



Lighting Strategy Document

Barkham Farm Solar Farm

Version Control

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1. Overview

A lighting strategy is a comprehensive plan which outlines the design, placement and control of artificial lighting with a demise. It aims to provide where possible, a balance between functionality, safety and energy efficiency while considering potential environmental impact.

The purpose of this lighting strategy is to provide a sustainable, minimal-impact lighting solution for the proposed solar farm being delivered that ensures safety during the construction, maintenance and general operation of the site. This is intended to be carried out while preserving the ecological balance of the site where possible.

This is of particular importance to the ecological aspects of the site with respect to local nocturnal mammals and bat populations. This strategy will highlight sensitive areas or features of the site for protected species, show where external lighting is to be located and the control strategies employed during their operation.

2. Scope

This strategy covers the lighting requirements for during the construction phases of the project as well as emergency and maintenance operations after the construction.

The lighting strategy will ensure adequate illumination of critical areas such as substations, operational zones and specifically for emergency maintenance activities that may could occur outside of daylight hours.

Design, installation and control of a limited number of floodlights will be used to minimise the volume of light pollution produced and preserve the ecological balance of the site, particularly in protecting nocturnal mammals such as Bats.

Methodology of the installation of the project during the construction phase is included in the CTMP and CEMP.

The external operational lighting solution will generally be confined to the customer substation and O&M/Spare parts container to supply sufficient visibility during emergency night-time call outs which are anticipated to be very low. These are designed to not compromise safety or security.

The system specified will incorporate energy efficient LED Fixtures equipped with a photocell and occupancy detection to ensure the most effective utilisation while minimising the length of time the lighting will be activated and only when needed. A Warm colour temperature will be used to minimise disruption to the rural environment and impact to local ecology.

3. Technical Requirement

The technical requirements focus on providing sufficient illumination for emergency operations while minimizing the quantity and intensity of lighting to reduce ecological disturbance. Floodlights used must be LED with low wattage, shielded to reduce light spillage, and activated only when necessary. All lights should have motion sensors to limit their use to essential times, and they should be equipped with timers to avoid prolonged operation after the work is completed.

3.1. Illumination Zones

- during the site operational phase, lighting will be confined to high-priority areas such as substations, inverter stations, and key operational pathways. No general site illumination is required on a permanent basis during the operation of the site.

3.2. Lighting Fixtures

- All fixtures shall be energy-efficient LED floodlights with a colour temperature below 3000K to minimize ecological disruption, particularly to nocturnal wildlife such as bats.
- Fixtures must have a minimum Ingress Protection (IP) rating of IP65 to ensure durability in outdoor conditions.

3.3. Control Systems

- Lighting will be integrated with photocell in order to restrict functionality during daylight hours.
- Lighting will utilise motion detection in order to activate, sensors must be capable of detecting activity within a range of 10-15 meters.
- Timer settings in tandem with motion detection should limit operation to a maximum of 30 minutes after last detected movement to minimize unnecessary lighting.

3.4. Light Pollution Mitigation

- All fixtures must feature directional spread or include shielding to prevent light spill into surrounding areas and avoid interference with ecological habitats.
- Lighting should be downward-facing and mounted at low heights (no higher than 4 meters) to focus light in operational areas only where required.

3.5. Compliance

- The lighting design must comply with relevant national lighting regulations and standards (such as BS EN 12464-2 for outdoor workplaces), as well as environmental impact assessments related to wildlife protection.

4. Environmental Impact

The environmental impact of lighting in a solar farm setting is a critical consideration, particularly given the presence of nocturnal wildlife such as bats and badgers as well as birds. Artificial lighting can disrupt natural behaviour, including foraging, mating, and navigation, potentially leading to a negative ecological impact. The goal of the lighting strategy is to ensure operational functionality while minimizing disturbances to the local fauna.

Lighting can interfere with bat foraging routes and disrupt their navigation. Bats tend to avoid well-lit areas, which can fragment their habitat and reduce their hunting efficiency. Warm-coloured LED lights (with a colour temperature at or below 3000K) are less attractive to insects, reducing the risk of altering the food supply for bats. Additionally, minimising the intensity and duration of lighting, along with the use of downward-facing, shielded fixtures, can help reduce light pollution that might interfere with their natural activity.

Badgers, which are also nocturnal, may experience habitat disturbance due to unnecessary lighting. Bright, continuous light could alter their nighttime behaviour, potentially affecting their foraging or burrowing activities. Motion-activated lighting with a short operational time (up to 30 minutes) and minimal light spillage can mitigate this issue, ensuring that badgers are only briefly exposed to light during essential human activity.

Birds, particularly migratory species, can become disoriented by artificial light. Some birds may be drawn to bright lights, increasing the risk of collisions with infrastructure. The use of low-intensity, shielded lighting that directs light downward and avoids upward spill can help mitigate the risk to birds, especially during night-time migratory periods.

Mitigation strategies for all species include using motion sensors to ensure lights are only active when necessary, minimizing the time fauna may be disturbed, and installing shielded, downward-facing lights to prevent light spill into surrounding habitats. Where possible, creating dark corridors free of lighting in areas of known wildlife activity can help preserve essential ecological routes for these species.

5. Design proposal

The lighting design for the 30MW solar farm will utilize a low number of strategically placed occupational floodlights around the substation entrance areas. The external lighting used in these cases are intended to only be activated during emergency or maintenance operations which are outside of daylight hours.

These floodlights will be downward-facing and equipped with motion sensors and photocells as per the technical requirement above.

The design ensures that only the immediate areas needing illumination are lit, thereby reducing both energy consumption and ecological disruption. Additionally, light fixtures will be mounted at low heights to further reduce the spillage of light into the surrounding environment. This approach strikes a balance between operational safety and ecological preservation.

- All lighting will use a warm white spectrum to reduce blue light components, and should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- Specific details of the luminaires have been provided for reference in “BFSF-EQNS-ZZ-SP-Z-0004”.
- A layout of the operational phase external lighting is under “BFSF-EQNS-ZZ-DR-Y1-0023”.
- Elevation of the related external lighting mounted buildings can be found in “BFSF-EQNS-ZZ-DR-E-0029”