

VOLUME 6: CHAPTER 2 - PROJECT DESCRIPTION – ALTERNATIVE ALIGNMENT

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Appendix V6-2.1: Indicative Tower Schedule (Alternative Alignment)

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Figure V6-2.1a to V6-2.1e: The Alternative Alignment

2. PROJECT DESCRIPTION

2.1 Introduction

2.1.1 This Chapter describes the various elements of the works that constitute the Alternative Alignment for the construction and operation of a 132 kV transmission connection between Broadford Substation and Kyle Rhea. Details in relation to the dismantling of the existing 132 kV OHL are also provided.

2.1.2 Given that many of the elements of the Alternative Alignment would be similar to other Sections of the project, this Chapter is structured in accordance with **Volume 1, Chapter 3: Project Description** and a number of cross references to that Chapter and supporting appendices are made where relevant.

2.2 Development for which Section 37 Consent and deemed planning permission is sought

2.2.1 This is described in Part 3.2 of **Volume 1, Chapter 3: Project Description** in relation to the project as a whole.

2.2.2 The Applicant's preference is to construct and operate the Proposed Alignment, as presented in **Figures V1-1.1a to 1c: Overview of the Proposed Development**. If Scottish Ministers were to agree that the Applicant's Proposed Alignment within Section 3 should be consented, the Applicant would request that consent be granted for that option within Section 3, and refused in respect of the Alternative Alignment.

2.2.3 In the event that Scottish Ministers were to conclude, contrary to the Applicant's view, that the Proposed Alignment within Section 3 should not be consented, the Applicant seeks consent for the Alternative Alignment. This would comprise the installation and operation of approximately 20.8 km of new double circuit 132 kV OHL supported by steel lattice towers within Section 3 of the project between Broadford and Kyle Rhea via Glen Arroch (see **Figure V6-2.1a to V6-2.1e: The Alternative Alignment**).

2.3 Ancillary Development for which Deemed Planning Permission is sought

2.3.1 This is described in Part 3.3 of **Volume 1, Chapter 3: Project Description** in relation to the project as a whole.

2.3.2 Specifically in relation to the Alternative Alignment, ancillary development would comprise:

- The formation of access tracks (permanent, temporary, and upgrades to existing tracks) and the installation of bridges and culverts to facilitate access;
- The upgrade of existing, or creation of new, bellmouths at public road access points;
- Establishment of temporary measures to protect road and water crossings (e.g. scaffolding);
- Working areas around infrastructure to facilitate construction;
- Tree felling and vegetation clearance to facilitate construction and operation of the Proposed Development, to comply with the Electricity Safety, Quality and Continuity Regulations (ESQCR) 2002¹;
- Foundation works required at existing crossing and anchor towers at Kyle Rhea that are to be utilised as part of the Proposed Development; and
- Dismantling of the existing 132 kV OHL following completion and commissioning of the Skye Reinforcement Project and a Dismantling Plan explaining the works involved is provided in **Appendix V1 - 3.8**.

2.4 Associated Works

2.4.1 Associated works are described in Part 3.4 of **Volume 1, Chapter 3: Project Description** in relation to the project as a whole.

¹ The Electricity Safety, Quality and Continuity Regulations (2002), available at <https://www.legislation.gov.uk/uksi/2002/2665/contents/made>

2.4.2 Of most relevance to the Alternative Alignment, associated works would include borrow pits, quarries and temporary construction compounds (refer to **Appendix V1-3.3**), public road improvement works (refer to **Appendix V1-3.4**) and the extension to Broadford Substation.

2.5 Limits of Deviation

2.5.1 Limits of Deviation (LoD) are described in Part 3.5 of **Volume 1, Chapter 3: Project Description** in relation to the project as a whole.

2.5.2 Specifically in relation to the Alternative Alignment, the following horizontal LoD would be sought:

- OHL (Steel Lattice) – 80 m LoD (40 m either side of the centre line); and
- Access Tracks – 50 m LoD (25 m either side of the centre line).

2.5.3 A vertical LoD of 3m is also sought, as described in Part 3.5 of **Volume 1, Chapter 3: Project Description**

2.6 Project Overview

2.6.1 An overview of the project as a whole is provided in Part 3.6 of **Volume 1, Chapter 3: Project Description**. An overview of the Proposed Development is shown on **Figure V1-1.1a to c**. This shows both the Proposed Alignment and Alternative Alignment within Section 3.

