



## Environmental Health Technical Planning Guidance

### **External Artificial Lighting**

The purpose of this guidance is to direct planning applicants who are contemplating a lighting scheme or proposal. It includes information on what factors will be taken into account by the District Council in determining planning applications for such schemes. The guidance also acknowledges the technical nature of lighting schemes.

#### **Background**

The presence of external artificial lighting is very beneficial on a broad scale. For example, it enhances public safety of the streets and properties as lighting improves security, and so encourages movement, contributes towards safer roads therefore influencing a reduction in accidents, encourages people to participate in outdoor working and sports activities in the evening and is actively used to advertise commercial enterprises. Essentially, lighting improves our opportunities giving us a higher quality standard of life.

Despite this, Lichfield District Council is concerned at the increasing number of proposals for external artificial lighting, often in sensitive locations, and the need to consider in general and technical terms their impact on the environment in the determination of planning applications that involve lighting schemes.

#### **What are the issues of External Artificial Lighting?**

The adverse effect of its benefits is an increasing demand for external artificial lighting to improve further, road safety, crime prevention (security lighting) and use for leisure activities (floodlighting of sports). Subsequently, obtrusive light or light pollution is more prevalent increasing the number of complaints received by the local authorities.

This combination of circumstances has raised the profile of obtrusive light as an environmental issue. This is highlighted by the inclusion of central Government guidance on lighting matters in various Planning Policy Guidance Notes (PPG's) including PPG's 1,7,15,17,19 and 23.

In order to tackle the issue of obtrusive light, it is important to identify the different and most common types. They are: -

- **Sky glow** – the orange glow we see around urban areas caused by a scattering of artificial lighting by dust particles and water droplets in the sky;
- **Glare** – the uncomfortable brightness of a light source when viewed against a darker background; and
- **Light Nuisance** – light spilling beyond the boundary of the property on which a light is located.

### **Why are their complaints?**

**Sky glow** is the result of wasteful and ill-directed lighting and reduces the ability of people to see the natural light sky. This is a problem found not only in urban areas but also in rural areas where dark skies at night are one of the special and intrinsic qualities of the rural landscape. Artificial lighting can also destroy local character by introducing a suburban feel into rural areas.

Disability **glare** and insensitive lighting can have serious implications for motorists who may become distracted or blinded by glaring lights spilling out on to the highway.

**Light nuisance** is a common problem and can intrude on the residential amenity in both urban and rural settings causing stress and anxiety for people affected.

### **Will your lighting scheme require planning permission?**

**It does not** require planning permission if you are: -

- Carrying out maintenance, improvement or other alterations of any building works, which affect only the **interior** of the building or do not significantly affect the external appearance of the building.

**For example**, most work involving lighting particularly of the householder DIY type, such as home security lights, will fall within this category.

**Does** require planning permission if you are: -

- Installing a lighting scheme of such nature and scale that it would represent an engineering operation and typically be undertaken by specialist lighting engineers could be deemed “development” and so is likely to require planning permission;
- Installing large-scale lighting such as the floodlighting of football stadiums or public tennis courts are clearly a form of development; and
- Listed building consent is required for lighting schemes if it is deemed that the character of the building would be significantly affected by the lighting.

However, it is advised that prospective applicants check with the local planning authority before installing any lighting scheme. When checking with the local planning authority you should be able to confirm the nature and extent of the scheme proposed, i.e. number of lights and their likely output, the height of the lighting columns (if applicable) and the area to be lit, to enable the planning officer to give you informed advice.

### **What information does the Local Planning Authority require?**

The local planning authority and environmental health strongly encourage applicants to engage in pre-application negotiations.

Any proposal for artificial lighting will need to be accompanied by the information normally required for any other planning proposal, which are: -

- A statement setting out why a lighting scheme is required, the proposed users, and the frequency and length of use in terms of hours of illumination;
- A site survey showing the area to be lit relative to the surrounding area, the existing landscape features together with proposed landscaping features to mitigate the impacts of the proposed lighting;
- A technical report prepared by a qualified competent person (e.g. Lighting Engineer) setting out the type of lights, performance, height and spacing of lighting columns. The light levels to be achieved over the intended area, at the site boundaries and, for large schemes, 50m outside of the boundary of the site should be superimposed on a map of the site and its surrounding area.

