 6.3 The Proposed Development has been designed in accordance with THC's SG on Sustainable Design, where relevant. The use a colour assessment has helped ensure that the design and appearance of the scheme would be visually appropriate. Landscaping plans have been provided, together with a Landscape Habitat Management Plan, to integrate the development into the existing landscape, with local materials being prioritised for use in the construction of the development. Further environmental assessments have ensured mitigation measures, where relevant, would be implemented to mitigate against any significant impacts on natural heritage, ecology, cultural heritage, and flooding. The Construction Environmental Management Plan (CEMP) and the Outline CTMP would ensure construction works are undertaken in a way that protects the environment, while minimising disturbances to neighbouring properties. Please see Appendix A for further information.



Appendix A - Sustainable Design Guide Supplementary Guidance Checklist

Sus Che	stainable Design ecklist	Minimum Standards	Relevant Policies & Additional Guidance	Commentary
1.	Layout, scale, proportion, materials, construction and finishing.	A – D achieved	HwLDP Policy 30 Design Quality & Place-Making HwLDP Policy 62 Landscape	A - An Environmental Colour Assessment was undertaken to identify the natural colours present in the surrounding landscape during different
Will the visu con cha rein dist mat etc) inte con	the appearance of development be ially appropriate, inplementing local racter whilst forcing local inctiveness (e.g. terials, road pattern and be clearly grated with the wider inmunity?		Housing in the Countryside Siting and Design Guide (Supplementary Guidance) Residential Layout and Design Supplementary Guidance PAN 68 – Design Statements	colour strategy was developed and will form part of a Design Code for the further detailed design development. Public feedback from consultation events included suggestions for greens, browns and blacks or a mix with the prominent requests noted for subdued greens and browns which have been
A.	Building materials and colour complement local character			included in the colour palette. The above colours also include a mid-grey colour, as requested by THC, along
В.	Site layout, building style and scale enhance local			with browns, greens and grey. B, C, D - Legislation and
C.	Roof-scales visually respect the local context (allowing for low carbon technologies where appropriate)			standards drive the basic design with the functionality of the Proposed Development required by the Applicant as an Electricity Undertaker. Key design
D.	Continuity of local building details such as simple and uncomplicated design of roofs, dormers, windows			principles and objectives followed in the design evolution of the Proposed Development are listed in Section 4. E - N/A this is industrial
E.	Potential for personalisation by prospective residents			development. F - N/A this is industrial development.
F.	Contemporary approach which reflects the local vernacular where appropriate.			



Sustainable Design Checklist	Minimum Standards	Relevant Policies & Additional Guidance	Commentary
 Landscaping Has a landscaping scheme been drawn up for the site which ensures that: A. Landscape forms the context for the development. B. The development integrates into or enhances the present landscape character. C. Green spaces are provided for public/private and site boundaries (including tree and shrub planting). D. Public open space and recreational provision is given as required. E. Safeguards green networks within the site, and establishment of green network features that link into the wider green network. 	Landscape Scheme drawn up covering criteria A – E.	HwLDP Policy 62 Landscape. HwLDP Policy 76 Open Space. and Open Space in New Residential Development: Supplementary Guidance. Housing in the Countryside Siting and Design Guide (Supplementary Guidance). Trees, Woodland & Development Supplementary Guidance. Green Networks Interim Supplementary Guidance. Green Networks Interim Supplementary Guidance. Natural History Museum Plant Finder Website: http://www.nhm.ac. uk/fff/search.html for information on native species.	A, B, C, E – A Landscape Architect has informed the design of the proposed development, and a Landscape Mitigation Plan has been provided as part of the EIA together with Landscape Habitat Management Plan. D – N/A this is industrial development and health and safety precludes the use by public of land within or directly surrounding the development.
3. Cultural Heritage Are the culturally and archaeologically important features on the site and their settings known, and how will these be affected by the development?	Important features are identified, assessed and protected.	HwLDP Policy 58 Natural, Cultural & Built Heritage. Heritage Strategy Supplementary Guidance.	Heritage assessments have been undertaken, concluding that it is unlikely that there would be significant adverse effects on cultural heritage assets, as a result from this development proposal. To ensure this is the case, mitigation measures, such as Archaeological Project Design for Archaeological Evaluation and Mitigation, are being proposed.
4. Materials Which materials are from secondary or recycled sources, have low- embodied energy, and are from sustainable and/or local sources?	At least 3 out of the 5 key elements achieve a Green Guide rating of A+ to D.	BRE Green Guide to Specification provides additional background information. Housing in the Countryside Siting and Design Guide	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 (and e.g. used for creating



