

# Guidelines for lighting in churches

A church that is considering a new lighting scheme, or varying their existing scheme, should begin by contacting their architect.

Churches should also consider requesting a demonstration *in situ* of any proposed scheme.

## Introduction

The main requirement for the lighting in a church interior is to produce enough light enable all members of the congregation to see clearly. A secondary requirement is to add 'effect' or supplementary lighting to enhance the beauty and design of the building and to help create a good atmosphere for worship. Any proposal for lighting a church needs to consider each of these elements, and not just devise a scheme to 'make the church brighter'.

The minimum illumination level required for the nave is about 150 lux. (A lux is a unit of light reflected from a surface). To provide a point of focus for the congregation the altar area is more brightly lit at about 300 lux.

## Types of lamps

### Tungsten lighting

This is any light fitting (luminaire) that uses 'domestic' type lamps (bulbs). Standard 100w or 150w BC (bayonet cap) lamps used as pendant fittings do not give enough light for illumination of the nave and isles and are not used. Spotlight lamps (usually with a screw base) produce directional light but only produce enough intensity up to about 3m from the subject. Larger size spotlights use PAR lamps of wattages up to 300w. These fittings have a longer throw and are sometimes used to highlight the altar.

Tubular tungsten fittings are used for illuminating notice boards and pictures, and for lectern and organ reading lights.

### Tungsten halogen

The most popular fitting for churches is the 300w or 500w floodlight. The disadvantage of this type of fittings is that it seldom has any beam shaping, so light is 'splashed' everywhere. Also, the lamps do not last very long. As the fittings are usually placed high up lamp changing is always a problem. The tungsten halogen fitting has now been replaced by the metal halide fitting.

### Low voltage halogen

These use 12-volt low voltage lamps and the type of lamp fitted sets the beam shape. The beam angle may be any type between a sharp, small spot and a wide flood. The fittings may be fitted on a track or individually mounted. Useable light level usually falls off after 3m so this type of fitting is usually mounted in rooms with standard ceiling heights, or in side isles of churches, if the ceiling is not too high. As the fittings are physically small, they are ideal for highlighting architectural features. The fittings require a transformer and lamp life is about 3,000 hours. The colour of the light is slightly whiter than normal tungsten lighting, giving a bright, sharp light.

### Metal halide

These lamps were developed from the sodium (orange light) and mercury (mauve light) lamps. Lamps are available that give a range of light colours, all similar to the colour of tungsten lighting. The fittings that use these lamps can be spotlights or floodlights and they give sufficient light levels over long throws from only 70w or 150w lamps. The fittings can accept accessories such as barn doors (to reduce light spill) or louvers (to minimise glare). Lamp life is long, at about 6,000 hours.

Any proposed scheme for using metal halide lamps should clearly specify the colour of light that is being proposed.

The disadvantage of this type of lamp is its warm-up time of about 4 minutes. This can be a disadvantage if, for example, lights need to be dimmed for one part of the service (perhaps during a Christingle Service) but then put back on again quickly (so people can sing a hymn).

## Fluorescent lighting

Fluorescent fittings do not have a place for lighting church interiors, except perhaps in a kitchen. The light cannot be controlled or dimmed and the fittings look intrusive. The compact versions of fluorescent lamps are the small low energy lamps. These are sometimes used for general lighting, but the light level is far too low for lighting large areas.

## Area lighting

### Nave lighting – chandeliers

Chandeliers are sometimes used for nave lighting, but often the style of the fitting is brought into question. A satisfactory aesthetic design may not mean efficient light distribution and usually light is only produced in areas under and around the chandelier.

One particular design of chandelier that uses translucent globes gives good light distribution, as the globes can be equipped with efficient metal halide lamps. 'Crown' chandeliers contain a collection of light fittings, usually low voltage, fixed around a ring. The fittings are angled down at the congregation and a large number of lamps are required to obtain reasonable coverage.

### Nave lighting – metal halide

Metal halide fittings are probably the most suitable type of fitting for nave lighting. These luminaires are designed to produce any beam width from spot to flood, so it is possible to illuminate the seating, say, without flooding the walls with light. The fittings are usually secured to the sidewalls of the nave, high up by arch spring points or at roof level. The long life of the lamp means that lamp changes are infrequent, a point worth considering when lamp changes would involve very long ladders or towers. Additional spotlight luminaires may be fitted for special purposes, such as pinpointing an architectural detail or a special area of the church.

If the church has a fine roof this is often illuminated by upward facing fittings, positioned near the high level luminaires lighting the nave. These fittings are often left on to provide background illumination if the main nave lighting is switched off.

## Side aisles

If the ceilings are high, metal halide luminaires could still be used, although they may be lower power (70w). For lower ceilings low voltage or PAR lamps are often used.

## Sanctuary and altar

These areas are more brightly lit to give focus. Again, metal halide spotlight luminaires would be used to high light the altar with wider beam units illuminating the choir. Smaller areas could be lit with PAR spotlights attached to the inside of window reveals. Sometimes it is possible to light the altar or screen from below, using small low voltage fittings. This would add impact to the altar lighting.

