The Great Grid Upgrade

Sea Link

Sea Link

Volume 9: Examination Submissions

Document 9.147: Outline Operational Lighting Management Plan

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Contents

Executive Summary

Ex1.1 Summary

Ex1.1.1 The purpose of this Outline Operational Lighting Management Plan, which forms Application Document 9.147 Outline Operational Lighting Management Plan, is to provide a framework for delivering the lighting strategy and the successful construction and future operation of the proposed lighting works associated with the Proposed Project.

Ex1.1.2 It sets out the short and long-term measures and practices that will be implemented by National Grid to minimise and control the impact of lighting associated with the Proposed Project. It also provides a mechanism for the delivery of lighting to avoid and reduce environmental effects identified in the Environmental Statement.

Ex1.1.3 This Outline Operational Lighting Management Plan has been informed by consultation with stakeholders as part of the Statutory Consultation. It should be noted that as this is an outline document, which will be fully developed as the Proposed Project progresses into detailed design and prior to the commencement of works. National Grid will maintain a regular dialogue with statutory bodies and relevant stakeholders during this period.

1. Introduction

1.1 DCO Submission

1.1.1 This Outline Operational Lighting Management Plan and the preliminary lighting design drawings have been produced to support the application for Development Consent of the Sea Link project (the Proposed Project). This strategy provides the outline proposals for lighting required for the operation of the converter and substation sites in Suffolk and Kent. There are no operational lighting requirements for the cable connections onshore or offshore.

1.1.2 This outline management plan is intended to provide additional information to that provided in **Application Documents 6.2.1.4 Description of the Proposed Project**, **6.2.2.2 Environmental Statement Part 2 Suffolk Chapter 2 Ecology and Biodiversity** and **6.2.3.2 Environmental Statement Part 3 Kent Chapter 2 Ecology and Biodiversity**. The strategy is unchanged from those documents; however, this document provides further information.

1.1.3 This outline management plan should be read in conjunction with **Application Document 9.124 Landscape and Visual Nighttime Assessment**.

1.2 Project Overview and Scope

1.2.1 The Proposed Project would comprise the following elements:

The Suffolk Onshore Scheme

1.2.2 A connection from the existing transmission network via Friston Substation, including the substation itself. Friston Substation already has development consent as part of other third-party projects. If Friston Substation has already been constructed under another consent, only a connection into the substation would be constructed as part of the Proposed Project.

1.2.3 A high voltage alternating current (HVAC) underground cable of approximately 1.9 km in length between the proposed Friston Substation and a proposed converter station (below).

1.2.4 A 2 GW high voltage direct current (HVDC) converter station (including permanent access from the B1121 and a new bridge over the River Fromus) up to 26 m high plus external equipment (such as lightning protection, safety rails for maintenance works, ventilation equipment, aerials, similar small scale operational plant, or other roof treatment) near Saxmundham.

1.2.5 A HVDC underground cable connection of approximately 10 km in length between the proposed converter station near Saxmundham, and a transition joint bay (TJB) approximately 900 m inshore from a landfall point (below) where the cable transitions from onshore to offshore technology.

1.2.6 A landfall on the Suffolk coast (between Aldeburgh and Thorpeness).

The Offshore Scheme:

1.2.7 Approximately 122 km of subsea HVDC cable, running between the Suffolk landfall location (between Aldeburgh and Thorpeness), and the Kent landfall location at Pegwell Bay.

The Kent Onshore Scheme:

1.2.8 A landfall point on the Kent coast at Pegwell Bay.

1.2.9 A TJB approximately 800 m inshore to transition from offshore HVDC cable to onshore HVDC cable, before continuing underground for approximately 1.7 km to a new converter station (below).

1.2.10 A 2 GW HVDC converter station (including a new permanent access off the A256), up to 28 m high plus external equipment such as lightning protection, safety rails for maintenance works, ventilation equipment, aerials, and similar small scale operational plant near Minster. A new substation would be located immediately adjacent.

1.2.11 Removal of approximately 2.2 km of existing HVAC overhead line, and installation of two sections of new HVAC overhead line, together totalling approximately 3.5 km, each connecting from the substation near Minster and the existing Richborough to Canterbury overhead line.

1.2.12 The Proposed Project also includes modifications to sections of existing overhead lines in Suffolk (only if Friston Substation is not built pursuant to another consent) and Kent, diversions of third-party assets, and land drainage from the construction and operational footprint. It also includes opportunities for environmental mitigation and compensation. The construction phase will involve various temporary construction activities including overhead line diversions, use of temporary towers or masts, working areas for construction equipment and machinery, site offices, parking spaces, storage, accesses, bellmouths, and haul roads, as well as watercourse crossings and the diversion of public rights of way (PRoWs) and other ancillary operations.

