

Appendix B

The Horlock Rules:

Substations and the Environment: Guidelines on Siting and Design

BT Route Tie-in and Associated Ladyburn 132 kV Collector Substation

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1 Introduction

- 1.1 This appendix introduces the Horlock Rules, guidelines first published by the National Grid Company plc in 2003 and updated in 2009 to clarify the approach to siting substations and similar infrastructure. Section III of the Horlock Rules provides a set of guidelines to help those responsible for siting and designing substations reduce the environmental impact of such developments. The document is widely used across the industry for the design and siting of substations, as well as cable sealing end compounds and line entries. The Horlock Rules complement the Holford Rules, which provide guidelines for routing high-voltage transmission lines, and should be used together with them when appropriate.

2 The Horlock Rules

2.1 The guidelines given within the Horlock Rules and supplementary notes are as follows:

Overall System Options and Site Selection

Rule 1: In the development of system options, including new substations, consideration must be given to environmental issues from the earliest stage to balance the technical benefits and capital cost requirements for new developments against the consequential environmental effects in order to keep adverse effects to a reasonably practicable minimum.

Amenity, Cultural or Scientific Value of Sites

Rule 2: The siting of new NGC substations, sealing end compounds and line entries should as far as reasonably practicable, seek to avoid altogether internationally and nationally designated areas of the highest amenity, cultural or scientific value by the overall planning of the system connections.

2.2 Notes on Rule 2:

- Internationally and nationally designated areas of highest amenity, cultural or scientific value are: National Parks; Areas of Outstanding Natural Beauty; Heritage Coasts; World Heritage Sites; Ramsar Sites; Sites of Special Scientific Interest; National Nature Reserves; Special Protection Areas; Special Areas of Conservation.
- Care should be taken in relation to all historic sites with statutory protection, e.g. Ancient Monuments, Battlefields and Listed Buildings.
- Account should be taken of Government Planning Policy Guidance and established codes of practice.
- Account should be taken of any development plan policies relevant to the siting or design of substations.

Rule 3: Areas of local amenity value, important existing habitats and landscape features, including ancient woodland, historic hedgerows, surface and ground water sources and nature conservation areas should be protected as far as reasonably practicable.

Local Context, Land Use and Site Planning

Rule 4: The siting of substations, extensions and associated proposals should take advantage of the screening provided by land form and existing features and the potential use of site layout and levels to keep intrusion into surrounding areas to a reasonably practicable minimum.

2.3 Notes on Rule 4:

- A preliminary study should be undertaken to identify the extent of land required to meet both operational and environmental needs.
- In some instances, it may be possible to site a substation partially or fully enclosed by existing woodlands.
- Topographical information should be obtained at an early stage. In some cases, a geotechnical survey may be required.

Rule 5: The proposals should keep the visual, noise and other environmental effects to a reasonably practicable minimum.

2.4 Notes on Rule 5:

- Allow sufficient space for screening of views by mounding or planting.
- Consider appropriate noise attenuation measures where necessary.
- Use security measures which minimise visual intrusion from lighting.
- Consider appropriate on-site water pollution prevention measures.

- Consider adjoining uses and the amenity of local inhabitants.

Rule 6: The land use effects of the proposal should be considered when planning the siting of substations or extensions.

2.5 Notes on Rule 6:

- Issues for consideration include potential sterilisation of nationally important land, e.g., Grade 1 agricultural land and sites of nationally scarce minerals.
- Effects on land drainage. In all locations, minimise confusing appearance.

Design

Rule 7: In the design of new substations or line entries, early consideration should be given to the options available for terminal towers, equipment, buildings and ancillary development appropriate to individual locations, seeking to keep effects to a reasonably practicable minimum.

2.6 Notes on Rule 7:

- With outdoor equipment, a preference should be given normally to a low-profile design with low height structures and silhouettes appropriate to the background.
- Use lightweight narrow-section materials for taller structures, especially for gantries over about 6 metres in height.
- Commission exterior design and colours appropriate to the surroundings.
- Materials and colours for buildings, equipment and fencing should be chosen to harmonise with local surroundings.
- Where possible, avoid the use of prominent insulators by considering available colours appropriate to the background.
- Where possible site buildings to act as visual screens for switchgear.
- Ensure that the design of high voltage and low voltage substations is coordinated by early consultation between NGC and its customers.
- Where there are particular technical or environmental constraints, it may be appropriate to consider the use of Gas Insulated Switchgear (GIS) equipment, which occupies less space and is usually enclosed within a building.
- Early consideration should be given to the routing of utility service connections.

Rule 8: Space should be used effectively to limit the area required for development consistent with appropriate mitigation measures and to minimise the adverse effects on existing land use and rights of way, whilst also having regard to future extension of the substation.

2.7 Notes on Rule 8:

- Assess the benefit of removing redundant substation equipment from existing sites where this would improve their appearance.

Rule 9: The design of access roads, perimeter fencing, earthshaping, planting and ancillary development should form an integral part of the site layout and design to fit in with the surroundings.

Line Entries

Rule 10: In open landscape especially, high-voltage line entries should be kept, as far as possible, visually separate from low voltage lines and other overhead lines so as to avoid a confusing appearance.

Rule 11: The inter-relationship between towers and substation structures and background and foreground features should be studied to reduce the prominence of structures from main viewpoints. Where practicable the exposure of terminal towers on prominent ridges should be minimised by siting towers against a background of trees rather than open skylines.