

## **LIGHTING IN CHURCHES – A GUIDANCE NOTE FOR PARISHES**

The purpose of this document is to provide parishes with information on installing a new lighting scheme in a church. It discusses how to assess the lighting requirements of your church, possible improvements that could be made, an overview of the types of lights available and where to go for help and advice.

### **Introduction**

A successful church lighting scheme needs to do several things, such as providing suitable illumination for users (worshippers and visitors) over a range of activities, highlighting important features of the building and its contents, complimenting health & safety measures by lighting potential hazards (eg. steps, low doorways, slopes, etc) and enhancing the building's security systems (a well lit exterior can deter vandalism and discourage break-ins).

Most existing church lighting systems have been added to over the years with the result that the individual elements (lights, switches, fuseboards, wiring, etc) have been replaced piecemeal and no longer effectively work together. This is understandable as most parishes do what they can when they have the money available. However, a well designed integrated lighting scheme can dramatically enhance the usability of a church and lower running costs. Even if it is not possible to implement a scheme in one go, by assessing your church's needs and then following a co-ordinated plan over a period of time (or as finances allow), you will still be able to achieve an effective solution to your lighting requirements.

### **I. What should a good lighting scheme achieve?**

A good lighting scheme should provide your church with a versatile and cost-effective means of illuminating the building and the items within it, and allow the people that use and visit it to safely move around. This may be through providing better lighting for worshippers to enable them to read hymn sheets or to participate in services, or to highlight important features and create a welcoming atmosphere for visitors. How you achieve this will depend on the requirements of your own individual building. The following sections highlight some of the main things you need to think about:

#### **a) Utility lighting**

This refers to the “day to day” lighting you need in the church for the utility areas such as toilets, kitchens, meeting rooms, offices, etc, where a range of activities would normally take place. All of these areas have similar requirements to a normal domestic dwelling with a mixture of overhead, directional and ambient lighting. For example, a kitchen may need a ceiling light or lights (spots, strip, pendant, etc) with additional directional illumination for food preparation on worktop surfaces (usually located under wall units), whereas a meeting room may only require dimmable ceiling lights.

## **b) Space lighting**

Large areas in a church like the nave, aisles and chancel have different lighting requirements than smaller areas. What may be suitable for a small space (eg. a single overhead light) will not provide enough illumination for a large high-ceilinged space. The types of light fittings and the lamps/bulbs they use can also differ (see *Section 4* for more information). In a nave for example, a combination of lighting would be more appropriate - perhaps pendant lighting in the main body of the nave with directional or spot lighting to pick out important architectural features like decorated capitals, roof bosses and beams.

## **c) Zone lighting**

Any building will benefit from individually controlled lighting zones. It is both practical and economical. Why light your whole church if you only want to use certain areas at certain times? You may also want to consider lights that only come on when motion is detected and then switch off automatically after a period of time. Areas like toilets and porches often use this type of lighting. Having the ability to manually control motion sensitive lighting when required is also a good idea!

## **d) Lighting effects and controls**

Some areas of the church or items within it may benefit from individual lighting to illustrate their special importance, such as architectural features, wall paintings and art work. Also, if you regularly hold large events or concerts you may want to think about lighting specifically for that. This could mean having individual lights for choir members in the choir stalls or multi-directional coloured lighting to create dramatic effects for things like orchestral recitals and plays.

Most modern lighting schemes have some form of central control unit which allows you to change the lighting in the church to suit your needs. This could include things like simple zone controls or the ability to dim or brighten individual lights. Many units also have pre-set or programmable controls for different lighting effects which will be initially set up by your lighting engineer. It is therefore important to make sure that you know how to use these and what effects you want programmed in.

## **e) Testing and maintenance**

You need to think carefully about how you will maintain your lighting system once it has been installed. Simple things like how to change a light bulb or reset a circuit breaker need to be factored in to the design scheme. You do not want to call in a lighting contractor every time you need a bulb changed or to reset an electrical trip. The correct use of light source technology can also help. For example, choosing long-life bulbs will reduce the frequency with which they need replacing, which is especially important for difficult to reach areas.

