SP TRANSMISSION

Erskine Substation to Devol Moor Substation

132kV OVERHEAD LINE

Public Consultation Document

November 2010

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Proposals

SP Transmission (SPT) has an overhead line (OHL) proposal in the Greenock and Erskine areas. This is an upgrade and replacement of an existing 132kV single circuit OHL between the existing Erskine and Devol Moor substations. It is proposed to upgrade this to a 132kV double circuit OHL in order to provide security of supply to the surrounding developed areas.

Consultation Document

This document has been prepared in order to inform those who have an active interest in the selection of the preferred route for the OHL and supersedes the consultation document issued in 2007. Following the consultation phase, SPT will review all consultation responses and found upon a proposed route for the OHL.

Preferred Route Option

After having consulted with a wide range of consultees and other interested parties in order to identify key constraints in the study area, SPT has identified a preferred route for the Erskine-Devol Moor OHL proposal. The examination of alternative routes and analysis and evaluation of the preferred route options against a range of established criteria and methodology is set out in this document.

The preferred route in this document supersedes the preferred route previously promoted in 2007. Changes in preferred route alignment are a result of representations from stakeholders following the last consultation; changes in land use on the preferred route alignment and a detailed technical feasibility study allowing a significant section to be realigned along the existing route.

The preferred route seeks to minimise the environmental effects on a range of physical, environmental and socio-economic considerations (including landscape and visual, woodland, flora and fauna, agriculture, people, settlements, properties and historical features) whilst remaining economically and technically viable.

Consent Procedure

SPT intends to prepare and submit an application for the OHL route to the Scottish Ministers under Section 37 of the Electricity Act 1989. This application will be accompanied by an Environmental Statement.

Consultation

Copies of the Consultation Document have been sent to a number of key consultees who include Renfrewshire Council, Inverclyde Council, Scottish Natural Heritage and Historic Scotland. A public exhibition, where copies of this document will be available for public review and details of the project will be on display, will be held in:

- Bogleston Community Centre, Port Glasgow on 2nd November 2010;
- Kilmacolm Community Centre on 4th November 2010; and
- Bishopton Scout Hall on 9th November 2010.

All between 1500hrs and 2000hrs.

In addition, copies of this document can be viewed on the internet at:

www.spenergynetworks.com/publicinformation/performance.asp

Or you can request a CD ROM or hard copy either by contacting:

devolmoor.projectmanager@sppowersystems.com

Or by writing to:

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1.0 INTRODUCTION

1.1 Background

SP Transmission (SPT), are responsible for the transmission network from the English/Scottish border to just north of Stirling, an area of some 23,000 square kilometres. As the licence holder, SPT is required under the Electricity Act 1989 *"to develop and maintain an efficient, co-ordinated and economical system of electricity transmission"*. SPT develop, operate and maintain the transmission system on behalf of ScottishPower.

SPT has a new overhead line (OHL) proposal in the area surrounding Erskine and Port Glasgow. The proposal involves the upgrade and replacement of an existing single circuit 132kV OHL between the existing substations at Erskine and Devol Moor. This OHL is now coming towards the end of its operational life and so it is proposed to replace and upgrade it to a double circuit 132kV OHL in order to provide security of supply to the surrounding developed areas. Upon completion of this new line, the existing 132kV OHL will be removed.

A routeing study has been prepared which considers the connection.

This Consultation Document reports on a detailed assessment of the constraints, route options and selection of a preferred route for the proposed 132kV OHL. The location and context of the existing substations and existing 132kV OHL to be removed is shown in Figure 1.

The process of route selection and environmental assessment of the OHL proposal will follow four phases:

Phase A: Routeing Study and Consultation Document

Phase B: Scoping Document

Phase C: Environmental Assessment and Environmental Statement

Phase D: Mitigation Measures

The routeing study considers the background landscape and environmental planning constraints information for the route before considering routeing options, a preferred route corridor and preferred alignment. For the purposes of a legible and consistent narrative throughout the report the route options are described from east to west, ie. From Erskine to Devol Moor.

1.2 Purpose of Consultation Document

The Consultation Document has been prepared in order to set out the steps taken in identifying the preferred route of the 132kV OHL.

Its purpose is to allow statutory and other interested parties the opportunity to comment on the preferred route and any other matters in order to inform the selection of a proposed route. Comments will also inform the preparation of

an Environmental Statement, which will accompany the Section 37 application for consent to construct and operate the OHL.

SPT will hold public exhibitions in Port Glasgow, Kilmacolm and Bishopton, where the background, methodology and evaluation of the preferred option will be on display for stakeholders and the general public to make comment and discuss with members of the professional team.

1.3 Scope

The Consultation Document is divided into six sections as follows:

Section 2	Description of the project and summary of Government policy
Section 3	Methodology used in the route appraisal and selection process
Section 4	Description of baseline landscape, physical and environmental features within the study area and the technical, environmental and landscape constraints that these represent with regard to the identification and evaluation of route corridor options
Section 5	Description and appraisal of corridor options, the selection of a preferred corridor and preferred route alignment for the Erskine to Devol Moor line.
Section 6	Outline of the steps that will be taken following completion of the consultation exercise regarding the preferred route alignment

1.4 Statutory Consent Procedures

Under Section 37 of the Electricity Act 1989, SPT is required to seek consent from the necessary decision making body for the construction of any non-exempted overhead line operating at a voltage greater than 20kV.

An application will be made by SPT to the Scottish Ministers for Section 37 consent under the Act and at the same time, a request for deemed planning permission will be made under Section 57 of the Town and Country Planning (Scotland) Act 1997.

The OHL is defined by the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 as a „Schedule 2 Development' as it is "an electric line installed above ground with a voltage of 132 kilovolts or more, the installation of which (or the keeping installed of which) will require a Section 37 consent but which is not Schedule 1 development".

Due to the nature and size of the proposal it is recognised that the development is likely to have significant effects on the environment, and on this basis SPT proposes to submit an Environmental Statement with the application for consent. In accordance with regulation 3(2), this intention to submit an Environmental Statement confirms the development as an EIA development.

2.0 PROJECT DESCRIPTION

2.1 The Need Case

Due to system security issues with the existing transmission system in the Inverclyde and Renfrewshire areas, there is a need for SPT to reinforce the 132kV electrical network in this area. In the event of a sustained fault on the 400/275kV network in the area, a significant load would require to be placed on the existing single circuit 132kV OHL from the existing Erskine and Devol Moor substations. This line is in poor condition and so requires to be upgraded and replaced in order to provide security of supply to the surrounding areas in the event of a sustained fault on the transmission network.

Therefore, in order to resolve the security of supply issues in the area it is proposed to replace the existing single circuit Devol Moor - Erskine 132kV OHL with a double circuit 132kV overhead steel tower line. On commissioning of the new double circuit line, the existing single circuit will be removed.

2.2 The Project

Ironside Farrar (together with subconsultants Central Environmental Surveys, Headland Archaeology and Envision 3D) were commissioned by SPT in June 2006 to undertake an options appraisal exercise for the proposed 132kV OHL in the Erskine, Port Glasgow and Greenock area.

An initial route appraisal was undertaken in 2006/7, leading to a consultation document published in September 2007 and two public exhibitions: in Bishopton and Kilmacolm. As a result of public consultation responses and a detailed engineering assessment of the Preferred Route since that time, a number of amendments have been made and the route appraisal revisited.

As with the original appraisal, the current route assessment has been based on identification and assessment of the baseline landscape and environmental features present within a defined study area. Together with the public consultation responses these have formed the key drivers in the identification and analysis of route corridor options and preferred routes. The preferred route corridor has been considered, based on a balanced assessment of a range of factors to have the least overall impact on the natural and built environment.

2.3 SPT Transmission System

SPT is responsible for the transmission network from the English/Scottish border to just north of Stirling, an area of some 23,000 square kilometres. SPT is required under the Electricity Act 1989 *"to develop and maintain an efficient, co-ordinated and economical system of electricity transmission"*.

All transmission licence holders are required by Schedule 9 of the 1989 Act to take account of the following factors in formulating proposals for the installation of overhead transmission lines:

"(a) to have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features or special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and,

(b) to do what he reasonably can to mitigate any effects which the proposals would have on the natural beauty of the countryside or any such flora, fauna, features, sites, buildings or objects."

As a result, a licence holder is required to consider then balance technical, economic and environmental issues, through the application of a logical process. The exercise of professional judgement involved in weighing the issues results in a route, which, on balance, best meets the stated „routeing objective'. That routeing commitment requires to reflect the licence holder's statutory duties. This is discussed in further detail in Section 3.2

2.4 Design, Construction and Maintenance

2.4.1 Design

Following identification of the proposed route for the new OHL, a detailed topographical survey will be carried out. This is required to identify the proposed positions and heights of each individual tower.

The majority of electricity transmission line towers in the UK are lattice steel structures supporting three conductors or conductor bundles from horizontal crossarms on both sides of the tower (see Figure 2). Additionally there is an earth conductor suspended between tower peaks to provide lightning protection. This includes fibre optic cores for communication purposes.

The proposed design for both connections is the L4S steel lattice tower, refer to Figure 2 for details. The nominal height of the towers is likely to be in the range 28.5m, with a maximum in exceptional circumstances of 41m. The spacing between towers will vary depending on topography and altitude, with towers being closer together at higher altitudes to counteract the effects of greater exposure to high winds and other weather events. The height and distance between towers will therefore be determined after a detailed line survey but will be in the range of 280m, with a maximum of 380m. The towers are manufactured from galvanised steel and are grey in colour. Tower steelwork is painted at intervals throughout their life to afford continued protection against corrosion.

There are basically two types of tower, a „line' tower, as illustrated in Figure 2, and an „angle' tower. The angle tower as its name suggests is used where the line changes direction and different designs accommodate different degrees of angle up to 90^0.

The conductors are attached to the crossarms at line towers via insulator strings which hang vertically below the crossarms. At angle towers the conductors are again attached to the crossarms via insulators but in this case the insulators are in line with the conductors. Insulators are typically coloured porcelain, polymeric or clear glass.

Conductors for transmission lines are typically manufactured from aluminium.

Site surveys will be carried out at proposed tower positions in order to examine the subsoil conditions in order that the tower foundations, can be designed.

2.4.2 Construction

Line construction typically follows a standard sequence of events which are:

- Prepare access
- Install tower foundations
- Erect towers
- String conductors
- Reinstate tower sites and remove temporary accesses

It is preferred to have vehicular access to every tower site for foundation excavation, concrete delivery and a crane to erect towers. Additionally, the conductors are winched to/pulled from section towers thus access to these towers is required for conductor drums and large winches. The access arrangements to angle towers are greater than for line towers.

Access can take various forms and is dependent on ground conditions. In poorer conditions more access works are required which can vary from laying temporary wooden or aluminium matting to installing crushed stone roads. Helicopters may also be used to facilitate access in sensitive or remote areas.

Tower foundations are typically 3-4m deep with excavation carried out by mechanical excavator. Prior to excavation the foundations for each tower site will be securely fenced off to ensure the safety of members of the public and livestock.

Once the concrete has been poured and set the excavation is back-filled using the original material in layers. Surplus material is removed from site.

Around two weeks after the foundations have been cast tower erection can commence. Tower steelwork can be delivered to site either as individual steel members or prefabricated panels, dependent on the method of erection for the tower.

Once a number of sections of towers are erected, conductor stringing can commence, installing conductors from section tower to section tower via the line towers. Conductor drums are set up at one end of the section with a

winch at the other end and the conductors pulled from one end to the other utilising a winch bond.

Prior to stringing the conductors, roads and railways which are to be crossed by the power line have to be protected by building a scaffold tunnel through which vehicles/trains can pass. Other obstacles such as existing power lines have to be either switched off, deviated or protected using “live line” scaffolds.

Materials required for construction are transported around the site by general purpose cross-country vehicles fitted with a lifting device. Excavators are generally of the tracked type to reduce likely damage to, and compaction of, the ground. Materials are delivered to site storage/assembly areas by conventional road transport and then transferred to tower sites by either smaller four-wheel drive lorries or in some cases helicopter.

In all cases every effort is made to cause least disturbance to landowners and local residents during construction. The route of the line is selected to avoid as far as possible communities and individual dwellings and ground disturbance during construction of the new line will be reinstated. Refer to Figure 3 for images of an L4 steel lattice tower under construction.

2.4.3 Maintenance

In general a transmission line requires very little maintenance. It is periodically inspected to identify any unacceptable deterioration of components so that they can be replaced. From time to time inclement weather, storms or lightning, can cause damage to either the insulators or the conductors. If conductors are damaged short sections may have to be replaced and that would involve winching to or from section towers. Insulators and conductors are normally replaced after about 40 years and towers painted every 15-20 years.

3.0 STUDY APPROACH AND METHODOLOGY

3.1 Introduction

The following routeing study and assessment is based on information that has been accumulated during the initial desk based assessment and from route assessment through field visits. The data used to inform routeing includes national, regional and local environmental planning designations and potential physical and landscape constraints. This was analysed in the context of the key project requirements:

- SPT project design requirements
- Scottish Power Transmission (2002) Overhead Transmission Lines – Routeing and Environmental Assessment
- The Holford Rules: Guidelines for the Routeing of New High Voltage Transmission Lines with NGC 1992 and SHETL 2003 notes (see Appendix 1)
- Section 9 of the Electricity Act 1989

3.2 SPT Routeing Commitments and Objectives

3.2.1 SPT's Routeing Commitment:

In developing and maintaining an efficient and coordinated technically and economically viable transmission system in accordance with the license agreement, SP Transmission Ltd is committed to limiting disturbance to people and the environment by its operations.

