VOLUME 2: CHAPTER 3 - DESCRIPTION OF THE PROPOSED DEVELOPMENT

Appendices (Volume 4 of this EIA Report)

There are no appendices associated with this Chapter.

Figures (Volume 3 of this EIA Report)

Figure 3.1: Proposed Development

Figure 3.2: Landscape Design

3. DESCRIPTION OF THE PROPOSED DEVELOPMENT

3.1 Introduction

This Chapter describes the various elements of the works that constitute the Proposed Development for the construction and operation of the proposed 400 kV air-insulated substation on Emmock Road and the formation of associated earthworks, access, drainage, landscaping, and security, including the creation of temporary construction compounds. The Proposed Development is also referred to as Emmock substation (see **Section 1.1 Chapter 1 Introduction**).

3.2 Location of the Proposed Development

3.2.1 The Site comprises arable land at Balkemback Farm with an approximate centroid National Grid Reference (NGR) at NO 38862 37812 (See **Chapter 1 - Figure 1.1: Proposed Development**). The Site is located south of the Sidlaw Hills in Angus, an area of open agricultural lowlands with scattered properties and existing infrastructure. Dundee is located approximately 2.8 km to the south of the Site. A number of individual residential properties are scattered throughout the area including, but not limited to, the dwelling at Balkemback located outside the Site along its northeastern boundary and Balkemback Cottages located approximately 50 m to the north of the Site. The settlement of Tealing is located approximately 1.6 km to the east of Site and the settlement of Bridgefoot is located approximately 1.8 km to the southwest of the Site.

3.2.2 The Site is currently in agricultural use and is comprised of several fields with associated boundaries of hedging and fencing. The Site is bounded to the south by existing field boundaries and to the southwest by the Fithie Burn which is heavily modified. To the west the Site is demarcated by traditional agricultural boundary treatments. At the northern periphery the Site boundary terminates mid-field with the aim to return much of the field to agricultural use post construction. This would make the effective site boundary proximal to the existing field boundary immediately north of the proposed location of the substation platform. To the eastern extent, a culverted watercourse runs near the periphery of the agricultural land, separating the fields from Emmock Road (U322).

3.2.3 The wider site setting is similar in character to the Site, comprising agricultural land with small pockets of residential properties to the north and east of the Site, of which eight properties are located within 200 m from the northern edge of the Site boundary. The settlement of Tealing lies approximately 1.5 km to the northeast of the Site. Two notable exceptions to the general pattern of the wider landscape are: Craigowl Hill, some 2 km north, with its associated elevations and woodland to the northwest; and the existing Tealing Substation located approximately 230 m to the southeast of the Site, along with its attendant infrastructure, including two existing 275 kV OHLs connecting Tealing Substation with Alyth and Westfield (Glenrothes) Substations. An overhead line passes through the southern part of the Site in an east to west orientation. Two on-site, landowner-owned, low-output wind-turbines, which will be decommissioned prior to construction, are located within the western part of the Site.

3.3 Description of the Proposed Development

3.3.1 The Proposed Development comprises the construction and operation of a 22 bay, 400/275 kV Air Insulated substation located on a level platform and the formation of associated earthworks, access, drainage, landscaping, and security, including the creation of temporary construction compounds. The Site layout is shown in **Figure 3.1: General Arrangement**.

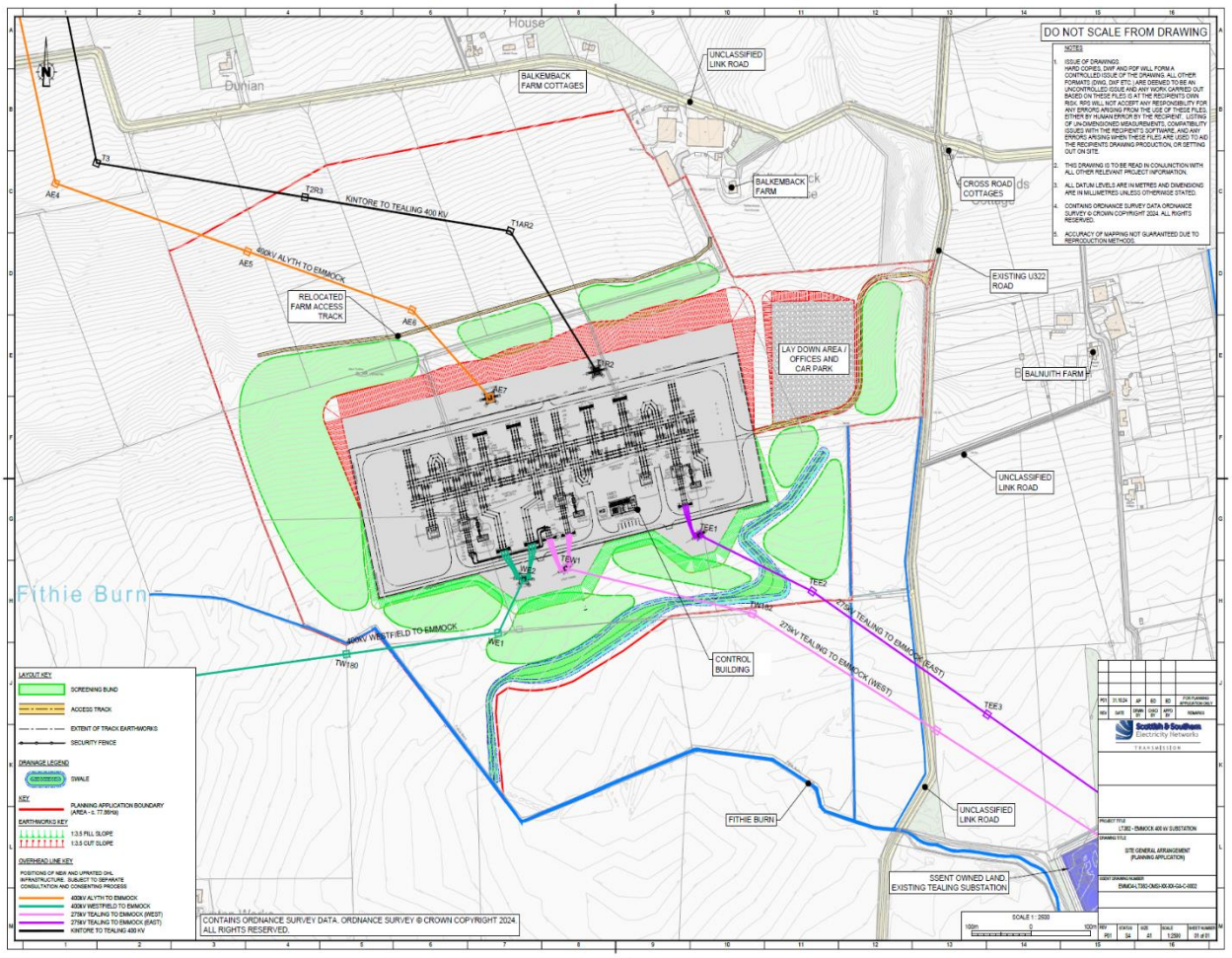

Figure 3.1: General Arrangement

3.3.2 In summary, Site development would involve cut and fill earthworks to create a level platform of approximate dimensions 675 m x 285 m along an east-west orientation in the centre of the Site, to accommodate the electrical infrastructure and provide space in the event future equipment is needed. To the west, north and east of the platform, earth bunds would be formed to screen the electrical infrastructure, with further bunds and SuDS to the south of the platform. A new access would be formed between Emmock Road (U322) and the platform. A temporary combined compound and laydown area approximately 188 m x 140 m would be formed to the east of the platform This area would be returned to agricultural use following construction.

