Dark Skies – A Careful Approach to Lighting

Local Plan Supplementary Planning Document

Introduction

In December 2020, the North York Moors National Park was awarded 'International Dark Sky Reserve' status– only the 18th area in the world at the time to be designated as such.

Dark night skies are rare, and an intrinsic part of the character of the National Park landscape and one of its listed "special qualities."

- **They are good for nature**. Light can be very disruptive to species' circadian body clocks, acting as a barrier to migration and movement. Artificial lights can disrupt nocturnal activity such as foraging, interfering with reproduction and reducing populations of species crucial to the integrity of our ecosystems, such as bats and moths. Th e Institute of Lighting Engineers has published advice on bats and artificial lighting which provides much more detail on this issue.
- **They boost our health and wellbeing.** Light pollution can disrupt body clocks, disrupting sleep, leading to loss of attention, increased stress and fatigue.
- **They benefit those who live and work here.** Dark skies bring in people to appreciate them – which increases spending, and boosts tourism numbers, often in the quieter, darker 'off peak' months.
- **They can help us learn and develop**. Dark night skies are there to be discovered by a new generation who can discover and learn about astronomy and associated branches of science.
- **They benefit the planet as a whole.** Changing to newer lighting technologies is also one of the easiest and cheapest ways of reducing your carbon footprint, helping combat climate change. Not only that, modern lighting, used carefully, is cheaper to run.

The Authority adopted a planning policy in 2020 (North York Moors Local Plan Policy ENV4)[1] to guide and control lighting in new development. This Supplementary Planning Document (SPD) helps explain how the policy will be implemented and confines itself to planning matters only. The Authority has also produced separate guidance explaining the benefits of dark skies, as well as good practice guidance. Guidance in this document is based on a Lighting Management Plan prepared by a professional lighting consultant to support the Authority's bid to become an international dark sky reserve.

If we would like you to take anything away from all this guidance it is that protecting our dark skies is not about rationing or removing lighting. It is about being careful in our use of lighting. Use light only where it serves a clear purpose, where it is needed, and make sure that it is no brighter than necessary.

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[1] https://www.northyorkmoors.org.uk/planning/framework/local-plan/Local-Plan-FINAL-DRAFT.pdf

Do I need planning permission?

The focus of this SPD is on providing planning guidance where new development requiring planning permission is proposed and where careful use of lighting will help minimise glow, glare and light spillage from buildings. However, the National Park Authority also strongly encourages adherence to the guidance contained in this Supplementary Planning Document, even if planning permission is not required. The Authority is keen to encourage the replacement of existing, non-compliant, external lighting on both residential and commercial development, with new lights that comply with dark skies guidelines. In some cases, where existing lighting is having a significant impact, grant funding may be available to assist with this and you are advised to contact the Authority for more information about any options that might apply in your circumstances.

Whether permission is needed is not always straightforward and you may need to seek further advice. For a modest fee, we provide pre-application advice on a proposal. Details can be found on the Authority's website[2].

The advice below summarises the general position:

1. Residential development - In most circumstances, installation of new or replacement minor and domestic style lights on existing buildings does not require planning permission. However, if the lighting is to be affixed to a building listed for its architectural or historic interest then Listed Building consent will be required.
2. Commercial and industrial development and uses and non-residential agricultural buildings - Installation of new or replacement external light fittings (other than minor, domestic style fittings) will usually require planning permission due to the need to light outside working/operational areas or for security which is more likely to be considered as "development." New or replacement lighting used to light a sign may also require Advertisement Consent.
3. Conditions imposed on planning permissions and Listed Building Consents - When granting planning permission for new build or operational development, or when granting Listed Building Consent, the Authority will often also impose a condition requiring the applicant to submit details of the proposed external lighting arrangements, prior to their installation. This helps ensure that lighting complies with the requirements of relevant policy and guidance.

Planning Policy

The Authority will assess proposals against Local Plan Policy ENV4 - Dark Night Skies. In summary, it requires new development to minimise light spillage through good design and lighting management. It states that:

1. No external lighting will be permitted in Remote Areas.

[2] https://www.northyorkmoors.org.uk/planning/pre-application-advice

2. In Open Countryside proposals that involve external lighting will only be permitted where it can be demonstrated that the lighting is essential for safety or security reasons and the lighting details meet or exceed those set out in any lighting guidelines adopted by the Authority.
3. Within settlements listed in the Authority's settlement hierarchy, proposals that involve external lighting will be permitted where it can be demonstrated that the lighting is essential for safety, security or community reasons and the lighting details meet or exceed those set out in any lighting guidelines adopted by the Authority.