Any church electrical systems should be tested every five years by a suitably qualified professional (see *Resources* section) who has been approved to work on non-domestic buildings. However, regular simple maintenance such as ensuring light fittings are clean and in good condition and switches and sockets are not cracked or damaged, can be done by the parish.

#### **f) Energy savings**

The introduction of new lighting technologies such as LEDs (light emitting diodes) has dramatically increased the energy efficiency and durability of lighting systems over the past few years. This, coupled with the use of renewable energies like PV (photo-voltaic) panels to generate electricity (and feed the surplus back to the grid for profit), means that parishes can make substantial savings on their overall energy use. It is therefore important to consider both together when designing a lighting scheme for your church, although parishes should be aware that government incentives for renewable energy generation have reduced in recent years.

#### **g) External lighting**

Lighting a building externally can increase a building's profile in the community, assist with overall security and help deter vandalism and theft. A well designed scheme should be able to help you achieve all of these. You therefore need to consider what you want to accomplish by lighting your church externally. If it is primarily for security purposes only, then you should consider lighting vulnerable areas that would be an easy target for thieves and vandals, such as doors and windows normally hidden from passersby or roofs that can be easily accessed from adjacent buildings or walls. Any lighting in these areas doesn't have to be on permanently but could be activated by motion or infrared sensors (and maybe even tied in to an alarm system).

If your aim is to raise the profile of your church by lighting it externally, you need to consider which areas or features should be lit as blanket coverage with high powered spotlights can be both costly and unsympathetic to the building's architecture. It may also interfere with light levels to neighbouring properties or be inappropriate for the context of the building's setting. Consider the use of time switches for external lighting schemes (to save money) and don't forget external lighting for paths, slopes and steps especially if your church grounds are used frequently in the evenings.

#### **h) Health & safety**

Appropriate lighting for hazards can help health & safety within a church. If you have steep, narrow or uneven stairs, using additional lighting to help illuminate these areas can be very effective. It will also compliment and strengthen any warning signs. Think about providing extra lighting in areas that may cause problems such as narrow spaces, slopes, crypts, etc. Motion activated lighting can be used in areas that are not visited very often (eg. tower stairs) to help save money.

Churches are classed as non-domestic buildings for health & safety purposes which means that parishes should ensure they are compliant with the appropriate regulations. Part of this includes clearly signed emergency exits which can be further enhanced by introducing emergency lighting and illuminated exit signs. The Health & Safety Executive (HSE) website at [has an extensive range of information on these issues](#). Click [here](#) to go to the website.

#### **i) Lighting for people with disabilities**

A good lighting scheme should cater for everyone, especially those with disabilities. Things like providing enough illumination to read hymn sheets, prayer books or overhead screens, should be considered for those who are partially sighted or extra lighting for handrails, wheelchair ramps, steps, and slopes for people with mobility issues. Try to incorporate lighting considerations into your church's general accessibility audit.

## **2. Assessing your lighting needs**

You need to think carefully about how your church is used as this will dictate your lighting needs. Some areas will have different requirements to others. For example, a busy multifunctional space will need to be well lit with a variety of different lights that can be individually or zone controlled, whereas a crypt may only need one central ceiling light. Perhaps you need to “future proof” your lighting so that your building can be easily adapted for increased use if (say) you are in receipt of a grant that requires increased community use or opening hours as part of the award. Or maybe your current lighting or electrical system has failed and you need a new one. Whatever the reason, try not to rush into installing a new scheme which may later prove inappropriate and costly. An initial assessment of how you use your building and what you want from it, could help save you time and money in the long term and better inform any briefs or tender documents that you put together when seeking quotes from suitably qualified lighting professionals.

### **a) How is your church used now?**

This will have a large influence on your choice of lighting system. If your church is used infrequently (perhaps only once or twice a month) and you do not have a lot of money to spend, then you may only want to provide new lighting in the most used areas (eg. nave and chancel). Any other areas such as the vestry (if you have one) could have simple overhead lighting. If you have a well used building (maybe every day or several times a week), then you will need a variety of lighting solutions for each area, along with their own individual controls. You will also need to look at keeping running costs down by using energy efficient and/or long-life bulbs.