3.3.3 The key design elements of the Proposed Development are described below:

- Cut and fill operations to create a development platform to accommodate the electrical infrastructure.
- Creation of a new permanent access road east of the Site from Emmock Road
- Construction of a structure over an unnamed culverted watercourse that drains to the Fithie Burn to the south;
- Widening of the access track at Emmock Road to allow for passage of HGVs;
- The erection and commissioning of electrical equipment;
- Erection of a single storey control building approximately 7m in height;
- Perimeter fence, potentially up to 4 m height;
- Landscaping, including screening bunds and new planting to deliver landscape and visual mitigation, and biodiversity net gain (BNG) measures (both on and off site);
- Permanent earthworks and site drainage provisions, including Sustainable Drainage Scheme (SuDS) basins, swales, and a network of interceptors draining into Fithie Burn;
- Internal accesses and parking spaces within the substation platform area;
- Temporary site compound lay down area and material storage areas; and

- Temporary site offices and welfare facilities for on-site construction workers.

The substation would use new 400 kV Air Insulated Switchgear (AIS) equipment with an approximate height of 18 m above platform level, including transformers, connection bays and gantries. **Table 3.1: Substation Technical Requirements** below lists the technical requirements of the substation and **Table 3.2: Substation Equipment** the electrical infrastructure and connection requirements. **Figure 3.2: Site Plan** shows the electrical layout.

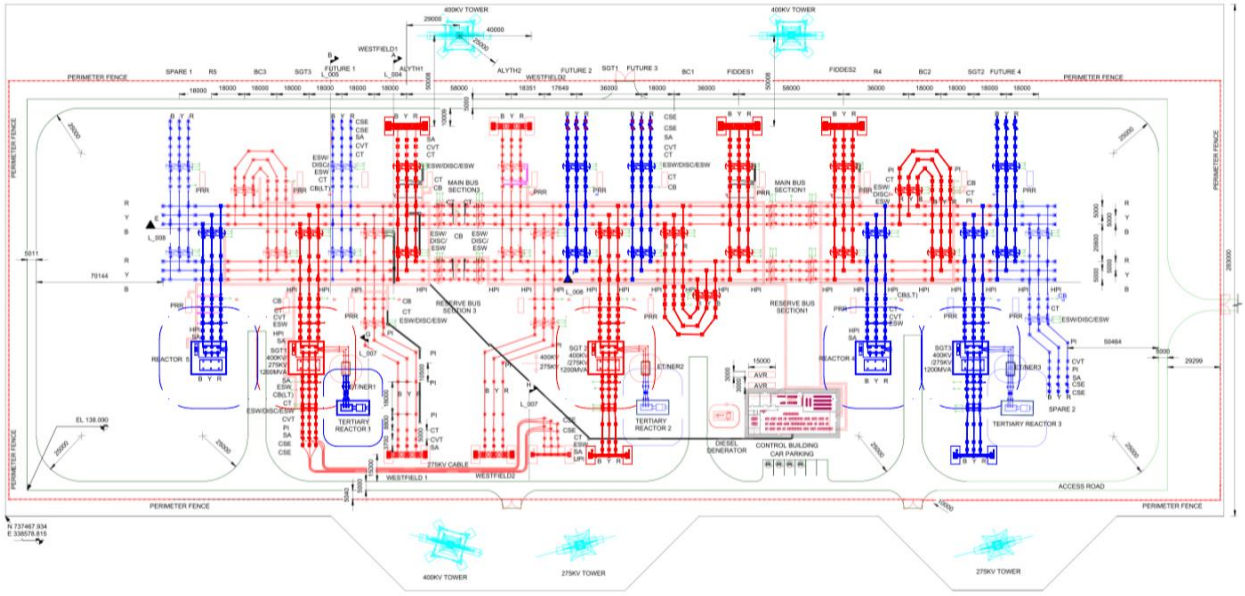

Figure 3.2: Site Plan (Excerpt/Not to scale)

Table 3.1: Substation Technical Requirements

Substation Technical Requirements	Purpose
Large, levelled platform area, sized approximately 675 m x 285 m	Provide foundation for substation structures and equipment
400 kV Control Building	Houses critical equipment for monitoring, controlling, and protecting electrical systems
3 x Bus Couplers	Couple two busbars to perform maintenance on other associated circuit breakers
2 x Bus Sections	Sectionalize bus system for load breaking
2 x Feeder Bays	Enable connections for the new 400kV OHL to Hurlie/Kintore
2 x Feeder Bays	Connect the upgraded Alyth – Tealing OHL
2 x Feeder Bays	Connect the upgraded Westfield – Tealing OHL
6 x Future Feeder Bays	Connect Scotwind projects
Below ground earthing	Ground electrical equipment for safety

Table 3.2: Substation Equipment

Substation Equipment	
Primary	**Purpose**
Support structures	Construct, mount, and secure equipment
Gantries x 9	Steel structures to support OHL connections
Switchgear	Disconnectors and circuit breakers to control, protect and isolate electrical equipment to allow work to be done and clear faults downstream
Instrument transformers	Transform voltage or current levels for metering and protection purposes
Surge arrestors	Protect electrical devices in alternating current circuits from voltage spikes with very short duration measured in microseconds, e.g. lightning strikes

Substation Equipment	
Busbars and clamps	Aluminium bars used to transfer the electricity between equipment in the substation
HV Cable	High-voltage cable including a conductor and insulation for electric power transmission at high voltage
SGT x 3	Supergrid transformer to change the voltage from one part of the network to another
275 kV feeder circuits x 3	Provide circuit connection to 275 kV Tealing substation
Tertiary reactors x3	Provide reactive compensation for transmission lines
Shunt reactors x 2	Assist in managing and controlling system voltage levels across the network
Secondary	**Purpose**
Control building steelwork	Construction
Diesel generator	Provide backup power should the normal supply fail, so that the substation can continue operating until permanent supply is restored
AVR x 2	Automatic voltage regulation to stabilise the substation's auxiliary power supply to allow reliable operation
Protection panels & SCS	Protection and control panels that contain relays to protect the substation equipment and allow remote monitoring and control
LVAC, LVDC panels and cables	Panels and cables for Low Voltage Alternating Current / Low Voltage Direct Current
Multicore cables	Combine multiple power feeds into a single jacketed cable
Batteries	Provide auxiliary power supply
PRRs	Portable relay rooms to locate protection and control equipment within the substation compound

3.3.4 **Figure 3.3: Newly Constructed Rothienorman Substation** is a photograph of the recently commissioned Rothienorman substation which gives a general impression of the appearance of the substation platform of the Proposed Development. Note that the platform dimensions for the Rothienorman platform is smaller than Emmock.

