

Denny to Wishaw Network Upgrade (DWNO): Cumbernauld Substation Extension

Design and Access Statement

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Prepared for:

SP Energy Networks
320 St Vincent St
Glasgow,
G2 5AD

Prepared by:

AECOM Limited
177 Bothwell Street
Glasgow,
G2 7ER

Table of Contents

1.	Introduction	1
1.1	Introduction	1
1.2	Project Context	1
1.3	Requirement for and Purpose of the DAS	2
1.4	Structure of the DAS	3
2.	The Proposed Development and Site Context.....	4
2.1	The Proposed Development Context	4
2.2	Site Context	5
3.	Policy and Guidance Context.....	6
3.1	Policy Approach to Design	6
3.2	National Planning Framework 4.....	6
3.3	North Lanarkshire Local Development Plan	7
4.	Design Development.....	8
4.1	Identification of the Site.....	8
4.2	Design Evolution and Alternatives	9
4.3	Pre-Application Public Consultation	9
5.	Design Considerations	10
5.1	Overview.....	10
5.2	Key Site and Design Considerations	10
5.3	Design Principles	12
6.	Access	16
6.1	Access Arrangements during Construction	16
6.2	Permanent Access Arrangements	16
7.	Conclusion.....	16

1. Introduction

1.1 Introduction

This Design and Access Statement (DAS) has been prepared by AECOM Limited (AECOM) on behalf of Scottish Power Transmission (SP Transmission) (the Applicant) to support an application for consent to North Lanarkshire Council (NLC) under the Town and Country Planning (Scotland) Act 1997¹ (TCPA) to:

Construct and operate a new 275/33 kilovolt (kV) substation extension located at the existing Cumbernauld Substation, within the North Lanarkshire local authority area (the Proposed Development).

The DAS describes the Proposed Development and how it has evolved through the design process taking into account a range of factors as well as how it will be accessed during construction and operation.

1.2 Project Context

Overview of the wider DWNO Project

The Proposed Development forms part of the wider Denny to Wishaw Network Upgrade (DWNO). DWNO will reinforce and increase the capacity of the electricity transmission network in central Scotland.

DWNO comprises a number of components as detailed below:

- The construction of a new 275/400kV double circuit overhead line (to be known as WB route). This is referred to as the 'New Build Line Overhead Line'
- ZD Route - installation of two new towers as part of reconfiguration of connections to Denny North Substation
- The uprating of the three existing overhead line routes from 275kV to 400kV, referred to as the 'Uprated Overhead Lines':
 - ZG Route – uprating of approximately 4km of an existing overhead line between Denny North and Bonnybridge Substations
 - XX Route – uprating of 15km of an existing overhead line between Easterhouse and Newarthill Substations; and
 - XR Route – uprating of approximately 16km of existing overhead line between Newarthill and Wishaw Substations.

There are also ancillary works which form part of DWNO, these are hereafter referred to as the 'Ancillary Works', and comprise the following:

¹ UK Government (1997). Town and Country Planning (Scotland) Act 1997. Available at: <https://www.legislation.gov.uk/ukpga/1997/8/contents>

- The undergrounding of two short sections of the existing 132kV overhead line referred to as the 'AA Route Undergrounding'
- The removal of approximately 11km of an existing 132kV overhead line between Bonnybridge and Cumbernauld, referred to as the 'CB Route Removal'
- Works to and extensions of Denny North, Bonnybridge and Wishaw substations
- Diversions to other SP Distribution plc. infrastructure are required as part of the Proposed Development, referred to as the 'Distribution Line Diversion Works'.

Overview of the Proposed Development

The Proposed Development will involve the construction of a new Cumbernauld 275/33kV Substation, as shown in EIA Report Figure 4.1 'Site Layout' and EIAR Figure 4.2 'Temporary Work Layout'. This will involve the demolition of the existing 132/33kV Cumbernauld Substation outdoor equipment and control building. The area of temporary and permanent works associated with the Proposed Development would be approximately 7.14 Ha, and new infrastructure would be a maximum height of 15.5m above the finished platform level.