3.2.2 The Project Routeing Objective:

"to identify a technically feasible and economically viable route for an overhead transmission line that meets the technical requirements of the electricity network and causes, on balance, the least disturbance to the environment and the people who live, work and recreate within it"

3.3 Defining the Study Area

The first stage in the routeing assessment was to establish a study area which defined an area of feasible routeing options and an area of search for potential environmental and technical constraints. Figure 4 shows a study area and wider buffer zone:

- The study area has been defined by the key geographical, environmental and technical constraints beyond which it would not be feasible to route the line
- The wider buffer area of 5km around the outside of the study area represents the potential area in which there could be indirect effects on important designated areas, landscapes and views from settlements.

Factors located in this area may influence the route corridor options and are discussed in the detailed assessment of route corridor options.

3.4 Data Collection

3.4.1 Information Sources

Following identification of the study area a process of collecting baseline environmental and geographical information and collating a baseline database of potential constraints was initiated. This process involved desk study, consultation and fieldwork in which information from the following was collected and collated:

- Responses from a wide range of statutory and non-statutory consultees following circulation of an initial consultation letter and direct contacts
- Local and structure plans including information sent by Councils consulted
- Sites and monuments records
- Historic Scotland spatial data website
- Ordnance Survey digital mapping
- SNH Landscape character assessments
- Site survey photos, notes etc
- Meetings with key consultees
- Public consultation

3.4.2 Constraints Hierarchy

The analysis of constraints is critical to the selection of route corridors, route options and the preferred route alignment. The constraints include a wide variety of information relating to environmental designations and land use, with differing levels of importance. For the purposes of this study the constraints have been divided into three categories of importance, relating to the potential level of physical or environmental constraint that they could place on the routeing of the line. A hierarchical approach allows the assessment to focus on the constraints most likely to be of importance in routeing the OHLs.

Category 1 Constraints	National importance/ significant physical and/or environmental constraint
Category 2 Constraints	Regional importance/ potentially significant physical and/or environmental constraint
Category 3 Constraints	Local importance/ minor physical and/or environmental constraint

In the context of the Holford Rules the Rule 1 areas of „Highest Amenity Value' are equivalent to the Category 1 constraints, whereas the Rule 2 areas

of „High Amenity Value' would generally be considered equivalent to Category 2 or 3. As with previous routeing studies we have considered population centres and residential properties to be a significant constraint, with settlements and groups of five or more properties in Category 1 and smaller groups or individual properties in Category 2.

It should be noted that, although they are potentially significant environmental planning designations or physical impediments, not all of the items listed in Category 1 would constrain route options. Although of significant importance, they may be of limited extent and easily crossed by the OHL without significant effects. However, some constraints may have sensitive settings beyond their physical boundaries or combine with other physical constraints or designated areas to create a more significant obstruction to routeing.

In addition to environmental and technical constraints attention has also been paid to the potential landscape and visual constraints presented by topography, trees, waterbodies and other features. The Holford rules 3 to 7 (see Appendix 1) relate to minimisation of landscape and visual effects and have been applied to route corridor selection and particularly to identification of the preferred route alignment. In particular the routeing has also been influenced by the desirability of minimising skyline routes, sharp changes in direction with heavy angle towers and the need to avoid concentrations of lines or wirescapes where possible.

3.5 Presentation of Information

The information has been recorded in GIS format on an Ordnance Survey 1:25,000 digital base. It is available as a single database and is presented on maps in this report. Physical constraints clearly shown on the OS base mapping, such as settlements, waterbodies and roads have not been digitally mapped but are visible on the map base and clearly identified in the assessment process. The maps are as detailed in Table 3.1 (see end of this section).

3.6 Limitations and Routeing Options

This assessment has identified a series of key landscape, environmental, land use and technical constraints that have restricted route corridor options and influenced the final choice and details of preferred route alignment. These include:

- designated areas of national and international importance for nature conservation and cultural heritage;
- the presence of the 400kV OHL to the south of the study area;
- the presence of the existing 132kV OHL to be replaced, as there are technical limitations to the degree to which the new line can located within close proximity or on the same alignment;
- the Inner Firth of Clyde to the north;

- built up areas and concentrations of dwellings;
- key transport routes including the M8 and electrified railway line;
- the Royal Ordnance Factory site at Bishopton;
- escarpments, hills and ridges;
- reservoirs and woodlands.

The physical and technical constraints and concentration of designated areas has simplified the routeing process by limiting the areas in which route corridors can be located without potentially significant environmental effects or land use issues. However this has meant that, in some locations, landscape fit and the potential for visibility has not been the primary determining factor in route selection.

Table 3.1. GIS Mapping

Study Area (shown as one map covering the whole study area)	
Figure 4	The study area and buffer zone
Figure 5	Landscape Context - SNH Landscape Character Areas *(in relation to the study area and buffer zone)*
Figure 6	Local Landscape Character Areas *(in relation to study area)*
Detailed Constraints and Route Selection (shown as 2 maps at 1:25,000)	
Figure 7a&b	Overall constraints – *allowing areas with no or few constraints to be identified*
Figure 8a&b	Route Corridor Options and Overall Constraints – *showing all potential route corridors considered and the constraints affecting them*
Figure 9a&b	Preferred Route Corridor and Alignment and Key Constraints – *showing preferred route corridor with fewest constraints and preferred alignment within the corridor* (NB. Also showing previous preferred route for comparison)
Figure 10a&b	Preferred Route Alignment and Local Landscape Character Areas - *showing preferred route corridor and alignment against landscape constraints* (NB. Also showing previous preferred route for comparison)

4.0 BASELINE INFORMATION

4.1 Introduction

This section of the report describes the main constraints identified during the study. As described in Section 3 the baseline data collection and analysis has built up a picture of the key areas of environmental, landscape and technical constraint. In addition to defining the study area this has allowed the identification of corridors of least constraint within the study area, through which the OHL could be routed with the least potential for environmental effects.

4.2 The Study Area

4.2.1 Extents of Study Area

The potential area for routeing lies between two key corridors of constraint:

- the Inner Firth of Clyde and Port Glasgow to the north; and
- the existing Inverkip to Neilston 400kV OHL to the south.

These are physical and technical barriers that would be difficult, expensive and unnecessary for the proposed overhead line to cross. The physical, technical and environmental constraints of routeing in the estuary and adjacent urban areas are clear. In the case of the 400kV OHL, the proposed OHL would require undergrounding in order to cross it. This would require sealing end compounds and heavy towers either side of undergrounded sections, creating significant landscape and visual effects in themselves. These key constraints provide the basis for a routeing study area defined in Figure 4.

The study area covers the area between Erskine Substation in the east and Devol Moor substation in the west:

From east to west, the northern boundary is initially defined by the town of Erskine together with parkland and an industrial area to the north. It then follows the Inner Firth of Clyde shore between Erskine and Langbank. At Langbank it turns inland to avoid the settlement and continues, to follow the southern edge of Port Glasgow, west of the Finlaystone Estate. From Port Glasgow it heads west, keeping south of the escarpment of Devol Moor and Harelaw Reservoir just north of Devol Moor substation. From here it turns south, following the Auchenfoil Road to Devol Moor substation.

The southern boundary has been drawn from Erskine Substation to include the Bishopton Royal Ordnance Factory Site, the southern boundary of which coincides with the route of the Inverkip-Neilston 400kV interconnector. The study area boundary then continues to follow the interconnector northwest, north of Kilmacolm. It then turns WSW, south of Devol Moor to meet the 400kV OHL branch on the edge of Strathgryfe and head NNW to Devol Moor substation.

Figure 4 also shows a buffer area lying up to 5km beyond the potential routeing corridor in which there is the potential for receptors to experience indirect effects such as visual effects. This buffer area extends east into the fringes of Glasgow and envelopes the Inner Firth of Clyde to the coast of West Dunbartonshire and Argyll & Bute. The western edge includes Greenock and the edge of Renfrew Heights. To the south it includes more of Renfrew Heights, Bridge of Weir and the northern part of Paisley.

4.2.2 Landscape and Topography

There are four main landscapes in the core study area: South of the Firth of Clyde between Erskine and Greenock there is a narrow costal strip defined by a raised beach and steep escarpment. This area has a significant proportion of built up land including settlements and transport corridors.

Inland is broadly divided into two topographic and landscape types. Most of the area between Erskine and Devol Moor comprises a landscape of varying topography all under 200m. There are a number of steep rocky hills of modest elevation surrounded by more gently rolling topography with minor valleys, supporting mainly improved pasture, woodland and small scale forestry. One main valley, Strathgryfe separates this area. There are a number of settlements including Bishopton and Kilmacolm in the lower areas.

South of Bishopton and Erskine the elevation lowers to below 25m AOD and the topography becomes flat or gently undulating, forming a flood plain around the River Gryfe. This area is farmed, with blocks of woodland but also occupied by the Royal Ordnance Factory south of Bishopton.

West of Kilmacolm and the upper reaches of Strathgryfe, the land increases in elevation: mostly above 150m and up to nearly 450m, becoming larger scale with rolling topography and upland pasture, moorland and forestry land uses predominating. A series of larger reservoirs lie in the middle of this area and there are no settlements.

4.3 Landscape Character

4.3.1 Regional Character Types

The landscape character of the study area and buffer is covered by SNH's Glasgow and the Clyde Valley Landscape Character Assessment.

The area falls into four broad landscape character types, broadly based on the topographic areas described above. These are shown in Figure 5. There are further Landscape Character Areas within the 5km buffer area but these play only a peripheral role in the landscape character of the study area.

Raised Beach

The coastal strip is Type 1: Raised Beach. This is characterised by the following:

- steep scarp, representing the former cliffline, and narrow platform, representing the former beach, with estuarine mudflats along the inner part of the Firth of Clyde
- „hanging' broadleaf woodland on many of the steeper slopes
- coastal settlements
- defensive sites, castles, historic houses and designed landscapes
- dominance of horizontal landscape elements
- prominent area with extensive views

Planning and management guidelines state that particular care is required in the siting of vertical features such as pylons and that visual effects can be reduced by siting them in locations where they are generally viewed against a background rather than against the sky. It is recommended that areas downslope or further inland are considered.

Alluvial Plain

The flatter area around the River Gryfe, to the south of Bishopton and Erskine is Type 2: Alluvial Plain, characterised as follows:

- distinctive low-lying landform
- generally open character though woodland blocks and remnant field boundary trees create containment in some areas
- lush pastures, arable fields and a number of surviving mosses
- significant urban influences in some areas, resulting from urban expansion, transport infrastructure and activities such as waste disposal

No guidelines in relation to pylons are given but it is stated that planning and management guidelines should aim to reinforce the area's rural character and pursue strategies to reduce the visual influence of existing urban developments.

Rugged Upland Farmland

The area between Bishopton and Kilmacolm, including Strathgryfe is Type 6: Rugged Upland Farmland. Key characteristics include:

- rugged landform comprising rocky bluffs and shallow troughs
- dominance of pastoral farming
- tree cover often emphasising landform, for example concentrated on bluffs and outcrops

It is noted that there is a concentration of tall structures such as masts and pylons and that, particularly when situated near the northern edge of the area, they have a significant adverse effect on landscape character. It is stated that they should generally be discouraged, except where there are opportunities to provide a degree of backclothing.

Rugged Moorland Hills

The higher area to the west, including Devol Moor and Renfrewshire Heights is Type 20: Rugged Moorland Hills. Key characteristics include:

- distinctive upland character created by the combination of elevation, exposure, rugged landform, moorland vegetation and the predominant lack of modern development;
- a sense of apparent naturalness and remoteness which contrasts strongly with the farmed and developed lowland areas;
- presence of archaeological sites on hilltops and sides.

The landscape is considered sensitive to the development of tall structures (such as pylons) on hilltops and along the crests of scarps as they would be potentially obtrusive and visible from surrounding landscapes. Local areas with landform enclosure may be capable of reducing visual effects and may, therefore, be less sensitive.

Other Areas

There are further Landscape Character Areas within the 5km buffer area but these play only a peripheral role in the landscape character of the study area:

- The River Clyde is defined as Type 9: Green Corridor, referring mainly to its banks. Despite being shown in the SNH landscape character assessment as extending to Port Glasgow, the description of the area starts from the Erskine Bridge eastwards. The shorelines of the Clyde are therefore defined by the Raised Beach LCA. The Green Corridor type is also represented along the White and Black Cart Waters east of Erskine and River Leven and Duntocher Burn in West Dunbartonshire.
- Type 19, Moorland Hills and Ridges is represented in West Dunbartonshire, across the Clyde Estuary.
- Type 20, Rugged Moorland Hills is also represented north of the Clyde, by the Kilsyth Hills in West Dunbartonshire.

4.3.2 Local Landscape Character Areas

The regional landscape assessments by SNH provide a very broad picture of the study area and surroundings. In order to allow a finer grained approach to route corridor selection, the landscape of the study area has been assessed in more detail. This involves further subdivision into local landscape character types and areas characterised by topography, vegetation and land use, such as localised hill and valley forms, agricultural practices and areas of woodland.

The local landscape character areas (LLCAs) are at a scale that allows the identification of areas of greatest and least landscape constraint to the routeing of transmission lines. The LLCAs are described in Table 4.1 below and their extents within the study area boundaries are shown in Figure 6.