The policy requires adherence to 'lighting guidelines.' These are set out in the next section.

Lighting Guidelines

The level of information required on lighting arrangements will depend on the scale, location and potential impact of the development, but in most cases only limited information will be needed. This is likely to include:

- The type/s and specification of lighting unit/s to be installed.
- The proposed output of the unit/s in lumens (lm).
- The colour temperature of the bulb/s to be installed measured in Kelvins (K).
- The proposed location, height and orientation of the unit/s.
- Any lighting control measures to be installed such as motion sensors and timers.

Appendix 1 includes an explanation of basic lighting terms.

Some larger or more 'light intensive' cases, or proposals in particularly sensitive locations, may require the submission of more detailed information on lighting requirements and impacts, requiring the services of a qualified lighting engineer. We expect such cases will be infrequent. Examples could include installing large-scale lighting within substantial housing development schemes; commercial and industrial projects; camping, caravanning or holiday lodge developments; floodlighting of sports pitches or tennis courts, or other significant new built or operational development. For such proposals illuminance levels will also be expected to be compatible with any relevant industry guidelines.

The Careful Lighting Checklist

We have prepared a 'Careful lighting checklist' which asks applicants to confirm the following:

1. Is the application for development within a 'Remote Area'?

Policy ENV3 of the Local Plan identifies 'Remote Areas – defined as areas which are 1 kilometre or more from a road or building with a postal address.' In these areas, Policy ENV4 (Dark Night Skies) requires that no external lighting is fitted to new development. Development is restricted in Remote Areas in any event, except in the strict circumstances outlined in Local Plan Policy ENV3.

2. Is the lighting needed?

Lighting should be used only to provide the right type of light where it is needed, when it is needed, and to the minimum extent necessary for the intended purpose.

It is not possible in this document to specify limits on the total number of lights, or the total light output (typically measured in lumens) that may be acceptable, as every case will be different. However, it is unlikely that individual lighting units with an output more than 500 lumens will be required for residential purposes. In most cases the justification for the lighting will be obvious, including for reasonable safety, security or operational purposes. Unnecessary or excessive lighting, including lighting for aesthetic or dramatic effect, can be intrusive and harmful and should be avoided except in circumstances, which are expected to be very rare, where it is critical to the development.

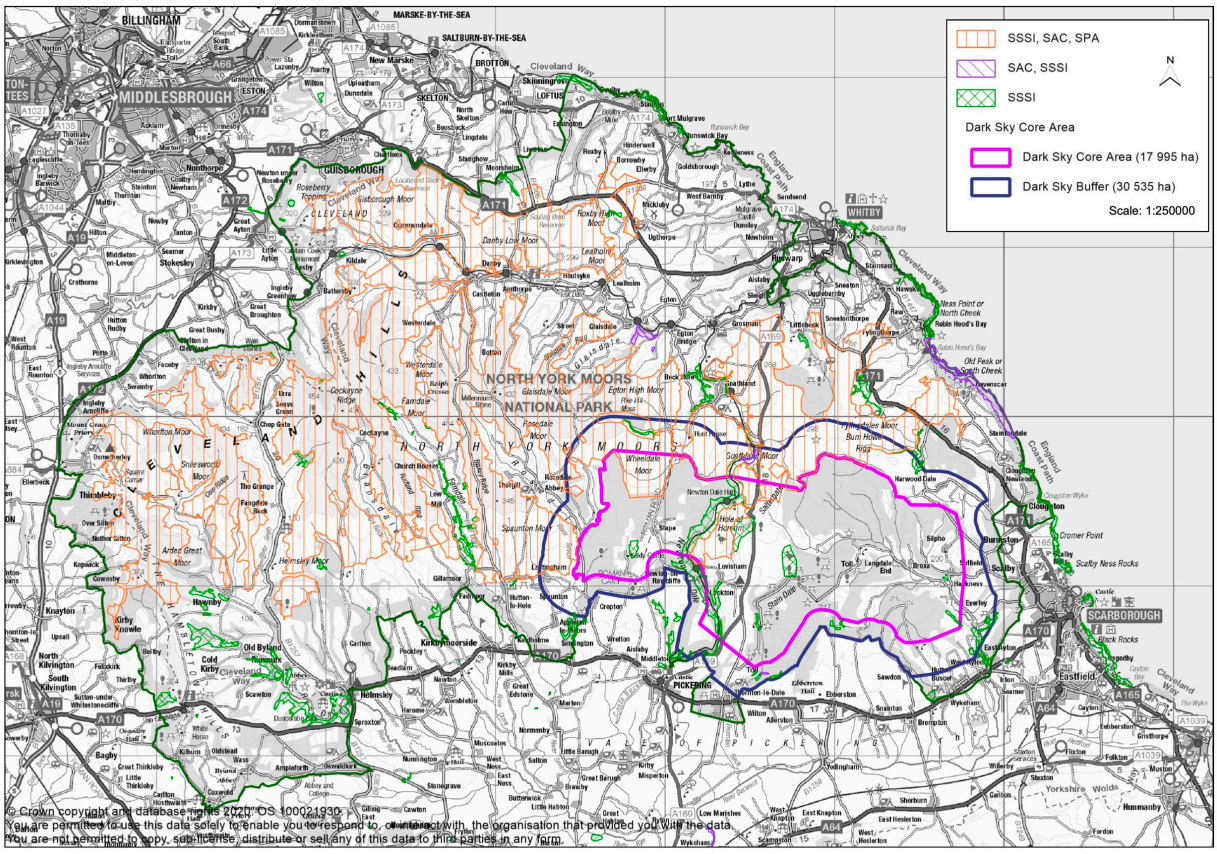
3. Does the lighting have a colour temperature of 2700K or less or, where this is not practicable, does not exceed 3000K?