Any proposal for the display of **illuminated advertisements** will need to be accompanied by information normally required for any other planning proposal plus the information below: -

- Details of the proposed location, positioning and dimensions of the sign face;
- The sign face maximum luminance in candelas per square metre;
- The number, size and type of light sources and details of the sign face materials;
- The type of illumination – internal or external; static or intermittent;
- Details of the make and catalogue number of any luminaries / floodlights;
- Size, type and number of lamps fitted within any luminaries / floodlight;
- The mounting height of the luminaries / floodlights specified;
- The location and orientation of the luminaries / floodlights.

### **General Factors to be considered by the Local Planning Authority**

The local planning authority will seek to balance the need for each lighting scheme against the implications it may have on the environment in terms of obtrusive light. The District Council has identified a number of factors that will be taken into consideration in the determination of planning applications for proposals that include lighting. These factors are: -

- An Assessment of the Need for Lighting

The Local Planning Authority will require the applicant to assess the need for the lighting scheme proposed, taking into consideration whether the development could proceed without lighting, whether the benefits of lighting outweigh any drawbacks and if there are any alternative measures that may be taken. No lighting is ultimately the best solution in sensitive locations and therefore the Council will ensure that only lighting schemes that are necessary to the general use of the development are considered. The Local Planning Authority will also take account of the requirements of the Highway Authority with regard to proposals relating to highway safety.

- The Location of the Proposal In Relation to Neighbouring Uses

The Local Planning Authority has identified the following environmental zones against which impacts of external artificial lighting will be judged.

EZ 1: Lighting proposals that neighbour or are near enough to significantly affect areas of nature conservation importance, e.g. Sites of Special Scientific Interest, National Nature Reserves and County Wildlife Sites will only be permitted in exceptional circumstances. External artificial lighting can have severer implications for the natural diurnal rhythms in a range of animals and plants and therefore sites, which are deemed important in terms of their provision of wildlife, should not be in anyway affected.

EZ 2: Lighting proposals within the open countryside will only be permitted if the applicant can demonstrate to the Local Planning Authority that the scheme proposed is the minimum needed for security and/or working purposes and that it minimises the potential for obtrusive light from glare or light trespass to an acceptable level. Artificial lighting in the open countryside can have a demonstrable effect on 'dark skies', one of the special qualities of the rural landscape.

EZ 3: Lighting proposals that are within or adjoining residential or commercial areas will only be permitted if the applicant can demonstrate to the Local Planning Authority that the scheme proposed is the minimum needed for security and /or working purposes and that it minimises the potential obtrusive light from glare or light trespass to an acceptable level. Obtrusive light can have a significant impact on amenity of residential areas in towns and villages.

The Institution of Lighting Engineers has provided guidance on acceptable levels of illumination for specific environmental zones, which relate to the areas we have identified above. The Local Planning Authority will require any applications for lighting schemes to adhere to the following guidance for the relevant environmental zone (as shown below).

| Environmental Zone | Sky Glow UWLR<br>(Max. %) | Light into Windows<br>Ev (lux)<br>Before After<br>Curfew Curfew | Source Intensity<br>I (kcd)<br>Before After<br>Curfew** Curfew | Building Luminance<br>L (cd/m2)***<br>Average,<br>Before Curfew |
|--------------------|---------------------------|---|--|---|
| EZ 1               | 0                         | 2   | 1*   | 0   |
| EZ 2               | 5                         | 5   | 1  | 5   |
| EZ 3               | 15                        | 10  | 5  | 10  |

**Notes**

UWLR (Upward Waste Light Ratio) = Maximum permitted percentage of luminaire flux that goes directly into the sky.

Ev = Vertical Intensity in Candelas per square metre

Before/After Curfew = An agreed time, usually late evening, at which the level of artificial lighting should be reduced in the interests of maintaining residential amenity.

\* Acceptable from the public road lighting installations only.

\*\* Source Intensity – This applies to each source in the potentially obtrusive direction, outside of the area being lit. The figures given are general guidance only and for some medium to large sports lighting applications with limited mounting heights, may be difficult to achieve. However, if the aforementioned recommendations are followed then it should be possible to lower these figures to less than 10kcd (kilocandela).

\*\*\* Building Luminance – this should be limited to avoid lighting, and relate to the general district brightness.