Sustainable Design Checklist	Minimum Standards	Relevant Policies & Additional Guidance	Commentary
 A. Roof B. External walls C. Internal walls (including separating floors) D. Upper and ground floors (including separating floors) E. Windows 	100% of timber must be from FSC/PEFC sources.	(Supplementary Guidance). Forestry Commission Scotland's 'Sustainable Construction Timber' gives additional guidance on sourcing and specifying timber.	 landscape forms) or imported locally. Site won materials would be prioritised over imported materials. A, B, C - Buildings on Site would comprise of a steel frame with either metal or composite cladding. D – The ground floor would consist of a concrete finish, which would be delivered to site pre-mixed or would be batched onsite. Any first floors would consist of steel flooring. E - This is not applicable or relevant due to the nature of the Proposed Development.
5. Natural Heritage Has an assessment been made of the site's ecology and will the ecological value of the site be protected or recreated to equal quality and or enhanced?	Assessment undertaken and strategy produced by an ecologist (or equivalent) to protect or recreate existing ecological value.	HwLDP Policy 58 Natural, Cultural & Built Heritage.	Ecological assessments have been undertaken, and with the proposed mitigation measures and biodiversity enhancement plans, (including offsite), this would result in an overall greater ecological value, including achieving a minimum of 10% BNG. Ecological and ornithological assessments have determined that, with proposed mitigation including where relevant, compensatory measures, any residual effects from construction and operation of the Proposed Development would not be significant. Proposed mitigation measures and further details on natural heritage can be found in Chapter 9 of the EIA Report (and Chapter 10 for Ornithology).
6. Enhancing Wildlife Will there be;	A – D achieved.	HwLDP Policy 59 Protected Species. HwLDP Policy 60 Other Important Species.	A - The Proposed Development will result in losses to habitats that will lead to a decrease in Biodiversity Units (BU) and an Outline Landscape



Su: Ch	stainable Design ecklist	Minimum Standards	Relevant Policies & Additional	Commentary
			Guidance	
А. В.	No net loss in relation to habitats and species? A mixture of locally occurring species specified for planting and landscaping		HwLDP Policy 61 Other Important Habitats. HwLDP Policy 75 Green Networks.	and Habitat Management Plan (oLHMP) has been formulated to replace those lost BU as far as possible on the site. Overall, not all the BU that will be lost as a result of
C.	schemes? Any new links between habitats within the site or links to habitats outside the development		Green Networks Supplementary Guidance. Guidance on Development and	the Proposed Development can be replaced on site and the Applicant will therefore be providing new and enhanced habitats off-site to achieve 10% net gain.
D.	boundary? An increase in important or sensitive habitats identified in the Local Biodiversity Action Plan (LBAP), either by creating or restoring ecological value (as assessed by an ecologist), or support for a species identified in the LBAP?		Biodiversity (Supplementary Guidance). Trees, Woodlands & Development Supplementary Guidance.	 B - The design strategy that forms part of the environmental commitments aims to introduce native habitat types in keeping with local biodiversity targets. The new proposed landscape that will be created would be vegetated by sowing wildflower meadows or planted with occasional shrubs, hedgerows and native broadleaved woodland plantations. C, D - UK Habitat Classification (UKHab) and NVC surveys were
				undertaken to identify primary habitats of elevated importance with reference to national and local biodiversity priority lists. These have informed the Landscape and Habitat Management Plan (LHMP). There are predicted beneficial impacts for bats in terms of enhanced habitat for foraging, heterogeneity and connectivity created by the woodland planting on the landforms which would create additional linear features (for bats) and sheltered commuting corridors (badgers), connecting across the Site to further woodlands and sheltered habitats in the wider landscape to the south west and north east.
7.	Energy efficiency	A – C achieved.		This criteria is not directly relevant to the Proposed