Table 4.1. Local Landscape Character Types and Areas

CHARACTER TYPE AND LOCATIONS	KEY FEATURES
Escarpment Erskine Park to Port Glasgow	The predominantly steep north facing slope above the Inner Firth of Clyde. A varied small to medium scale landscape of pasture, broadleaved woodland and occasional parkland set between areas of settlement. Climbed by steeply ascending roads cutting diagonally across the slope. Extensive views northwards across the Inner Firth of Clyde. *Key sensitivities in relation to this landscape would be in the potential visibility of the OHL at the top of the escarpment, the steepness of some areas and the small scale of parts of the landscape.*
Raised Beach Erskine Park to Langbank	The flat and undulating pastureland forming the coastal strip along the Inner Firth of Clyde. Predominantly improved pasture divided into fields by post and wire fences. Traversed by main transport corridors including the M8 and railway. Views southwards cut off and dominated by escarpment and woodlands. *The flat topography, background escarpment and predominance of linear infrastructure in this landscape make it potentially less sensitive to the proposed OHL.*
Rolling Pastureland Extensive throughout much of study area between Erskine and Port Glasgow above the Firth of Clyde escarpment.	Small to medium scale, rolling and undulating improved and semi-improved pasture. Predominantly enclosed by hedges, fences and walls with occasional trees, copses and shelterbelts with a high proportion of broadleaved trees. Frequent farms, isolated houses and small settlements connected by a network of narrow, winding roads and lanes. Traversed by electricity transmission lines. Occasional small scale waterbodies and rapidly flowing minor watercourses. Views vary from highly enclosed to extensive from tops of ridges. A complex, semi-enclosed and often intimate landscape. *This landscape would be moderately sensitive to the OHL: whilst providing some screening between higher landforms and trees, there is the potential for skylining when crossing higher ridges and adverse effects on the setting of smaller scale landscapes including estate policies, buildings and settlements. Also potential for cumulative effects with existing OHLs.*
Rocky Hills and Ridges Isolated summits and ridges between Bishopton and Port Glasgow	Small to medium scale hills and ridges set in a predominantly pastoral landscape where they define lower lying pastureland and shallow valleys. Steep sided in places with rocky outcrops. Predominantly rough grazing in large enclosures. Areas of bracken. Lower summits crowned with mature mixed or broadleaved woodland. Occasional masts and pylons. Extensive views. *These areas would be sensitive to the proposed OHL as they often form the skyline seen from the surrounding area and from north of the Clyde. They would also act as a backdrop if routed through the surrounding farmlands.*

CHARACTER TYPE AND LOCATIONS	KEY FEATURES
Pastoral Valleys Dargavel Glen, Finlaystone Glen, Strathgryfe, Formakin/ Park Glen.	Areas of small to medium scale Rolling and Upland Pastureland which are sufficiently topographically defined by surrounding ridges and/ or by watercourses to be considered as valleys. Views enclosed to the sides but often lengthy along and beyond the valley. Often crossed or traversed by electricity pylons although these are often viewed against a background of slopes and/ or woodland and trees. *Moderately sensitive to the OHL: whilst providing screening between areas of higher ground and trees there is the potential for adverse effects on the setting of buildings and smaller scale intimate landscapes within valleys; potential need to remove trees and potential for cumulative effects with existing OHLs within the confines of valleys.*
Lowland Arable Farmland Gryfe floodplain south of Bishopton ROF and Erskine	Flat or gently undulating predominantly arable farmland with large rectilinear fields separated by fences and drainage ditches. Straight roads and tracks. Occasional farm buildings. An open, flat landscape with long distance views to higher ground. Vertical elements including electricity pylons are prominent. *Potentially sensitive to the OHL due to visibility of tall structures, lack of screening and potential for cumulative effects with existing OHLs.*
Improved Upland Pasture Mainly in west of study area including the area around Devol Moor and the head of Strahgryfe	Medium scale undulating or rolling improved and semi-improved pasture. Predominantly enclosed by fences and drystone walls. Open and exposed with few trees and occasional shelterbelts or small mainly coniferous, plantations. Isolated farms, occasional roads and tracks. A simple, open landscape with wide views where tall or large scale objects are easily visible. *Potentially sensitive to the OHL despite larger scale, due to higher elevation, lack of tree screening and potential for cumulative effects with existing OHLs.*
Forestry Surroundings of Bishopton ROF	Extensive areas of commercial forestry plantation set out in geometric blocks, generally located in upland areas. Dominated by even age stands of coniferous trees of varying maturity. Serviced by a network of tracks. No habitation. *Whilst providing potential for partial screening or backgrounding of the OHL these areas would also be sensitive to felling.*
Moorland Devol Moor	Undulating and rolling, predominantly unimproved, upland used for rough grazing. Occasional watercourses. Few enclosures, roads or tracks and little habitation. A simple, open medium to large scale landscape with wide views where tall or large scale objects are easily visible. *These areas would be sensitive to the proposed OHL due to their relatively natural, undeveloped character. Furthermore they often form the skyline seen from the surrounding area and from north of the Clyde.*
Settlement and Industry Bishopton and ROF	No character assessment made as these are areas through which the line cannot be routed.

4.3.3 Landscape Fit and Topographic Constraints

There are few areas of very steep topography in the study area that might prove to be a technical constraint to construction. The main topographic constraints relate to areas of locally high ground and coastal escarpments on which the OHL may appear prominent, and areas of exposed high ground to which difficulties of access and adverse weather conditions may apply as well as landscape effects in a relatively open environment.

Valleys present an opportunity to route lines in a less prominent location and against a backdrop but can be adversely affected when crossed at an obtuse angle or are at an intimate scale such that the line would be a dominant feature. Shallow valleys lie around Formakin, the Dargavel Burn, Finlaystone Burn and rising up to Devol Moor above West Kilbride farm.

Between Erskine and Devol Moor the main constraints relate to the steep escarpment above the Firth of Clyde and steep hilltops to the south of here, including Barmore Hill, Barscube Hill, Knockmountain and Craigmarloch. These areas have the potential for skylining of the OHL when seen from the surrounding lower ground, particularly when viewed from north of the Firth of Clyde.

Devol Moor rises gently up to over 200m AOD south of Port Glasgow. West of Devol Moor there are extensive areas of rolling upland hills broken into two masses by Strathgryfe and the Gryfe Reservoirs and Loch Thom. Strathgryfe forms a significant broad, open, valley between Kilmacolm and the reservoirs.

4.3.4 Reservoirs

There are three small reservoirs between Erskine and Devol Moor. The Whitemoss Dam north of Formakin lies just south of the existing 132kV OHL. Auchindores and Leperstone lie inbetween Kilmacolm and Port Glasgow. The latter reservoirs present a significant obstacle in combination with other factors: they lie across the route and are separated by a narrow isthmus already crossed by the existing 132kV OHL to be replaced, with the 400kV OHL immediately to the south of Leperstone. Leperstone has a permanently low water level and is now developing thickets of scrub in formerly inundated areas.

4.4 Environmental Designations and Land Use Constraints

4.4.1 Introduction

As explained in Section 3 the data on environmental designations and land use collected during this study has been sieved into three categories based on importance and potential significance as a physical and/ or planning constraint. The detailed list of constraints and constraining properties are given in Table 4.2 below. The category 1 designations together with settlements should generally be considered equivalent to Holford's areas of „Highest Amenity Value' although some land use features are also included

due to the significance of the constraint that they represent. Category 2 together with isolated residential properties are generally equivalent to „High Amenity Value'. The distribution of the constraints throughout the study area is shown in Figures 7a&b.

Table 4.2: Potential Routeing Constraints

CONSTRAINT	CONSTRAINING FACTORS/ COMMENTS
Category 1: National/ International	
Settlements (5nr properties or more).	Often extensive area. Physical routeing constraints, visual effects, perceived health concerns. 150m clearance zone considered desirable.
Special Protection Areas/ Ramsar Sites	Effects on protected species, bird flight effects, extensive area
SSSIs	Effects on habitats, wildlife or designated features
Scheduled Ancient Monuments and Sites of Schedulable Quality	Damage to cultural heritage, effects on setting
Historic Scotland Sites	Damage to cultural heritage, effects on setting
Conservation Areas	Settlement. Physical routeing constraints, damage to cultural heritage, effects on setting
Category A Listed Buildings	Damage to cultural heritage, effects on setting
Historic Garden/ Designed Landscape (Inventory listed)	Damage to cultural heritage, effects on setting, often extensive area
Bishopton Royal Ordnance Factory (ROF)	Exclusive land use, extensive area
Proposed Bishopton Development Site	Future residential land use, uncertainty over future development pattern, extensive area
MOD land	Land use restrictions
Category 2: Regional/ Moderate	
Residential Properties (Fewer than 5nr.)	Physical routeing constraints, visual effects, perceived health concerns. 150m clearance zone considered desirable.
Clyde Muirshiel Regional Park	Extensive area, landscape/ visual and recreational concerns
Ancient and Semi-Natural Woodlands	Tree loss, severance of habitat
Country Parks	Extensive area, landscape and recreational issues
Golf Courses	Extensive area, land use
Cultural Heritage Sites	Sites and Monuments Records. Potential cultural heritage effects.
Category B Listed Buildings	Cultural Heritage Effects, effects on setting.

CONSTRAINT	CONSTRAINING FACTORS/ COMMENTS
Historic Gardens and Designed Landscapes (Non-inventory)	Damage to cultural heritage, effects on setting, often extensive area.
Category 3: Local/ Minor	
Tree Preservation Orders	Loss of trees/ woodland
SWT sites	Wildlife and habitat effects
Forestry Commission Land	Extensive areas but scope for routeing
Category C Listed Building	Cultural heritage effects
Sites of Importance for Nature Conservation (S.I.N.C sites)	Wildlife and habitat effect

It should be noted that the location of the substations and the existing 400kV and 132kV OHLs are also a significant constraint on routeing, largely defining the study area. However as they are considered to be technical constraints they are not included with the environmental and land use constraints in Table 4.2.

The following paragraphs detail the key issues in the study area relating to the above constraints.

4.4.2 Landscape Designations

There are no national or regional landscape designations based primarily on landscape quality within the study area. However the Clyde Muirshiel Regional Park covers most of the study area west of Devol Moor substation, and is an area valued for both its recreational and landscape value. The need to enter this area would be unlikely but there would be a possibility of visual effects from the line as it crosses Devol Moor. These are unlikely to be significant as (a) the proposed OHL is a replacement of the existing and (b) the 400kV OHL and substation closer to the designated area already have a greater effect.

There are two significant Designed Landscapes between Erskine and Devol Moor, at Finlayston and Formakin. These are discussed below under cultural heritage.

4.4.3 Nature Conservation Designations

There are significant areas with nature conservation designations throughout the study area. Special Protection Areas are of international importance: the Inner Firth of Clyde SPA lies immediately to the north of the Devol Moor to Erskine study area and the Renfrewshire Heights SPA covers much of the Clyde Muirshiel area west of Devol Moor. There is also an SPA around the Black Cart Water to the east of Erskine with the potential for indirect effects on designated interests.

In addition to this there are SSSIs between Erskine and Devol Moor, at Formakin and Dargavel Burn, both currently crossed by the existing line. There are also numerous woodlands identified by Local Authority inventories as being of Ancient origin and/or Semi-Natural origin, at least 3 of which are currently crossed by the existing 132kV OHL.

There are a number of local authority SINC sites covering a significant proportion of the study area east of Devol Moor. The existing OHL between Erskine and Devol Moor crosses six of these.

4.4.4 Archaeology and Cultural Heritage

Between Erskine and Devol Moor there are significant numbers of Scheduled Ancient Monuments, sites of Schedulable Quality and Listed Buildings as well as two Inventory-listed Designed Landscapes: Formakin and Finlayston. In places, together with dwellings and woodlands these represent significant areas of potential constraint. The existing 132kV OHL to be replaced currently passes across Whitemoss Roman Fort SAM, west of Ingliston House, and through the western edge of Formakin Designed Landscape.

4.4.5 Existing Transmission Lines and Other Infrastructure

The presence of the existing 132kV OHL from Erskine to Devol Moor (to be removed upon completion of the proposed new line) and the 400kV Inverkip to Neilston OHL in the study area are potential technical constraints on both of the proposed OHLs.

The existing Erskine to Devol Moor 132kV OHL will be operational during construction of the new OHL. If the final proposed route requires to cross or closely parallel this existing line then a temporary outage will be required during construction. Whilst this is not an absolute constraint, it is desirable to minimise the number of crossings or areas of close proximity as the existing system could only sustain an outage for a limited time.

Crossing the 400kV OHL to the south would require under grounding of the proposed 132kV OHL and require cable sealing end towers (larger and more visually prominent structures) on either side of the 400kV OHL. Close proximity to this line without crossing it would also potentially lead to cumulative landscape and visual effects of these two similar infrastructure elements.

4.4.6 Roads and Other Infrastructure

The study area is mainly traversed by minor roads or lightly trafficked „A' roads. However, in the north and east there is a major transport corridor including the M8, A8 and an electrified railway line passing through the area around Erskine and Bishopton and along the raised beach coastline to Port Glasgow.

A gas pipeline passes south of Greenock and Port Glasgow, past Devol Moor Substation and south of Kilmacolm.

4.4.7 Settlements and Dwellings

Settlements, dwellings and some places of education and work represent significant constraints to routeing due to visual effects and perceived adverse effects on health. SPT have adopted a rule of thumb in which 150m of clearance from properties is a trigger for further consideration of effects where possible. Nevertheless in particular circumstances it cannot be guaranteed that this clearance would not be breached.

There are several larger settlements within and close to the study area between Erskine and Devol Moor. Most notably the small town of Bishopton lies immediately west of the Erskine substation and much of the coastal area is built up with the settlements of Langbank and Port Glasgow, defining the northern boundary of the study area. To the south of the existing OHLs lies the town of Kilmacolm. In between the towns and scattered throughout most of the study area there are farms, single dwellings and small clusters of dwellings, becoming much more scattered in the west.

West of Devol Moor there are no significant settlements and only a few scattered farms and dwellings at the upper end of Strathgryfe.

4.4.8 Planning and Land Use

The Royal Ordnance Factory occupies an extensive area south and west of Bishopton. This area is currently surrounded by high security fencing. The northern section of this site is designated for redevelopment as housing, with an access road joining the A8 northwest of the town. It is undergoing a decommissioning and decontamination process. Outline plans for the redevelopment of the site have been submitted to Renfrewshire Council. These include extensive housing and greenspace areas within the existing development footprint. However the fields and woodland areas along the northwestern boundary would remain largely unaltered. Consultations with BAE's development planning advisors have indicated that they have concerns about the potential effect of the proposed OHL on the setting of their development, should it be routed in close proximity.

