

DRAFT SUPPLEMENTARY PLANNING DOCUMENT

LIGHT POLLUTION

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1.0 INTRODUCTION AND POLICY CONTEXT

- 1.1 This document sets out Supplementary Guidance on the suitable design of artificial lighting to minimise light pollution and provides advice on domestic amenity / security lighting which is outside the scope of planning control.
- 1.2 The unwanted effects of poorly designed lighting do not constitute a statutory nuisance, however, National Planning Policy Guidance (PPG) 23 on Planning and Pollution Control permits the incorporation of policies on light pollution in Local Plans. Paragraph 2.18 states that when preparing Local Plan policies, Local Planning Authorities should take account of, "the possible impact of potentially polluting development on land use, including the effects on health, the natural environment, or general amenity, resulting from the release of light".
- 1.3 In support of PPG23 Woking Borough Local Plan Policy BE4 (Environmental Pollution) states development will not be permitted which would have a significant adverse effect on the environment and cause demonstrable harm to general amenity resulting from light. Policy BE4 provides the foundation for this Supplementary Guidance, which should be considered by applicants before submitting development proposals that involve external artificial lighting which may have an adverse impact through glare and light spillage (light pollution) that can be both environmentally damaging and create a visually intrusive nuisance.
- 1.4 It is widely recognised that artificial lighting can provide important benefits in assisting safety and security during the hours of darkness, as well as increasing access to sport and recreation. Local Plan Policy REC7 refers to the intensification of use of land in formal recreational use and relates to the increased use of floodlights.
- 1.5 Lighting can also play an important role in stimulating and enhancing the night time amenity and economy of the built environment by illuminating important venues and historic buildings, as well as celebrating special events, such as at Christmas. However, unless the design of artificial lighting is carefully directed and used with restraint, it can also have an intrusive and environmentally damaging effect. In particular extensive light spillage from urban areas or inappropriate lighting in rural locations, can alter the rural character of the countryside, impacting on wildlife and diminishing the opportunity to access celestial views of the night sky, as well as intruding on the amenity of local residential areas.
- 1.6 The restraint of artificial lighting in terms of illuminated signs is dealt with in PPG19 Outdoor Advertisement and Control. It is suggested that when it is appropriate to consider how brightly advertisements should be illuminated, LPA's should have regard to the Institute of Lighting Engineers Technical Report Number 5. In addition, Local Plan Policies BE19, BE20 and BE21 refer to illuminated signs, which ensure that consideration of the size, position and level of illuminations proposed are compatible with their surroundings

2.0 GENERAL POINTS

2.1 In all lighting schemes, regardless of the type of equipment used, the three main factors which can contribute to light pollution are; the extent of the hours of operation, the brightness of lighting and the control of beam direction. With a carefully designed lighting scheme it should be possible to achieve the main objectives of the scheme whilst minimising any occurrence of light pollution. Moreover, careful direction of lighting can help to reduce the energy cost of running a scheme as well as reducing light pollution, so achieving these objectives can often be mutually beneficial. *(further advice on reducing energy demand in new and existing development is provided in the Council's Climate Neutral Practice Note)*

2.2 **Operating Hours.** Lights should be switched off when not required for safety, security or enhancement of the night-time scene. Time limits may need to be imposed for operating certain types of lighting in the interest of local amenity, such as floodlighting for recreation, particularly where there are residential uses in the vicinity. Clearly, such limits may be inappropriate where the lighting is crucial for reasons of safety or security and other measures may need to be considered to mitigate adverse effects, such as a curfew on lighting levels (Set Back) between agreed hours.

2.3 **Brightness** (normally measured by LUX level). The brightness and colour of illumination will depend on the type of light source and its power. Various types of fluorescent, metal filament and discharge lighting is available which all have quite different characteristics and running costs. An experienced lighting designer will be able to advise on the suitability of light source and power output in relation to function and location. The table below sets out guidance criteria on the suitable limit of light levels for exterior installations in different locations:

Suitable Light Limitations for Exterior Lighting Installations					
Location	A. Light into Windows LUX level		B. Source Intensity Candelas (kcd)		C. Building Luminance Candelas per m ²
	*Before Set Back	*During Set Back	*Before Set Back	*During Set Back	Average Level Before Set Back
Rural Areas	5	1	50	0.5	5
Urban Areas	10	5	100	1.0	10
Town Centre	15	10	100	2.5	25

Source : Institute of Lighting Engineers.

A. Light into Windows - The LUX level measured from the affected window.

B. Source Intensity - Measurement in Candelas for each light source.

C. Building Luminance - This should relate to the general district brightness.

*The time of the Set Back would be subject to agreement e.g. 10.0p.m. - 9.0a.m.