2.6.2 The Alternative Alignment would comprise a new double circuit steel structure 132 kV OHL from Broadford Substation to the existing crossing towers at Kyle Rhea. The Alternative Alignment would be routed as per the Proposed Alignment until crossing the Allt Mor and minor road to Glen Arroch (see **Figure V6-2.1c: The Alternative Alignment**). To the east of this point, the Alternative Alignment is routed in a south easterly direction through Glen Arroch and Kylerhea Glen (see **Figure V6-2.1d and e: The Alternative Alignment**). Prior to reaching the settlement at Kylerhea, the Alternative Alignment is routed in a northerly direction via the lower slopes of Beinn Bhuidie and through commercial forestry to the existing crossing towers at Kyle Rhea (see **Figure V6-2.1e: The Alternative Alignment**). The total length of the Alternative Alignment would be approximately 20.8 km in length.

2.6.3 **Table V1-3.2** in **Volume 1, Chapter 3: Project Description** provides a summary of the main elements of the Proposed Development on a Section by Section basis. **Table V6-2.1** below provides a summary of the main elements of the Alternative Alignment.

Table V6-2.1 Summary of main elements of the Alternative Alignment

Section	Design Solution	Other Ancillary / Associated Works
Section 3 – Broadford to Kyle Rhea: Alternative Alignment	Steel lattice OHL for the entirety of this Section (approximately 20.8 km in length) from Broadford Substation to the existing crossing towers at Kyle Rhea (to be retained) via Glen Arroch.	<u>Ancillary Works</u> <ul style="list-style-type: none"> • Temporary and permanent construction access via; <ul style="list-style-type: none"> • Existing access tracks (approx. 0.9 km); • Existing access tracks to be upgraded (approx. 2.9 km); • New permanent access tracks (approx. 1.6 km); • New permanent access tracks (floating construction within SAC) (approx. 3.6 km); • New permanent access tracks (floating construction outwith SAC) (approx. 2.17 km); • New permanent access tracks (cut / fill construction within SAC) (approx. 1.1 km); • New permanent access tracks (cut / fill construction outwith SAC) (approx. 0.15 km);

Section	Design Solution	Other Ancillary / Associated Works
		<ul style="list-style-type: none"> • New temporary access tracks (approx. 11.5 km); and • Temporary spurs to tower positions. • The upgrade of existing, or creation of new bellmouths at public road access points; • Establishment of temporary measures to protect road and water crossings (e.g. scaffolding); • Tree felling and vegetation clearance to facilitate construction and operation of the Proposed Development; • Foundation works required at existing crossing and anchor towers at Kyle Rhea that are to be utilised as part of the Proposed Development; and • Dismantling of the existing 132 kV steel lattice OHL. <p><u>Associated Works</u></p> <ul style="list-style-type: none"> • Public road improvement works as required; • Temporary construction compounds; • Borrow pits and / or quarries; and • Broadford Substation Extension.

2.7 Description of Overhead Line Infrastructure

- 2.7.1 This is described in Part 3.7 of **Volume 1, Chapter 3: Project Description** in relation to the project as a whole. Of relevance to the Alternative Alignment is the description of steel lattice towers, described in paragraph's 3.7.1 to 3.7.4 within the noted chapter, and summarised below.
- 2.7.2 The steel lattice towers to be used for this project would be constructed from fabricated galvanised steel and would be grey in colour. The towers would likely comprise a 'L7' series of steel lattice tower (an example photograph of which is shown in **Plate 2.1**).
- 2.7.3 Towers would carry two circuits, each with three conductors supported from either glass, porcelain, or composite insulators attached to the horizontal cross arms on both sides of each steel lattice tower. An Optical Ground Wire (OPGW)² would be suspended between tower peaks, above the conductors.
- 2.7.4 The span length (distance between towers) would vary slightly depending on topography and land usage. Typically, span lengths for the L7 standard tower are 290 m. Tower heights would also vary, depending on local topography, but would typically be in the region of 27 m to 33 m in height. A tower schedule for the Alternative Alignment is included in **Appendix V6-2.1: Indicative Tower Schedule (Alternative Alignment)**.
- 2.7.5 It is proposed to use the existing crossing towers at Kyle Rhea. This includes two crossing towers at Kyle Rhea, along with adjacent anchor towers, which would require steel work strengthening to support the additional weight of the new OHL conductors. The existing foundations would also require to be reinforced using anchoring and reinforcement techniques to make them suitable for new tower loadings. A photograph of the crossing towers taken from the Skye side of Kyle Rhea is included in **Plate 2.2**.