1.3 Requirement for and Purpose of the DAS

The Proposed Development is classed as a 'National Development' by National Planning Framework 4 (NPF4), in accordance with Section 3A (4)(b) of the TCPSA. National Development 3 'Strategic Renewable Electricity Generation and Transmission Infrastructure' is relevant to the Proposed Development as it supports expansion of the electricity grid and recognises the need for substantial reinforcement.

This DAS has been prepared to meet the requirements of the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013 which require applications for planning permission for national development to be accompanied by a Design and Access Statement.

The purpose of the DAS is to provide information on the approach to the design of the Proposed Development and how access considerations have been addressed. This DAS is one of a wider suite of reports and documents submitted with the planning application for the Proposed Development.

The principles and concepts which have shaped the Proposed Development's location and design are detailed through this DAS. This includes relevant national and local policies; physical, environmental and technical considerations; the appraisal methods for various stages of the design; and the consultation that has taken place throughout the design process.

This statement primarily focuses on design but also briefly considers access, as required under Regulation 13(5) of the Development Management Procedures Regulations. These regulations require access to be addressed within a DAS, with an emphasis on how access has been considered. While the Proposed Development is solely intended for energy transmission and is not designed as an accessible destination for visitors, primary access to the site is required for maintenance and operational purposes. Site access arrangements, including provisions for maintenance vehicles and operational staff, are addressed in more detail in Chapters 4 (Project Description) and 9 (Traffic and Movement) of the Environmental Impact Assessment Report (EIA Report).

1.4 Structure of the DAS

The approach to this DAS has been based on Circular 3/2022 Development Management Procedures (Scottish Government, 2022)².

This DAS is structured as follows:

- **1. Introduction** – providing an overview of the Proposed Development and the wider DWNO Project as well as the structure and content of the DAS
- **2. The Proposed Development and Site Context** – providing an overview of and the Proposed Development and the area within which it is located.
- **3. Policy and Guidance Context** – providing a description of how key policies and guidance have informed design development.
- **4. Design Development** – providing a description of how key factors have informed the design of its components.
- **5. Design Considerations** – gives an overview of which design considerations have been established that have informed its siting and design.
- **6. Access** - provides a description of proposed temporary and permanent access arrangements to its key components.
- **7. Conclusion** – highlights the final design of the Proposed Development was the result of several stages of design iteration in addressing a wide range of physical, environmental and technical issues during the development of the new Cumbernauld Substation design.

The DAS is supported by a comprehensive package of reports published in three volumes (plus a non-technical summary). These form part of the Environmental Impact Assessment (EIA) Report and are submitted as part of the planning application.

² Circular 3/2022: Development Management Procedures, as amended (2022), Scottish Government, <https://www.gov.scot/publications/planning-circular-3-2022-development-management-procedures/>

2. The Proposed Development and Site Context

2.1 The Proposed Development Context

Since commencement of the Project, there have been continuing design iterations for the Proposed Development. These changes have been driven by the ongoing EIA, the AECOM design engineering team, the Applicant's construction team, and engagement with statutory and non-statutory consultees and the public.

The final design iteration, as submitted with this application, marks the 'design freeze' stage of the Proposed Development. As the final design of the Proposed Development, the main elements of the design freeze layout include the following:

Permanent Works

The permanent works would include:

- New sub-station equipment including:
 - 275kV Air Insulated Switchgear (AIS);
 - Two Super Grid (275/33kV) Transformers with Oil insulating circuit breakers;;
 - Two Connection bays with Marshalling Kiosks;
 - 275kV bus section breaker;
 - 2no. new Gantries;
- New access road (5.5m width), from Forest Road main road;
- One single storey new control building (including toilet, mess room, storage, office, battery room, and other electrical equipment);
- New platform to accommodate new electrical equipment (no more than 1.8Ha);
- Diesel generator;
- DNO (Distribution Network Operator) Substation;
- Car parking for up to 6 vehicles;
- 3m high palisade perimeter fencing;
- Internal footpath (2m wide);
- Internal vehicular access road (3.5m wide);
- Realignment of existing 33kV cables and overhead line;
- Dedicated Sustainable Drainage System (SuDS);
- Storage of up to 90,000 litres of insulating oil;
- Operational lighting (only during maintenance in hours of darkness); and
- Associated landscape planting.