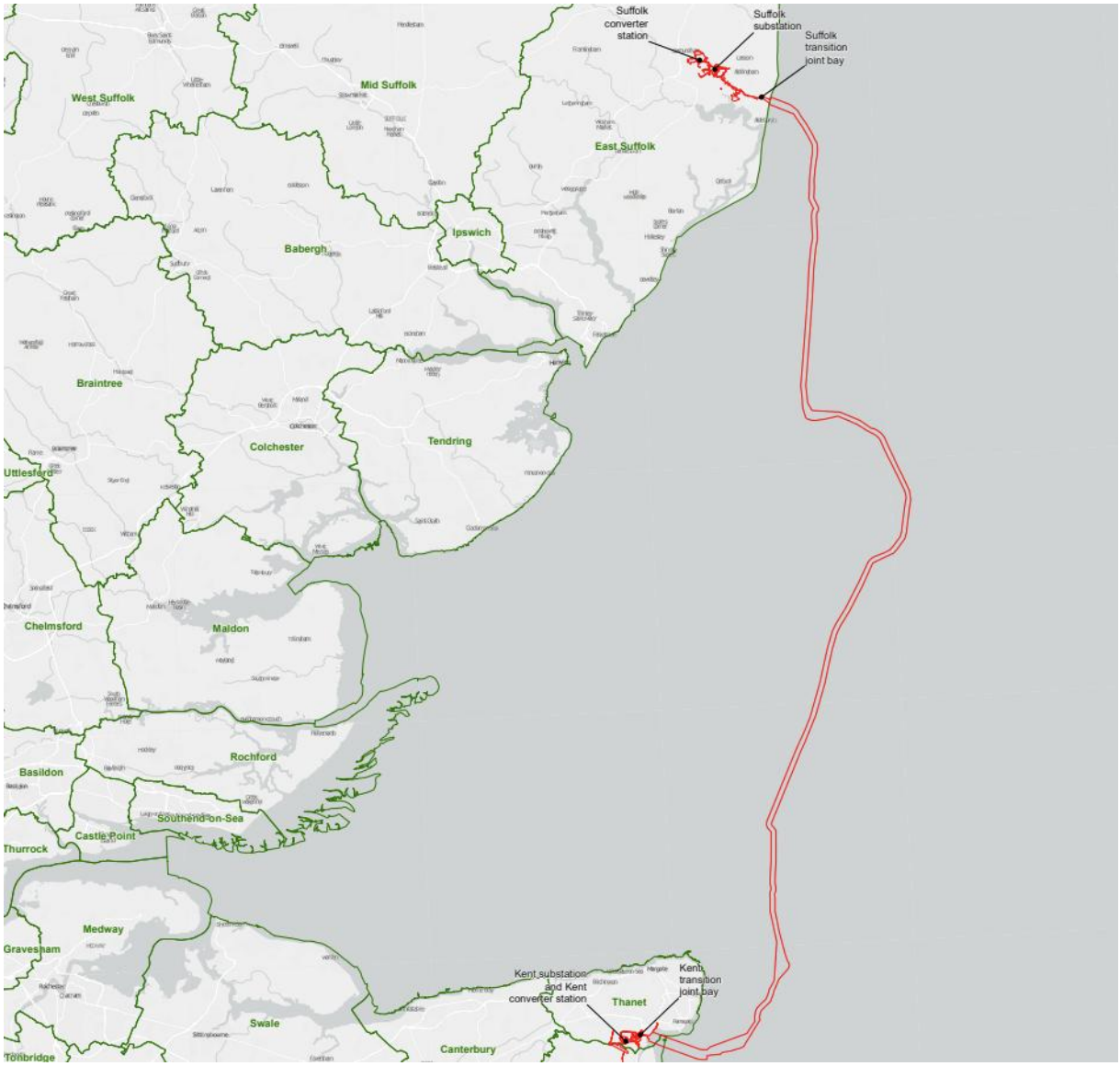

Plate 1.1 Sea Link proposed project (Source: 2.2 Location Plans [APP-018])

1.2.13 For further details describing the Scheme as a whole, refer to **Application Document 6.2.1.4 Description of the Proposed Project**.

1.2.14 This report is intended to bring together information on operational lighting contained in different application documents to assist all parties in understanding the proposals. The operational lighting proposals in the application have been informed by feedback received during Statutory Consultation alongside ongoing consultation meetings with the relevant stakeholder bodies between 2023-2026.

2. Legislation, Planning Policy, Guidance and Standards

2.1 Introduction

2.1.1 This section presents a summary of the legislation, planning policy, standards and guidance relevant to potential for obtrusive light.