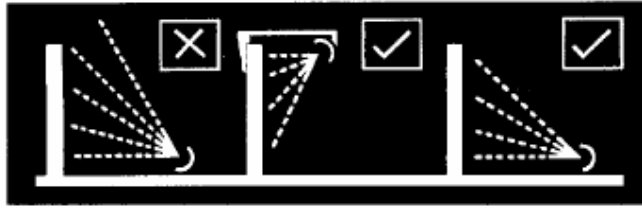
- The Nature of the Use of the Lighting Proposed

For all lighting proposals, the applicant will identify the purpose and use of lights, the potential users of the lighting scheme (e.g. for recreation facilities) and the hours the lights will be in operation (summer-time and winter-time). All lighting schemes hours of operation will be expected to be kept to a working minimum, and applicants will be expected to show this in their application. Keeping the use of the lighting to a minimum will reduce the impact the lighting may have on the environment.

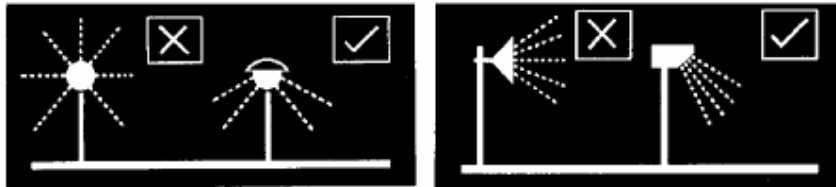
- The Design of the Lighting Proposed

To achieve the necessary minimising of obtrusive light the applicant should adhere to the following general principles taken from the Institute of Lighting Engineers, Guidance Notes for the reduction of Light Pollution, 2000.

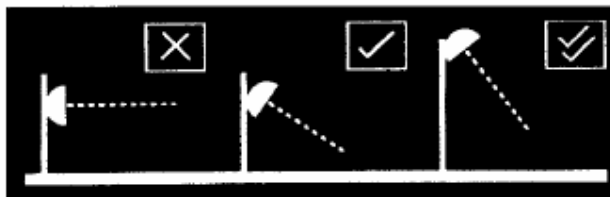
Lighting is directed downwards wherever possible to illuminate its target (see image below). If there is no alternative to up lighting, then the use of shields and baffles will help reduce light spill to a minimum. Up lighting is a particularly bad form of obtrusive light and contributes to sky glow.



Lighting is designed so as to minimise the spread of light near to, or above the horizontal (see image below). Again any light that shines above the horizontal line of the light adds to the sky glow effect.



Lighting should be designed to the correct standard for the task and should not over light. 'Over' lighting is a cause of obtrusive light and also represents a waste of money and energy.



The main beam angle of all proposed lights directed towards any potential observer should be kept below 70 degrees. It should be noted that the higher the mounting height, the lower the main beam angle could be. This will help reduce the effect of glare and light spill on neighbouring dwellings, passing motorists, pedestrians, etc. Lighting should be directed to minimise and preferably avoid light spillage onto neighbouring properties. Wherever possible use floodlights with asymmetric beams that permit the front glazing to be kept at or near parallel to the surface being lit.

The lights used should be the most efficient required taking into account cost, energy use, colour rendering, and the purpose of the lighting scheme required. All lighting schemes should meet British Standards.

**Specific Factors to be taken into Consideration for Various Land Uses**

Different development proposals will warrant more specific guidance. It is the Local Planning Authority's policy that this more specific guidance is complied with as relevant. These extracts have been taken from the Office of Deputy Prime Minister (ODPM) publication, Lighting in the Countryside: towards better practice, modified 2003. It includes recommendations for good practice in lighting issues for various land uses.

- Commercial Developments
  1. All lighting should have a clear purpose – avoid use of lights simply to create a 'presence' at night;
  2. Concentrate lights where they are needed and establish a clear hierarchy, with minimum lighting around the outer, more rural, perimeter of the complex;
  3. Reduce the scale of street/road lighting (from usual standards for roads) and consider height and spacing of lights in relation to buildings, if other requirements like visibility, glare, etc. permit it.
  4. Position promotional lighting/signs so that they are not visible from open countryside i.e. Concentrate at public entrance to buildings;
  5. Direct all floodlights carefully to where they are most needed and design equipment to minimise light pollution;
  6. Encourage a 'rural' image, with low key lighting in small developments and on the edges of larger sites and design lighting to be in harmony with the building styles;
  7. Use a unified lighting scheme, so that the different types of lighting are not intrusive in daytime;
  8. Consider timing of lights - avoid any lights being left on during daytime and turn off all lights after working hours; and
  9. Consider design of overall site to minimise use of lighting e.g. segregate pedestrian and vehicular traffic and introduce traffic calming measures.
  