Temporary Works

The temporary works associated with construction would include:

- Earthworks;
- Decommissioning and removal of two existing 132kV grid transformers;
- Construction phase lighting (only during hours of darkness);
- Dismantling and removal of one existing CB tower to make space for new substation infrastructure;
- Two temporary compounds to provide office accommodation and welfare facilities during construction;
- Upgrade to telecommunications;
- Dismantling and removal of existing control building;
- Removal of existing septic tank and associated drainage; and
- Diversion of water mains associated with Forest Road.

A detailed description is available in Chapter 4 of the EIA Report.

2.2 Site Context

The existing Cumbernauld Substation is located to the east of the town of Cumbernauld, and south of the Abronhill area. The application site for the Proposed Development (hereafter referred to as the Site) includes the area within the red line boundary shown on EIA Report Figure 1-1 and Figure 4-1. The Site is situated within woodland to the south-east of Forest Road, on the south-eastern periphery of the town of Cumbernauld.

The Site is located at around 120 metres Above Ordnance Datum (AOD). Land within the Site slopes down toward the north-west, towards Forest Road and the Red Burn watercourse. Red Burn runs around of the southern, western and north-western Site boundaries.

North-east of the Site, land use is characterised by open fields interspersed with woodland. To the north-east, a new residential development (Firview) comprised of over 200 homes is under construction located approximately 120m northeast away at its closest point from the Site. To the northwest of the site land use is urban and primarily residential.

In addition, the Palacerigg CGA includes a housing development site under application 24/00230/PPP for a residential-led mixed-use development with associated access, open space, landscaping, drainage features, and associated infrastructure (in principle), which has been permitted. Moreover, the Mid Forrest CGA includes a housing development site under application 24/01227/MSD for 300 dwellings, representing an amendment of consented proposals for residential development as part of the planning permission in principle (16/00698/PPP), which was permitted. The Site is separated from the town of Cumbernauld by Forest Road, the railway line, and bands of forestry listed on the Ancient Woodland Inventory. Cumbernauld Academy lies approximately 400m to the north-west. The Slamannan Plateau Special Protection Area (SPA) designated for Taiga Bean Goose lies approximately 1.5km east. West Fannyside Moss Special Area of Conservation (SAC) overlaps for a portion of the

Slamannan Plateau and features blanket bog habitat. Palacerigg Country Park boundary wraps around the Site from the south and to the south-west.

The Proposed Development is located in the settlement of Cumbernauld, with the residential area of Abronhill and Cumbernauld Academy located to the northwest of the Site Boundary. Residential properties to the northeast of the Site are located off Forest Road, Redwood Road, Laburnum Road, Alder Road, Medlar Road, Cedar Road, Hazel Road, and Aspen Road. Carbrain Industrial Estate is located to the southwest of the Site.

In addition, although still technically within the Plateau Farmland LCT, the area to the northeast of the site is under development as a residential area and is designated as a Community Growth Area (CGA) with a planned capacity of approximately 2,000 homes. This future development should be considered when planning mitigation to minimise cumulative effects and maintain an appropriate transition between rural and residential character.

Moreover, the Proposed Development is located within the Cumbernauld Green Belt (NLC)- however, as the Proposed Development is for an extension of the existing Cumbernauld Substation only, it is considered a necessary infrastructure project that aligns with the established use of the site. The development is designed to minimize its impact on the surrounding environment and landscape, ensuring that it complies with relevant planning policies and supports the region's energy infrastructure needs.

3. Policy and Guidance Context

3.1 Policy Approach to Design

The Scottish Government Circular 3/2022 states that a DAS should explain how national and local policies relating to the design of a development have been considered. National guidance, local authority design policies, supplementary guidance documents and design guides are also referenced as being an element of a DAS.

This section of the DAS therefore summarises how national and local policies relating to substation design have been considered. These are generally high-level documents which focus on the factors which may influence the siting of a substation and the typical constraints which must be considered.