2.2 National Legislation and Planning Policy

Clean Neighbourhoods and Environment Act (2005)

2.2.1 The Clean Neighbourhoods and Environment Act (2005) amended Section 79 of the Environmental Protection Act 1990 by extending the statutory nuisance regime to include light nuisance, by stating the following: "(fb) artificial light emitted from premises so as to be prejudicial to health or a nuisance".

National Policy Statements

2.2.2 The relevant National Policy Statements for decision making on Sea Link are :

- Overarching National Policy Statement for Energy (NPS EN-1) (2024)
- National Policy Statement for Renewable Energy Infrastructure EN-3 (NPS EN-3) (2024) (DESNZ, 2024)
- National Policy Statement for Electricity Networks Infrastructure EN-5 (NPS EN-5) (2024) (DESNZ, 2024).

2.2.3 Part 5.7 of NPS EN-1 addresses artificial light and sets out the nature/scope of assessment required by applicants (paragraphs 5.7.5), the basis for decision-making by the Secretary of State (paragraphs 5.7.12) and mitigation measures (paragraph 5.7.15).

2.2.4 Paragraph 5.5.54 of NPS EN-1 also addresses the statutory requirements concerning lighting to tall structures stating: "*Where lighting is requested on structures that goes beyond statutory requirements by any of the relevant aviation and defense consultees, the Secretary of State should be satisfied of the necessity of such lighting taking into account the case put forward by the consultees. The effect of such lighting on the landscape and ecology may be a relevant consideration*" (page 118).

2.2.5 The Sea Link application was submitted under the 2024 versions of the relevant National Policy Statements and these are the relevant versions for decision making on the Development Consent Order application. These documents have subsequently been superseded by 2025 versions, which are relevant and important matters but are not the documents the application will be determined against so are not referenced here.

National Planning Policy Framework

2.2.6 At the national level, the need to consider the potential effects of artificial lighting is embodied in the wording of the National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government (MHCLG), 2024) and should be considered during the application process to reduce the potential for unnecessary delays owing to unacceptable (unknown) potential effects on local amenity and nature conservation.

2.2.7 Paragraph 198 of the NPPF states:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation" (page 57).

National Planning Practice Guidance

2.2.8 The UK Government's National Planning Practice Guidance (NPPG) (November 2019) for England presents specific guidance on light pollution in paragraph(s) 001-007 of ID 31 (MHCLG, 2019b). Below are the seven questions and how they relate to the proposed project.

2.2.9 What light pollution considerations does planning need to address?

- Artificial lighting needs to be considered when a development may increase levels of lighting which may be the case for the Sea Link project. Artificial light has the potential to become what is termed 'light pollution' or 'obtrusive light', and not all modern lighting is suitable in all locations. It can be a source of annoyance to people, harmful to wildlife and undermine enjoyment of the countryside or the night sky, especially in areas with intrinsically dark landscapes. The design approach laid out in this strategy looks to mitigate these potential impacts.

2.2.10 What factors can be considered when assessing whether a development proposal might have implications for light pollution?

- Will a new development, or a proposed change to an existing site, be likely to materially alter light levels in the environment around the site and/or have the potential to adversely affect the use or enjoyment of nearby buildings or open spaces? The design approach laid out in this strategy looks to mitigate these potential impacts.

2.2.11 What factors are relevant when considering where light shines?

- Light intrusion occurs when the light 'spills' beyond the boundary of the area being lit. The design approach laid out within this strategy looks to mitigate light intrusion.

2.2.12 What factors are relevant when considering when light shines?

- The use of lighting only when the light is required can have a number of benefits, including minimising light pollution, reducing energy consumption, reducing harm to wildlife and improving people's ability to enjoy the night sky. Lighting schemes could

be turned off when not needed ('part-night lighting') to reduce any potential adverse effects.

2.2.13 What factors are relevant when considering how much the light shines?

- Consideration of how much light shines may include an assessment of the quantitative and spectral attributes of the lighting scheme (eg light source and performance levels) and whether it exceeds the levels required to fulfil its intended purpose.

2.2.14 What factors are relevant when considering possible ecological impacts of lighting?

- Wildlife species differ from humans in their sensitivity to light (e.g. they can be affected by very low levels of light) and may be adversely affected in a number of ways by it (see the Royal Commission on Environmental Pollution's 2009 report, Artificial light in the environment). The positioning, duration, type of light source and level of lighting are all factors that can affect the impact of light on wildlife.

2.2.15 What other information is available that could inform approaches to lighting and help reduce light pollution?

- Information from the Bat Conservation Trust on Bats and artificial lighting in the UK, and Eurobats Guidelines for consideration of bats in lighting projects
- The Chartered Institution of Building Services Engineers (CIBSE) – Society of Light and Lighting (SLL) Code for Lighting
- The Chartered Institution of Building Services Engineers (CIBSE) – Society of Light and Lighting (SLL) Lighting Guide 6: The Exterior Environment
- The Chartered Institution of Building Services Engineers (CIBSE) – Society of Light and Lighting (SLL) Lighting Guide 15: Transport Buildings
- Dedham Vale National Landscape & Coast & Heaths National Landscape Lighting Design Guide, Guidance to reduce light pollution and protect our dark skies (Darkscape Consulting, 2023)
- Institute of Lighting Professionals (ILP) Guidance Note 01/21 The Reduction of Obtrusive Light (Institution of Lighting Professionals, 2021).

