

Guidance Note 9/19

Domestic exterior lighting: getting it right!



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Introduction

Well designed, installed and maintained domestic exterior and security lights bring comfort and wellbeing to our lives, providing us with a sense of security and pleasure in our homes. However, much domestic exterior lighting is installed without due consideration of its suitability for the task and its effect on neighbours and the environment.

This leaflet advises on how such lighting can be considered to ensure that it serves the required purpose, providing the level of illumination required, but does not become a cause for concern to adjacent residents or affect the natural environment surrounding your property. Whilst you may be happy with a light that illuminates half the street, your neighbours may not be.

the atmospheric conditions (humidity, aerosols, clouds, haze, atmospheric pollution, etc). Artificial light propagating into the atmosphere – either directly from upward-directed or incompletely shielded sources, or after reflection from the ground or other surfaces – contributes to sky-glow, however it is predominantly light emitted from 85 through to 100 degrees from the downward vertical that is the main cause of sky-glow as it is this light that is mainly scattered back towards observers on the ground. The sky-glow/glare weighting/effect of light emitted from various angles from the luminaire is shown in table 1.

It is therefore important to consider the luminaire, its light distribution, how it is installed and how it is set up. Mounting height has minimal effect.

Mitigating obtrusive light and sky glow

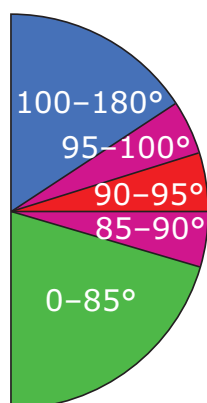
Artificial light can be a source of discomfort or disability glare, obtrusive light and loss of darkness. It can also affect fauna and flora. This intrusion of light represents 'obtrusive light' and all these effects may have negative monetary and environmental effects.

Sky-glow is the general diffuse sheen that is visible in the direction of large cities, airports, and industrial complexes. It occurs from both natural and artificial light sources and does not depend exclusively on the lighting design. It also depends on

Mitigating obtrusive lighting effects

It should be noted that artificial light emitted from premises which affects someone's enjoyment of their own premises can be considered as a legal nuisance.

The Clean Neighbourhoods and Environment Act (CNEA) 2005 provides local authorities and the Environment Agency with powers to deal with a wide range of lighting-related issues by classifying artificial light emitted from premises as a statutory nuisance or as prejudicial to health where it affects



Indicative diagram

Table 1: The effect on the ability to view the night sky at various angles

Angle of light emitted (degrees)	Sky glow effect	Glare effect
100 – 180	Local	Little
95 – 100	Significant	Some
90 – 95	High	High
85 – 90	Significant	High
0 – 85	Minimal	Some

someone's enjoyment of their own premises.

This essentially has two components, which are light spill on to windows and source intensity, the uncomfortable brightness of the light source against the background.

The legalisation does not deal with sky glow or other environmental effects and these should be managed through good design practice and planning based on the Institution of Lighting Professionals 'Guidance notes for the reduction of obtrusive light' document. See <https://www.theilp.org.uk/documents/obtrusive-light/>

Domestic Security

Well designed, installed and maintained security lights bring comfort and well-being to our lives, providing us with a sense of security in our homes. However, much security lighting is chosen and installed without due consideration of its suitability for the task and its effect on neighbours and the environment. Domestic security lights should provide the minimum level of illumination necessary to light a property and not half of the street and neighbouring properties.

Because of price and ease of installation, many people have installed tungsten

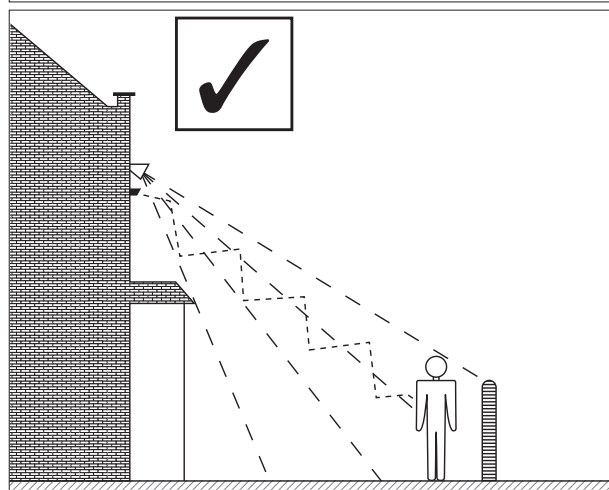
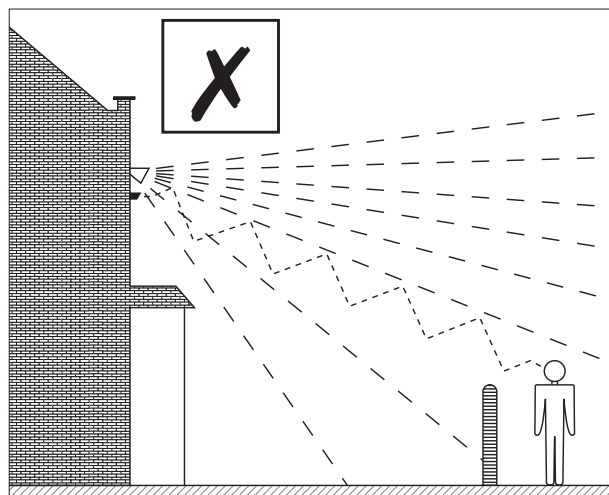