Will your lighting requirements change in the near future? If so, are you anticipating an increase or decrease in building use? It makes sense to try and “future proof” your building wherever possible. This means designing your lighting system to be flexible enough to adapt to changes in use without having to go through a major refit or new installation. Having a system that incorporates things like individually controlled lights or zones, motion sensitive or timed lighting, will give you maximum flexibility when using different areas at different times. Try to think a minimum of 5 to 10 years ahead if possible. If you are installing a new lighting system as part of a larger grant assisted project, then the people giving you the money (the Heritage Lottery Fund for example) will usually be expecting your church to have a minimum life of 10 years.

### **b) Light levels**

Ask the people that use your church how they find the current light levels. For example, members of the choir may have individual lights in the choir stalls in order to read their hymn sheets, but are they adequate? Can they be individually controlled? Can visitors see well enough to get around the church? Do worshippers have enough light to see their order of service, hymn books and bibles? Can cleaners, flower arrangers, greeters, etc, see well enough to do their jobs?

Observe how the light levels change during the course of the day and the year. For example, if your church is in an open sunny position, it may get lots of natural light during the day or throughout the summer months. This may mean that you only require artificial lighting at certain times of the day or year to supplement or compliment the natural light. If your church is in a sheltered or shady position, you will require more light over longer periods. You may therefore need different lighting strategies for different areas depending on the availability of natural light.

### **c) Are some areas of the church used more than others?**

Well used churches will have different lighting requirements to those that are not. It doesn't make financial sense to spend a lot of money on a state-of-the-art lighting system if your church, or parts of it, are not well used. Even if you have a church that is used every day for a range of activities, some parts will still be used less often than others. Areas like stairwells, crypts and vestries for example, do not need to be lit constantly – only when in use. Motion sensitive or infra-red activated lighting could be a more practical and economical solution to having these areas lit permanently. On the other hand, frequently used and large areas will almost certainly benefit from a range of different lighting solutions with individual, zone and programmable controls.

### **d) Your current lighting system**

What is the current state of your lighting system/scheme? Are the existing lights too dim? Are some of them not working? If so, why not? Do you just need a new bulb or is the fitting itself broken? How easy is it to change a bulb? Have you had a recent electrical inspection report that has recommended replacement of the electrical wiring? If so, consider whether the light fittings need replacing at the same time. Whatever the reason, you need to carefully assess the current state of your lighting in order to better inform what changes you want to make.

Critically review each area of your church. Not all areas may need changes to the lighting. Look at what works well in each area, perhaps this can be copied in other parts of the building. For example, you may have general pendant lighting in the nave which is complimented by uplighters to show off medieval roof beams and carved bosses, but none in the chancel which is rather dim. Would uplighters therefore work in the chancel too?

Are there any other factors that may be affecting the light levels in the church? Does the interior look dim because it is heavily shaded by trees outside? If so, perhaps they need pruning. In which case, you may not need more powerful lights to illuminate the interior after all! Or maybe your light fittings are sound but you need new bulbs with a greater amount of light output. A good place to start for a lighting audit is to look at the comments in your last quinquennial inspection report which should contain a section on electrics and lighting.

## **3. Can you improve anything straightaway?**

A review of your current lighting arrangements may reveal that you don't actually need a new lighting system, but should just improve the one you've already got. Lighting systems can become inefficient with age as new bulb technologies and fittings become available. Simple things like cleaning and replacing cracked or broken lamp shades or using more energy efficient bulbs (possibly with a higher light output) can help. Also use lighter colours for fittings and shades to increase light levels.

It may sound obvious but dirty windows and foliage outside the church can contribute to low light levels inside, so make sure these are also taken care of. If you have painted internal walls in your church think about changing the colour to help reflect more light. If you already have painted walls, make sure they are clean and free from dust and mould which will diminish their light reflecting ability.