3.2 National Planning Framework 4

The key national policy regarding substation design is provided within the National Planning Framework 4 (NPF4), adopted in 2023. Policy 11 (Energy) of NPF4 provides a comprehensive list of the impacts that energy transmission development, including substations, must address through planned design and mitigation:

- Impacts on communities and individual dwellings, including, residential amenity, visual impact, noise and light;
- Significant landscape and visual impacts, recognising that such impacts are to be expected for some forms of renewable energy. Where impacts are localised and/ or

appropriate design mitigation has been applied, they will generally be considered to be acceptable;

- Public access, including impact on long distance walking and cycling routes and scenic routes;
- Impacts on road traffic and on adjacent trunk roads, including during construction;
- Impacts on historic environment; effects on hydrology, the water environment and flood risk;
- Biodiversity including impacts on birds;
- Impacts on trees, woods and forests;
- Proposals for the decommissioning of developments, including ancillary infrastructure, and site restoration;
- The quality of site restoration plans including the measures in place to safeguard or guarantee availability of finances to effectively implement those plans; and
- Cumulative impacts.

In addition, Policy 11 states that development proposals that impact on international or national designations will be assessed in relation to Policy 4 (Natural Places). Policy 4 makes clear that development proposals that are likely to have significant negative effect on the natural environment will not be supported, and that development proposals that will affect designated sites (European Special Areas of Conservation (SACs) or Special Protection Areas (SPAs); National Parks; National Scenic Areas (NSAs); Sites of Special Scientific Interest (SSSIs); National Nature Reserves (NSRs); Ramsar Sites), will only be supported if said affects can be mitigated or outweighed by social, environmental or economic benefits of national importance.

In Sections **Error! Reference source not found.** and **Error! Reference source not found.** of this DAS, the considerations listed above have all been taken into account in the selection of the Site and the design of the Proposed Development.

3.3 North Lanarkshire Local Development Plan

Adopted in 2022, North Lanarkshire Local Development Plan (NLLDP) presents a 5-to-10-year strategy for development within the North Lanarkshire authority area.

The LDP's vision introduces a focus on places, placemaking and sustainability, and successful and safeguarded places. As such, the LDP is intended to guide the regeneration of North Lanarkshire's economy and physical fabric with the creation of better places.

Policy PROT A: 'Natural Environment and Green Network Assets' seeks to safeguard natural heritage assets and ensure that development proposals avoid adverse impacts on designated sites, habitats, species, landscape features and the wider Green Network. Where potential impacts arise, proposals must demonstrate that these can be appropriately avoided or mitigated. The Site is located in proximity to a number of locally designated Sites of Interest for Nature Conservation (SINC) and areas of woodland which form part of the Green Network. The design and layout of the Proposed Development have therefore been informed by the need to protect and enhance these environmental assets. Embedded mitigation includes the retention

and reinforcement of existing woodland and vegetation, the introduction of native woodland and hedgerow planting, and the use of landscape buffers to integrate the substation infrastructure into its surroundings. These measures reduce visual effects, protect ecological receptors and support the continued function of the Green Network, ensuring compliance with Policy PROT A.

Policy EDQ 3: 'Quality of Development' requires development proposals to demonstrate a high standard of design which responds positively to site context, local character and landscape setting, while protecting residential amenity and environmental quality. Development should be appropriately scaled, well sited and designed to integrate effectively with surrounding land uses and infrastructure. The Proposed Development has been designed with regard to its woodland and urban-edge setting, ensuring that the scale, layout and appearance of the substation infrastructure are compatible with the character of the area. The incorporation of appropriate boundary treatments, landscape screening and a muted colour palette assists in minimising visual prominence and potential amenity impacts. The proposal therefore achieves an appropriate balance between the operational and safety requirements of essential electricity infrastructure and the design quality expectations set out in Policy EDQ 3.

Policy EDQ 1: 'Site Appraisal' and Policy EDQ 2: 'Specific Features for Consideration' require development proposals to demonstrate that site constraints and environmental considerations, including topography, drainage, watercourses and flood risk, have been considered at an early stage in the design process. In this regard, flood risk and surface water management have informed the site layout and detailed design of the Proposed Development. SuDS have been incorporated to manage surface water runoff on-site, protect the Red Burn watercourse and ensure that the development does not increase flood risk elsewhere. These measures ensure the proposal is resilient to climate change impacts and accords with the requirements of Policies EDQ 1 and EDQ 2.