4.4.9 Recreation and Tourism

In the Erskine and Devol Moor study area there are a number of potential visitor locations and recreational facilities. This includes the previously mentioned Formakin and Finlaystone Estates, the latter being a country park. In addition there are three golf courses: at Erskine; Gleddoch House Hotel near Langbank and Auchinleck at Port Glasgow. The latter course, on Devol Moor, is crossed by the existing 132kV OHL. A course has also recently been constructed at Mar Hall Hotel, north of Bishopton.

National Cycle Route 75 passes under the existing 400kV and 132kV lines between Kilmacolm and Port Glasgow.

The Clyde Muirshiel Regional Park is a key regional resource for informal recreation and covers much of the area west of Devol Moor substation. The potential for visual effects on the northeastern edge of this will be considered.

4.4.10 Forestry and Agriculture

Routeing through areas of plantation woodland and forestry is likely to require felling of trees which may lead to additional landscape and visual effects or the potential for wind throw. With the exception of the extensively planted surroundings of the Royal Ordnance Factory there are no substantial areas of forestry between Erskine and Devol Moor, although there are many scattered blocks and strips of plantation and woodland, some of which are on the Ancient and Semi-Natural Woodland Inventory. However an extensive area around Knockmountain Farm, north of Kilmacolm, is designated as Forestry Commission land in which there are plans to plant extensive areas of native woodland of high amenity and recreational value. This is crossed by the existing 132kV OHL that is to be replaced.

There is extensive pastoral farming throughout most of the study area. The majority in the east is on enclosed, improved pasture with rough grazing restricted to a few hilltops and on Devol Moor. To the west the majority of grazing is open, unimproved moorland with improved pasture concentrated around the head of Strathgryfe.

5.0 ROUTEING STUDY

5.1 Introduction

The objective of this stage of the assessment is to identify areas in which there are fewer of the highest level constraints. This has facilitated the determination of a number of potential route corridors to be assessed in more detail before selecting a preferred route corridor and then a preferred alignment to be developed and assessed in detail.

5.2 Corridor Options

A series of potential route corridors were identified. These are a nominal 400m wide and are considered wide enough to accommodate the eventual alignment of the proposed OHL.

5.2.1 The Holford Rules

The Holford Rules form the accepted guidance for the routeing of OHLs in the UK and these formed the starting point for the development of route corridor options. This was carried out by identifying broad areas of least environmental, physical and technical constraint in combination with considering the principles of good route design in relation to landscape and visual constraints:

- avoiding sharp changes of direction where possible
- considering topography, particularly visual effects, associated with hills, ridges and skylines
- following open valleys where possible
- avoiding concentrations of transmission OHLs (where possible)
- avoiding recreational and residential land

5.2.2 Establishment of Route Corridors

This has allowed the establishment of corridors that balance good routeing principles and reduced potential for environmental effects. The corridors do not completely avoid constraints due to the concentration and extent of environmentally sensitive locations. Furthermore some physically possible but potentially constrained routes were included to test the overall suitability of the more obvious options. Ongoing consultations during preparation of and following the initial report and exhibition in 2007 revealed further information and this is discussed below.

Three main corridor options were identified between Erskine and Devol Moor substations: Northern, Central and Southern, together with potential sub-options and crossovers between the principal lines. The following sections of this report consider each of the options in detail, leading to eventual selection of a Preferred Route.

The main corridors shown in this report are the same as were shown in the 2007 consultation document, but additional sub-options and crossovers are considered following the results of the consultations and the technical appraisal of the route. The previous Preferred Route is also shown for the purposes of comparison.

5.3 Route Corridor Assessment

There are three main corridors passing east to west from Erskine to Devol Moor: **Northern: Central** and **Southern.** They are shown in Figures 8a and b, together with potential sub-options along, and linkages between, the main corridors

5.3.1 Northern Corridor

The northern corridor leaves Erskine substation to pass north of Bishopton broadly east of the existing line over undulating improved pasture south of an industrial area. At this stage two closely aligned options are available:

- Bishopton: the more westerly option is shorter, passing NNW and turning W towards the M8 at North Polton through a belt of inventory woodland and past an archaeological site of schedulable quality
- Erskine: the corridor heads NNE to the east of Drumcross farm and then NW to Erskine Farm, thus avoiding the woodland and archaeological site but close to a prominent B-listed monument and a number of listed properties, including the gatehouse to Mar Hall Hotel (former Erskine House).

Both options then head W along the southern edge of Erskine golf course towards the M8, crossing it north of Bishopton.

West of the M8 two options are available:

- Escarpment: the corridor closely follows the existing 132kV OHL, crossing the railway at Bishopton Tunnels and rising up the escarpment on a WSW alignment, passing a number of properties and towards Ingliston House. It crosses the existing OHL at the Old Greenock Road and turns WNW near Whitemoss Dam towards the lodge at the entrance to Drums, crossing the existing OHL again but going south of the Whitemoss Roman Fort SAM.
- Coastal: the corridor deviates NW from the existing 132kV OHL, following the relatively flat raised beach land between the motorway and railway. It crosses the railway east of the M8/A8 junction as roads, woodland and settlements constrain further coastal routeing, and rises SW diagonally up the escarpment slope towards the lodge at Drums.

West of Drums Lodge there are again two options for the Northern Corridor:

- Escarpment: the corridor passes WNW, crossing and re-crossing the Old Greenock Road and passing between it and the upper edge of Langbank through small steep fields, turning west and back over Old Greenock Road at Undercraig.

- Inland: the corridor heads SW on rising ground towards Barscube Hill across small fields between small plantations, along the southern edge of the golf course at Gleddoch House Hotel and then turning sharply to the NW towards Undercraig, following a line between the ridge of Barscube Hill and the golf course

West of Undercraig is a single corridor which follows a westerly route over undulating farmland, passing north of Auchendores Reservoir and south of the Bardrainney suburb of Port Glasgow. It crosses the Auchenbothie Road and crosses south of the existing line to rise up onto Devol Moor, following a course 200-300m south of the existing 132kV OHL to arrive at Devol Moor substation after crossing the southern end of Port Glasgow golf course. A minor variation to this route passes slightly further south onto lower ground between the golf course and the substation.

5.3.2 Central Corridor

The central corridor follows the same initial routes north of Bishopton as the northern corridor. After crossing the M8 motorway and railway it then departs from this route, heading sharply SSW round the edge of Bishopton and over the undulating farmland between the ROF Bishopton development site and the Formakin Estate. The corridor bends south of Formakin, passing through plantation woodland on the ROF site on low ground and then heads WNW crossing Barochan Road and climbs steeply up Barmore Hill, following a small stream valley to pass between two hilltop woodlands to Park Erskine. At this point it is joined by an alternative corridor connected to the Northern Corridor, which passes SSW-NNE over rolling pastureland between Formakin Estate to the east and Drums to the west.

Heading west of Barmore Hill at Park Erskine the central corridor passes across rolling pastureland between plantations and south of Barscube Hill into the shallow valley of Dargavel Glen. It then follows a WNW line across undulating improved pasture on the northern side of Dargavel Glen, paralleling the existing 132kV and 400kV OHL routes along the valley before passing north of Knockmountain Farm at its head and downhill to the isthmus between the two reservoirs west of Finlaystone Road, passing just north of the existing 132kV line.

In the 2007 Consultation Report the corridor splits into northern or southern alternatives west of the reservoirs and around Craigmarloch Hill:

- The northern heads north between Cloak and Auchendores Reservoir then west around the hill before turning sharply SW to West Kilbride.
- The southern route heads SW towards Craigmarloch, crossing the existing 132kV OHL before turning WNW to West Kilbride.

Past West Kilbride the route continues WNW, heading uphill onto Devol Moor via a shallow fold in the topography, where it joins the northern corridor between Cunston and Devol Moor substation.

This split was considered necessary as there was physically no space between the Leperstone and Auchendores reservoirs to construct the new OHL whilst maintaining the existing line in service. Nevertheless, further to the concerns raised through the 2007 consultation and a technical appraisal of the potential for building on line over this length, a third central route option following the existing alignment between the reservoirs and just north of Craigmarloch Wood is now considered. This joins the northern corridor in the open ground between Craigmarloch Wood and Bardrainney.

5.3.3 Southern Corridor

The southern corridor goes south of Bishopton from the substation. Initially crossing the M8 west of Erskine substation it then heads SSW across undulating farmland, across the A8 and the railway and into the Royal Ordnance Factory site, skirting the southern edge of the proposed development area, where two options are possible:

- Northern: the corridor turns WNW through the ROF, continuing to skirt SW of the proposed development area, until it joins the central corridor at Nether Mill just south of Formakin. It then heads WSW on steadily rising improved pastureland to Towncroft.
- Southern: the corridor continues W across the ROF, passing a sand and gravel pit to the west and then to the north side of Barochan Hill (which has a Roman Fort SAM on its summit), before turning NW and passing across woodland and rolling pasture just north of the 400kV line to Towncroft.

West of Towncroft the corridor turns WNW to Haddockston, following the gap between the two existing OHLs (400kV and 132kV) along the southern side of Dargavel Glen. There are also potential links from the central corridor between Nether Mill and Towncroft and between Barscube and Mid Glen. The route passes south of Knockmountain where it merges with the central corridor to descend to the two reservoirs.

West of the reservoirs the route follows the same corridor options to Devol Moor substation as the northern and central corridors.

5.4 Route Corridor Appraisal

5.4.1 Erskine – Bishopton

West of Erskine substation the primary routeing consideration is whether to pass north or south of Bishopton. Further consultation concerning the ROF site to the south and west of Bishopton has indicated that routeing through the site on the southern corridor would be constrained due to the housing development proposals and due to the remaining ROF site to the south of this area, which will have continued use by BAE and may have land contamination issues. Furthermore, routeing so closely along the perimeter of the proposed development area would be considered undesirable due to potential adverse effects on future amenity. As routeing even further south round the southern end of the ROF site would involve a considerable

diversion and two crossings of the 400kV OHL it is concluded that only the north and central corridors, passing north of Bishopton and the ROF, are feasible.

North of Erskine substation the principal constraints include an ancient woodland; a monument of schedulable quality; a number of residential properties; some listed buildings; a B-listed monument and Erskine golf course. Analysis of the two sub-options indicates that the optimum would be a combination of the two: initially passing east and north of Drumcross and then cutting south of the monument, residential properties and golf course on the alignment closer to Bishopton.

5.4.2 Bishopton - Formakin

West of Bishopton a number of high category constraints limit the routeing options to three:

- The northern corridor sub-options pass by a high concentration of designated and developed sites including the Whitemoss Roman Fort SAM, Ingliston Equestrian Centre; Cora Campus and an area of Ancient Woodland:
  - the coastal option avoids all the designated areas but is close to the Firth of Clyde SPA and then has to cross the electrified railway on a slope.
  - due to the paddocks and buildings at the recently expanded equestrian centre the escarpment option would have to pass across the Roman fort SAM.
- The third option is the central corridor which passes between the ROF/ Bishopton development site and the Formakin Designed Landscape.

The two northern corridors have significant problems: the escarpment option would require scheduled monument consent at Whitemoss fort and would be visible on the skyline when seen from the north shore of the Clyde. The coastal option is close the SPA and has to cross the railway.

West of Formakin the northern corridor splits again into two sub-options to pass either side of the Gleddoch House Hotel and Golf Course:

- the escarpment corridor passes close to the southern edge of Langbank; and
- the inland corridor rises onto the shoulder of Barscube Hill and around the southern edge of the golf course.

West of the golf course there are no designated areas or landuse issues as the corridor passes north of Auchendores Reservoir. However both the escarpment and inland corridors present potential problems including:

- adverse effects on residential amenity around Langbank;
- adverse effects on the amenity of the hotel and golf course;
- potential for skylining of the escarpment route when seen from below.

Given the potential problems associated with the northern corridor, the central corridor is considered the most feasible as it:

- does not directly affect sensitive receptors and passes fewer residential and recreational receptors;
- does not have to cross a major transport route;
- crosses low lying ground with a backdrop of trees to the east and south and minimises potential for skylining when seen from either side of the Firth of Clyde;
- lies west of the proposed ROF development site and would not directly affect proposed areas designated for housing.

5.4.3 Formakin – Leperstone/ Auchendores

To the southwest of Formakin there are two options from the central corridor:

- continue WNW along the central corridor past Barbeg Hill and Dargavel Glen to Knockmountain north of the existing 132kV line.
- cross SW to the southern corridor on rising ground to Towncroft and then WNW past Haddockston and along Dargavel Glen to Knockmountain south of the existing 132kV line.

The central and southern corridors are considered preferable to the northern as they avoid population centres and recreational interests as well as the potential for skylining. Furthermore they are located in a landscape already affected by overhead transmission lines whereas the northern corridor has no existing lines.

Analysis of the central and southern corridors indicates that a combination of the two would be the optimum solution. Between Formakin and Mid Glen farm the southern corridor is preferable as it follows generally lower ground into the lowest part of Dargavel Glen and passes between groups of trees. The OHL would therefore benefit from better screening and backclothing than on the central route which is more open west of Park Erskine. Although passing close to more properties than the central route, and within 100m of the existing 400kV line at one point, it lies very close to the existing route alignment and would not be an entirely novel effect on residential amenity in this area.

To the west of Mid Glen the central corridor is clearly preferable:

- the southern corridor would have to either cross the Dargavel Burn SSSI or the 400kV line to avoid this whereas the central corridor would accommodate the OHL to the north of the SSSI;
- the southern corridor would be very close to the 400kV line leading to potential cumulative „wirescape' effects;
- the central corridor follows lower and less steep ground thus reducing the potential for skylining.

5.4.4 Auchendores/ Leperstone – Devol Moor

The central and southern corridors merge at the isthmus between Auchendores and Leperstone Reservoirs. West of here there were two options in the 2007 report:

- The northern option passes the B-listed residential property at Cloak, a further property and a hilltop settlement site of schedulable quality, before passing between the heavily designated Craigmarloch Hill and the suburbs of Port Glasgow.
- The southern option passes an occupied prefabricated building on the reservoir shore, then between two clusters of properties on the A761 and then south of Craigmarloch Hill.