Cheap (£15 – £25) flood light, with very limited optical control



Security light, light source and sensor can be aimed separately (£45 to £120). When installed the LEDs should be directed downwards.

halogen floodlights. These units can provide satisfactory security lighting if correctly installed and aimed. However, it is rarely necessary to use a lamp of greater than 2000 lumens (150W) in such fittings. The use of a higher power only causes more glare and darker shadows.



Poor and good practice for aiming of domestic security lighting

The same principle applies to modern LED security lighting and perhaps more so as many of the products readily available on the market have little, if any, optical control.

Many of these floodlights are fitted with detectors to sense the movement of intruders. These can be useful if they are correctly installed and aimed.

Unfortunately, many products do not allow the detector to be separately aimed from the floodlight and the detector's physical location on the floodlight may prevent it from being aimed correctly.

Floodlights and detectors should be chosen and installed to detect and light only people on your property. The aiming and adjustment is best undertaken at dusk when the area being lit can be assessed.

Porch lighting

For many properties, a better solution for security lighting is to use a bulkhead or porch light fitted with a low-power 600–900 lumens (9/11w) compact fluorescent or LED lamp. These units can be left lit all night, providing all night security, for only a few pounds of electricity per year.

Besides being cheap to run, this type of light is kinder to the environment providing a gentle wash of light with reduced glare. Bulkhead and porch lights cast fewer shadows, reducing the hiding places for criminals. These units can be

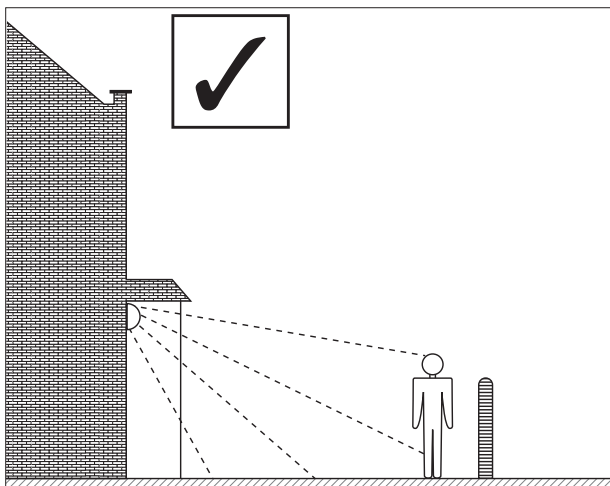
fitted with a movement detector if required and are generally mounted lower and are therefore less susceptible to nuisance switching on/off and complaints from neighbours.



Typical porch light, up & down projector



Poor porch lighting using up & down projector



However, a recent move towards 'up and down' projector porch lights such as those shown above do not really light the porch area and also produce a considerable amount of un-controlled upward light.

Garden general/exterior area lighting

When considering lighting an area, the same principles apply to those discussed for domestic security lighting. It is a matter of considering the height at which the lighting will be mounted and the spacing between luminaires.

For such areas using readily available domestic lighting equipment a spacing between luminaires of around 2.5 times the mounting height should provide the right lighting performance.

Route lighting

The use of low-level bollard lighting can be useful when looking to light a garden or



Typical low-level bollard lighting.

footway. When considering such features, it is important to consider the light distribution from them and ensure that the light is directed downwards. This will ensure a level of light on the pathway/feature and avoid any glare towards the user/observer. Due to the short height and local distribution of the light, these may be required at a fairly close spacing.

Allan Howard, Technical Director (Lighting), WSP

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