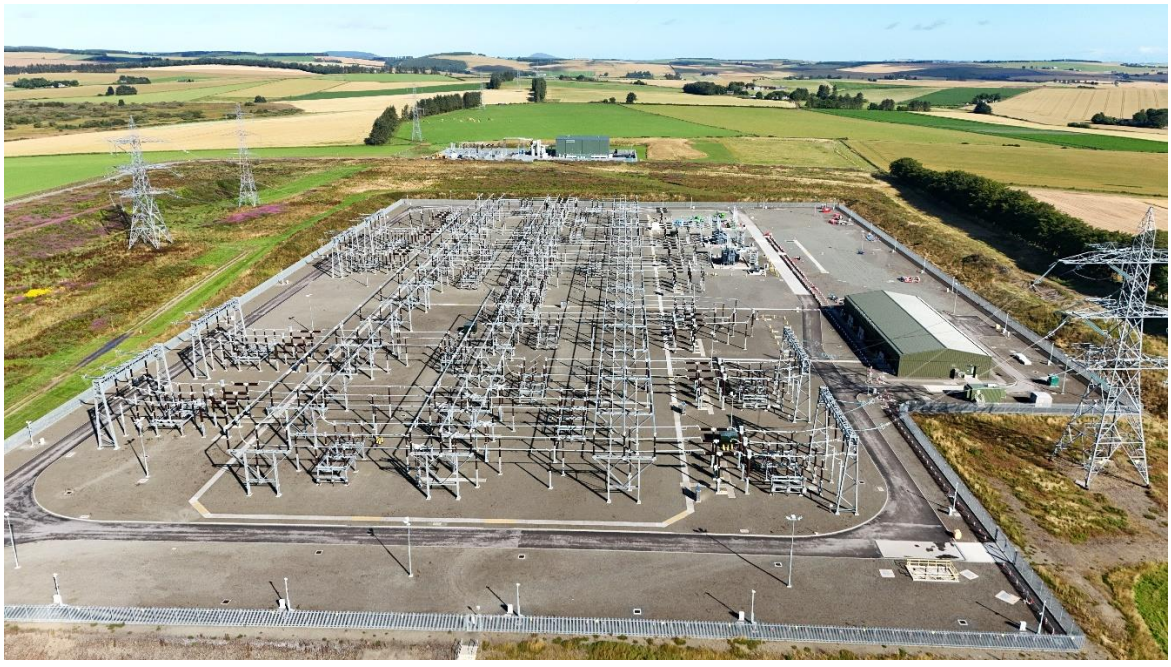

Figure 3.3: Newly constructed Rothienorman Substation. Source. SSEN Transmission

Related Developments

3.3.5 The Proposed Development is being planned in parallel with the following SSEN Transmission projects which would connect to the Proposed Development, and for which separate section 37 applications will be submitted.

- The Kintore to Tealing (K-T) 400 kV OHL

- A-T and W-T OHL tie-ins to Emmock substation, and tie-backs between Emmock and Tealing substations.
- Reconductoring of the Westfield to Tealing (W-T) 275 OHL
- Reconductoring of the Alyth to Tealing (A-T) 275 kV OHL

The connections would be formed via terminal towers located within the footprint of the Proposed Development, but which are not part of the substation electrical infrastructure and not part of the Proposed Development.

Where the above-mentioned connecting OHLs are considered likely to give rise to cumulative impacts, in combination with the substation, they will be considered in the respective EIARs/supporting environmental information. The approach to identifying and assessing cumulative impacts is detailed in **Chapter 14: Cumulative Effects**.

3.4 Substation Design

Evolution of Substation Design

3.4.1 The proposed substation design has been progressed through an iterative process integrating electrical and civil engineering and environmental considerations. The design process has sought to reduce the potential for significant environmental effects at the outset taking account of site topography, slope, drainage, existing land uses and vegetation**.**

The principal iterations have focused on reducing the extent of the Site and on optimising the cut and fill works. As a result, the Site area has been reduced from approximately 90ha to 78ha, largely driven by the requirements of the landowner. The main platform width has been reduced slightly from 300m to 285m with extension areas measuring up to 331m and the platform level lowered from 140.5m to 139m reducing the extent to which the electrical infrastructure would be visible, particularly from the north. The access from the U322 has been repositioned and shortened to enter the platform at a different point, accommodating storm water flows in a more efficient manner and removing the need to raise part of the proposed road. The SuDS has been reconfigured as a single detention channel, while maintaining its function in ensuring run off from the Site is no different in volume or quality to current run-off. The landscape design has been reconfigured as a result of the reduction in Site area while retaining its function to mitigate potential landscape and visual impact.

Substation Platform

3.4.2 The Site falls from approximately 173m AOD in the north to 131 m in the south. The substation platform would be formed by excavating into the slope of the Site. Excavated material would be used to form the platform where the Site slopes away and to form screening bunds around the perimeter of the platform. See **Figure 3.4: Emmock Illustrative Section** for a profile illustration of the Site. The platform would comprise a flat, rectangular area accommodating the electrical and built infrastructure. A number of concrete foundations will be installed to support the electrical equipment, with a stoned finish to the compound. Curbed tarmac surfaced roads will be installed.

3.4.3 Drainage will be provided by a network of surface drains with interceptor traps, which will drain to the SuDS (see Drainage below).

3.4.4 The platform would be formed largely from site won excavated material although it is anticipated that engineered stone would need to be imported to form the upper drainage layer.

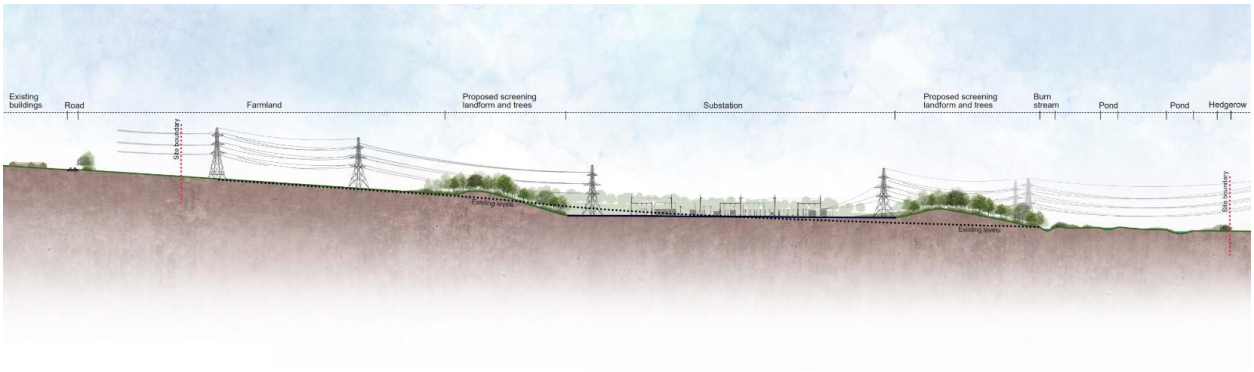

Figure 3.4: Emmock Illustrative Section

Control Building

3.4.5 A steel framed and cladded control building would be required to house equipment to monitor, control and protect electrical systems. The control building would have a footprint no greater than 50 m x 25 m with an elevation no higher than 7 m. The building, which SSEN Transmission would use to manage the maintenance and operation of the substation, would contain welfare facilities and likely be located on the southern boundary of the Site. palate would be determined during detailed design and through agreement with Angus Council and would likely be consistent with other SSEN Transmission infrastructure. The substation would be controlled remotely and not permanently staffed.

3.4.6 Parking places would be provided within the Site for control and maintenance personnel.

Security Fencing and Lighting

3.4.7 The platform will be secured with the provision of a 4 m high steel palisade security fence around its perimeter. Access will be via a security gate mid-way along the eastern edge of the platform. Individual light clusters will be low-level, narrow beam, and directed downwards to minimise glare and light spill; different lighting configurations and designs will be adopted for different parts of the Site. Lighting would only be provided during emergency operations at night-time. No lighting would be used under normal operation.

Landscape Design

3.4.8 The proposed landscape design is shown in **Figure 3.5: Landscape Design**. It would comprise screening bunds, SuDs ponds, and the establishment via new planting of a variety of habitat types that would provide both visual screening and improved opportunities for biodiversity. The design will introduce new elements formed from excavated material, new shelter belts and new field edge treatments.