The southern option was originally considered preferable as it avoids affecting the setting of two cultural heritage sites and avoids moving the line closer to a centre of population. However the consultation process indicated considerable opposition on the basis of cumulative effects on residential amenity with the existing 400kV line passing to the south of Leperstone. Further to a technical appraisal of on-line construction, a third option of remaining on the existing line between Knockmountain and Craigmarloch Wood, thus avoiding both sets of effects, is therefore considered to provide the best balance of landscape, visual, environmental and technical issues.

West of Craigmarloch Hill the corridor passes to the south of the existing 132kV OHL on a route to Devol Moor substation that mitigates the skylining issues that the existing OHL creates. It also avoids Port Glasgow Golf course by passing it to the south.

The preferred route corridor is shown in Figures 9a and b and 10a and b. In summary the preferred corridor has been chosen on the following basis:

- Avoidance of existing Bishopton ROF and proposed housing development land;
- Avoiding highest amenity sites represented by statutory and local plan designations including Inner Firth of Clyde SPA, Whitemoss Roman Fort SAM, Formakin Designed Landscape and SSSI, Dargavel Burn SSSI and Craigmarloch Hill SAM;
- Avoiding Ancient/ Semi-natural Woodland at Drumcross, Formakin and Craigmarloch Hill;
- Avoiding centres of population at Erskine, Bishopton, Langbank and Auchinleck (Port Glasgow);
- Avoiding close proximity to residential properties around Erskine, Langbank, Gleddoch House Hotel and Crigmarloch;
- Avoiding paralleling or crossing skyline escarpment above the Clyde and ridges at Barscube Hill;
- Following low ground including a shallow valley and using woodland and trees for screening/ backclothing;

- Its location in areas already affected by overhead transmission lines including the existing line to be replaced, as OHLs will already have been accepted as part of the landscape compared with areas that currently have no OHLs;
- Avoiding the setting of high amenity cultural heritage sites such as the monument at Erskine farm and listed building at Cloak.

5.5 Preferred Route Alignment Criteria

Following identification of the preferred route corridor between Erskine and Devol Moor a preferred route alignment was defined within this. The criteria used to define the alignment were primarily based on Holford Rules 3 to 7 and localised landform and topography within the preferred corridor:

- Minimising the number of changes in direction to reduce the number of angle towers required (these are more complex and heavier than straight line towers and considered to be more visually intrusive);
- Avoiding sharp changes in direction that require the heaviest angle towers;
- Using detailed routeing to avoid woodlands, trees, higher topography and other landscape features where possible;
- Using detailed routeing to avoid encroaching on residential properties where possible;
- Using detailed routeing to avoid effects on highest and high amenity sites.

Often a balance has to be achieved between reducing the number of changes in direction and routeing to avoid sensitive receptors or high ground.

5.6 Preferred Route Alignment

The preferred route alignment lies within the preferred route corridor. It is a notional 100m width, allowing a more refined route to be defined. It has been refined from the preferred corridor to build upon a number of environmental objectives as well as achieve improvements from the existing 132kV OHL it is to replace. It is illustrated in Figures 9a and b and 10a and b. Photographs 1-12 illustrate key locations. The key refinements on the wider corridor include:

- Removing the line completely from Dargavel Burn SSSI;
- Avoiding visual effects by routeing as far away as practicable from residential properties (eg. Drumcross, Meiklefield, Haddockston, Mid Glen, Cloak, Craigmarloch, Cunston);
- Following the lowest practicable topographic line, including avoiding hill summits and exposed/ skyline ridges and keeping close to the bottom of shallow valleys or topographic depressions such as the area between Formakin and the ROF; Dargavel Glen and on Devol Moor;

- Avoiding the loss of mature woodland and trees wherever possible but using them as a screen and backdrop (eg East of the M8, Formakin/ ROF; Haddockston and Dargavel Burn;
- Minimising the number of changes in direction and therefore the number of angle towers, except where this conflicts with higher level routing objectives such as avoiding skylining (eg. at Dargavel Burn SSSI);
- Avoiding crossovers with the existing 132kV OHL to be removed except where this enables a significant environmental objective to be achieved (eg. avoiding Craimarloch and Cloak).

By comparison with the existing 132kV OHL the preferred route alignment achieves some key improvements in environmental performance:

- Four designated areas of the highest amenity are no longer directly affected (one SAM, two SSSIs, and an inventory-listed designed landscape);
- The line is moved further from the northern edge of Bishopton and southern edge of Port Glasgow;
- Within the above constraints it keeps to a lower alignment between Bishopton and Dargavel Glen and across Devol Moor, with little difference in other locations.

Nevertheless, there would be a greater number of angle towers in the preferred route. This is partly due to the technical constraints imposed by construction across the M8 and the need to avoid extensive sections closely paralleling the existing line, but also to avoid the highest and high amenity value sites and to keep the line low in the landscape to maximise backclothing opportunities with existing tree and hill backgrounds.

By comparison with the original preferred route of 2007 the proposed preferred route represents an improvement in environmental performance in the following areas:

- It would not have to pass across the Whitecross Roman Fort SAM;
- By passing south of Formakin it follows a lower alignment in the landscape, being better screened by landforms and trees and avoiding potential skylining seen from the Firth of Clyde area;
- By keeping closer to the existing alignment between Formakin and Craigmarloch the route will affect fewer residential properties and lead to fewer visual effects on residential receptors that are not already affected by the existing line.

The current preferred route also has more angles than the 2007 route. This is partly due to the technical constraints relating to the M8 crossing, which were not fully proven in 2007, and partly due to keeping the route as low as possible in the landscape.

6.0 THE NEXT STEPS

6.1. Selection of the Proposed Route

At the conclusion of the consultation process, a proposed route will be selected by SPTafter consideration of:

- all the comments and responses made by statutory and other interested parties during the consultation process;
- the appraisal of options on the route corridor;
- having regard to all other matters that SPT consider to be relevant

6.2 Scoping

Following consultation, it is SPT's intention to submit a Scoping Report to the Scottish Ministers with a written request under Regulation 7 of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 for their opinion as to the information to be provided in the Environmental Statements that SPT intends to prepare. The Scoping Report will set out the proposed structure and content of the Environmental Statement and identify the possible effects on the environment. The scoping report will reference this Consultation Document.

6.3 Detailed Studies

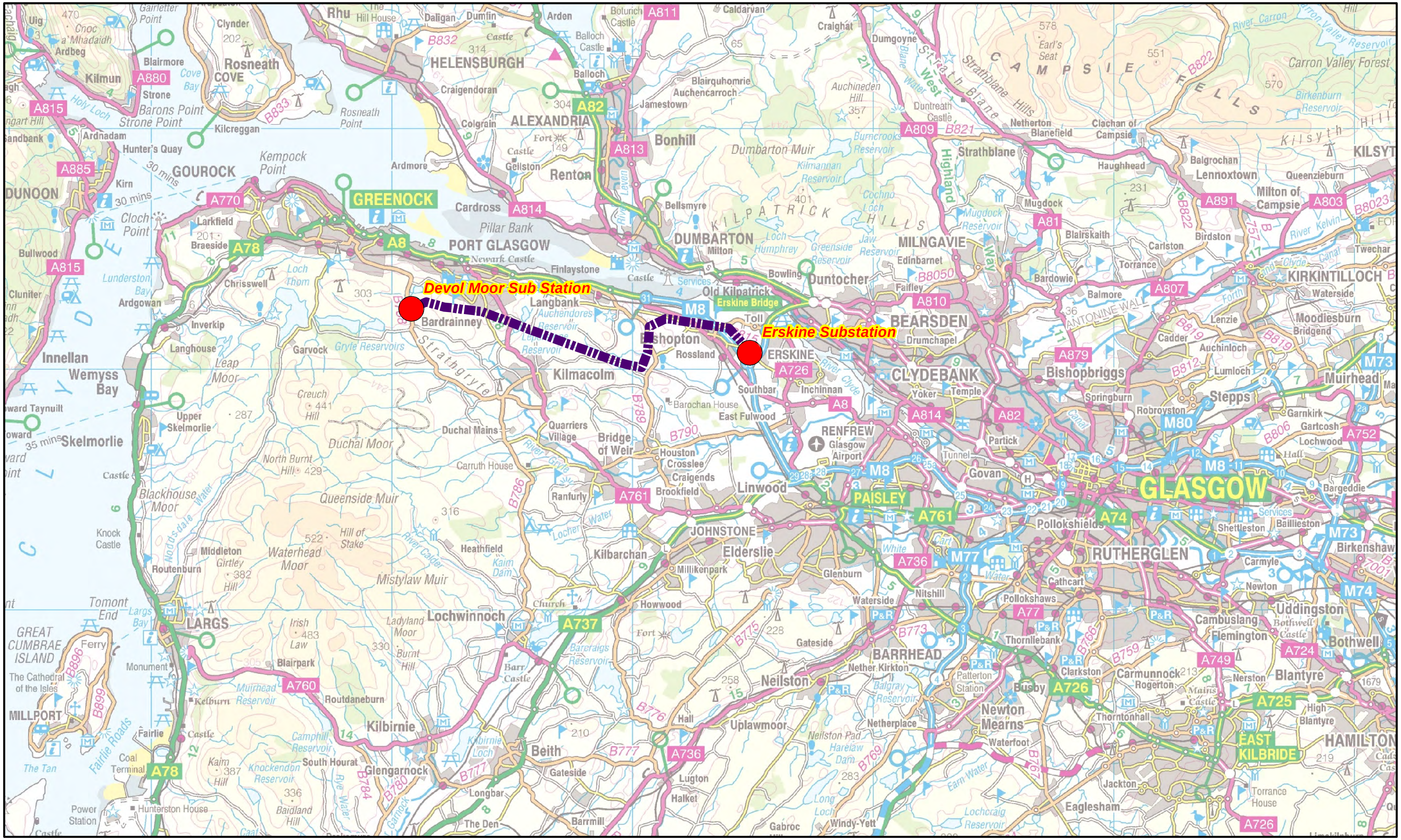
Further detailed studies including technical studies will be undertaken for the preparation of the Section 37 application. The Environmental Statement will provide a detailed visual and environmental assessment of the proposed routes and will include any appropriate mitigation measures. Computer aided techniques will be used to assist the evaluation of the visual effects of the proposed route.

6.4 Environmental Statement

The Environmental Statement will assess the environmental effects of the proposed route, which will be developed from the preferred route identified in this Consultation Document following public consultation. It is envisaged that this process will identify the main environmental considerations. The Environmental Statement will incorporate relevant information from this document and the consultation process. Following further detailed environmental and technical assessment; it may identify localised deviations from the proposed route in order to mitigate local effects.

The Environmental Statement will identify and describe in detail the environmental effects of line construction and operation and will identify any appropriate mitigation measures.

FIGURES



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Erskine to Devol Moor Overhead Line Route

Existing Electricity Substation

Existing 132kv Electricity Services

0 0.5 1 2 3 4 5 km

Figure 1
Location & Context

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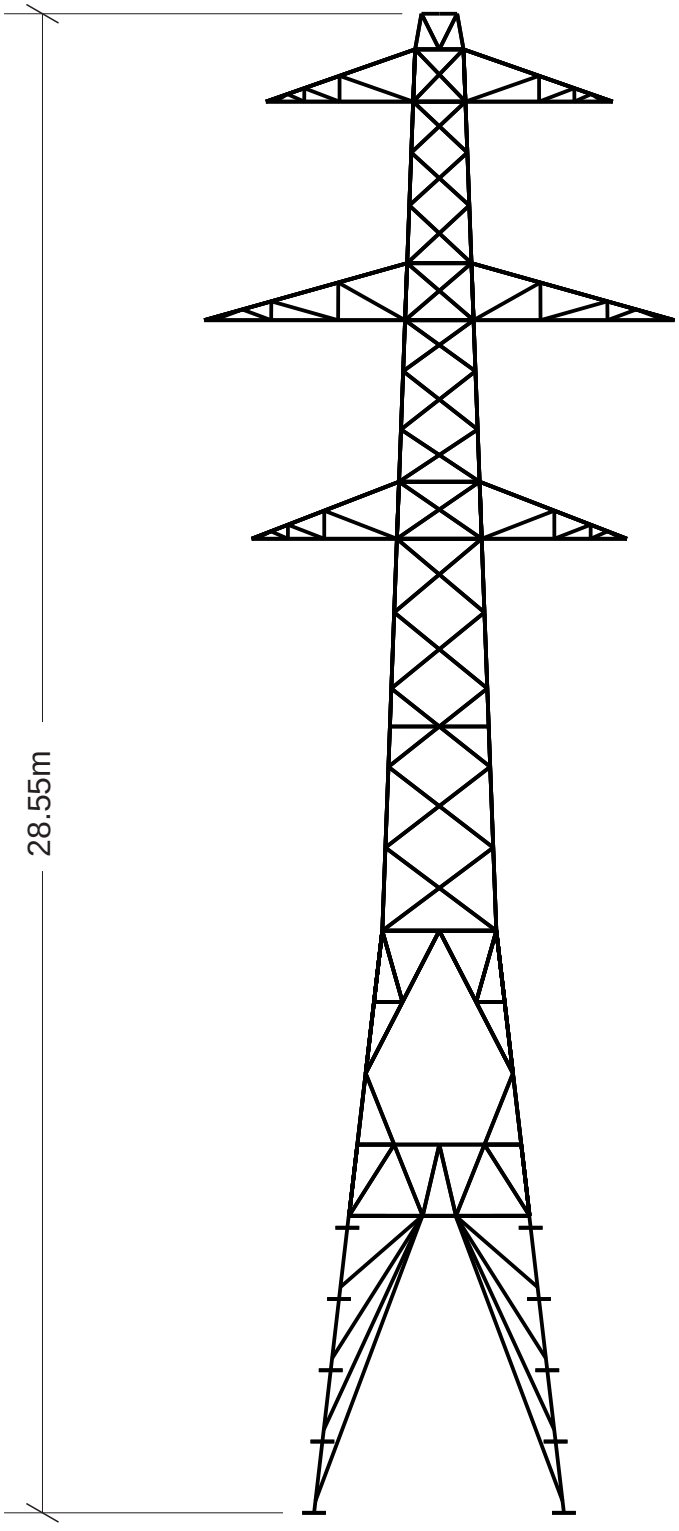
6847_ Fig 1