There are different tones of white light, as measured by the Kelvin scale (K). Manufactures sometimes use phrases such as 'warm white,' 'brilliant white' or 'cool white' to distinguish between the different types of white light, but you will also see light bulbs identified by their 'Kelvin' output. There is growing evidence that blue-rich white light (above 3000K) is detrimental to nocturnal wildlife and to our general health and wellbeing, and therefore the lower the 'K' value the less effect impact it has. Lighting with a lower 'K' value also tends to generate less intrusive 'sky glow' effects. The objective should be to install external lighting with a 'warm white' colour temperature of 2700k or less. A colour temperature not exceeding 3000k may be acceptable in some instances where it is not practicable to install lighting with a lower 'K' value.

4. Is the lighting effectively shielded regardless of light output?

Use of effectively shielded lights helps ensure that light is only directed where it is needed. 'Fully shielded' means that there is no light spill at or above the horizontal, i.e., zero upward light. Examples of fully shielded lighting are included in separate good practice guidance.

Whilst the use of fully shielded lighting is preferred in all circumstances, full shielding is particularly important within the dark sky 'Core Area' and associated 'Buffer Zone.' The Core and Buffer Zones were established through technical work carried out to support the bid for International Dark Sky Reserve status.



Where it is not possible to install a fully shielded light for exceptional design and historic interest reasons and the lighting is outside the Core Zone,[3] installation of lighting which is not fully shielded may be acceptable if the light is no more than 500 lumens output (and is also consistent with the advice in point 4 above regarding colour temperature). The Authority recognises that, exceptionally, there may be circumstances where some 'leeway' on standards may be needed if there is an overriding justification on design and built heritage grounds, however it anticipates that such circumstances will be rare and will need agreeing on a case-by-case basis. 'Historic interest' in this case means that the building(s) is subject to some form of statutory designation to protect its historic value.

5. Is the lighting fitted with a sensor or timer appropriate to the intended function of the lighting?

Use of motion sensors (often referred to as Passive Infra-Red or PIR) and/or timers can ensure that lighting is only in use when needed, thus helping to reduce light pollution and save energy. All proposals involving external lighting should include provision for the fitting of a sensor/s appropriate to the intended use unless there is clear justification as to why a sensor is not required in any particular case. 'Dawn to dusk' type photo sensors, which can result in lights being on all night, are not appropriate and should not be specified unless there is a specific and justifiable need.

[3] A more detailed map boundary can be viewed on the Authority's Planning application map search site: https://www.northyorkmoors.org.uk/planning/planning-applications/application-search-map

6. Does the development include large areas of new glazing?

Where a proposed new building or structure (including garden rooms and conservatories) contains large areas of glazing, measures may be required to help control external light pollution originating from internal light sources. This can include a requirement for installation of blinds or shutters. In particularly sensitive locations, or on particularly sensitive building elevations, it may be necessary to ensure that large areas of glazing are excluded at the initial design stage. In other circumstances, it may be necessary for appropriate glazing to be specified to reduce the level of visible light transmission (VLT, see Appendix 1 for a definition). For large continuous areas of glazing (i.e., more than $5m^2$) mounted on a vertical wall, an upper limit for VLT of 0.65 is likely to be required. Where particularly large areas of vertical glazing (i.e., more than $10m^2$) are proposed, as well as for substantial roof lights and skylights, a lower VLT limit of approximately 0.4 to 0.5 or less is likely to be required.