3.4.9 Nine landscape bunds are proposed that surround and screen the substation platform on all sides Bunds 1 to 3 provide screening to the north and northwest (bund 1); Bunds 4 to 6 screen to the east and southeast, with the design revised to reposition bund 5 closer to the eastern boundary between Emmoch Road and the compound and laydown area, as a result of access being moved further north away from Balnuith, to reduce direct views of the site. Bunds 4 and 5 were then merged to screen views from the southeast; while bunds 7 to 9 screen to the south and southwest (bund 9).

3.4.10 Where existing and proposed OHL lines are shown, no landscaping bunds or vegetation of significant 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 were trees to fall.

3.4.11 The planting schedule comprises woodland block and scrub, shelterbelt, riparian woodland hedgerow, and wetland planting and new grass interspersed with plug planting of native species. Broadleaved woodland, with species such as rowan, willow, hazel and birch would be complemented by grass meadows and wildflowers. Hedgerows of holly, dog rose and alder would be provided to allow connection for species through the creation of 'wildlife corridors'. Collectively, the planting proposed would be designed to ensure that habitats are created for invertebrates, mammals and avian species.

3.4.12 Screening bunds would be planted with woodland block native tree and shrub species (to be established in the early phase of construction from April to June 2026) with some transitional zones (e.g. between and at the edges of bunds) planted with deciduous only tree and shrub planting. Shrub and scrub will be planted downslope from the bunds transitioning to grass and wildflower. Riparian woodland will be planted close to SuDs features and along Fithie Burn, with wet grassland planting along the margins of SuDS.

3.4.13 The landscape planting will occur from April to June 2026 when landscaping bunds are first being formed to provide screening, and from October to December 2027 and January to March 2028 when bunds are completed at the end of June 2027 (See **Table 3.3: Planting Types** for programme). **Figure 3.5: Landscape Design** shows the proposed landscaping for the Proposed Development. For more information on landscaping and planting see **Chapter 7: Landscape and Visual Impact**.

Figure 3.5: Landscape Design (Excerpt/Not to scale)

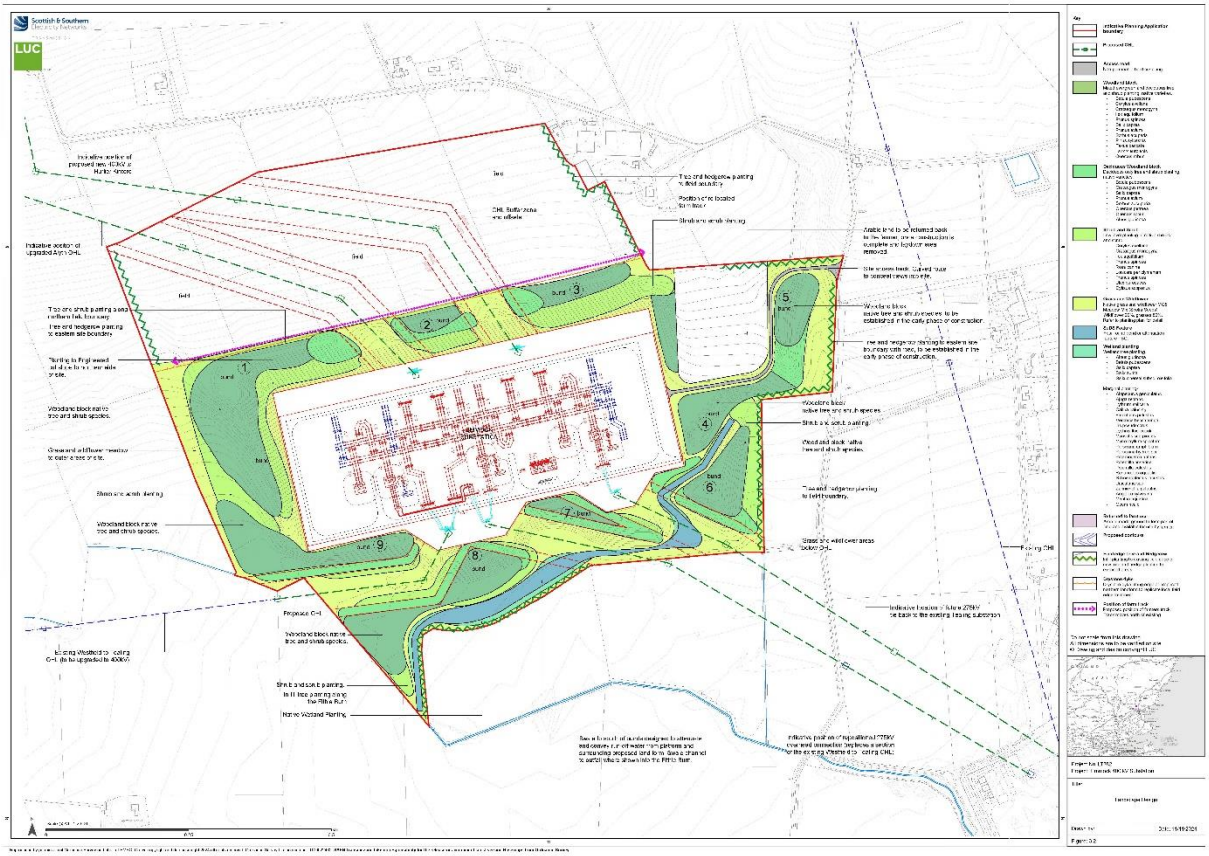

Table 3.3: Planting Types

Key	Type	Description
	Woodland block	Mixed evergreen and deciduous tree and shrub planting, native varieties
	Deciduous Woodland block	Deciduous only tree and shrub planting, native varieties
	Shrub and Scrub	Low level planting of native shrubs and scrub
	Grass and Wildflower	Native grass and wildflower species mix
	Wetland planting	Native species marginal planting
	Field edge Tree and Hedgerow	Infill planting to existing field edge or new tree and hedge planting to exposed areas
	SuDs including swale	Native grass and reeds

Water Supply and Drainage

Water use will be minimal, supporting welfare and general maintenance activities. Water will be supplied initially by tankers until a borehole or alternative source has been procured. Potable water will be provided through refillable dispensers.

3.4.14 A network of surface water drains will carry run off from the hard-surfaced areas of the platform and from the access road to the SuDS via interceptors which will capture grit and contaminants from the roadways. Field drains to the north, east, south and west of the platform will be reinstated/replaced, and a cut off drain will be installed along the northern perimeter of the platform to capture run off from the higher ground above to drain to the SuDs. Some clean water cut-off ditches may be discharged to vegetation areas.

3.4.15 The SuDS will comprise a single linear grassed drainage swale which would be constructed to the south of the platform (**See Figure 3.5: Landscape Design and Table 3.3: Planting Types**). This swale will encourage the infiltration of surface water but will also act as a drain discharging to outfall into the Fithie Burn during periods of intense precipitation or flood events when water flows uninhibited over the agricultural land and Emmock Road. The swale has been designed to accommodate the surface water runoff associated with a 1:200 year plus climate change event as detailed within the Flood Risk Assessment (**Appendix 11.1: Flood Risk Assessment and Outline Drainage Strategy**).

Foul drainage will be transferred to a package treatment plant.