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Erskine to Devol Moor
Overhead Line Route

Figure 2
Typical L4S Double
Circuit Tower Details

November 2010 6847_Fig 2

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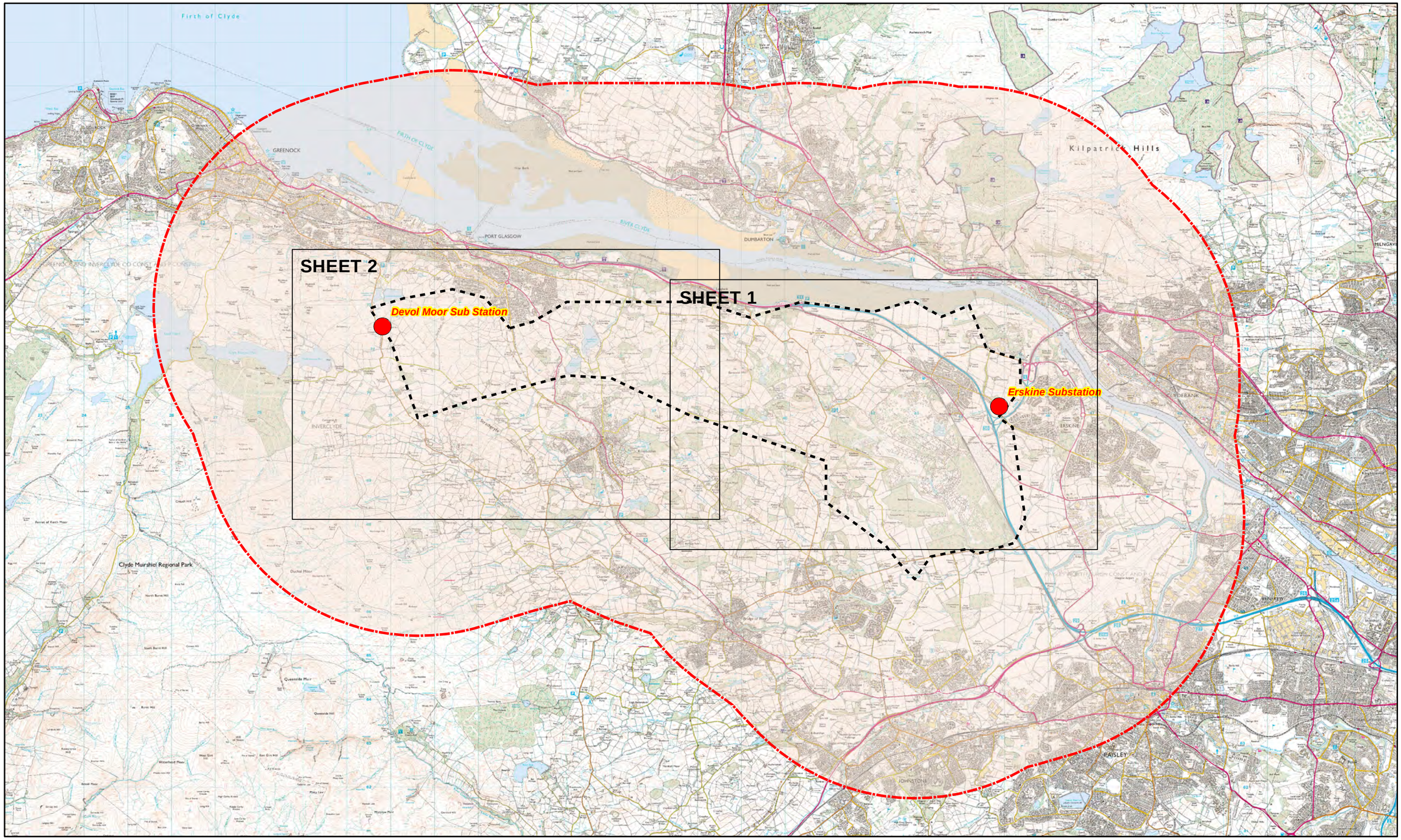
Erskine to Devol Moor Overhead Line Route

Figure 3
Typical L4 Tower
Construction Stages

November 2010

6847_Fig 3



Ironside Farrar Ltd

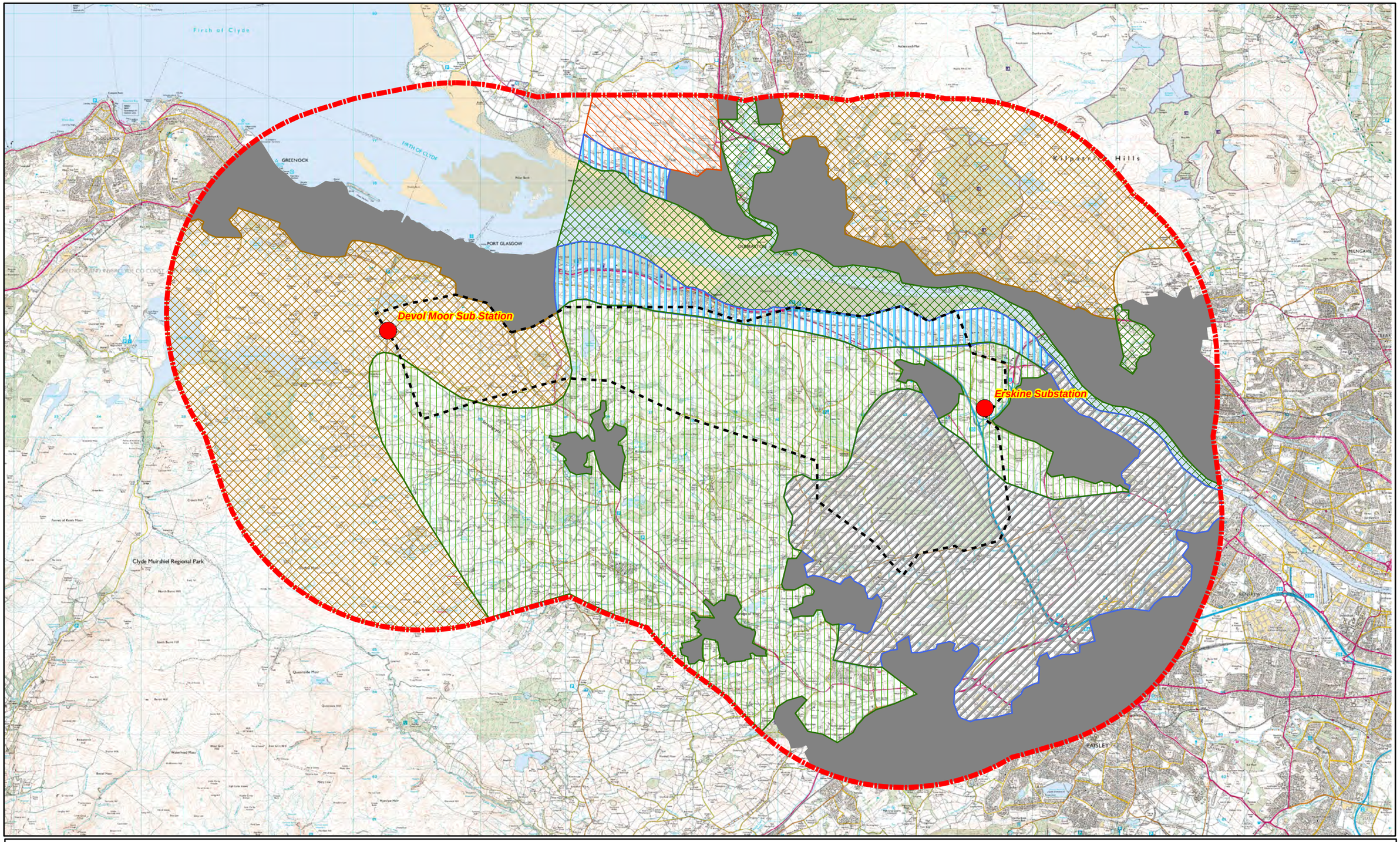
Erskine to Devol Moor Overhead Line Route

0 0.5 1 2 3 4 km

- 5km Buffer to Study Area
- Study Area Corridor
- Existing Electricity Substation
- Detailed Study Area Sheet Locations (See Figures 7 - 10)

Figure 4
Study Area & 5km Buffer

November 2010 **6847_ Fig 4**



Ironside Farrar Ltd

Erskine to Devol Moor Overhead Line Route

0 0.5 1 2 3 4 km

General

- Existing Electricity Substation
- Study Area Corridor
- 5km Buffer to Study Area
- Urban Areas

Glasgow & The Clyde Valley Landscape Character Areas

- Raised Beach
- Alluvial Plain
- Rugged Upland Farmalnd
- Rugged Moorland Hills
- Green Corridor
- Moorland Hills & Ridges

Figure 5
Landscape Context
SNH Character Areas

November 2010

6847_ Fig 5

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Erskine to Devol Moor Overhead Line Route

0 250 500 1,000 1,500 2,000 m

Figure 6
Local Landscape Character Areas

General

- Existing Electricity Substation
- Study Area Corridor

Local Landscape Character Types & Areas

- Escarpment
- Raised Beach
- Rolling Pastureland
- Rocky Hills & Ridges
- Pastoral Valleys
- Lowland Arable Farmland
- Improved Upland Pasture
- Forestry
- Moorland
- Settlement and Industry

November 2010

6847_ Fig6

16No

4No

Erskine Substation

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Erskine to Devol Moor Overhead Line Route

Cat 1: National/Significant Constraints
- SPA
- Ramsar Site
- SSSI's
- Scheduled Ancient Monuments
- Site of Schedulable Quality
- Historic Scotland Sites
- Conservation Areas

Cat 1: National/Significant Constraints
- Category A Listed Building
- Historic Gardens & Designed Landscape (Inventory - Listed)
- Bishopton ROF
- Proposed Bishopton Development Area & Road
- M.O.D Braehead Moor (NW) & (SE)
- World Heritage Site
- Gas Transmission Pipe

Cat 2: Regional/Moderate Constraints
- Residential Properties and 150m Offset
- Clyde Muirshiel Regional Park
- Ancient Woodlands
- Country Parks
- Golf Courses
- Historic Gdns & Designed Landscapes (Non-Inventory)
- Linear Cultural Heritage Site
- Other Cultural Heritage Sites
- Category B Listed Building

Cat 3: Local/Minor Constraints
- Tree Preservation Orders
- SWT Wildlife Sites (Provisional, Surveyed or Approved)
- Site of Interest for Nature Conservation
- Forestry Commission Land
- Category C(S) Listed Buildings

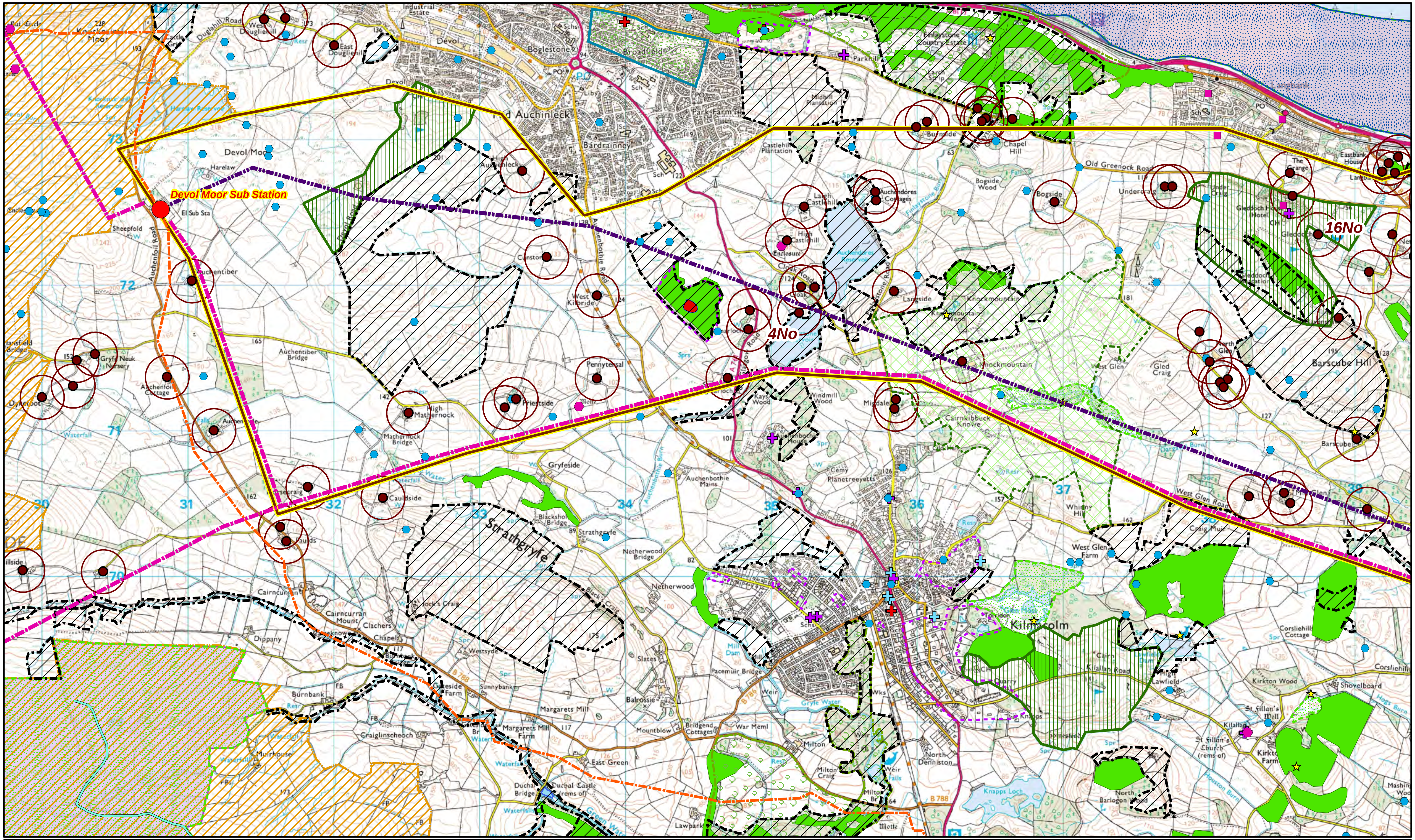
Existing & Proposed Infrastructure
- Existing Electricity Substation
- Existing 400kv Electricity Services
- Existing 132kv Electricity Services (to be removed)