4. Design Development

4.1 Identification of the Site

The Proposed Development has been designed through a systematic process taking account of SP Transmission's statutory duties and licence obligations, as well as relevant industry-recognised approaches such as the Holford and Horlock Rules (as detailed in Section 4.2). The design approach comprised two main steps: firstly, the identification and assessment of potential substation sites and secondly, the identification and assessment of alternatives. The results of the siting study were set out in the 2021 Routeing and Consultation Document and the Preferred Option Update Report 2024 covering the wider DWNO project and are also summarised in the Environmental Impact Assessment Report (Chapter 3: Design Evolution and Alternatives, EIA Report) which accompanies the planning application.

This stage concluded with the identification of a Preferred Option which was then subject to non-statutory pre-application consultation. This included consultation with North Lanarkshire Council (NLC), statutory and non-statutory consultees as well as local communities in the vicinity of the Proposed Development and the wider DWNO. The main purpose of this

consultation was to seek feedback on the Preferred Option for the Cumbernauld Substation Extension. The Preferred Option was confirmed as the Proposed Option and taken forward for further design development and refinement in response to detailed engineering studies, EIA and statutory pre-application consultation.

The following sections describe the design process for the key components of the Proposed Development following the identification of the preferred option.

4.2 Design Evolution and Alternatives

The Design of the Proposed Development has been developed through a systematic process taking account of SP Transmission's statutory duties and licence obligations as well as relevant industry-recognised approaches such as the Holford and Horlock Rules. The Holford Rules provide guidance on the routing of overhead electricity transmission lines to minimise their impact on the environment and landscape, while the Horlock Rules outline principles for the siting and design of substations to ensure they are sensitive to their surroundings. These rules are widely recognised as best practice within the energy infrastructure sector.

As part of the design evolution, SPEN initially consulted in 2021 on a previous design of the DWNO scheme. This consultation ran from May until June 2021. As a result of feedback received, alongside environmental and technical studies, the current DWNO scheme was developed.

The requirement to extend Cumbernauld substation is driven by the decision to rationalise existing grid infrastructure in this region and minimise potential for increased setting impacts on the Antonine Wall World Heritage Site (WHS). The existing CB route presently crosses the Antonine Wall WHS. This rationalisation includes removal of the existing CB route in its entirety. Removal of CB route in turn requires the proposed new WB route to be connected to Cumbernauld substation and therefore requiring an extension to Cumbernauld substation.

Reusing the existing CB wayleave will allow the preferred WB route to largely follow the current alignment, minimising additional land take. Removal of the CB route is also expected to deliver environmental benefits: a short section presently traverses the Slamannan Plateau Special Protection Area (SPA) near Tippet Craigs, and its removal will eliminate infrastructure within this designated site. In addition, a section through land identified in Falkirk Local Development Plan 2 (LDP2) as a Wildlife Site and as GN15 (an area with potential for bog and wetland habitat creation) will be decommissioned, helping to enable future habitat restoration and support biodiversity objectives. Finally, removing the CB line where it crosses the Antonine Wall WHS is anticipated to reduce overhead line visual effects on this internationally significant designation.

The Proposed Development would extend the existing Cumbernauld substation generally to the south-east of the existing substation.

4.3 Pre-Application Public Consultation

As the design of the Proposed Development has progressed, consultation has been undertaken with a range of interested parties including statutory and non-statutory consultees, stakeholders, and the local community. The Pre-Application Consultation (PAC)

Report provides an account of the pre-application consultation that has been undertaken by the Applicant in advance of submitting a planning application to NLC.

5. Design Considerations

5.1 Overview

While much of the design of the Proposed Development is informed by technical and operational requirements, the overall approach has also been shaped by a series of design parameters arising from key environmental considerations. These considerations have played an important role in influencing both the siting of the development and the evolution of its layout, scale, and appearance, ensuring that environmental effects are appropriately avoided, reduced, or mitigated where practicable.

Factors such as landscape and visual effects, noise, drainage, and ground conditions have been taken into account from an early stage, allowing environmental constraints and opportunities to be embedded into the design process rather than addressed retrospectively. The resulting parameters reflect best practice and draw on experience gained from the delivery of similar projects, helping to ensure that the Proposed Development achieves a functional and efficient design while responding sensitively to its surroundings and aligning with relevant planning and environmental objectives.