- Decorative Building Lighting
  1. Keep lighting understated and aim to enhance rather than swamp architectural character.
  2. Consider timing of lighting - only on special occasions?
  3. Direct light carefully, minimising up lighting where it distorts architectural detailing and design lighting scheme to prevent light pollution.
  
- Farms and Market Garden Centres
  1. Mount lights below the roof height of buildings and direct light downwards, to where it is needed;
  2. Avoid use of sensors which can be tripped by animals;
  3. As far as possible, position lights so that they are shielded by buildings and are not visible from the surrounding countryside;
  4. Use internal blinds to screen glasshouse lighting; and
  5. The potential impact of light from glasshouses should be considered at planning application stage.

- Lighting Railway Stations and Road/Rail Interchanges
  1. Design the lights for the station as a whole, balancing the need for lighting in different areas and considering the impact of light in views from the surrounding countryside;
  2. Concentrate on lighting to enhance the architectural character of the station building (which is often attractive) rather than on creating an `urban' level of light on the platform and in the station forecourt;
  3. Direct car park and security floodlights downwards and to where the light is required;
  4. Design floodlights to minimise light pollution; and
  5. Consider use of a larger number of lights mounted on lower columns if the station is in a relatively prominent site.
  
- Mineral Extraction
  1. Mount lights below the roof height of buildings and perimeter fencing and direct light downwards, to where it is required;
  2. Position lights so that they are shielded by buildings or permanent plant and are not visible from the surrounding countryside;
  3. Avoid lights mounted on the side of buildings that shine directly out, dazzling users of the facility.
  
- Petrol Filling Stations
  1. Canopy lights should be positioned to avoid light spill from the sides of the canopy;
  2. The use of dish diffusers causes some additional glare and should be avoided in rural areas;
  3. Reduce lighting or avoid it during daylight hours;
  4. Integrate design for promotional signage with that of the canopy, but ensure signs on canopies do not cause additional light spill;
  5. Avoid lighting internal fascia around canopy;
  6. Design and position signs so that they are visible only from the carriageway and not from the surrounding landscape;
  7. Co-ordinate security lighting to minimise accumulation of daytime structures; and
  8. Direct lighting to where it is needed and design apparatus to control levels of light spill and glare.
  
- Residential Development
  1. Consider whether lighting is required at all, and where it will be most effective;
  2. Keep lighting in new residential areas in balance with that of the village as a whole and lighting on adjacent road junctions;



3. Consider views from surrounding countryside and avoid a line of lights, defining the edge of a village.
- Road Junctions and Access
    1. Keep number of columns to a minimum - a single column may be sufficient on many small roundabouts;
    2. Consider colour of lighting columns in relation to surrounding landscape, i.e. use a dark colour if the columns are set against backdrop of vegetation;
    3. Give priority to the use of high pressure sodium lights which give some degree of colour rendition, and to the use of luminaires with full horizontal cut-off, wherever a lit junction is necessary; and
    4. Carry out a visual appraisal and design lighting scheme to minimise visual intrusion of light at night and of structures by day.
  - Rural Car Parks
    1. Direct lighting downward and design equipment to control levels of light spill and glare;
    2. Car park lighting should fall within the levels recommended in the ILE Guidance for rural zones E1 and E2;
    3. Site lighting equipment carefully, making use of the backdrop provided by any existing vegetation and introducing new planting within the car park to help integrate the lighting structures and minimise the visual impact of both equipment and lighting; and
    4. Consider views from the surrounding countryside and give special attention to the car park boundaries, using new hedgerow or tree planting to help minimise the impact of car park lights on the wider landscape.
  - Security Lighting
    1. Lighting should be controlled by photoelectric switches and should be on the minimum time setting - avoid sensors, which can be tripped by road or footway users.
    2. Lighting should be directed down and mounted below the property boundary height.
    3. Develop an integrated approach to security lighting, balancing levels of light with other lighting in and around the site to avoid glare and light spill as well as dark spots.
    4. Consider the use of alternative security measures, such as an inside light that is on a time switch, or CCTV.

- Sports Facilities
  1. Consider potential for temporary floodlighting and for lowering lighting columns in summer, when they are not in use;
  2. Design lighting to be as directional as possible, using the minimum number of lights required, and to minimise light pollution;
  3. The colour of lighting poles may have significant influence - light colours should be used if lights are generally seen against the sky, or dark if there is a backdrop of vegetation; and
  4. Floodlights should only be on when the facility is in use.