General
- Study Area Corridor

0 125 250 500 750 1,000 m

Figure 7a Overall Constraints Sheet 1

November 2010 6847_ Fig7a_Sht1



Ironside Farrar Ltd

Erskine to Devol Moor Overhead Line Route

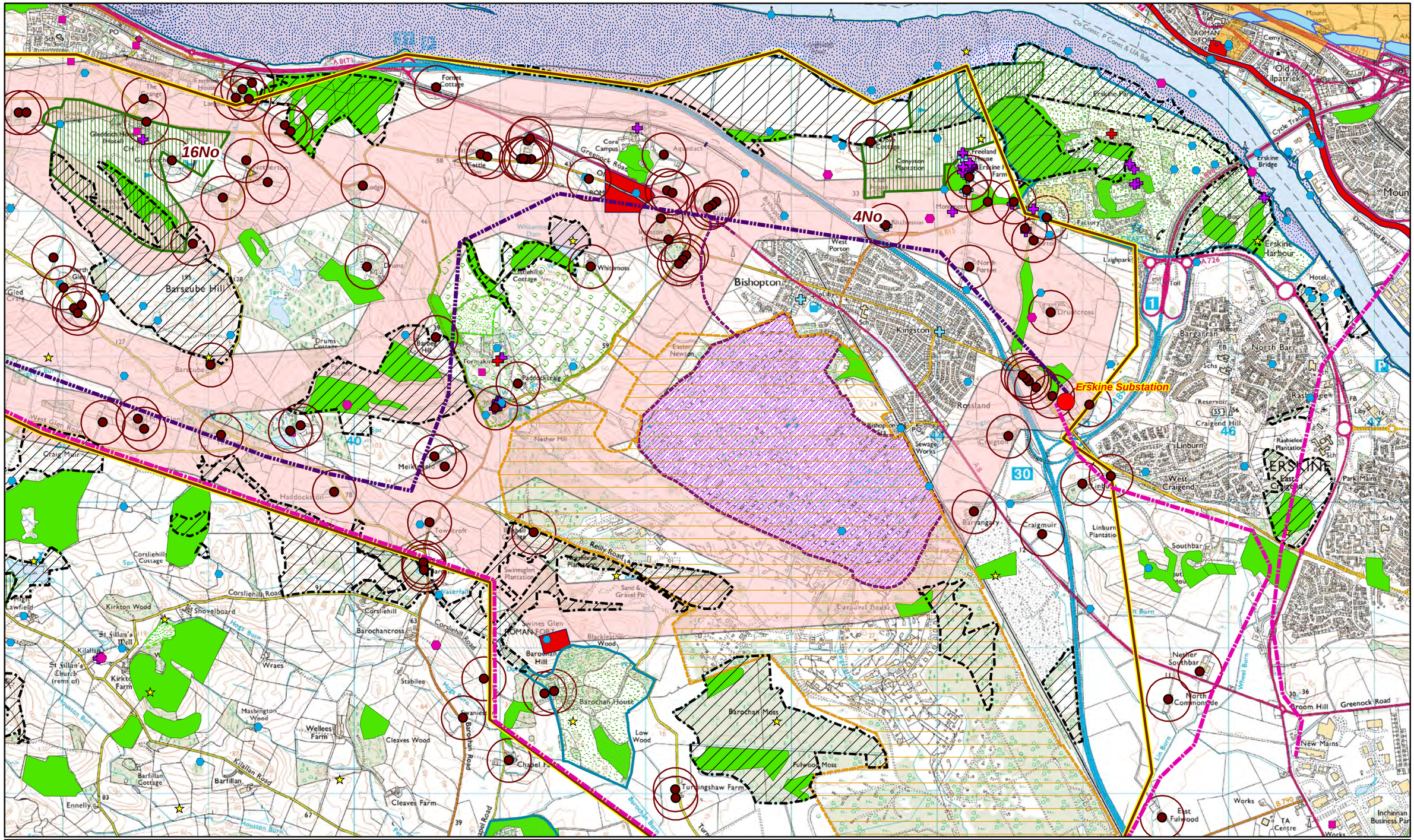
0 | 125 | 250 | 500 | 750 | 1,000 m

Cat 1: National/Significant Constraints	Cat 1: National/Significant Constraints	Cat 2: Regional/Moderate Constraints	Cat 3: Local/Minor Constraints	Existing & Proposed Infrastructure
SPA	Category A Listed Building	Residential Properties and 150m Offset	Tree Preservation Orders	Existing Electricity Substation
Ramsar Site	Historic Gardens & Designed Landscape (Inventory - Listed)	Clyde Muirshiel Regional Park	SWT Wildlife Sites (Provisional, Surveyed or Approved)	Existing 400kv Electricity Services
SSSI's	Bishopton ROF	Ancient Woodlands	Site of Interest for Nature Conservation	Existing 132kv Electricity Services (to be removed)
Scheduled Ancient Monuments	Proposed Bishopton Development Area & Road	Country Parks	Forestry Commission Land	**General**
Site of Schedulable Quality	M.O.D Braehead Moor (NW) & (SE)	Golf Courses	Category C(S) Listed Buildings	Study Area Corridor
Historic Scotland Sites	Gas Transmission Pipe	Historic Gdns & Designed Landscapes (Non-Inventory)		
Conservation Areas	World Heritage Site	Linear Cultural Heritage Site		
		Other Cultural Heritage Sites		
		Category B Listed Building		

Figure 7b
Overall Constraints
Sheet 2

November 2010

6847_ Fig7b_Sht2



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Erskine to Devol Moor Overhead Line Route

Cat 1: National/Significant Constraints
- SPA
- Ramsar Site
- SSSI's
- Scheduled Ancient Monuments
- Site of Schedulable Quality
- Historic Scotland Sites
- Conservation Areas

Cat 1: National/Significant Constraints
- Category A Listed Building
- Historic Gardens & Designed Landscape (Inventory - Listed)
- Bishopton ROF
- Proposed Bishopton Development Area & Road
- M.O.D Braehead Moor (NW) & (SE)
- Gas Transmission Pipe
- World Heritage Site

Cat 2: Regional/Moderate Constraints
- Residential Properties and 150m Offset
- Clyde Muirshiel Regional Park
- Ancient Woodlands
- Country Parks
- Golf Courses
- Historic Gdns & Designed Landscapes (Non-Inventory)
- Linear Cultural Heritage Site
- Other Cultural Heritage Sites
- Category B Listed Building

Cat 3: Local/Minor Constraints
- Tree Preservation Orders
- SWT Wildlife Sites (Provisional, Surveyed or Approved)
- Site of Interest for Nature Conservation
- Forestry Commission Land
- Category C(S) Listed Buildings

Existing & Proposed Infrastructure
- Existing Electricity Substation
- Existing 400kv Electricity Services
- Existing 132kv Electricity Services (to be removed)

General
- Study Area Corridor
- Route Options Corridors

0 125 250 500 750 1,000 m

Figure 8a
Route Corridor Options Overall Constraints
Sheet 1

November 2010

6847_ Fig8b_Sht2

Devol Moor Sub Station

4No

16No

Ironside Farrar Ltd

Erskine to Devol Moor Overhead Line Route

Cat 1: National/Significant Constraints
- SPA
- Ramsar Site
- Scheduled Ancient Monuments
- SSSI's
- Site of Schedulable Quality
- Historic Scotland Sites
- Conservation Areas

Cat 1: National/Significant Constraints
- Category A Listed Building
- Historic Gardens & Designed Landscape (Inventory - Listed)
- Bishopton ROF
- Proposed Bishopton Development Area & Road
- M.O.D Braehead Moor (NW) & (SE)
- Gas Transmission Pipe
- World Heritage Site

Cat 2: Regional/Moderate Constraints
- Residential Properties and 150m Offset
- Clyde Muirshiel Regional Park
- Ancient Woodlands
- Country Parks
- Golf Courses
- Historic Gdns & Designed Landscapes (Non-Inventory)
- Linear Cultural Heritage Site
- Other Cultural Heritage Sites
- Category B Listed Building

Cat 3: Local/Minor Constraints
- Tree Preservation Orders
- SWT Wildlife Sites (Provisional, Surveyed or Approved)
- Site of Interest for Nature Conservation
- Forestry Commission Land
- Category C(S) Listed Buildings

Existing & Proposed Infrastructure
- Existing Electricity Substation
- Existing 400kv Electricity Services
- Existing 132kv Electricity Services (to be removed)

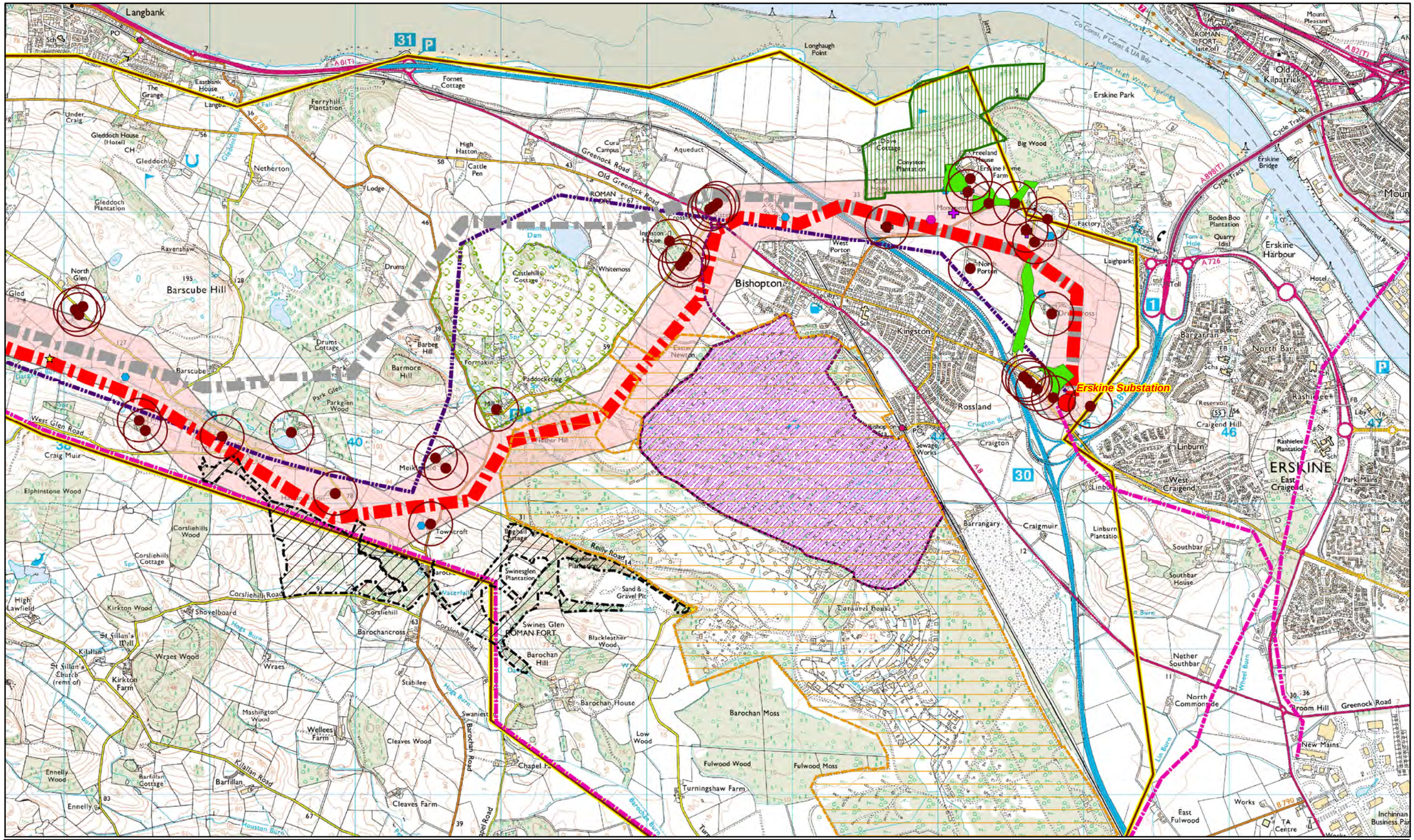
General
- Study Area Corridor
- Route Options Corridors

0 125 250 500 750 1,000 m

Figure 8b
Route Corridor Options Overall Constraints
Sheet 2

November 2010

6847_ Fig8b_Sht2



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Erskine to Devol Moor Overhead Line Route

Cat 1: National/Significant Constraints
- SPA
- Sites of Special Scientific Interest
- Site of Schedulable Quality
- Historic Gardens & Designed Landscapes
- Bishopton ROF
- Proposed Bishopton Development Area & Road
- Gas Transmission Pipe

Cat 2: Regional/Moderate Constraints
- Residential Properties and 150m Offset
- Clyde Muirshiel Regional Park
- Ancient Woodlands
- Golf Courses
- Other Cultural Heritage Sites
- Category B Listed Building

Cat 3: Local/Minor Constraints
- SWT Wildlife Sites
- Site of Interest for Nature Conservation
- Forestry Commission Land
- Category C(S) Listed Buildings

General
- Existing Electricity Substation
- Prefered Route
- 2007 Prefered Route
- Existing 400kv Electricity Services
- Existing 132kv Electricity Services (to be removed)

General
- Study Area Corridor
- Prefered Route Corridor

0 125 250 500 750 1,000 m

Figure 9a
Prefered Route Alignment Constraints
Sheet 1

November 2010

6847_ Fig9a_Sht1

Devol Moor Sub Station

Ironside Farrar Ltd

Erskine to Devol Moor Overhead Line Route

Cat 1: National/Significant Constraints
- SPA
- Sites of Special Scientific Interest
- Site of Schedulable Quality
- Historic Gardens & Designed Landscapes
- Bishopton ROF
- Proposed Bishopton Development Area & Road
- Gas Transmission Pipe

Cat 2: Regional/Moderate Constraints
- Residential Properties and 150m Offset
- Clyde Muirshiel Regional Park
- Ancient Woodlands
- Golf Courses
- Other Cultural Heritage Sites
- Category B Listed Building

Cat 3: Local/Minor Constraints
- SWT Wildlife Sites
- Site of Interest for Nature Conservation
- Forestry Commission Land
- Category C(S) Listed Buildings

General
- Existing Electricity Substation
- Prefered Route
- 2007 Prefered Route
- Existing 400kv Electricity Services
- Existing 132kv Electricity Services (to be removed)

General
- Study Area Corridor
- Prefered Route Corridor

0 125 250 500 750 1,000 m

Figure 9b
Prefered Route Alignment Constraints Sheet 2

November 2010

6847_ Fig9a_Sht1

Insufficient room between Whitemoss SAM and Riding School

Route passes between proposed ROF development and Formakin

Route avoids crossing escarpment slopes.