## Entrance

The entrance area should be warm and inviting and this is usually achieved by using low voltage lighting, either on a track or as individual units. Notice board lighting adds to the effect.

## Control

When planning new lighting consideration should be given to how it is to be controlled. Luminaires in the nave could be switched in pairs (a pair being one fitting each side). This is particularly useful when only part of the church is used, creating a more 'cosy' atmosphere. Light switches are usually by the entrance to the church. The first person entering the church for a service may use the vestry, at the other end of the church. It is essential that lights can be switched on to light the path to the main switches.

To create atmosphere, dimmers could be installed in some of the lighting circuits. Having said this, metal halide lamps cannot be dimmed so it is useful to have a mixture of tungsten and metal halide lighting in a church. The metal halide lamps could be switched off for candle-lit services leaving tungsten lighting to produce background illumination. Alternatively, if metal halide floodlights are used to light the roof, these could be left on whilst the nave lights are switched off.

## Exterior lighting

There are four key issues to be considered, quite apart from the initial question of whether or not to floodlight:

1. Which parts of the church are best suited for floodlighting?
2. The location and type of fittings.
3. The appropriate light source (colour and intensity).
4. How to avoid light overspill onto adjoining properties.

The two most common types of lamp used in exterior lighting are metal halide (white light) and high-pressure sodium (pale orange light). Usually one or other is used, but occasionally both are used to give some variety to the lighting. Most churches these days use metal halide lighting, as the white light shows the church to good effect when surrounded by sodium street lighting.

Fittings may be obtained that produce any type of beam between a spot and a flood. When barn doors are used the beam can be shaped to fit the area to be lit, reducing light pollution and spill. Fittings can be obtained that produce 'cigar shape' beams that are ideal for lighting towers.

When positioning exterior lighting care should be taken to keep glare to a minimum. Low-level floodlight fittings are ideal for lighting the walls of a church, but the light beams could dazzle people as they leave the building. Pole mounted fittings alleviate this problem, although this type of fixing may not be allowable in some areas. One advantage of pole-mounted fittings is that they are less likely to be damaged by vandalism than ground fittings.

Planning permission may be required before installing external lighting, and the local authority should always be contacted to establish whether planning permission is required. Great care should also be taken to ensure that any external lighting does not cause offence or difficulty for local houses and buildings, and consideration should be given to the general impact of 'light pollution' (particularly in rural areas where street lighting is modest). The DAC will require assurances that the local planning authority have been contacted, and that any installation of external

lighting will not cause unreasonable difficulty for local residents.

External lighting will normally be on a time switch, so that it is only on (for example) from dusk until 11.30pm.

Careful consideration needs to be given to the routing of power cables to the external lights, particularly when it will be necessary to take cabling through a graveyard. For obvious reasons, wherever possible a route should be taken that avoids any disturbance to an area where there are graves. If cabling might disturb the graveyard it may be necessary to contact the Diocesan Archaeological Adviser for advice about whether an archaeological investigation is needed.

## External security lighting

It is an unfortunate fact that these days many churches now require external security lighting. Standard fittings are of a design that don't blend in very well with the fabric of most churches, so wherever they are positioned they look obviously like security fittings.

The simplest form of security fitting is an 'all-in-one' sensor and light. The smallest type is a bulkhead fitting which contains both the sensor and the light. When a person enters the field of view of the sensor the light is switched on for a pre-set period. The light source is usually a 60w or 100w domestic lamp.

Low energy compact fluorescent lamps can sometimes be fitted, but these lamps do not usually last very long due to the constant switching on and off. The bulkhead fitting is usually installed relatively low (at eye height on a wall or over a doorway) to ensure that the surrounding area is reasonably lit. This does mean, however, that the fitting is prone to vandalism.

A second type of 'all-in-one' fitting uses a sensor and a floodlight coupled together on a bracket. The floodlight is usually a 300w or 500w tungsten halogen type and the design allows the installer to adjust the direction of the sensor independently from that of the floodlight. Because of the high light level from a tungsten halogen lamp the fitting can be mounted high up, out of reach of vandals.

A more sophisticated type of system uses separate sensors and lights. This may be more

convenient to install, as sometimes a good lighting position is not necessarily suitable for the sensor. The sensor is wired back to the light fitting, which is connected to the mains supply. Several sensors may be connected to the same light fitting. The light fitting itself could be a high-power floodlight or something more decorative, possibly to match with other external light fittings.

Light fittings using metal halide lamps should not be used, as the four minute warm up time and switch-on delay after switching off makes them unsuitable.

Planning permission may be required before installing external security lighting, and the local authority should always be contacted to establish whether planning permission is required. Great care should also be taken to ensure that any external security lighting does not cause offence or difficulty for local houses and buildings. The DAC will require assurances that the local planning authority have been contacted, and that any installation of external security lighting will not cause unreasonable difficulty for local residents.

### **Additional guidance**

Church House Publishing produce a useful booklet entitled 'Church Lighting' by Peter Jay and Bill Crawforth (ISBN No: 071517584X), £12.95.

A helpful article about church floodlighting is also available in the 'A to Z of Church Maintenance' section of [www.churchcare.co.uk](http://www.churchcare.co.uk).