2.3 Local Planning Policy

East Suffolk Council Local Plan

2.3.1 The Suffolk Coastal Local Plan (East Suffolk Council (ESC) 2020) considers themes that may be relevant to the consideration of energy infrastructure proposals during the construction, operation and decommissioning stages. This includes under the theme 'Natural Environment', the impact of light pollution to nocturnal species, on the AONB (rebranded as National Landscape in November 2023) and the historic environment and the effect of light and dust on nature conservation sites and the historic environment.

2.3.2 Policy SCLP10.3: Environmental Quality states that "*development proposals will be expected to protect the quality of the environment and to minimise and, where possible, reduce all forms of pollution and contamination. Development proposals will be considered in relation to impacts on light pollution. Proposals should seek to secure*

improvements in relation to the above where possible. The cumulative effect of development, in this regard, will be considered".

2.3.3 Policy SCLP10.4: Landscape Character states "*proposals for development should be informed by, and sympathetic to, the special qualities and features as described in the Suffolk Coastal Landscape Character Assessment (2018), the Settlement Sensitivity Assessment (2018), or successor and updated landscape evidence. Proposals for development should protect and enhance the tranquility and dark skies across the plan area. Exterior lighting in development should be appropriate and sensitive to protecting the intrinsic darkness of rural and tranquil estuary, heathland and river valley landscape character*".

Thanet District Council Local Plan

2.3.4 Policy SE08 covering Light Pollution within the Thanet Local Plan (Thanet District Council, 2020) states that development proposals that include the provision of new outdoor lighting or require specific lighting in connection with the operation of the proposed development will be permitted if it can be demonstrated that:

- 1) It has been designed to minimise light glare, light trespass, light spillage and sky glow through using the best available technology to minimise light pollution and conserve energy;
- 2) There is no adverse impact on residential amenity and the character of the surroundings;
- 3) There is no adverse impact on sites of nature conservation interest and/or protected and other vulnerable species and heritage assets;
- 4) There is no adverse impact on landscapes character areas, the wider countryside or those areas where dark skies are an important part of the nocturnal landscape;
- 5) It does not have an adverse impact on long distance views or from vantage points;
- 6) Where appropriate, mitigation measures are proposed.

2.3.5 In addition a lighting strategy may be required for major developments or those developments with specific lighting requirements or for those that are in or adjacent to sensitive locations.

2.3.6 A Landscape and Visual Impact Assessment will be required for proposed developments that fall into the E1 category, as set out in Table 15 Environmental Zones.

2.3.7 Proposals that exceed the Institution of Lighting Professionals standards will not be permitted.

Dover District Council Local Plan

2.3.8 Policy SP13 within the Dover District Local Plan (Dover District Council, 2024) looks to protecting the District's hierarchy of designated environmental sites and biodiversity assets, including a requirement that, for development within 500m of the Thanet Coast and Sandwich Bay SPA and Ramsar sites, the need for a project level assessment, in accordance with the Habitats Regulations, will be assessed on a case-by-case-basis to

ensure that any proposal will not adversely affect the integrity of these sites, with specific regard to non-physical disturbance (e.g. noise, vibrations and light spill).

2.3.9 Section 6.9 of the plan states Dover has a rich and diverse built and natural environment, and the District's towns, villages, rural and coastal areas all have their own distinct character and unique history that is valued by local communities. It is important that new development in the District respects this and seeks to enhance the District's environment by creating places that are attractive, well-connected and easy to understand and use, that do not result in harmful levels of light pollution, that harmonise with the surrounding built form and landscape, whilst seeking, where appropriate, to embrace the best of modern architecture and design so that innovation is not stifled.

2.4 Standards

National Grid Standards

2.4.1 The external lighting system at the proposed converter stations and substations would meet the requirements of National Grid's Technical Specification 2.10.04 Issue 1- 2017.

2.4.2 Exterior and interior lighting shall be provided at all sites to allow for safe movement and operation of equipment. All lighting shall be designed in accordance with the appropriate Chartered Institution of Building Services Engineers (CIBSE) (see section 2.2.13 of this strategy), British Standards Institution (BSI) and Health and Safety publications. Particular note shall be given to environmental considerations.