Construction facilities

3.4.16 During construction, a temporary compound approximately 188 m x 140 m will be established to the east of the platform, adjacent to the access road (see **Figure 3.1: General Arrangement**), providing equipment laydown areas and to accommodate the Principal Contractor's offices and welfare facilities. This area will be formed of a temporary hardstanding and be used for the storage of construction materials and plant storage as well as provisions for the storage and separation of waste prior to treatment and processing off site. Surface water runoff from the compound will be drained via a series of cut-off ditches/filter drains and conveyed to suitably sized temporary settlement ponds/lagoons prior to discharge to the water environment or tied temporarily into the permanent SuDS. The compound will be restored to agricultural use at the end of the construction phase.

Temporary haul roads will be constructed around the extents of the platform area to facilitate transportation and deposition of earthworks materials. Haul road drainage will consist of trackside ditches as required and will be conveyed to the construction phase temporary drainage system. check dams, sumps and settlement lagoons will be provided as appropriate for suitable treatment prior to discharge to the water environment. Further details will be developed in construction phase surface water management plan/ Pollution Prevention Plan (PPP).

3.4.17 Foul drainage during construction will be to an effluent tables which will be emptied by a specialist contractor.

3.5 Proposed Construction Activities, Programme and Working Hours

Main construction activities

3.5.1 The main construction activities, phasing and the associated HGV movements are shown in **Table 3.4: Indicative High Level Construction Programme** below.

Table 3.4: Indicative High Level Construction Programme

Activity	Estimated HGV Movements (1 way)	2026				2027				2028				2029				2030			
		Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec
Mobilisation	15		■																		
Site clearance	30		■																		
Form access road and temporary compound	250		■	■																	
Form site compound	1100			■	■																
Install temporary accommodation units	60			■																	
Install drainage from compound	40			■	■																
Cut and fill earthworks	40			■	■	■	■														
Form landscape bunds					■	■	■	■													
Install caping layer over platform	22500				■	■	■	■	■	■	■	■									
Install foundations for support structures	715						■	■	■	■	■	■	■								
Install control building	70						■	■	■	■											
Install platform drainage	300						■	■	■												
Form SuDS network	25						■	■													
Landscape planting	10								■	■	■										
Security fencing	15											■	■								
Installation of support structures	200							■	■	■	■	■									
Installation of gantries	20							■	■	■	■	■									
Installation of primary equipment	200										■	■	■	■	■	■					
Installation of transformers	10												■	■	■						
Installation of secondary equipment and cabling	75										■	■	■	■	■	■					
Commissioning														■	■	■	■				
Energisation																		■	■	■	■
Demobilisation and Reinstatement	80																■	■	■		

Site development

3.5.2 The indicative Earthworks Phasing Plan (See **Figure 3.6: Earthworks Phasing Plan** below) illustrates the earthworks by stage, including material handling sequence, cut/fill volumes, and earthworks movements, as follows:

- Stage 1: Site Preparation
- Stage 2: Compound and access set up
- Stage 3: Temporary Haul Roads and Platforms
- Stage 4: Bulk Earthworks
- Stage 5: Final Surfacing and Reinstatement

3.5.3 In summary, in Stage 1, topsoil would be stripped and temporarily stored in the compound east and adjacent to the future platform to allow for installation of pre-earthworks drainage. In Stage 2 the compound would be excavated to form the access to Emmock Road. Stone would then be imported for the compound and access track. Stage 3 includes the formation of temporary haul roads and topsoil stripping in all cells (A to D) for platform formation with temporary storage of material in the compound. Stage 4 comprises cut and fill operations to the platform in all cells (A to D) for the formation of landscape bunds 1 to 9 and filling of cells 2A to 2D to the south with surplus material from cells 1A to 1D to north to create a level earthworks platform foundation. Finally, in Stage 5, 1 meter of stone would be imported from the compound to reinforce the platform, and the landscape bunds would be vegetated as per the landscape zonal plan (**Figure 3.5: Landscape Design** and **Table 3.3: Planting Types**).

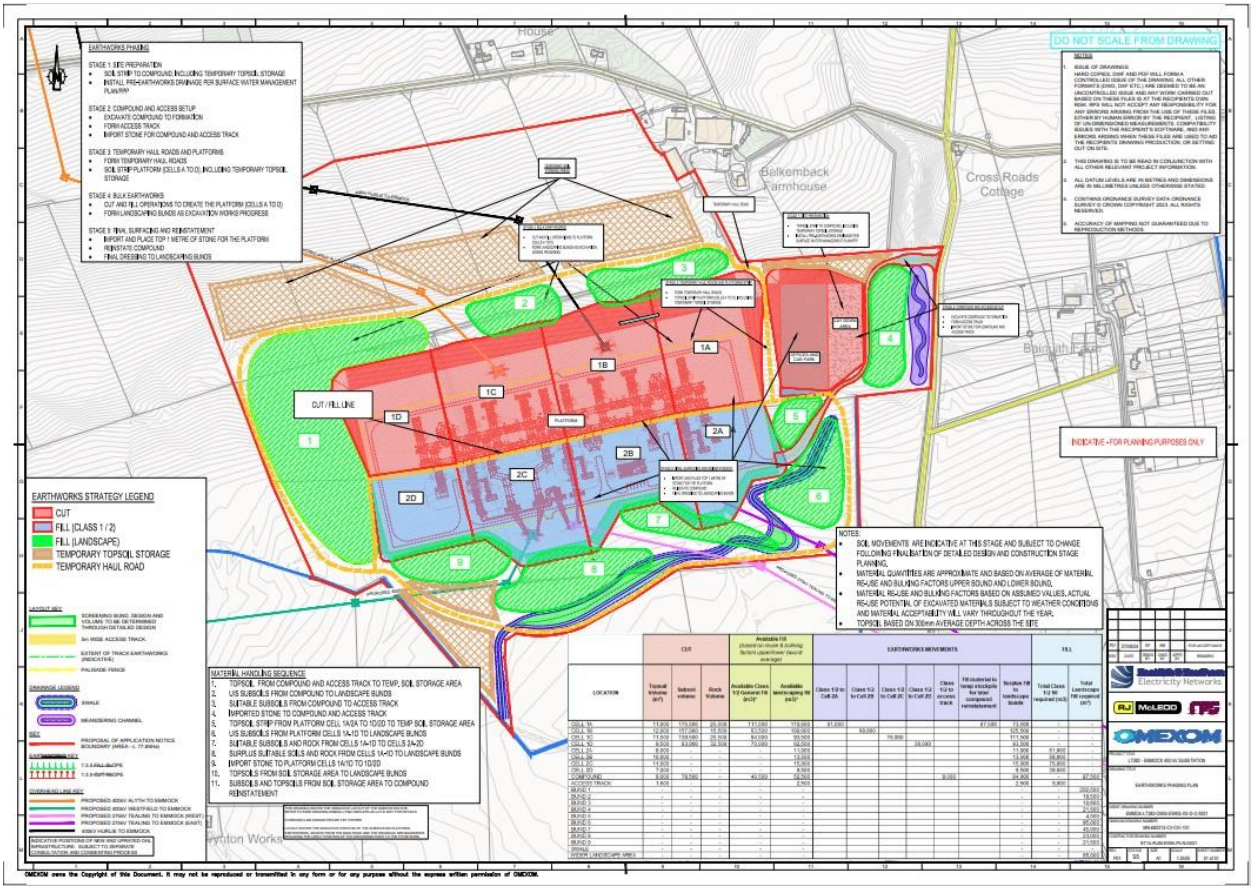

Figure 3.6: Earthworks Phasing Plan (Excerpt/Not to scale)

Working hours

3.5.4 Construction hours, including construction deliveries, are proposed to be as follows unless otherwise agreed with Angus Council:

Monday to Sunday – 07:00 to 19:00

3.5.5 The Principal Contractor may, following prior agreement with Angus Council, undertake construction works outside of these hours when there is a programme critical operation that cannot be postponed until the next working day, or where it is more appropriate to undertake the works outside these hours.