The Lighting Checklist Summary

-	Question	-	Requirements	Further information
1	Is the application for development within a Policy ENV3 'Remote Area'?	**Yes/No**	**If yes**, no new external lighting can be permitted in these areas. **If no**, proceed to question 2.	See Figure 1 or the Local Plan Policies Map.
2	Is the lighting needed?	**Yes/No**	**If no**, no external lighting should be installed. **If yes**, proceed to question 3.	See the Dark Skies Map.
3	Does the lighting have a colour temperature of 2,700K (or no more than 3000K where it can be justified that an appropriate 2700K unit is not commercially available)?	**Yes/No**	**If yes,** the lighting adheres to the relevant standard. Proceed to question 4. **If no,** an alternative unit meeting the requirement should be specified.	-
4	Is the lighting fully shielded or otherwise effectively shielded for the intended purpose and location regardless of light output?	**Yes/No**	**If yes,** the lighting adheres to the relevant standard. Proceed to question 5. **If no**, is the location outside the Dark Skies Core Zone and are there any compelling historic interest or design reasons why an unshielded unit should be installed; and is the unit of no more than 500 lumens and consistent with the colour temperature requirements in Question 3? If this criterion is met proceed to question 5.	Examples of fully shielded light fittings are shown in in accompanying good practice guidance.
5	Is the lighting to be installed with an appropriate timer and/or motion sensor to ensure it is only on when needed?	**Yes/No**	**If yes,** the lighting adheres to the relevant standard. Proceed to question 6. **If no,** lighting with timers and/or motion sensors should be specified unless an operational need can be demonstrated.	-
6	If a large continuous area of new glazing (more than $5m^2$ is to be installed does the glazing not exceed 0.65 Visible Light Transmission? Where glazing more than $10m^2$ is proposed, as well as for large roof lights and sky lights, does the glazing have a VLT in the range 0.4 to 0.5?	**Yes/No**	**If yes,** the glazing adheres to the relevant standard. **If no,** appropriate glazing should be specified.	-

Appendix 1 - Basic lighting terms

The power, output or brightness of a light – WATTS and LUMENS

Traditionally most people have been used to buying light bulbs (lamps) with the light output graded in units of watts (W). Watts are a unit of power and measure the rate of power consumption.

These days and because lighting technology has moved on in leaps and bounds and power is less important than brightness, it is now about the 'lumen' (lm) output of a bulb. Lumens describe the total amount of light given off or radiated by a bare lamp. Modern LED bulbs emit far more lumens using far less power than old 'filament' or incandescent bulbs. A 10-watt LED bulb now produces at least the equivalent level of brightness (700+ lumens) as a 60-watt standard incandescent light bulb.

The colour of a light - KELVIN

Modern LED bulbs emit a 'whiter' light than older incandescent bulbs or sodium streetlights – which emit a more yellow or orange hue. The colour temperature of the bulb is important in dark night sky skies terms – we need to avoid the piercing blue or white light often seen on LED lights. There is growing evidence that blue-rich white light (above 4000K) is detrimental to nocturnal wildlife and to our general health and wellbeing.

Colour is measured in Kelvins. The higher the Kelvin rating, the whiter the light. The preference for new exterior lighting within the Dark Sky Park is for bulbs to emit light of fewer than 3000 Kelvins – giving a warmer white light. In practice, many bulbs are available at operate at 2,700K – this would be the preference.

The amount or illuminance of a light - LUX

The amount the light that falls on a surface – its illuminance - is also important. This is measured by LUX. 1 Lux is 1 Lumen per square metre. 1000 lumens of light spread uniformly over an area of 1 square metre, would light up that square metre with an illuminance of 1000 lux. The same 1000 lumens of light spread out over 10 square metres produces a dimmer illuminance of only 100 lux. It is possible to have many low lumen lights that 'over light' an area – which is why illuminance is important – it is the measure to be used so that you only light the area you need.

Visible Light Transmission

The amount of light that can be transmitted through the glass stated as a proportion of the original light source, either as a percentage or as a figure between zero and one.