2.4.3 The minimum exterior lighting requirements are to maintain an average illuminance of 6.0 lux and maintain a minimum point Illuminance of 2.5 lux. The external lighting would allow the safe movement of vehicles and pedestrians between any two points that they may reasonably be expected to negotiate during the hours of low light or darkness within the site perimeter fencing.

2.4.4 The minimum lighting levels above is not intended to facilitate maintenance activities (planned or unplanned) for which it is assumed additional portable equipment will be employed.

British Standards

2.4.5 British Standards (BS) documents on lighting that are likely to be applicable to the operational phase of the Facility include the following:

2.4.6 BS EN 12464-2:2024 Lighting of workplaces – Part 2 (9): Outdoor work places. This document provides guidance for a variety of outdoor work places and the anticipated lighting requirements, in the form of illuminance levels and uniformities that are used as part of standard practice.

2.4.7 BS EN 5489-1:2020 Design of Road Lighting – Part 1 – Lighting of roads and public amenity areas – Code of practice: defines lighting classes for road lighting aimed at the visual needs of road lighting aimed at the visual needs of road users and it considers environmental aspects of road lighting.

2.4.8 BS EN 13201-2:2015 Road lighting – Part 2 - Performance requirements: defines road lighting performance requirements, detailed as lighting classes and considers the environmental aspect of road lighting.

3. Lighting Requirements

3.1 Introduction

3.1.1 This section sets out the external artificial lighting requirements of the Proposed Project during operation.

3.2 Operational Lighting Requirements

3.2.1 New external artificial lighting will be required at the converter stations and substations so the sites can be safely and securely operated during the hours of darkness. Lighting will be required for safe access and wayfinding.

3.2.2 Lighting will be required across the majority of the internal footprint of the proposed converter and sub-stations within the perimeter fencing, to ensure the safe movement of vehicles and pedestrians between any two points that they may reasonably be expected to negotiate during the hours of poor light or darkness. This lighting would only be on in low light conditions when work was ongoing.

3.2.3 Low levels of lighting are proposed to meet the minimum National Grid standards. These minimum levels enable low levels of lighting to be used across the site in normal working conditions. This low level is not sufficient for undertaking maintenance activities, therefore occasional use of portable lighting will be necessary in instances where maintenance needs to be undertaken during periods of poor light or darkness. This approach minimises the level of lighting generally used on the site.

3.2.4 Lighting shall be required at the access gates to the sites which will be automatically activated upon approach during poor light conditions and will deactivate after entry. Once at the access gate the sites general lighting can be turned on to facilitate safe access from the gate to the place of work within the compound. At the main buildings, switches will be provided to turn off the sites general lighting so that the lights can be turned off whilst staff are working internally. Upon leaving the site the lights will be turned off at the access gate.

4. Outline Operational Lighting Strategy

4.1 Design Principles

4.1.1 The following design principles have been used in the development of the outline operational lighting design and will form the basis of the detailed design for lighting at converter and substation sites.

4.1.2 Minimal lighting levels for the safe movement of staff and vehicles will be used within the footprint of the sites. This is secured by commitment GG38 of **Application Document 9.84 Register of Environmental Actions and Commitments (REAC).**

4.1.3 No lighting of the access roads outside the secure fencing of the sites shall be used other than immediately adjacent to the access gate.

4.1.4 Lighting shall be manually controlled at the gate access and at the buildings on the site so that external lighting can be turned off when staff are working internally.

4.1.5 Motion sensors shall not be used other than at the access gate so that lights are not triggered by animals when the sites are unoccupied.

4.1.6 Road lantern and floodlight type luminaires shall be LED type and would be mounted upon dedicated maximum 8m, galvanised steel, base-hinged columns designed to be lowered for maintenance purposes.

4.1.7 Building mounted lights shall be at a maximum height of 8m.

4.1.8 In line with best practice guidance from the Bat Conservation Trust and Institute of Lighting Professionals (ILP) operational lighting would be the minimum required for the safe working of the proposed converter stations and substations. Lighting would be directed to the interior of the converter stations and substations, and on as low a column height as practicable, with measures such as hoods or cowls implemented where required to minimise light spill onto immediately surrounding habitat. This is secured by commitment B39 and B58 of **Application Document 9.84 Register of Environmental Actions and Commitments (REAC).**

4.1.9 Direct illumination of boundary features (e.g. hedgerows, ditches, and woodland blocks) would be avoided. Lighting would be designed to comply with published guidelines (Bat Conservation Trust and Institute of Lighting Professionals, 2018). These are both secured by commitment B53 of **Application Document 9.84 Register of Environmental Actions and Commitments (REAC).**

4.1.10 The detailed lighting design will be developed to meet the appropriate Institute of Lighting Professionals (ILP) Environmental Zone, as referenced within ILP Guidance Note 01/21 - The Reduction of Obtrusive Light.