3.5.6 There may also be occasions where, for example to deal with emergencies, there is the need to undertake construction work outside of these hours without the prior agreement of Angus Council. The Contractor will endeavour to keep these measures to a minimum and for no longer than is strictly necessary.

3.6 Construction Traffic

3.6.1 The main types of construction traffic to the Site include vehicle movements of low-loaders with one-time delivery associated with mobilization, site set-up and bringing earthworks plant, and accommodation units to Site. HGVs would bring equipment and supplies, make up stone, and steel, while Abnormal loads would include crane, transformers, and other large equipment and structures.

3.6.2 All construction and staff movements are anticipated to use the A90 trunk road north of Dundee. Construction traffic will follow a circular route separating in and out traffic. Inbound bulk materials from the south will travel north on the A90, exiting onto Moatmill Road and continuing to Emmock Road to access the Site. Bulk materials traffic from the north will travel south to the Emmock Roundabout to perform a U turn in safety and exit under a 40mph limit from the A90 at Moatmill Road continuing to Emmock Road via a new access track at the existing Tealing substation to access the Site without crossing the A90; this traffic will leave the Site via Emmock Road and Moatmill Road, exiting north onto the A90 at Moatmill junction. Empty heavy goods vehicle (HGV) traffic will leave the site and travel Emmock Road to

cross the A90 and continue southbound to Dundee on an unnamed road. Passing places and laybys will be required on this route from the site to the A90 overbridge. Abnormal indivisible loads (AILs) only are anticipated to exit the A90 further north to the south of Inveraldie via an unnamed road. Basic traffic management measures including signage for construction vehicles would be provided. **Chapter 12: Traffic and Transport** provides a more detailed discussion of traffic.

3.6.3 Access for bulk materials and AILs would require road improvements, including improvements to bellmouths at the access track on Emmock road and the junction of Emmock Road and Moatmill Road, the formation of passing places on Emmock Road, and the possible strengthening of bridges and culverts. .

3.6.4 The proposed layby locations are to be agreed with Angus Council in their role as Highway Authority. The Applicant will prepare a detailed Construction Traffic Management Plan (CTMP) for approval by Angus Council that could be secured through a suitably worded planning condition to any planning permission. The CTMP will be required to identify the design and location of these laybys including any asset strengthening, surface finishing, drainage proposals, and approaches to environmental management which Angus Council deems to be required.

3.6.5 See **Figure 3.7: Emmock HGV and AIL Traffic Forecast** and **Table 3.5: Description of Traffic Movements** below for a visualization and description of total construction traffic movements by month from 2026 to 2030.

Figure 3.7: Emmock HGV and AIL Traffic Forecast

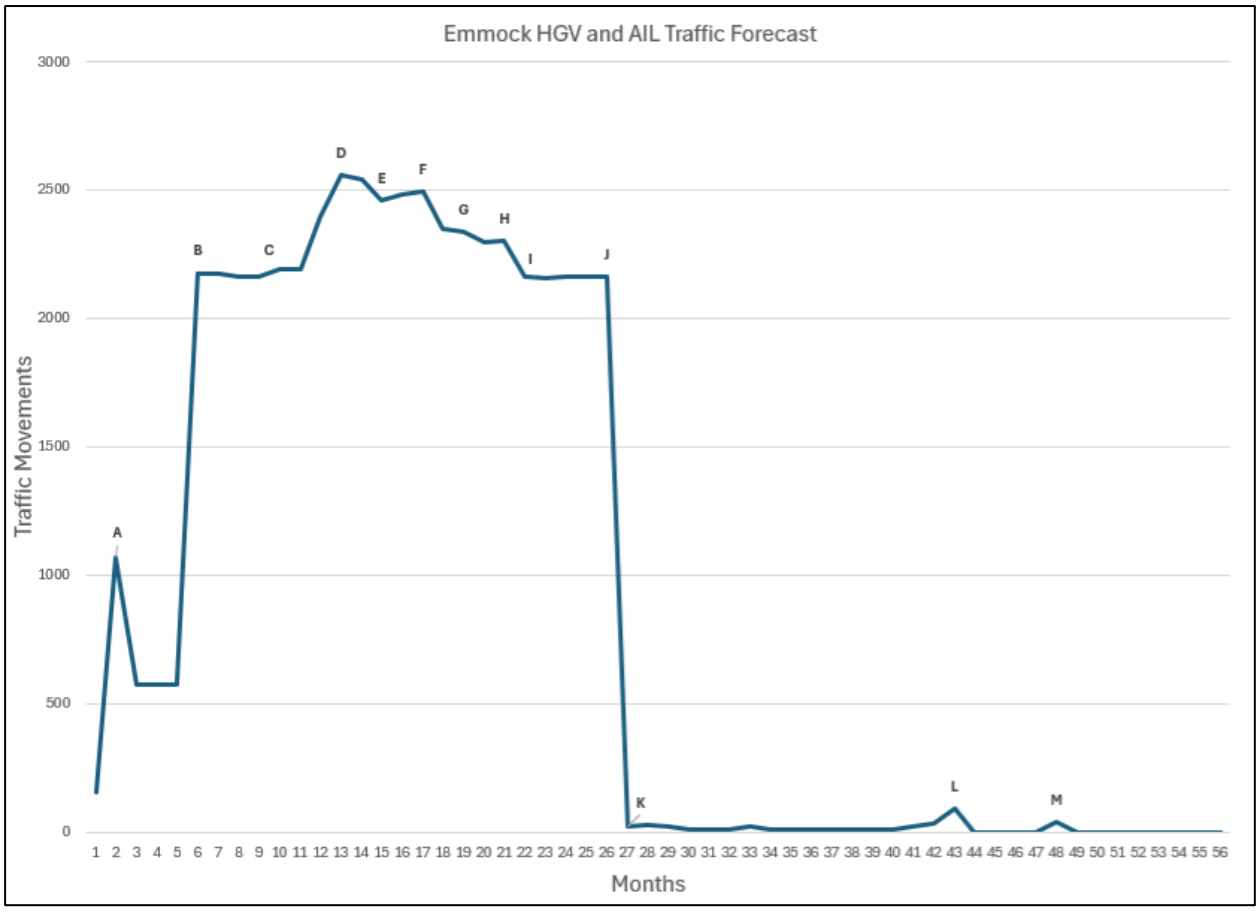

Table 3.5: Description of Traffic Movements

Key	Description
A	Form site compound, access road, site clearance, installation of construction phase drainage
B	Installation of construction phase drainage, import capping layers, cut and fill earthworks
C	Cut and fill earthworks, Import capping layers, control building, external AIS bases
D	Form SuDS area, import capping layers, control building, external AIS bases, transformer bunds, platform drainage + plant hire
E	Form SuDS area, import capping layers, control building, external AIS bases, transformer bunds, platform drainage
F	Import capping layers, control building, external AIS bases, transformer bunds, platform drainage, ducting and chambers, platform cable troughs
G	Import capping layers, control building, external AIS bases, transformer bunds, ducting and chambers, platform cable troughs
H	Import capping layers, control building, external AIS bases, landscape planting, platform cable troughs, earthing
I	Import capping layers, landscape planting, platform cable troughs, earthing
J	Import capping layers, kerbs and surfacing, security fence
K	Kerbs and surfacing, security fence

3.6.6 Ecological surveys of the most likely locations for these laybys have identified woodland listed in the Ancient Woodland Inventory (AWI) as well as the potential for protected species to be present in the wider area. No works would require felling or delimbing of trees within the AWI and in accordance with the SSEN Transmission Species Protection Plans (SPP) would be subject to pre-construction surveys.