Sustainable Design Checklist	Minimum Standards	Relevant Policies & Additional Guidance	Commentary
 What steps have been taken towards reducing CO² emissions through energy-efficient design for the proposed development? A. Minimising energy demand for the site through orientation and maximising passive solar gain. B. Maximising the thermal efficiency of individual buildings through thermal mass, insulation, natural shelter, and appropriate glazing. C. Minimising demand for water heating, space heating and cooling, lighting and power in individual dwellings through efficient equipment and controls. 			Development. During operation, due to the nature of the Proposed Development as a strategic transmission hub there is limited potential for emissions to air from the Site components. NPF4 concludes that: "the lifecycle greenhouse gas emissions assessment concludes this development [Strategic Renewable Electricity Generation and Transmission] will likely have an overall net positive impact on achieving national greenhouse gas emissions reduction targets" ¹ .
 8. Renewable energy Has the energy demand for the development been calculated to determine: A. The amount of low or zero carbon technology e.g. wind, solar, hydro, photovoltaic (PV), Combined Heat and Power (CHP) that is practicable to meet the extant Building Standards CO² emissions reduction target. B. The % of total site energy demand that will be produced from on-site renewable energy technologies. C. Meeting the remaining energy demand efficiently, e.g. non-renewable or waste powered 	A - C is required only where the development is 500m2 or over. The CO ² emissions reduction target should be met through a combination of on- site low or zero carbon technologies (LZCT) and other appropriate measures. The amount of low or zero carbon technologies (LZCT) employed will depend on the technical constraints and scale of the proposed development.	Climate Change (Scotland) Act. Scottish Planning Policy (SPP). A Low Carbon Building Standards Strategy For Scotland. Scottish Building Standards.	This is not applicable or relevant due to the nature of the Proposed Development. This application is essential to the increase employment of renewable energy projects.

¹ National Planning Framework 4 (www.gov.scot).



Sustainable Design Checklist	Minimum Standards	Relevant Policies & Additional Guidance	Commentary
district heating and cooling.			
9. Foul wastewater treatment Will the development be connected to the public sewer; if not has a sustainable waste water treatment system been designed to avoid unacceptable damage to the water environment?	Separate systems are proposed for foul and surface water drainage. Foul drainage is via a connection to the public sewer, or where no connection is available, system is designed and built to a standard to allow adoption by Scottish Water and can easily be connected to the public sewer at a later date. Discharges from private sewerage systems will be registered or licensed by SEPA depending on the development size.	HwLDP Policy 64 Water Environment. HwLDP Policy 66 Waste Water Treatment.	The foul water generated from toilets and washing facilities provided within the Proposed Development will be treated by the Package Treatment Plant on site. 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.
 10. Flooding What measures have been taken to ensure that the development will: A. Be free from significant risk of flooding; B. Not add to the area of land that requires flood; and C. Not affect the ability of the functional floodplain to store or move flood waters? 	Reference has been made to SEPA's Flood Risk Maps to determine if a Flood Risk Assessment is required. In all cases the development site is demonstrated to be outwith the functional floodplain (i.e. there is not more than a 1:200 year flood risk).	HwLDP Policy 65 Flood Risk. Planning for Managing Floods Supplementary Guidance.	Volume 2, Chapter 13 of the EIA Report addresses hydrology matters in detail including flood risk and sustainable drainage and there are no issues arising with regard to these topics. Flood Risk Assessment and Drainage Impact Assessment are included.
11. Surface water runoff Which of the following localised strategies for ensuring that runoff from the finished development does not exceed runoff from the previously undeveloped site have been proposed and designed in accordance with the SUDS Manual C697 published by CIRIA:	A and B.	HwLDP Policy 67 Surface Water Drainage.	The Proposed Development would 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 will be managed by using a SuDs system which is integrated as part of the landscape and drainage