Table 4.1 Environmental zones table 2 from ILP Guidance Note 01/21

Zone	Surrounding	Lighting environment	Examples
E0	Protected	Dark (SQM 20.5+)	Astronomical Observable dark skies, UNESCO starlight reserves, IDA dark sky places
E1	Natural	Dark (SQM 20 to 20.5)	Relatively uninhabited rural areas, National Parks, Areas of Outstanding Natural Beauty, IDA buffer zones etc.
E2	Rural	Low district brightness (SQM ~15 to 20)	Sparsely inhabited rural areas, village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Well inhabited rural and urban settlements, small town centres of suburban locations
E4	Urban	High district brightness	Town / City centres with high levels of night-time activity

4.2 Outline Design

4.2.1 Contour mapping of the outline lighting design has been provided in Appendix J Illustrative Lux Plots for the Proposed Substations and Converter Stations in Suffolk and Kent provided within **Application Document 9.73.1 Applicant's responses to First Written Questions – Appendices**. The contour mapping is also provided below in Plate 4.1 – 4.4 below.

4.2.2 The contour mapping provided shows that the 1 lux light spill is a maximum of 14m outside the boundary fenceline.

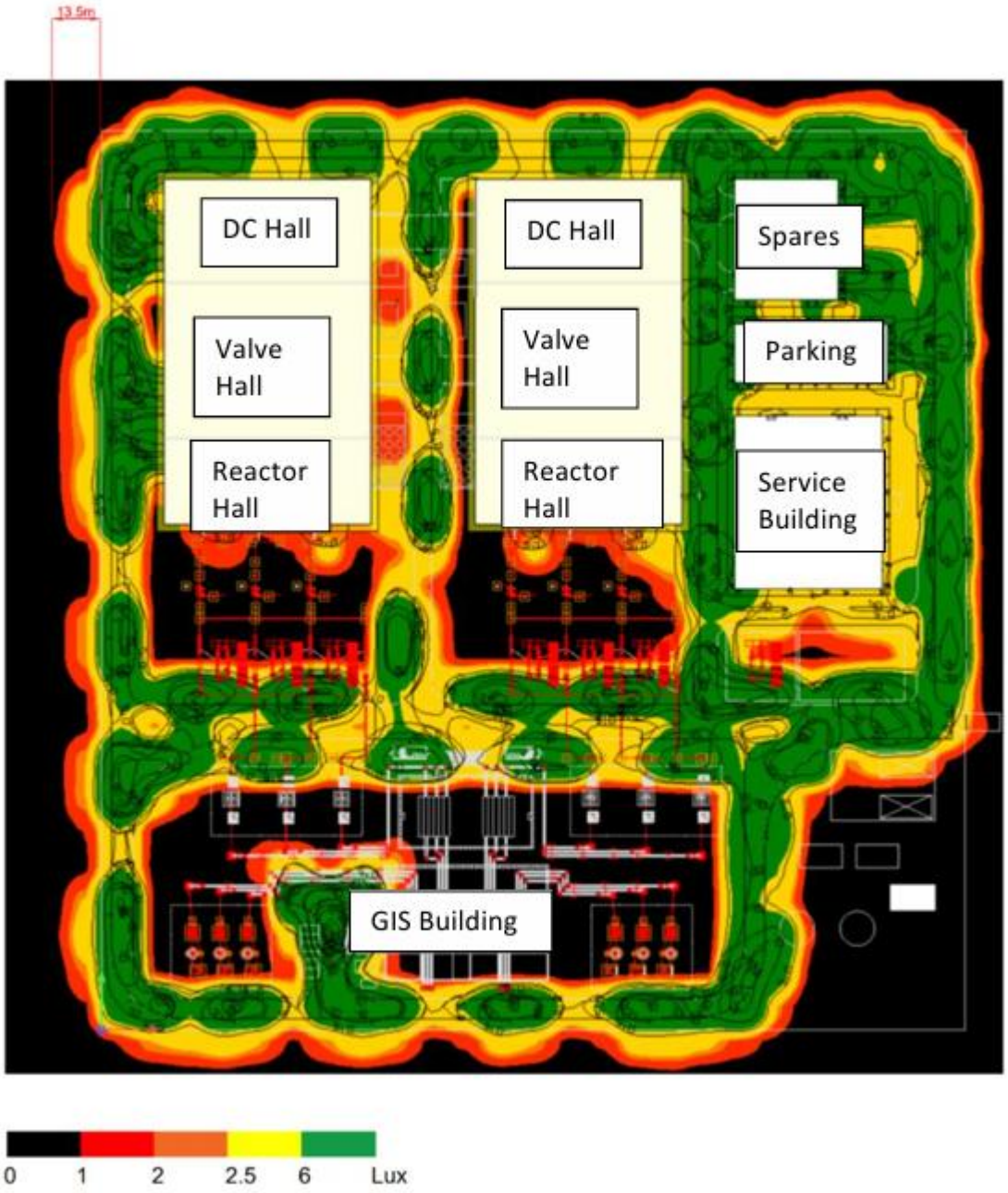

Plate 4.1 Illustrative Lux Plot for Saxmundham Converter Station

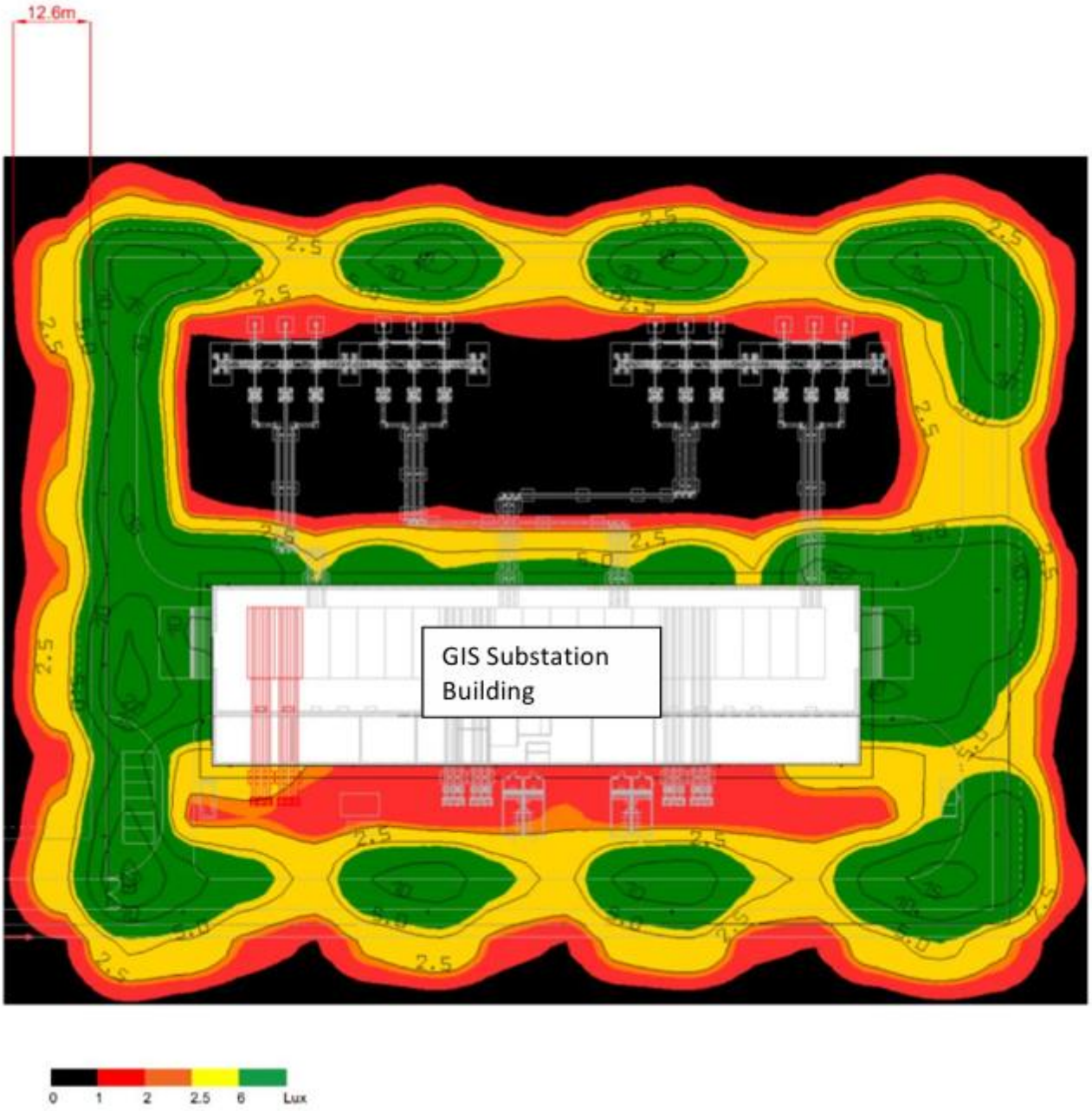

Plate 4.2 Illustrative Lux Plot for Kiln Lane Substation

Plate 4.3 Illustrative Lux Plot for Minster Converter Station

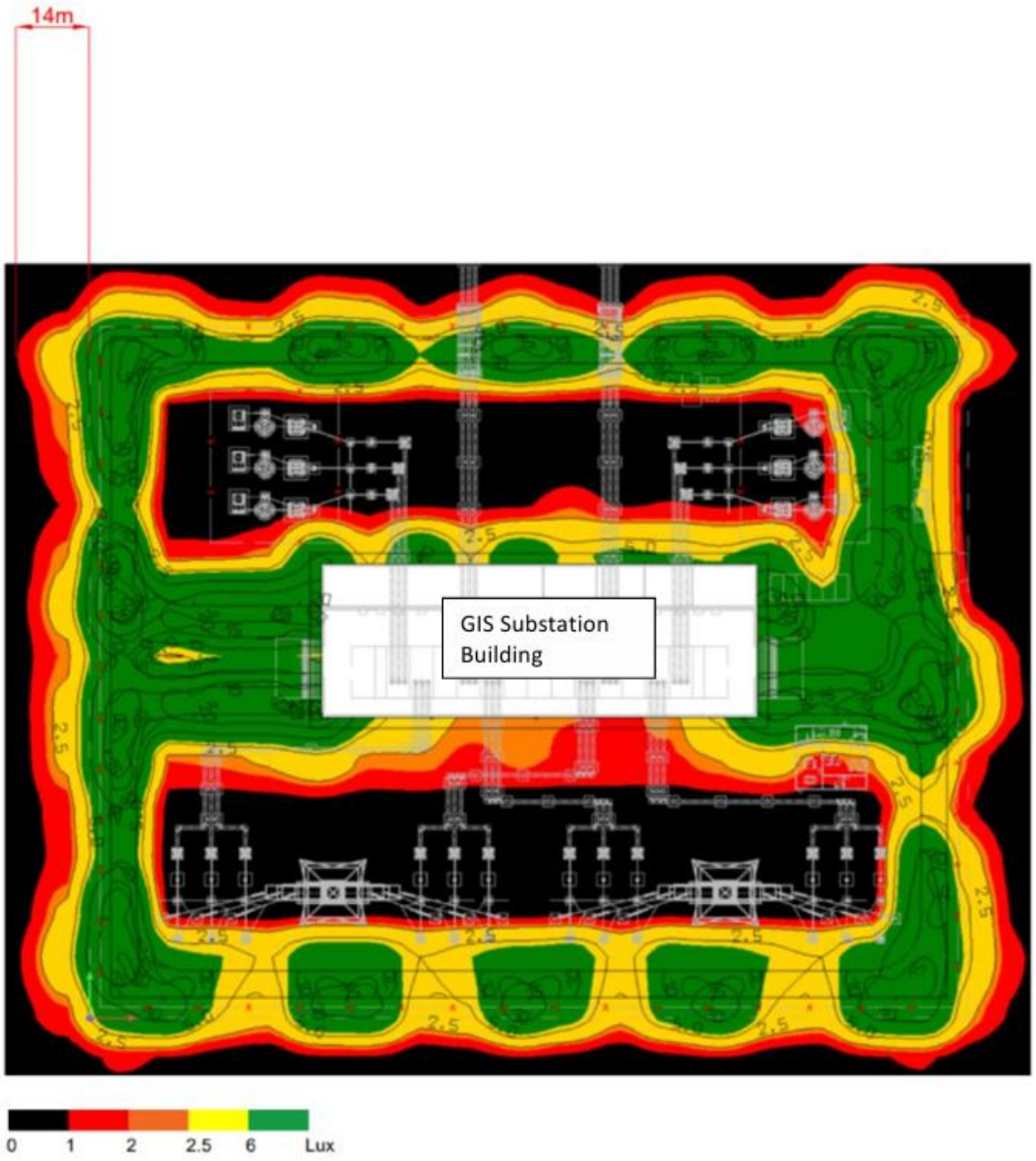

Plate 4.4 Illustrative Lux Plot for Minster Substation

5. Conclusion and Summary

5.1 Conclusion and Summary

5.1.1 The operational external lighting sources associated with the proposed Saxmundham Converter Station and the Minster Converter Station and Substation are limited to the site perimeter with no lighting along the permanent access roads. The lighting would be on daily for short periods of time in the morning and late afternoon during winter months whilst site operatives arrive and depart from site. There will be no lighting required when the sites are not occupied, which will typically be at nighttime unless ad hoc maintenance is required. Lighting will typically not be required during summer months when there is sufficient daylight during working hours to facilitate the safe movement of vehicles and pedestrians within the site perimeter.

5.1.2 Lighting levels within the design are shown to be limited with robust design principles in place.

5.1.3 Mitigation planting around the converter stations and substations is anticipated to further reduce the impact of lighting in the long term.

References

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BS EN 12464-2:2014 Lighting of workplaces – Part 2 (9): Outdoor workplaces.

BS EN 5489-1:2013 Code of Practice for the Design of Road Lighting – Part 1 – Lighting of Roads and Public Amenity Areas

BS EN 13201-2:2015 Road lighting – Performance requirements

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