Route keeps to lowest part of shallow valley where possible, passing between blocks of trees

Route keeps low in landscape against woodland backdrop

Erskine Substation

Ironside Farrar Ltd

Erskine to Devol Moor Overhead Line Route

General

- Prefered Route
- 2007 Prefered Route
- Study Area Corridor
- Existing Electricity Substation
- Photo Locations

Local Landscape Character Types & Areas

- Escarpment
- Raised Beach
- Rolling Pastureland
- Rocky Hills & Ridges
- Pastoral Valleys
- Lowland Arable Farmland
- Improved Upland Pasture
- Forestry
- Moorland
- Settlement and Industry

0 125 250 500 750 1,000 m

Figure 10a
Preferred Route Alignment
Local Landscape Character
Sheet 1

November 2010

6847_ Fig10a_Sht1

Route avoids crest of Devol Moor & follows shallow depression in landform.

Route kept off crest of Devol Moor

Route kept to existing alignment between reservoirs to avoid new visual impacts and properties

Route traverses shallow valley below main ridge and hilltops keeping to lowest points where possible

Devol Moor Sub Station

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Erskine to Devol Moor Overhead Line Route

General

- Study Area Corridor
- Prefered Route
- 2007 Prefered Route
- Existing Electricity Substation
- Photo Locations

Local Landscape Character Types & Areas

- Escarpment
- Raised Beach
- Rolling Pastureland
- Rocky Hills & Ridges
- Pastoral Valleys
- Lowland Arable Farmland
- Improved Upland Pasture
- Forestry
- Moorland
- Settlement and Industry

0 125 250 500 750 1,000 m

Figure 10b
Preferred Route Alignment
Local Landscape Character
Sheet 2

November 2010

6847_ Fig10b_Sht2

1: Entrance to Erskine Golf Club, looking east. The preferred alignment crosses the B815 beyond the trees.

2: Drive to Erskine Golf club looking north The preferred alignment crosses this and follows the line of trees to the left to cross the M8.

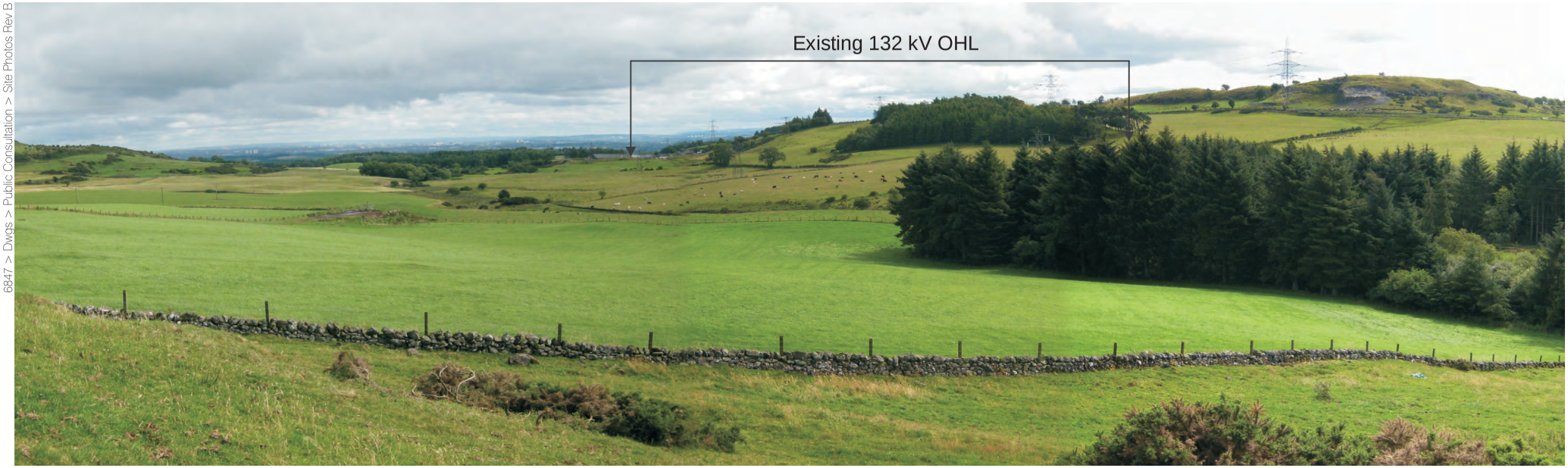
Erskine to Devol Moor Overhead Line Route
Photographs of Preferred Alignment

3: Bishopton. The preferred alignment passes north and then west of the town to the left of this frame.

4: Bishopton to Formakin: the preferred alignment passes southwest across fields between the former Royal Ordnance factory and the Formakin Estate.

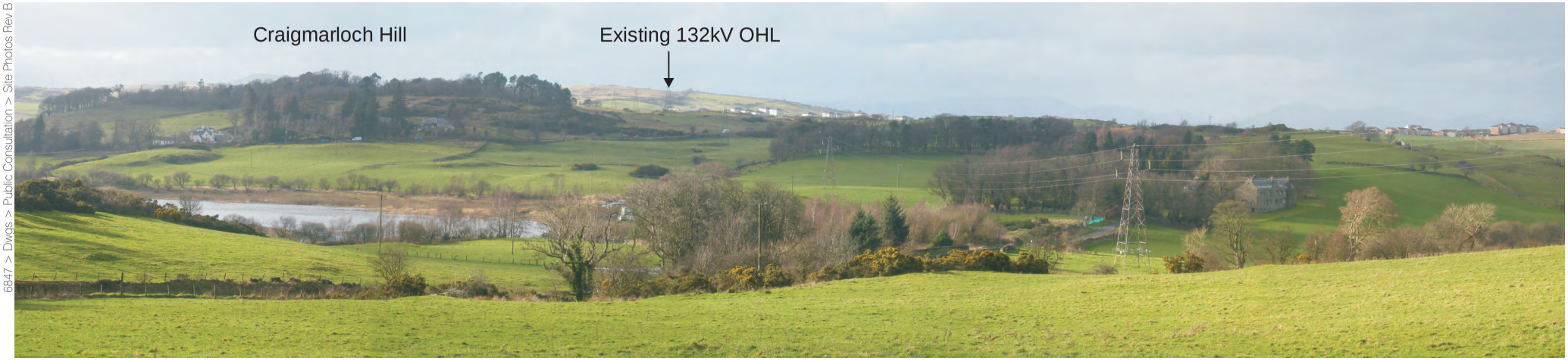
5: Formakin to Towncroft: the preferred alignment passes from right to left across the road and past Towncroft on rising ground

6: Towncroft to Haddockston: the preferred alignment passes from left to right between the two rounded landforms and across the road towards the 400kV OHL.



7: Dargavel Glen east: the preferred alignment passes through the bottom of the shallow glen to the left of the existing 132kV OHL and in front of the trees.

8: Dargavel Glen west: the preferred alignment passes right of the woodland at Dargavel Burn SSSI and on to Knockmountain on the horizon.



9:Knockmountain to Craigmarloch: the preferred alignment is on the existing alignment of the 132kV OHL between the reservoirs and right of the woodland on Craigmarloch Hill.

10: Devol Moor. The preferred alignment passes between the existing line and Cunston.

11: Port Glasgow Golf Course: the preferred alignment passes left (south) of the golf course on a lower alignment than the existing 132kV OHL which can be seen on the horizon to the right.

12: Devol Moor seen from the South: the preferred alignment passes on a lower alignment between the golf course and substation than does the existing 132kV OHL, reducing the degree of skylining.

Erskine to Devol Moor Overhead Line Route
Photographs of Preferred Alignment

APPENDICES

APPENDIX 1 - THE HOLFORD RULES

The Holford Rules were formulated by the late Lord Holford, Professor of Town Planning, University College, London in 1959 and published by the Royal Society of Arts. The Holford Rules remain the starting point for routeing electricity transmission lines in the UK. Since the Rules apply English designations, they require some interpretation to match them to circumstances in Scotland. The Holford Rules are a product of a specific time and set of circumstances. At the time the Holford Rules were written, the area of land designated for amenity value was far smaller than now and the design of routes to avoid such areas was easier as a result. In Scotland, land designated for amenity value is largely confined to areas of land with sparse population. The Holford Rules give no guidance on how to reconcile routeing to avoid areas of amenity value where this would have a greater visual intrusion due to the proximity of the line to people. This limitation of the Rules is clarified in the National Grid Company's (NGC's) Supplementary Notes to their Guidelines for the Routeing of New High Voltage Overhead Transmission Lines.

A central premise of the Holford Rules is that the extent of the visual effect of an overhead transmission line can be reduced by careful routeing. The Holford Rules provide a valuable basis for an approach to transmission line routeing, but require adaptation to meet present day circumstances. The routeing practice followed by SP Transmission Ltd is derived from the Holford Rules and takes account of the National Grid Company's Guidelines for the Routeing of New High Voltage Overhead Transmission Lines.

1. "Avoid altogether, if possible, the major areas of highest amenity value, by so planning the general route of the line in the first place, even if the total mileage is somewhat increased in consequence.

2. Avoid smaller areas of high amenity value, or scientific interest by deviation; provided that this can be done without using too many angle towers, i.e. the more massive structures which are used when lines change direction.

3. Other things being equal, choose the most direct line, with no sharp changes of direction and thus fewer angle towers.

4. Choose tree and hill backgrounds in preference to sky backgrounds wherever possible; and when the line has to cross a ridge, secure this opaque background as long as possible and cross obliquely when a dip in the ridge provides an opportunity. Where it does not, cross directly, preferably between belts of trees.

5. Prefer moderately open valleys with woods where the apparent height of towers will be reduced, and views of the line will be broken by the trees.

6. In country which is flat and sparsely planted, keep the high voltage lines as far as possible independent of smaller lines, converging routes, distribution poles and other masts, wires and cables, so as to avoid a concatenation or „wirescape'.

7. Approach urban areas through industrial zones, where they exist; and when pleasant residential and recreation land intervenes between the approach line

and the substation, go carefully into the comparative costs of under-grounding, for lines other than those of the highest voltage."

The National Grid Company (NGC) reviewed the Holford Rules in 1992 (refer Appendix 3) and confirmed them as an invaluable tool in selecting and assessing line routeing options as part of the environmental assessment process. As a result of this review, the Rules have had some supplementary notes added to them by NGC.

In 2004 a further review was carried out by Scottish Hydro-Electric Transmission Limited in conjunction with Scottish Power Transmission Limited and their review confirmed the relevance of "Rules" in overhead Line routeing.

APPENDIX 2 – GLOSSARY

Angle Tower: A tower erected to allow for a change in direction of the line.

Circuit: Consists of metal conductors, single or grouped in bundles of two (twin) or four (quad), one bundle for each of the three phases in which the electricity is transmitted. Two circuits are usually strung on each tower, one circuit on each side of the tower, giving the greatest economic benefits and minimising the numbers of towers required.

Conductor: The name given to the metallic wires strung from tower to tower to carry electric current.

Double Circuit: Transmission towers carrying two circuits, one either side of the tower. See circuit.

Earth Conductor: A wire erected above the topmost conductor at the tower peak for protection against lightning strikes. It can also contain fibre optic cores for communication purposes.

Insulators: Materials that are very poor conductors of electricity. Air exists as natural insulation around conductors, but at supports, an insulator string (or strings) is required to prevent live contact with the tower body. Glass, polymeric or porcelain insulators can be used.

Insulator Strings: Insulator units assembled in articulated strings between the tower steelwork and conductors.

Kilovolt (kV): 1,000 volts.

Lattice Steel Tower: The standard form of support structure for high voltage transmission lines in the UK. They are constructed as an open framework of steel angle sections.

Line Tower: A tower erected to divide the overhead transmission line into manageable sections

Megawatt (MW): 1,000,000 watts.

The National Grid: The electricity transmission network of the UK.

Overhead Transmission Line: An electric line installed above ground usually supported by lattice steel towers or wooden poles.

Substation: Controls the flow and voltage of power by means of transformers and switchgear, with facilities for control, fault protection and communications.

Volts: The international system unit of electric potential and electromotive force.

Watt: The unit of electric power.

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environmentalconsultants

Central Environmental Surveys
Natural Resource Management Consultancy

Headland Archaeology Ltd.

SP TRANSMISSION

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