5.2 Key Site and Design Considerations

The following sections outline key design considerations that have informed the outline design of the converter station in response to the site and its wider context.

Landscape Character

The site lies within NatureScot's Plateau Farmland Landscape Character Type (LCT), with a brief intersection with an urban area at its southwestern corner. This open, gently undulating plateau landscape offers little natural shelter, and drainage is via shallow, broad valleys. Predominantly pastoral farmland with large fields and sparse, declining tree cover, it contains remnants of hedgerows, drystone dykes, and occasional designed landscapes. Although settlement is generally sparse, larger towns and infrastructure (roads, pylons, reservoirs, turbines) are visually prominent, while former industrial land uses erode rural character.

The Site, including the existing substation, is located partially within the North Lanarkshire Green Belt. However, whilst the Green Belt will be protected, development may be acceptable where it constitutes essential infrastructure- the Proposed Development is considered to be essential infrastructure, as it constitutes infrastructure with a specific locational need and no suitable alternative site. It also directly supports the generation of renewable energy by enabling greater grid capacity and transmission.

The Site is not located within any North Lanarkshire Council Green Networks. The nearest North Lanarkshire Council Green Network is located on the north side of Forest Road, approximately 60m from the Proposed Development. There is therefore no possibility of direct impacts to this or any other North Lanarkshire Council Green Networks.

Given the landscape's openness and elevation, the Proposed Development is sited and designed to minimise prominence, integrate with existing shelterbelts/hedgerows, and adopt context-appropriate materials, with robust screening (particularly to the north) and mitigation that anticipates the approximately 2,000 home Community Growth Area (CGA) to the north-east.

Visual Amenity

The design of the converter station has been informed by a careful assessment of the Site's visual context, including proximity to residential areas, woodland, and designated landscapes such as Palacerigg Country Park. The substation extension footprint has been minimised where possible to reduce impacts on adjacent woodland and sensitive receptors. Permanent works, including new equipment and fencing, will be sited and screened to limit visual intrusion. An Outline Landscape Plan has been produced, as shown in Figure 6-7 contained within EIA Report Chapter 4, incorporating planting and screening measures to further mitigate visual impacts. Construction lighting will be limited in duration and directed to avoid sensitive receptors.

Operational Noise

Operational noise has been assessed to BS:4142 standard. Specific noise from the Proposed Development at all Noise Sensitive Receptors fall below background noise levels, resulting in negligible impacts. Mitigation is not required due to the low noise levels.

Topography and Earthworks

The site is located at approximately 120m AOD and slopes down toward the northwest, influencing the design and layout of the substation platform. Earthworks will be required to create a level platform for new equipment, with cut and fill operations designed to minimise landscape and drainage impacts. Two earthworks slope options were considered:

- A 1:3 slope, which has been adopted to ensure stability and minimise environmental effects; and
- A steeper 1:1 slope, which may be reconsidered subject to ground investigation results.

Fill material will be sourced offsite where necessary, and suitable won material will be reused. Drainage design incorporates SuDS and oil containment measures to manage surface water and protect the surrounding environment.

Watercourses and Flood Risk

The SEPA Flood Risk Map indicates that significant areas of the Site, particularly to the west, are at medium to high risk of flooding, with an annual exceedance probability between 0.5% and 20%. The Proposed Development will be designed to avoid areas at risk of flooding where feasible and will incorporate SuDS to ensure that the development does not increase flood risk elsewhere.

The drainage strategy has been developed in accordance with national and local policy, and will be informed by the site-specific Flood Risk Assessment and Drainage Strategy provided in the EIAR. The design will ensure that surface water is managed appropriately, with SuDS features such as detention basins and filter drains included to provide water quality treatment and attenuate runoff.

The Proposed Development will be subject to ongoing consultation with SEPA and the Local Authority to ensure that all flood risk and water environment issues are addressed, and that all necessary consents are obtained.

5.3 Design Principles

The following section sets out the design principles which relate to the outline design of the substation and will also inform its detailed design.