3.6.7 A review of any known heritage assets in the area has not identified any constraints of note and whilst some development within known flood risk areas will be required, the laybys will be at existing ground level and permeable and hence are suitable for consideration as 'essential infrastructure' as per SEPA's Flood Risk and Land Use Vulnerability Guidance.

3.6.8 All works will be undertaken in accordance with SSEN Transmission General Environmental Management Plans (GEMP) and SPPs and at this stage it is not considered that further environmental mitigation beyond these applied mitigation measures would be required.

3.6.9 More information on construction traffic and access, including mitigation is provided in **Chapter 12: Traffic and Access**.

3.7 Environmental Management during Construction

3.7.1 The EIA Regulations require, to the extent relevant to the specific characteristics of the Proposed Development and the environmental features likely to be affected, that the EIA Report provides an estimate, by type and quantity, of expected residues and emissions (such as water, air and soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced) resulting from the construction and operation of the Proposed Development.

3.7.2 **Table 3.6: Residues and Emissions** provides a summary of the principal residues and emissions for the Proposed Development. Further assessment of potential significant environmental effects of these residues and emissions is set out in Chapters 7 to 13 of the EIAR.

Table 3.6: Residues and Emissions

Topic	Potential Residues and Emissions
Water	Construction Surface water runoff and discharge is likely during construction. Surface water runoff from the compound will be drained via a series of cut-off ditches/filter drains and conveyed to suitably sized temporary settlement ponds/lagoons prior to discharge to the water environment or tied temporarily into the permanent SUDS. In addition, occasional discharges may arise from pumping, or over-pumping to dewater excavations for the substation platform. Pollution sources may arise from soil erosion or from activities such as oil/fuel or chemical storage and use. Check dams, sumps and settlement lagoons will be provided as appropriate for suitable treatment prior to discharge to the water environment. A Construction Environment Management Plan, including a Site Water Management Plan and Pollution Prevention Plan, and the following SSEN Transmission General Environmental Management Plans, would be implemented to mitigate runoff, discharges, and potential water pollution: • Oil Storage and Refuelling GEMP (TG-NET-ENV-510) • Soil Management GEMP (TG-NET-ENV-511) • Working in or Near Water GEMP (TG-NET-ENV-512) • Watercourse Crossings GEMP ((TG-NET-ENV-515) Operation Drainage from the Proposed Development will be attenuated through the use of SuDS, comprising a single linear grassed drainage swale, designed to encourage the infiltration of surface water and acting to discharge flows at greenfield runoff rates to the Fithie Burn during periods of intense precipitation or flood events. Further assessment of environmental effects on hydrology and the aquatic environment is presented in **Chapter 11: Hydrology and Hydrogeology**.
Air	Construction The construction phase would require the transport of people and materials by road with associated emissions to the atmosphere. Additionally, construction activities including preparatory works and creation of the earthworks associated with the installation of the civils element of the Proposed Development have the potential to generate dust emissions along with, potentially, the operation of plant on Site. The nearest AQMA lies circa 2.5 km to the south. Dundee AQMA covers the city of Dundee and was implemented due to breaches of NO_2 and PM_{10}.The proposed haul route for the majority of traffic for the Proposed Development takes access from a roundabout on the A90 which lies just within the northern periphery of the AQMA. Operation No significant point source or diffuse air emissions would be produced during substation operation. The Proposed Development would contribute to connecting renewable electricity generation capacity to areas of demand, in turn displacing emissions associated with fossil fuel-based electricity generation elsewhere. A Construction Environment Management Plan, Transportation Management Plan, and SSEN Transmission's Dust Management and Soil Management GEMPs, would be implemented to limit potentially significant emissions to air during construction and operation; therefore, air pollution has been scoped out of the EIA Report.
Soil and Subsoil Pollution	Construction Soil and subsoil excavation, handling and storage would be required during construction particularly for substation platform earthworks and new access tracks. All soil and subsoil would be stored temporarily for use in reinstatement. The Applicant will adopt measures in the Construction Environmental Management Plan (CEMP) and Soil Management Plan to avoid contamination of top and subsoil during construction. There will be no offsite disposal arising from the construction of the Proposed Development. Operation No requirement for soil or subsoil excavation or handling during operation has been identified. No significant sources of soil contamination have been identified for the operational phase.

Topic	Potential Residues and Emissions
	No significant effects are likely during construction or operation; therefore, soils and subsoil pollution has been scoped out of the EIA Report.
Noise and Vibration	Construction: Noise sources during construction would include increased traffic flows and noise from construction activities and plant at the Site and for forming access tracks. Operation: Transformers and other electrical equipment can emit continuous and consistent tonal noise. Cumulative: The existing Tealing substation and Alyth-Tealing and Westfield - Tealing OHL diversions and other third-party private developments would contribute to cumulative noise. Prior to cumulative assessment, noise models suggest adverse/significant adverse impact for a number of the surrounding receptors and exceedance of the noise limits for the site. Mitigation in the form of acoustic enclosures for SGTs and potentially Reactors is proposed to reduce the risk of adverse significant impact. Barriers, though not as effective for screening noise, are an alternative mitigation option. A construction noise management plan would determine final mitigation measures to be implemented based on final assessment. The potential for significant construction and operational noise effects is considered further in **Chapter 13: Noise and Vibration**.
Light	Construction: Temporary construction compounds and platform working areas are likely to be equipped with lighting installations for use during low light conditions and passive infra-red sensor-controlled security lighting. Any effect would be temporary and is not predicted to be significant. Operation: Lighting will be kept to the minimum to ensure safe operations and security; individual light clusters will be low-level, narrow beam, and directed downwards to minimise glare and light spill; different lighting configurations and designs will be adopted for different parts of the site and will be appropriate for use; landscape bund design and positioning will support the reduction of glare and light spill experienced by the local community. **No significant effects are likely**; therefore, light has been scoped out of the EIA Report.
Heat and Radiation	Construction: No heat or radiation sources have been identified during the construction phase which present significant environmental effects; therefore, these sources of impact will not be considered further in the EIA. Operation: Electromagnetic fields (EMFs) are emitted from the operation of substations but is typically contained within the boundary of the substation development. Electromagnetic Fields (EMF) arise from electric charges. To prevent known effects of EMFs on health, the International Commission on Non-Ionizing Radiation Protection (ICNIRP) developed health protection guidelines in 1998 for both public and occupational exposure. In the UK, the National Institute for Health Protection's (NIHP) Centre for Radiation, Chemical and Environmental Hazards (CRCE) has set out guidelines for exposure to EMFs. In March 2004, the UK adopted the ICNIRP 1998 guidelines on the advice of the National Radiological Protection Board (now part of NIHP CRCE). These guidelines set conservative exposure levels for the public to electric and magnetic fields, and they are endorsed by the World Health Organisation and the UK Government. The NIHP CRCE keeps under review emerging scientific research and/or studies that may link EMF exposure with health problems and provides advice to the Department of Health and Social Care on the possible need for introducing further precautionary measures. All new transmission and related infrastructure is required to comply with the government policy of adopting the guidelines of the International Commission on Non-Ionising Radiation Protection (ICNIRP) on exposure to EMF. The Applicant ensures at all times that it complies with relevant legislation, which in turn is based on the advice of the UK Government's independent scientific advisers, to ensure the appropriate level of protection for the public from these fields. In determining the level of impact, SSEN Transmission closely observe these independent guidelines which in conjunction with a Code of Practice, published in 2012 by industry and the Department for Energy and Climate Change (now part of the