Sustainable Design Checklist	Minimum Standards	Relevant Policies & Additional Guidance	Commentary
 A. Prevention of runoff at source – through simple design measures on individual buildings (e.g.; minimising paved areas) to allow water to return to the natural drainage system as near to the source as possible and not to contribute to runoff. B. Source control of runoff rate/volume - through control of the rate/volume of runoff generated close to source e.g.: rainwater harvesting systems, green roofs and individual soakaways for buildings. C. Site control of water management – water is managed from several areas e.g.: roofs and parking areas into one large soakaway or device such as an infiltration basin. This incorporates enhancing biodiversity and amenity and is sized to allow incorporation of further developments in future 			design. Natural vegetation, including wetland meadow grassland, have been introduced as part of the SuDS' design. 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. A Drainage Strategy and a Drainage Impact Assessment have been provided with the planning application (Volume 2, Chapter 13 Appendix 13.2 2 and 13.3)
12. Water conservation How will the development sustainably meet the required water demands including through the use of:	Α.		This is not applicable or relevant due to the nature of the Proposed Development and how infrequently the Site is visited by maintenance personnel.
 A. Water efficient appliances such as dual flush toilets, aerating taps, and water-efficient white goods; B. Rainwater collection for re-use; and C. Green roofs. 			



Sustainable Design Checklist	Minimum Standards	Relevant Policies & Additional Guidance	Commentary
 13. Waste and recycling Has suitably screened space been made available for the storage of waste and recyclables in or around each building including: A. Space for sorting and storing recyclable materials; B. Space for general waste storage; and C. Space for composting organic kitchen and garden waste? 	A-C.	Managing Waste in New Developments Supplementary Guidance.	This is not applicable or relevant due to the nature of the Proposed Development. All waste would be taken away by Site operatives to be recycled elsewhere.
 14. Site management How will development of the site be undertaken in a manner which minimises disturbance to neighbouring properties and the environment including addressing: A. Noise pollution B. Light pollution C. Air pollution D. Construction waste E. Surface water run-off F. Soil handling G. Protection of trees H. Traffic movements I. Access 	Considerate Constructors Scheme is implemented to minimise noise, light and air pollution and a Site Waste Management Plan is put in place which reflects the requirements of Netregs, including identifying: • types of waste removed from the site; • the person who removed the waste; and • the site that the waste is taken to. Key sources of potential disturbance and pollution are identified and mitigation measures put in place.	Considerate Constructors Scheme provides additional background information. Highland Council's Construction Environmental Management Process for Large Scale Projects. Trees, Woodlands & Development Supplementary Guidance. Netregs - www.netregs.gov.uk	All works will be completed in accordance with the General Environmental Management Plans (GEMPs and the SSEN Transmission's Species Protection Plans (SPPs). Furthermore, a contractual requirement of the PC 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. An Outline CTMP has been provided with the application. Once the Proposed Development is operational, traffic would be low, with the local road network being regarded as suitable to accommodate the traffic during the operational phase.