Layout, orientation and massing

The layout and footprint of the Proposed Development have been determined by technical and environmental constraints, including proximity to Forest Road to the northwest and a residential development to the northeast. The substation extension is sited generally to the southeast of the existing substation, with the footprint minimised to avoid significant encroachment into the woodland to the southwest, which forms part of Palacerigg Country Park and is designated as a SINC and a Scottish Wildlife Trust Reserve. The arrangement of equipment, access roads, and buildings is designed to optimise operational efficiency while minimising impacts on sensitive areas.

The substation platform is orientated northwest to southeast to best fit the site's topography and to optimise the relationship with existing infrastructure. This orientation also helps to minimise visual and environmental impacts by aligning the development with the natural contours and existing land use patterns.

The permanent works will include new substation equipment with a maximum height of 15.5m above finished platform level. The platform itself will occupy no more than 1.8ha within a total works area of approximately 7.14ha.

The massing (size, shape, and overall visual volume) of the substation extension has been carefully considered to reduce visual prominence, with equipment and buildings sited and screened where possible. The single-storey control building and other structures are positioned to maintain a low profile, and perimeter fencing is set to contain the operational area without unnecessary expansion. Landscaping and screening measures are incorporated to further soften the visual impact of the massing.

The design evolution process considered alternative layouts and technologies, including options that would have reduced the overall footprint. However, the chosen layout balances operational requirements, environmental constraints, and the need to avoid sensitive woodland and designated sites. The use of air-insulated switchgear (rather than more compact gas-insulated alternatives) was selected to avoid the use of SF₆, a potent greenhouse gas, even though this results in a slightly larger footprint.

Architectural form, facades and colour

While there is limited built development nearby to the substation, the design of the Proposed Development will be similar to the appearance of existing energy and industrial infrastructure (Carbrain and Lenziemill Industrial Estates to southwest of the Site) in the wider area. The design of the buildings and outdoor electrical equipment areas will display simple monolithic forms without unnecessary or small articulations, avoiding small recesses or small height

differences providing a simple rather than a complex built form, and offer a clean and unbroken silhouette.

A coordinated approach will be taken to the design of facades so that they look cohesive in views within the wider landscape. This will assist in reducing the apparent overall massing and improve the visual coalescence of the site. The colour of the substation buildings will reflect industrial development in the wider area.

Landscaping and biodiversity enhancement

An outline landscape plan has been developed that enhances opportunities for greater biodiversity as well as mitigating any visual impacts and aligning to the surrounding environment as much as possible.

Key aspects of the outline landscape plan include mitigation planting (such as a new hedgerow with woodland behind it to soften views), and bunding of up to 2m in height to further enhance screening. Towards the north-eastern part of Forest Road new woodland and shrub planting would extend the retained woodland, feathering into the site to create a more naturalistic appearance.

The cut-slopes surrounding the perimeter of the Proposed Development would be seeded to soften the engineered landform. Collectively, these interventions would help reinforce the rural landscape character and contribute to a landscape-scale approach to native planting and regeneration.

All planting and seeding (of woodlands, grasslands and wetlands) will be of species native to the area, of as local provenance as possible, and selected with cognisance to the native species composition of surrounding habitats.

Where possible, woodland will be created around the substation on cleared areas. Tree and scrub species selected will be broadly similar to the native species in nearby Wet Woodland and Lowland Mixed Deciduous Woodland Scottish Biodiversity List (SBL) Priority habitats, depending on the ground conditions of planting areas. Species which produce berries will be included to provide an additional foraging resource for bird and mammal species.

Where woodland creation is not practical, for example where the gradient is too steep, grassland will be seeded. An appropriate seed mix could be one that mimics the National Vegetation Classification (NVC) community MG5 (Lowland Meadow SBL Priority habitat). Locally, where conditions differ, a mix with additional wetland or shade tolerant species may be appropriate.

The Applicant is committed to deliver measurable biodiversity improvements in line with its commitment to providing at least 10% BNG on projects subject to planning consent as set out in its Environmental Action Plan.

Brash from scrub and woodland clearance to facilitate construction will be retained within the Site. This will be arranged into log piles at woodland edges and incorporated into earth covered reptile hibernacula.