In addition to thinking about permanent light fittings, also consider free standing ones for temporary use. There may be times when you need some extra lighting for things like

concerts, plays and exhibitions, which are only staged occasionally. If this is the case, free standing spotlights and uplighters should be considered. Or perhaps you just need a bit of additional light in offices or meeting rooms during the winter months. Simple desk lamps or uplighters could be used to supplement your existing light fittings.

#### 4. Types of lights/lamps

Nowadays there is a good range of light bulbs and fittings available that can be utilised for many different situations. Uplighters, downlighters, pendants and spotlights are some of the most common light fittings found in a church and each of these can use a variety of different bulbs. All have their pros and cons which you (and your lighting professional) will need to consider when designing a lighting scheme. Things like cost of purchase, energy efficiency, colour rendering and lifetime, all need to be considered. The table below describes some of the most common light bulbs available and has been compiled from information provided in the *Church of England Lighting Guidance Note* (available from [www.churchofengland.org](http://www.churchofengland.org)).

Type of Bulb	Efficiency (lm/W)	Lifetime	Advantages	Disadvantages
Tungsten halogen	Low: 18-25 lm/W	Short: 2,000 – 3,000 hours	Provides instant full power output, dimmable, good colour rendering	Can get very hot, not as energy efficient or cheap to run as fluorescent lamps or LEDs
Compact fluorescent (CFLs)	High: 70-75 lm/W Can be dimmed down to 1%	Long: 8,000 hours	Do not get hot, relatively inexpensive	Take time to reach full brightness (unless “quick start”), emit small amounts of UV, not all are dimmable, contain mercury
Fluorescent tubes	High: 80-100 lm/W	Long: 9,000 hours	Do not get hot, relatively inexpensive	May need extra parts to make them dimmable
Light emitting diodes (LEDs)	Medium through to high: 40-100 lm/W	Very long: 30,000-60,000 hours	Instant full output, do not produce heat or UV, dimmable,	Relatively expensive but technology improving all the time and the price is falling
Metal halide	High: 80 lm/W	Long: 12,000 hours	Highly efficient, good colour rendering after initial warm up, wide range of wattages	Can have colour variations between lamps, colour may shift over the life of the lamp and when dimmed
High pressure sodium	High: 125 lm/W	Very long: 20,000 hours	Good where colour rendering is not critical	Takes a long time to reach full colour brightness

## **5. Electricity suppliers**

Most church lighting is powered by mains electricity. However, you might want to consider using an alternate energy source, such as solar energy, to replace or reduce your reliance on this. Photovoltaic (PV) panels generate electricity which can be used to provide lighting. If you generate more electricity than you use, you can usually sell it back to the grid which can then offset the cost of any additional electricity you may require at a different time. Also think about using a “green” tariff from a mains supplier, many of which now offer electricity that comes from renewable (or part renewable) sources. The *Resources* section has more information on renewable energy.

## **6. Other considerations**

A lighting (and electrical) system can damage a historic building if not properly designed and installed. Consider the impact this may have on the historic fabric of your church and its contents and try to reduce this. Write a *Statement of Significance* or conduct an impact assessment to highlight possible problem areas and what can be done to reduce any potential damage. Both of these documents should be included with a faculty application and will show the DAC that you have carefully considered all options.

High powered light fittings (like tungsten halogen) can get extremely hot and damage historic fabric if placed too close to it. They can also cause severe burns if handled when lit. Sensitive items like wall paintings, can also be damaged by exposure to excessive light (natural and artificial), so you (and your lighting professional) need to think carefully about what light fittings are appropriate for use in your church.

If your new lighting system/scheme is being implemented alongside any new wiring in the church, you need to carefully consider where things like electrical sockets, switches and fuseboards are sited. All of these items will require a permanent fixing to the building, which could potentially cause irreparable damage to its historic fabric. A location plan showing the location of the new light fittings and any ancillary equipment within the church, will also need to accompany any faculty application, along with photographs of where they will go and details of how they will be fixed to the building. Manufacturer’s specifications for the items in question will also assist applications.