- Low energy lighting such as low pressure sodium (soft orange lighting used for street lighting) is economic to run but has limited definition and so has little use

for directed lighting and CCTV support. This type of lighting accounts for much of the red/orange glow around urban areas that contributes to general light pollution.

- High pressure sodium is more costly to install but economic to run and provides a warm yellow light with more definition that is more suited to directed lighting.
- Various types of metal halide/halogen lighting are more costly to install and have limited running life but provide a cool blue/ white illumination with high definition which is more suitable for controlled lighting including a narrow focussed beam.

2.4 **Control of Beam.** Suitable lighting equipment will provide for control of the light beam by the use of lenses/reflectors and hoods/shields. Generally high or column mounted down lighters will provide for greatest control where the beam of light is vertical. The use of light shields will also help to remove any upward glare. The use of up lighters such as from the base of a building or decorative globe type lighting will seldom provide any suitable control of the light beam to inhibit light pollution and should be avoided where possible.

2.5 **Light Pollution Issues.** Some of the main issues arising from common usage of external lighting are briefly discussed below:

- **Street lighting** – extensive use of low pressure sodium lighting can create high levels of poor quality ambient illumination, causing light pollution through urban glow, which is especially harmful where it spills out into the countryside.
- **Car parks and Shopping Centres** – similar problems to the above. Although more extensive use is usually made of high pressure sodium lighting, the inappropriate use of undirected lighting, such as decorative lighting to attract shoppers, may cause pollution through uncontrolled light spillage.
- **Advertising / Window Displays** – high levels of illumination can cause a nuisance to any adjacent residents, particularly where they remain in use throughout the duration of the night. Glare can affect motorists having clear views of traffic signs .
- **Security Lighting** – domestic lighting which is poorly angled can flood adjacent dwellings/ gardens in bright light creating a nuisance to neighbours.
- **Floodlighting of Games Pitches/ Outdoor Sport** – poorly angled or inappropriate height of lighting can cause light pollution through spillage onto surrounding residential areas/countryside and can cause nuisance if used into the late evening.
- **Amenity Lighting** – as with security and other forms of floodlighting, poorly angled ground mounted lighting can cause pollution by spilling into the night sky.

3.0 Lighting Design

3.1 General Design Points

- Where possible always use a professional designer.
- Carefully plan the lighting scheme.
- Only use lighting where and when it is required.
- Do not over illuminate any area.
- Where possible use light fittings which control the direction of beam and provide good cut-off.
- Provide sufficient technical information for the scheme to be properly assessed, this will require information on the type of lighting source/ light levels (LUX) and an ISOLUX illustration.

3.2 Street Lighting, Car Parks and Shopping Centres (Column Mounted Lights)

- Where possible always use high pressure sodium (HPS or SON) in preference to low pressure sodium (LPS or SOX) as this has a yellow light with higher visual definition and therefore can be used more accurately and sparingly.
- Use equipment that allows the light to be directed towards the ground and shields any light spill above the horizontal plane, such as by a hood or shield.
- Avoid using decorative, globe type lights, or up lighters which have little or no provision for controlling the direction of light emission.
- Avoid locating street lighting where it is near to or above the horizon.
- Use a level of illumination which is appropriate to the surrounding character of the area.
- Use control equipment incorporating 'Set Back' in critical areas. This will ensure the maximum output is provided during high risk periods.

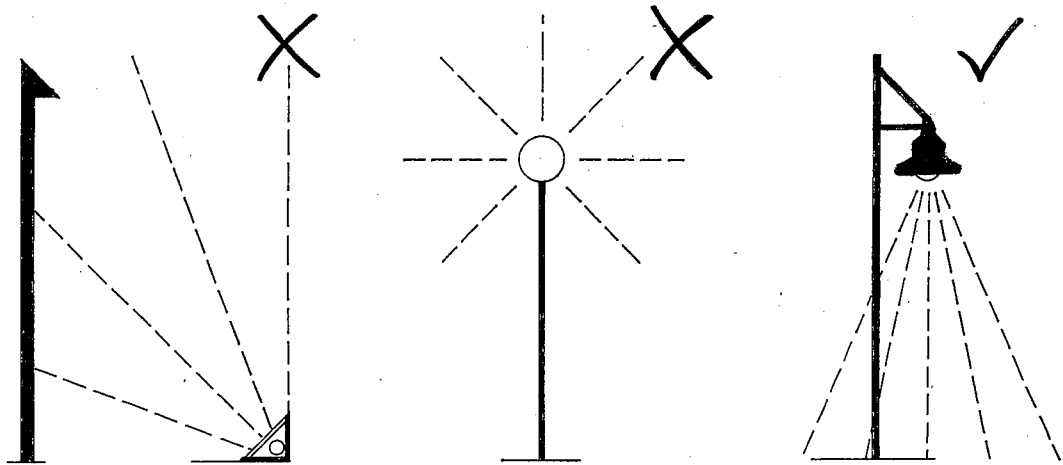


Fig 1 Use lighting equipment which directs the beam of light.