Topic	Potential Residues and Emissions
	Department for Energy Security and Net Zero), sets out all the practical details needed to apply the exposure limits for substations. EMF resulting from the Proposed Development are compliant with National Policy and Industry Standards as specified with the Energy Network Association Code of Practice and Electricity Safety, Quality and Continuity Regulations 2002. Consequently, in setting out the scope of an EIA, SSEN Transmission can demonstrate that levels of exposure are within the limits set within these standards, within the exposure guidelines as specified in the Code of Practice on compliance, and with the policy on phasing as specified in the Code of Practice on optimal phasing, **no significant effects are likely** to result from radiation and EMFs. Therefore, an assessment on EMF has been scoped out of this EIA Report.
Waste	The construction phase of the Proposed Development will generate some waste that will be managed in accordance with good practice guidance and implementation of a Site Waste Management Plan (SWMP) to implement the waste management hierarchy. Waste that arises is likely to be domestic and commercial wastes and other material arisings, for example, wood, metals and plastics, that will be segregated to allow recycling and appropriate disposal of non-recyclable materials and surplus building materials that will be returned to suitable secondary material processors. Office, canteen and hygiene facilities will be connected to the foul sewer which runs beneath Emmock Road to the east of the site. More information on these measures will be included in the outline Construction Environmental Management Plan (CEMP) that will be prepared by the Principal Contractor, and in SSEN Transmission's Waste Management GEMP. Substation operation does not produce any waste. During the operational phase of the Proposed Development, maintenance activities will generate waste, but this will not be in significant quantities and will likely be restricted to waste associated with employees and visiting contractors. It will be managed on site and separated into recyclable waste streams accordingly. All foul drainage and infrastructure will be provided for on-site through the use of suitable septic tanks.

3.8 Mitigation Proposals

3.8.1 SSEN Transmission is committed to protecting and enhancing the environment by minimising the potential impacts from their construction and operational activities through a three-tiered mitigation hierarchy presented in Chapter 5, wherein the three tiers are as follows:

- Embedded Mitigation: design stage mitigation
- Applied Mitigation: standard/best practice environmental discipline/construction industry mitigation
- Additional Mitigation: Site-specific bespoke mitigation

3.8.2 Embedded mitigation has sought to avoid sensitive habitat and watercourses and to minimize construction and operational impacts through design of the platform, access, and drainage solutions. Where necessary, applied mitigation in the form of GEMPs and SPPs, and additional mitigation for site specific impacts and effects will be implemented, as conditions of the Principal Construction Contract.

3.8.3 Effective implementation of all of these will be assured through an independent auditor appointed by SSEN Transmission who will share findings and reports with statutory consultees, including Tealing and Glamis and Area Community Councils.

3.8.4 In addition, the Contractor will be required to prepare additional plans to cover specific requirements that arise through the EIA process, including a Community Engagement Plan to outline how SSEN Transmission, its Contractors and local stakeholders can come together to address issues that adversely affect the community.

The requirement for an Advisory Environmental Clerk of Works (ECoW) is provided for under the Applicant's Consents and Environmental Specification which is a contractual requirement between the Applicant and the Principal Contractor. The ECoW will report to the Principal Contractor's Environmental Manager whose responsibilities will include but not be limited to:

- Management and implementation of all environmental requirements of the Proposed Development;
- Provision of environmental reports;

- Delivery of programme of environmental works, inclusive of, but not limited to, surveys, pre-construction mitigation, monitoring of mitigation, watching briefs, and exclusion periods;
- Reporting liaison with external parties;
- Environmental auditing and inspection of the procedures contained within the Principal Contractor's CEMP;
- Reporting of all environmental incidents; and
- Compliance with the project environmental requirements, legislation and consents throughout the site.

3.8.5 The EIA process and methodology and approach to mitigation is detailed in **Chapter 5** of this report. Additional mitigation is detailed within **Chapter 16: Schedule of Mitigation**.

3.9 Reinstatement

3.9.1 Following successful commissioning of the Proposed Development, all temporary construction areas would be reinstated. Reinstatement would form part of the contract obligations for the Principal Contractor and will include the removal of all temporary access tracks and work sites.

3.10 Biodiversity Net Gain (BNG)

3.10.1 Biodiversity Net Gain (BNG) is an approach to development that aims to leave the natural environment in a measurably better state than it was pre-development. SSEN Transmission has developed a BNG toolkit which quantifies biodiversity based upon the value of habitats for nature. It is an efficient and effective method for demonstrating whether development projects have been able to maintain or increase the biodiversity value of a development site after construction works.

3.10.2 The BNG toolkit has been applied to quantify the overall biodiversity impacts for the Proposed Development; this includes a biodiversity baseline assessment, analysis of habitat losses due to temporary works and permanent structures during construction works, and analysis of biodiversity gains following reinstatement of habitats in areas of temporary construction work. A BNG report for the Proposed Development is included as addenda to **Chapter 9: Ecology**, where it is discussed further.

3.10.3 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 plc has made commitments within its Sustainability Strategy (2018), Sustainability Plan (2019) 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; positively contribute to the UN and Scottish Government Biodiversity strategies by committing to deliver 10% Biodiversity Net Gain on all Transmission projects gaining consent on or after 22 May 2023, actively enhancing biodiversity and leaving a positive legacy at all of our SSEN Transmission sites as we deliver the UK and Scotland's Net Zero targets; and
- Work with their supply chain to understand enhancement opportunities to gain the maximum benefit during asset replacement and upgrades.

The planting proposals on Site deliver a net loss of 2% for area habitats. SSEN Transmission will therefore enter into an agreement with a landowner to deliver the remaining 12% required in order to achieve the 10% gain that is required by their own corporate targets.

3.11 Future Maintenance of the Substation

3.11.1 The Proposed Development would be unmanned, with operations largely being controlled remotely from SSEN Transmission's control centre, with routine inspection and maintenance performed at regular intervals. Most substations have a monthly inspection, whilst varying degrees of maintenance would be undertaken annually. There will be other visits as required for operational duties and occasional repairs, as necessary.

3.12 Decommissioning

3.12.1 The Proposed Development would not have a fixed operational life and in the event that the Proposed Development is decommissioned the effects associated with the construction phase can be considered to be representative of worst-case decommissioning effects, and therefore no separate assessment is necessary.

3.12.2 Should the Proposed Development be decommissioned the site would be restored as follows:

- The substation infrastructure would be removed;
- Where removal of infrastructure such as substation foundations would result in more damage than leaving them in place, they would be left in-situ; and

Disturbed ground would be reinstated.

It is likely that a decommissioning strategy would be made a condition of a grant of planning consent for the Proposed Development. Full details of any subsequent decommissioning plan would be agreed with the appropriate authorities prior to any decommissioning works commencing.

3.13 Construction Employment

3.13.1 Employment of construction staff will be the responsibility of the Principal Contractor, but the Applicant encourages the Principal Contractor to make use of suitable labour and resources from areas local to the location of the works. At its peak construction of the Proposed Development is expected to employ 150 people.

The Applicant is actively seeking opportunities to accommodate its workers in a way that provides a range of local benefits. In consultation with the local authorities, the Applicant is in the process of developing a Housing Strategy which would address the needs of construction employees for the Proposed Development, and other related development summarised in paragraph 3.3.5. The objective of the Strategy is to meet the short-term needs of project construction while delivering a legacy of new housing to meet future housing demand.