² Optical Ground Wire is a dual functioning cable, providing a 'shield' to conductors from lightning, whilst also comprising optical cables for telecommunication purposes.

Plate 2.1: Photograph of Steel Lattice Tower Double Circuit (L7 series)



Plate 2.2: Photograph of Existing Crossing Towers at Kyle Rhea



2.8 Typical Construction Activities for Overhead Line Infrastructure

2.8.1 Enabling and construction works for the OHL elements of the Proposed Development are described in Part 3.9 of **Volume 1, Chapter 3: Project Description**. The description in this Chapter focusses on construction and operational access requirements, and forestry clearance relevant to the Alternative Alignment.

Road Improvements and Access

2.8.2 Should the Alternative Alignment be consented and constructed, construction access would be taken via the A87 along the minor road through Glen Arroch. It is anticipated that public road improvement works would be required along the road from the junction of the A87 to within the vicinity of Bealach Udal as construction traffic would be required to utilise this part of the road. Given the condition of the road and terrain from the Bealach to Kylerhea, further use of this road by construction traffic would necessitate extensive improvement works to the road, which are not feasible to undertake as part of this project. Instead, a construction haul road would be required to be constructed along the length of the OHL to avoid heavy vehicle use of the road between the Bealach and Kylerhea. A haul road would also be required along the length of the OHL westwards from the Bealach to just east of Allt Coire nan Cuilean to facilitate construction of towers along this part of the route (see **Figure V6-2.1D**). Both of these haul roads would require to be permanent tracks to ensure safe operational access (refer to paragraph 2.8.5). Further detail on public road improvement works relevant to the Alternative Alignment along the minor road through Glen Arroch is included in **Appendix V1-3.4**.

2.8.3 A combination of new temporary and permanent stone access tracks would be required during construction to access each tower location along the Alternative Alignment (as shown on **Figure V6-2.1a to 2.1e**) as they offer the most robust means of providing access for the heavy construction plant required. Existing forestry tracks would also be utilised, upgraded as required, where practicable. The type of track construction would be determined by the Principal Contractor. However, given the sensitivities of the Kinloch and Kyleakin Hills SAC, preliminary design work has identified those areas that are likely to require cut tracks, and those that would likely use a floating construction within the SAC (see **Figure V6-2.1c to 2.1e**).

2.8.4 Track widths during construction are typically expected to have a running width of 6 m, with an overall construction corridor of approximately 8 m to allow for suitable drainage and pollution prevention measures.

2.8.5 As described within **Volume 1, Chapter 3** (paragraph 3.9.9), to ensure safe access to the Proposed Development, operational access would be required in areas which are remote, or where terrain is difficult. This is the case for the Alternative Alignment, whereby permanent access is required to access the Alternative Alignment through Glen Arroch (including within the SAC).

Forestry Clearance and Vegetation Management

2.8.6 Whilst the design of the Proposed Development has sought to minimise impacts on woodland and commercial forestry plantations where possible, some felling during construction, and to create an operational wayleave corridor, is required. For the Alternative Alignment, some felling of native woodland would be required, together with the creation of an Operational Corridor (OC) through areas of commercial forestry at Kyle Rhea.

2.8.7 Further detail on proposed felling requirements for the Alternative Alignment is set out within the Forestry Chapter (see **Volume 6, Chapter 9: Forestry**) and woodland reports (See **Volume 6, Appendix V6-9.1: Woodland Report – Kyle Farm and Mudalach**).

2.9 Land Use

2.9.1 **Table 2.3** summarises the indicative land take associated with the Alternative Alignment within Section 3 of the project.