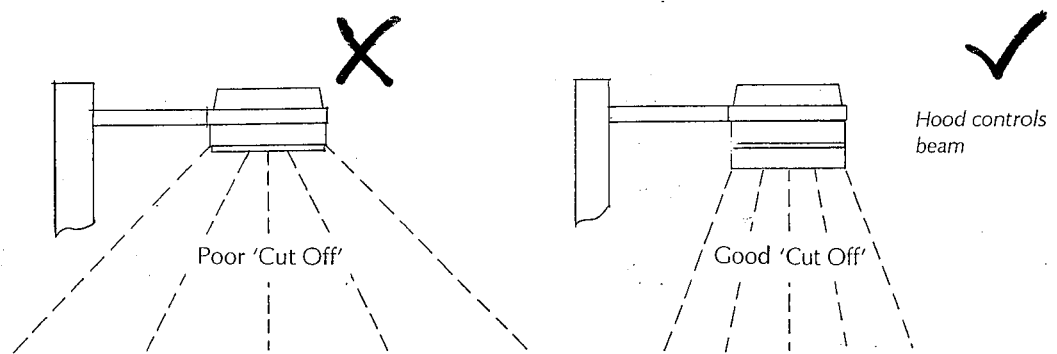


Fig 2 The use of a hood or shield can help to restrict the beam of light from unwanted areas.

3.3 Illuminated Fascia Signs and Advertisements

Apart from shops there are many other buildings in commercial use which require illuminated signs to advertise their presence, including petrol filling stations and pubs/restaurants, which may be located in residential and rural locations as well as commercial areas. Illuminated signs can be either internally or externally lit. **Local Plan Policies BE19, BE20 and BE21** which specifically refer to the control of illuminated signs are set out in Appendix 1.

- Care must be taken to ensure that lights are not located where they may affect the clarity of highway traffic signs.
- The light level should be appropriate to the character of the area and in particular should not be positioned to cause glare to any adjoining residents or passing motorists.
- Illuminated signs and advertisements in residential areas will require time switches as hours of operation will be restricted.
- Internally illuminated box signs which extend the entire length of the fascia are unlikely to be acceptable where both the background and the sign letters are made from transparent materials which emit light.
- Stencil cut internally illuminated signs which only illuminate the sign lettering or have opaque backgrounds are more likely to be acceptable.
- Externally illuminated fascia signs such as by down lighters concealed in a trough above the fascia or the use of 'halo' effect back lighting to individual letters are preferred.

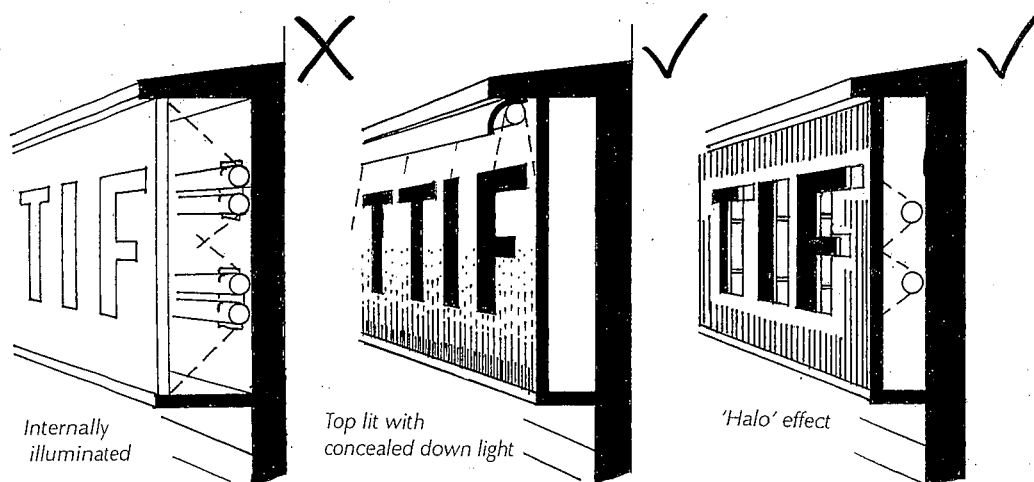


Fig 3 . Avoid internally illuminated fascia signs and use top lit or 'halo' effect lighting with opaque materials

3.4 Security Lighting

Although not usually requiring any form of consent, security lighting, especially domestic forms of appliance can often be a nuisance to other residents in the vicinity, or cause general light pollution if not carefully installed. The Department of Environment Circular 5/94 on planning out crime states;

"Those installing security lighting need to strike a balance between their desire to increase the security of their properties and the possible effect that unnecessarily obtrusive and glaring light, due to badly installed or designed lighting fixtures, may have on neighbours. Care should be taken to ensure that the intensity and focus of security lighting respects the amenity of others."