Drainage

The drainage of the Proposed Development will be subject to the final design of the appointed Contractor. The principles will include all foul rain and surface water drainage.

Ponds are proposed as part of an integrated SuDS which will be seeded with a wetland grassland mix to provide effective surface water management while enhancing habitat diversity. New planting and seeding will be monitored and maintained to ensure successful establishment throughout the site.

The SuDS ponds will be designed to appear and function as naturally as possible in line with guidance. This will include the following measures to benefit biodiversity:

- the features will remain permanently wet;
- edges will be appropriately sloped (gradually declining to provide different water levels). Where possible, the SuDS pond will be constructed to have a variety of different depths, with banks of varying steepness, to provide structural diversity; and,
- marginal areas which are seasonally inundated will be seeded with an appropriate wetland herb seed mix

A drainage survey is scheduled to be undertaken for the existing 132/33kV substation. SP Energy Networks will incorporate the findings of this survey into the final Site Condition Assessment (SCA), which will confirm the condition and capacity of the existing drainage infrastructure and identify any remedial or alteration works required. It is anticipated that elements of the existing drainage system will partially interface with the proposed development; as such, localized demolition, re-alignment, cleaning and repair works may be necessary where conflicts arise.

The drainage strategy for the Site will not rely on perimeter flood walls or embankments as a mitigation measure. While such measures were considered in accordance with SPEN's Substation Flood Resilience Policy, pluvial flood modelling demonstrated that a perimeter flood wall would intercept overland flows from the south of the Site and redirect them towards Forest Road, resulting in increased flood depths during the 1 in 200 years plus climate change event. As this would increase flood risk beyond the Site boundary, it is considered unacceptable in policy terms and has therefore been discounted.

Any new manholes or pipework will be designed in accordance with the relevant EN Eurocodes, British Standards, Codes of Practice and National Grid specifications. All drainage outflows, following appropriate treatment where required, will discharge to an agreed outfall, subject to consultation and agreement with the relevant technical authorities. The final drainage design will be informed by the Flood Risk Assessment (FRA) to ensure that flood risk is appropriately managed and that the development does not increase flood risk on- or off-site.

Security fencing and lighting

The converter station site will be within a fenced compound with restricted access for security. An approximately 3 m high palisade fence will be erected around the platform with additional internal fencing between the control room and live compound (also 3m palisade). A 2m wide footpath will also be installed around the perimeter of the SP Energy Networks security fence.

Lighting of the converter station during operation will be required for safety purposes. This will be minimised wherever possible and will be directional to prevent/reduce light spill. External lighting will be off as a default during the hours of darkness unless otherwise needed. The design of the lighting scheme for the converter station is subject to detailed design

6. Access

6.1 Access Arrangements during Construction

Access to and egress from the converter station site during construction will be via the Forest Road to the north of the site. There is an existing access point which is proposed to be upgraded and utilized as part of a one-way system during construction.

6.2 Permanent Access Arrangements

The existing substation access road would be re-aligned to accommodate the arrangement of the Proposed Development. This existing access road will be maintained as the primary vehicular access point during operation of the Proposed Development.

A separate entirely new 5.5m wide access road would be constructed to facilitate delivery of the two new transformers, as well as facilitate their future maintenance or replacement. This secondary access road would be retained during operation and would enter the Proposed Development from Forest Road via a new bell mouth, entering the extension area from the west. Internal access roads would be designed to accommodate delivery of the new transformer.

6.3 Access for all

The substation buildings onsite will be provided in line with the relevant building regulations (at the time of construction) to accommodate the access needs of people with limited mobility.

7. Conclusion

As outlined throughout the DAS, the Applicant has addressed a wide range of physical, environmental and technical issues during the development of the Cumbernauld Substation design and the Proposed Development is based on a thorough understanding and appreciation of local character and circumstances.

The final design of the Proposed Development was the result of several stages of design iteration, informed by analysis of national and local policy, the environmental baseline, technical constraints, financial viability and comprehensive engagement and consultation.

As a direct consequence of the site and routeing selection and design process outlined within this DAS, the Proposed Development contains considerable embedded mitigation which is detailed in full in Chapter 4: Project Description of the EIA Report.