### **Types of Planning Conditions Applied**

Where the District Council grants planning consent for a development proposal it may impose conditions controlling the lighting scheme required. These may include: -

- Limiting the time of use of lighting;
- Limiting the light levels to a designed conformity;
- Limiting the use of lighting schemes to identified uses or users;
- Specifying lamps, luminaires and columns;
- Specifying the need for full horizontal cut-off;
- The design, height and position/angle of the lighting;
- The retention of screening vegetation;
- The use of planting and bunding to contain lighting effects;
- The future maintenance of the lighting schemes and post-installation checks in accordance with the original design and planning approval; and
- In exceptional circumstances, the granting of temporary planning permission to enable a review of lighting impacts after installation.

These conditions will be applied as necessary by the local planning authority to help reduce obtrusive light from new proposals, particularly glare and light spillage, from areas of wildlife importance, open countryside and residential amenity.

### **Glossary of Terms used in External Lighting**

The definitions and explanations are given in this Glossary are intended to help readers to understand the Guidance.

**Asymmetrical Beams** – floodlights giving a fan shaped lighting pattern – available in wide, medium and narrow beams.

**Beam Angle** – the angle formed by the centre of the beam of light from a lamp relative to the vertical. When light is emitted from a lamp it forms a cone from the light source. The shape of this cone will depend on the reflector design in the lamp.

**Candela** – the unit of luminous intensity of a light source in a given direction.

**Front Glazing** – The front face of the lighting unit through which the light passes.

**Glare** – the discomfort or impairment of vision, which is experienced when part of the visual field is excessively bright in relation to the general surroundings. Direct glare normally occurs when the viewer can see the light source. Glare can cause discomfort or disability to see detail.

**Illumination** – the process of lighting an object or surface

**Light Trespass** – any light, which illuminates beyond that which needs to be lit, particularly into residential areas or properties, which is perceived to be a nuisance.

**Lumen** – the unit of luminous flux (light) emitted by a light source or falling on a surface

**Luminance** – a term, which expresses the intensity of the light emitted in a given direction by unit area of a luminous or reflecting surface. It is the physical equivalent of what is subjectively called brightness. The unit most commonly used is the candela per square metre

**Luminaire** – formerly known as a lighting fitting. The apparatus which controls the distribution of flux from a lamp or lamps, and which includes all the components necessary for fixing and protecting the lamps and for connecting them to the local supply circuit. Floodlights and some other luminaires retain their individual names.

**Luminous Flux** – the light emitted by a source or received by a surface. The unit is the lumen (lm).

**Luminous Intensity** – the power of a source or illuminate surface to emit light in a given direction. The unit is the candela (cd).

**Lux** – a measurement of illumination. One lux equals one lumen per square metre.

**Main Beam Angle/Horizontal Cut-Off** – a term applied to a luminaire. The angle measured from the downward vertical upwards to the first line of sight at which the lamp(s) or surface of high brightness is no longer visible. This angle is usually measured from the downward vertical or, for a floodlight, from the beam axis. Horizontal cut-off refers to the limiting of light above an imaginary line at horizontals with the luminaire.

**Mounting Height** – the vertical distance between the luminaire and the ground or floor.

**Obtrusive Light** – any light, which illuminates areas beyond that, which needs to be lit can be considered to be a form of light pollution. The extent to which it is perceived as being a nuisance will often depend on the background light from other sources and the intensity of light.

**Sky Glow** – a phenomenon where light – usually from a major light source such as an urban area or industrial/recreational floodlight installation is seen, often from many miles distance, as a glow in the sky. Some of the light is reflected from the illuminated surfaces although most is emitted directly skyward from poorly designed lighting systems. Sky glow resulting from poorly designed systems is particularly noticeable in dark landscapes where there are few other light sources. Most rural areas and in particular the Area of Best landscape would fall into this category.

### **Further information**

Department of Environment, Food and rural Affairs

<http://www.defra.gov.uk/environment/localenv/nuisance/light/index.htm>

Environment Agency

<http://www.environment-agency.gov.uk/yourenv/eff/1190084/pollution/152227/>

Institute of Lighting Engineers

<http://www.ile.org.uk/>

Communities and Local Government - Planning Policy

<http://www.communities.gov.uk/planningandbuilding/planning/planningpolicyguidance/>