- Floodlighting with passive infra red sensors (PIR) can be effective as they only switch on when someone approaches the house. However, they need to be correctly aligned and installed so they only come on when someone is close to the property and the beam of light does not adversely affect neighbours. A 150W (2000 Lumen) tungsten halogen lamp should be adequate. Larger lamps are not appropriate. Security lighting should be fitted well above head height level, facing at a sharp downward angle so the light does not shine into the street or towards a neighbours house or garden.

- Permanent lighting under the porch, at low levels of brightness, can be equally acceptable. A domestic porch light at 9-11W (600-900 lumens) should provide adequate lighting levels. However, permanent bright lighting should be avoided as it can assist intruders by illuminating points of weakness such as an open window and create dark spots where intruders can hide.

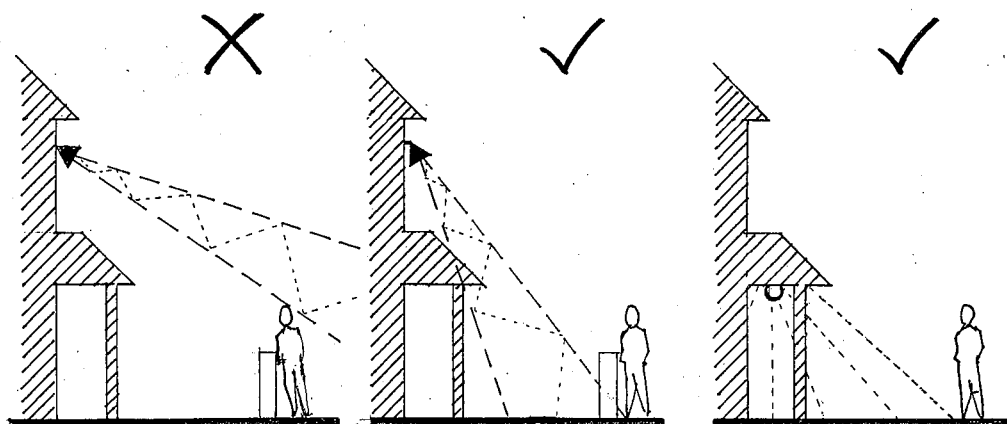


Fig 4 Use sensor controlled lights (PIR) with the beam directed close to the property, or a low power porch light.

3.5 Floodlighting of Games Pitches / Outdoor Sports

Changing demands in recreational needs often means there is a requirement to use facilities more intensively, including use during the hours of darkness which will necessitate appropriate floodlighting. In accordance with **Local Plan Policy REC5** the Council will permit new and extended facilities in the urban area where the proposal would not give rise to loss of amenity. Also in accordance with **Local Plan Policy REC7** the Council will permit the increased use of formal recreation facilities elsewhere providing there would be no adverse effect on the environment or local amenity, including that from light pollution.

- It is unlikely that proposals for floodlights will be permitted in close proximity to existing residential areas where the level of lighting would create a nuisance to residents. Similarly, it is unlikely that floodlighting would be permitted in, or close to environmentally sensitive locations, such as; conservation areas where the installation would impact adversely on the character or appearance of the area, or Sites of Special Scientific Interest where artificial lighting could disturb a wildlife habitat.
- As powerful floodlighting can be disturbing to residents even when it is some distance away, the period of operation will normally be restricted to certain times of use, such as between 10.0pm and 9.00am, depending on location and days of the week that it is to be used.
- Only column mounted equipment on a relatively tall mast will have sufficient scope to accurately direct a beam of light downwards without causing extensive light spill beyond the pitch. The number of masts will depend on the type and standard of the sport/games activity it needs to cater for. However, a balance needs to be struck between the night time performance of mast floodlighting and the daytime appearance of the structures.
- To avoid light spillage the main beam angle for all lights should not exceed 70° from the vertical. The use of equipment with internal louvers/reflectors should enable an asymmetrical beam to be generated whilst permitting the unit to remain parallel to the pitch. Lamps limited to 1kw power should be sufficient for this purpose. Light shields should be fitted to ensure that there is no illumination beyond the immediate outfield (approximately 10m.)