## **7. Consultations**

Once you have a basic idea of what your lighting requirements are and what fixtures and fittings are available, think about getting some professional advice. As a first step, speak to your DAC Secretary about your proposals, as they will be able to advise what supporting documentation you will need to supply with your faculty application. You can then make sure any lighting professionals you appoint can supply this information.

Always seek advice from a suitably qualified lighting specialist/engineer. This is particularly important if you are planning a large project and have an architecturally and historically significant church. Make sure they have worked with historic buildings before (preferably churches) and understand the particular needs of these types of buildings. The *Resources* section has information on the various professional bodies that lighting professionals belong to and where you can search for suitably qualified individuals.

If the proposed works will affect the character or setting of the church (eg. adding PV panels to a roof), you should also consult your Local Authority Planning Authority as planning permission may be needed in addition to a Faculty.

If your project is a small one or you are replacing like-for-like equipment, you may prefer to use someone who has done work for you before or comes with a personal recommendation from another parish. Ask your DAC Secretary if any similar projects have been done in the diocese recently and then speak to or visit those parishes.

Remember that you should always have a contract in place for large projects and obtain a minimum of three quotations for smaller projects.

## RESOURCES

The following websites and publications contain useful information on church lighting, electrical installation & testing and renewable energy sources.

### CHURCH LIGHTING

#### **The Church of England (CoE)**

The CoE has lots of useful information on lighting on its main website at: [www.churchofengland.org](http://www.churchofengland.org).

#### **Historic England (HE)**

Historic England have produced information relating to internal and external lighting in historic buildings, and outlines the general principles of lighting in places of worship. It can be found on their main website at: [www.historicengland.org.uk](http://www.historicengland.org.uk).

### ELECTRICAL INSTALLATION & TESTING

Churches should have their electrical installations inspected and tested at least once every five years with an electrical installation and conditioning report issued in every case. Since churches are classed as non-domestic buildings, only electrical contractors with full scope registration or membership to work on commercial installations with the National Inspection Council for Electrical Installation Contracting (NICEIC), The Electrical Contractors Association (ECA) or The National Association of Professional Inspectors and Testers (NAPIT) should be employed. Please note that the Ecclesiastical Insurance Group (EIG), who act as insurers for all Church in Wales' churches, state that electricians or electrical contractors who are only registered to undertake work on domestic installations under Part P of the Building Regulations are not acceptable to them\*. Parishes therefore need to check that any electrical contractors they employ for testing and installation purposes are members of these groups. Further information can be found by clicking on the following websites:

[www.niceic.com](http://www.niceic.com)

[www.eca.co.uk](http://www.eca.co.uk)

[www.napit.org.uk](http://www.napit.org.uk)

In addition, the Ecclesiastical Insurance Group (EIG) have information on their website relating to electrical wiring in churches: [www.ecclesiastical.com](http://www.ecclesiastical.com)

## **The Chartered Institution of Building Services Engineers (CIBSE)**

CIBSE maintains a register of consultants working in the building services industry. You can search for professionals in the field of heating, lighting, energy, etc, who work with a variety of different types of buildings (such as historic buildings). [www.cibse.org](http://www.cibse.org).

## **RENEWABLE ENERGY**

It may be possible to power your lighting system by using electricity generated from renewable energy sources rather than from the mains electrical supply. Any parishes considering this should look at the following resources:

### **Parish Buying**

This website aims to give parishes preferential rates when buying a variety of items including “green” energy: [www.parishbuying.org.uk](http://www.parishbuying.org.uk)

### **Energy Savings Trust**

This organisation gives energy saving advice on a range of subjects including renewable heat and electricity. Go to: [www.energysavingtrust.org.uk](http://www.energysavingtrust.org.uk)

### **The Diocese of London (CoE)**

The Diocese of London has produced a series of *knowledge base articles* dealing with lighting in churches and renewable energy sources. These articles can be accessed via the main website at: [www.london.anglican.org](http://www.london.anglican.org).