Table 2.3: Indicative Land Take for Construction and Operation of the Alternative Alignment

Activity	Construction	Operation
Access Track (Temporary)	92,584 m ²	N/A
Access Track (Permanent)	68,849 m ²	21,514 m ²
Temporary Construction Working Area at towers	210,000 m ²	N/A
Permanent Land Take for 132 kV towers	N/A	117.6 m ²
Area of Operational Corridor within Woodland	20.5ha	20.5ha

2.10 Construction Programme

2.10.1 It is anticipated that construction of the project as a whole would take place over a 36 month period (approximately), following the granting of consents and discharge of pre-commencement conditions. A further seven months (approximately) would be required for dismantling works associated with the existing OHL. It is not anticipated that the construction of the Alternative Alignment would alter programme estimates at this stage.

2.11 Construction Employment and Hours of Work

2.11.1 This is described in Part 3.14 of **Volume 1, Chapter 3: Project Description** in relation to the project as a whole and remains of relevance to the Alternative Alignment.

2.11.2 Construction working is likely to be during daytime periods only. Working hours are anticipated 7 days a week between approximately 07.00 to 19.00 March to September and 07.30 to 17.00 (or within daylight hours) October to February. Working hours would be confirmed by the Principal Contractor and agreed with The Highland Council as local authority.

2.12 Construction Traffic and Site Compounds

2.12.1 This is described in Part 3.15 of **Volume 1, Chapter 3: Project Description** in relation to the project as a whole and remains of relevance to the Alternative Alignment.

2.12.2 Construction of the Proposed Development would give rise to regular numbers of staff transport movements, with work crews travelling to work site areas from a series of site compound areas located throughout the route. Indicative locations and a preliminary appraisal of these locations is included in **Appendix V1-3.3: Preliminary Appraisal of Borrow Pit, Quarry and Temporary Site Compound Areas**.

2.12.3 Vehicle movements would be required to construct access tracks; deliver the foundation and relevant components and conductor materials to site; and deliver and collect materials and construction plant from the site compounds to work areas.

2.12.4 A Traffic Management Plan would be prepared by the Principal Contractor, in consultation with SSEN Transmission, The Highland Council and Transport Scotland. The Traffic Management Plan would describe all mitigation and signage measures that are proposed on the public road network. An Outline Traffic Management Plan is provided in **Appendix V2-10.1: Transport Assessment**.

2.13 Environmental Management during Construction

2.13.1 This is described in Part 3.16 of **Volume 1, Chapter 3: Project Description** in relation to the project as a whole and remains of relevance to the Alternative Alignment.

2.13.2 A contractual management requirement of the Principal Contractor would be the development and implementation of a Construction Environmental Management Plan (CEMP). This document would detail how the Principal Contractor would manage the site in accordance with all commitments and mitigation detailed in the EIA Report, statutory consents and authorisations, and industry best practise and guidance. The CEMP would also reference the Applicant's General Environmental Management Plans (GEMPs) and Species Protection Plans (SPPs) (see **Appendix V1-3.5: General Environmental Management Plans (GEMPs) and Species Protection Plans (SPPs)**). The implementation of the CEMP would be managed on site by a suitably qualified and experienced Ecological Clerk of Works (ECoW), with support from other environmental professionals as required.

2.13.3 An Outline CEMP is included in **Appendix V1-3.9**.

2.14 Operation and Maintenance

2.14.1 This is described in Part 3.17 of **Volume 1, Chapter 3: Project Description** in relation to the project as a whole and remains of relevance to the Alternative Alignment.

2.14.2 In general, OHLs require very little maintenance. Regular inspections are undertaken 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 on OHLs. If conductors are damaged, short sections may have to be replaced.

2.15 Dismantling of the Existing OHL

2.15.1 This is described in Part 3.18 of **Volume 1, Chapter 3: Project Description** in relation to the project as a whole and remains of relevance to the Alternative Alignment.

2.15.2 Following completion of the Proposed Development, the existing 132 kV OHL would be dismantled and removed. Within Section 3 of the project, this comprises the existing 132 kV OHL heading north from the crossing towers at Kyle Rhea, around the headland at Loch Alsh and Mudalach, and west to Broadford Substation.

2.16 Decommissioning the Proposed Development

2.16.1 This is described in Part 3.19 of **Volume 1, Chapter 3: Project Description** in relation to the project as a whole and remains of relevance to the Alternative Alignment. The Proposed Development would not have a fixed operational life.