- It is recommended that operators should engage professional advisors about the suitability of equipment and prepare an accurate light scatter diagram to predict the performance of the scheme before any application is submitted and equipment purchased. Any technical supporting information which has been prepared should be submitted with the planning application.

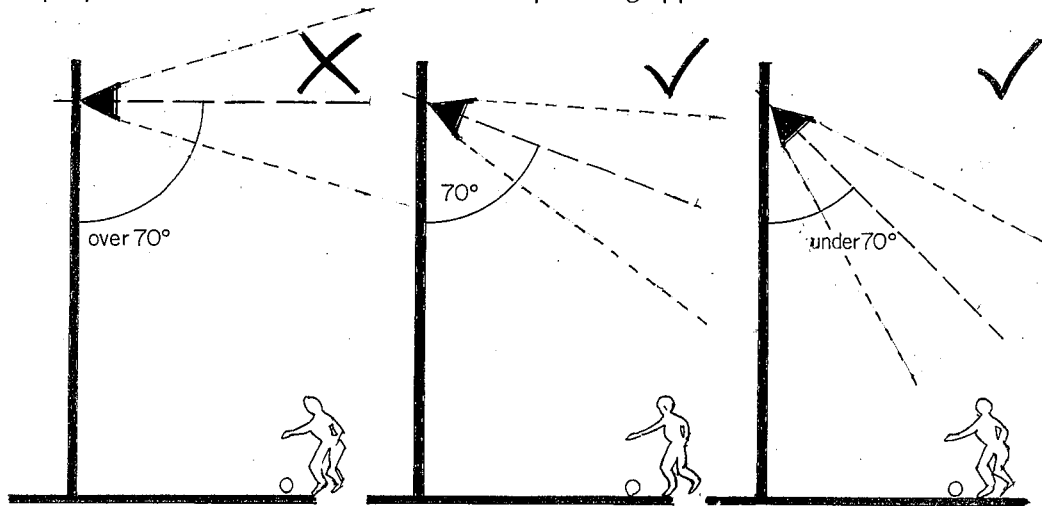


Fig 5 Keep the floodlighting beam within 70° of vertical.

3.6 Amenity Lighting

Schemes for the external lighting of architecturally interesting buildings and structures should be restrained in both the quantity of light sources and brightness of illumination. To avoid proliferation it is advised that they should be restricted to only the most architecturally interesting buildings. Where possible schemes should be co-ordinated to adopt a common approach to lighting and avoid any adverse competition or conflict between different projects, which may lead to over intense illumination. Lighting schemes will usually need to comprise a number of different light sources to bring out the best features of the building and compliment the colour of its material finish.

- Use a professional consultant to design the scheme.
- Only use sufficient lighting levels to undertake the task and respect the character of the location.
- Where possible use down lighters to wash the face of the building rather than up lighters which will spill into the night sky, particularly when lighting structures with highly reflective surfaces such as glass or polished stone.
- Floodlights need to be carefully controlled (cut off) so that the beam does not spread beyond the top face of the building and into the night sky.

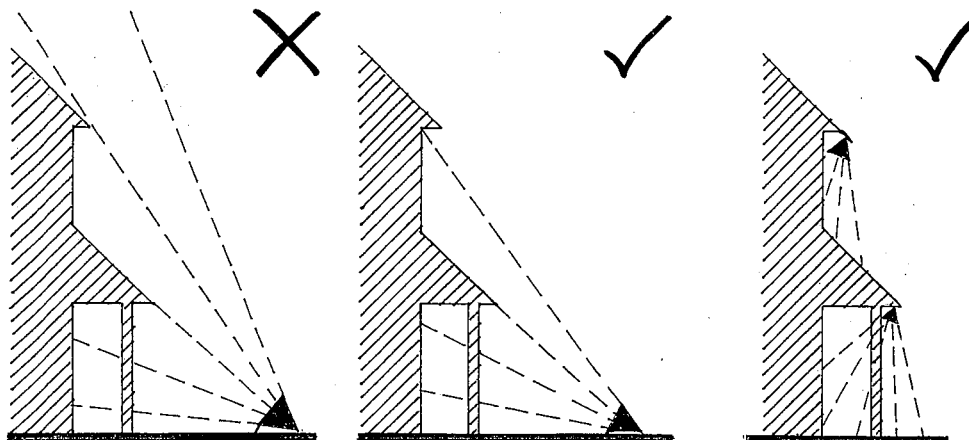


Fig 6 Keep the floodlight beam within the target or use down lighters