Sustainable Design Checklist	Minimum Standards	Relevant Policies & Additional Guidance	Commentary
 15. Transport How does the development proposal make a positive contribution towards the improvement of the sustainable transport network by: A. Reducing car dependency; B. Promoting sustainable transport modes; C. Creating or linking to existing sustainable travel modes including the core path network, safe routes to schools and workplaces by cycle, pedestrian or public transport; and D. Reducing the need to travel; demonstrated through a Transport Assessment where transport impacts are considered to be significant. 	Positive impacts are demonstrated on A – D.	HwLDP Policy 57 Travel. Highland Council Local Transport Strategy.	A, B, C - This is not applicable or relevant due to the nature of the Proposed Development. Furthermore, due to the Sites location, public transport would not be readily available, however Site operatives would car share wherever possible. The Proposed Development does not impact on any Core Paths. D – An Outline CTMP has been provided with the application. Once the Proposed Development is operational, traffic would be low, with the local road network being regarded as suitable to accommodate the traffic during the operational phase.
 16. Pedestrians and cyclists How close is the development to existing public transport networks? What provision is made for secure cycle storage in new buildings and at associated local facilities including transport hubs? 	State approximate distance from the centre of the development to nearest bus stop. For residential development, the design provides external cycle storage space, for example in private garden area garages, or in the case of flats secure communal cycle storage. For non-residential development secure cycle storage is provided on-site.	HwLDP Policy 57 Travel. Highland Council Local Transport Strategy.	This is not applicable or relevant due to the nature of the Proposed Development.
 17. Efficient use of land and existing buildings How does the design ensure that: 	A-B. C is required where derelict and redundant buildings exist on the development site.	HwLDP Policy 36 Housing in the Countryside (Hinterland areas). Housing in the Countryside	A - 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



Sustainable Design Checklist	Minimum Standards	Relevant Policies & Additional Guidance	Commentary
 A. Disturbance to soils is minimised for example through minimising required earthworks. B. Where appropriate demolition materials will be re-used on- site, rather than transported off-site as waste materials. C. Existing redundant and derelict buildings are sympathetically converted and/or restored where appropriate with a bat survey and mitigation plan carried out if necessary. 	Their exclusion from a development proposal should be adequately explained and evidenced.	Supplementary Guidance. Highland's Statutorily Protected Species Supplementary Guidance.	 construct the platforms or imported locally. The size of the Site has been dictated by engineering constraints and requirements. B - The Principal Contractor will evaluate options for re-use where possible once the materials have been characterised. Where possible materials will be sorted on site by the contractor and recycled / disposed as appropriate and feasible, in line with the principles of the Waste Hierarchy. C - This is not applicable or relevant due to the nature of the Proposed Development.
 18. Design for flexibility Has flexibility been designed into all units to provide adaptability to changing needs? A. Has design to Lifetime Homes Standards been adopted? B. Has infrastructure been installed to allow for home working, e.g. telephone / Wi-Fi for all developments? C. Does building structure and position allow for future extension? D. Have construction techniques been used which enable internal walls to be easily removed or re-positioned to create new spaces? 	A-B required for residential developments. C-D required for non-residential developments.	HwLDP Policy 46 Communications Infrastructure.	This is not applicable or relevant due to the nature of the Proposed Development.
 19. Private amenity space Is there provision for private amenity space e.g.: private garden, 	A – E.		This is not applicable or relevant due to the nature of the Proposed Development.



Sus Che	stainable Design ecklist	Minimum Standards	Relevant Policies & Additional Guidance	Commentary
bald pati gard is e occ proj size proj	cony, roof terrace or o, or a communal den/courtyard which asily accessible for upants of designated perties, and does the e and type of area vided allow for:			
А. В.	All occupants to sit outside at once; Safe access by those using wheelchairs or mobility aids:			
C. D. E.	Growing fruit or vegetables; Composting of kitchen and garden waste; and Drying washing.			
20.	Accessibility of community facilities	State approximate distances from the development to the	HwLDP Policy 38 Accommodation for an Ageing	This is not applicable or relevant due to the nature of the Proposed
Hov dev follo	v far in miles is the elopment from the owing facilities?		HwLDP Policy 41 Retail Development.	Development.
A.	Healthy facilities such as a surgery or pharmacy;		Highland Council Local Transport Strategy.	
В. С.	Education facilities such as a crèche, primary and secondary schools; Shop;			
D. E.	Bank, Post Office or cash machine; and Leisure facilities such as a community centre or indoor sports facility.			