

## Some thoughts on church lighting: preparing an Audit of Needs

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I am sometimes asked to offer thoughts about the need for lighting upgrade and how the PCC might approach the project.

In the thoughts that follow I have very largely kept to general principles and avoided technical detail. Much of church lighting design is common sense, carefully applied to a very special environment.

In lighting terms, it is useful and quite permissible to think of a church as a theatre. Apart from audience participation, one fundamental difference is that the 'house lights' remain lit for the 'performance', although they might be dimmable for such occasions as carol services.

It goes without saying that at all parts of a church, the illumination level should be high enough for whatever task is carried out there, with a warm colour rendering; and that includes ancillary areas such as a porch, kitchen, w.c., meeting room, vestry, etc.

**The purposes and categories of lighting are defined by the need to:**

- Find one's way about; *Task lighting*
- See other people; *Task lighting*
- Read books and other literature; *Task lighting*
- Read information panels (which can be achieved with dedicated high-level spots or by 'swan-neck' fittings mounted on the boards themselves); *Task lighting*
- See and appreciate the architecture, furnishings, and decorative details such as memorials, hatchments, Royal Arms, painted screens, roofs (but not too brightly), etc; *Dressing*
- Observe liturgical activity, lit strongly enough to be a liturgical focus wherever it takes place – altar, pulpit, lectern, font; *Accent lighting*
- Avoid risk from tripping hazards such as steps;  
Light exterior pathways, etc *Safety lighting*
- Overall, to create ambience and mood: to heighten the sense of the church's specialness in its architecture, shape, decoration, people, and Christian worship, and to make people feel they want to be in it, individually and as a congregation, and as far as possible that they are welcome and part of the proceedings.

**The fundamental design approach**

1. Start by lighting the body of the church where the congregation sits (Nave, Aisles, Transepts) strongly enough to read easily. The minimum level should be

120 to 150 lux (technically, 1 lux = 1 lumen per square metre, which is a measure of luminous flux density. As a comparative measure, modern school and library lighting would not be less than 300 lux.)

It is critical not to aim for a 'dim, mysterious light' – nor to allow one to continue.

- a) As a service provider, the PCC must observe the Equalities Act (formerly the Disability Discrimination Act) in lighting as well as disabled access etc. Although lighting levels have not yet been tested in the courts, there is still a duty of care to observe; it is, however, generally agreed among lighting designers that 120 lux would be a reasonable minimum. It appears to be a real defence under the Act to show that steps are being taken to improve lighting that would fail to meet the standard demanded.
  - b) You should remember that visitors such as children may be used to much higher lighting in schools etc: to them, low lighting may just seem 'dingy'.
  - c) By the age of 60, the human eye typically needs up to 6 times stronger light than it did in youth, even when cataracts are not present. Also, light towards the red and blue ends of the visible spectrum is less efficacious in conveying visual information than the yellow/green at the centre of the spectrum, so a reasonably warm colour rendering is essential.
2. Then, increase the lighting levels towards the Chancel and Sanctuary to create a 'ramp' of light of increasing interest and importance toward the centre of liturgical action.
    - a. A rule of thumb based on guidance produced by the Chartered Institute of Building Services Engineers (CIBSE) is Nave (ordinary task lighting): 120-150 lux; Chancel: 200-250 lux; Altar/Sanctuary: 300-500 lux; – or thereabouts. In practice, the Chancel may need stronger light for a choir, and many designers aim for 400-500 lux or so at the altar itself. It can always be dimmed.
  3. Provide accent lighting anywhere necessary – pulpit, lectern, font. It assists reading and focusses attention on the people doing things at those places.
  4. Design for extra light if necessary where there are physical hazards, eg at chancel and sanctuary steps.

Where a Nave altar is in use, the lighting focus will move from the east end towards the centre of the church. In this case, there should be a secondary ramp of light down towards the altar from the east end. This reduces any possibility of a dark backdrop to the action at the Nave altar and maintains a visible (but in lighting terms, less important) presence of the east end and Chancel architecture.

### **Energy considerations**

All electrical design projects from this time forward must take account of energy use in accordance with the worldwide aspiration of 'Net Zero Carbon'. This is now covered in Appendix 17 (Informative): Energy Efficiency of the IET Wiring Regulations, BS 7671:2018 Amendment 2:2022.

On September 1<sup>st</sup> 2021, the manufacture of tungsten and tungsten halogen lamps has been legally restricted. In consequence, our lighting medium will be almost exclusively

light emitting diode (LED), which will reduce energy consumption. Although it may seem wasteful to discard existing halogen fittings in good condition, it is difficult if not impossible to buy new lamps. As well as respecting 'green' principles, it makes eventual economic sense to replace with LED. Compact fluorescent lamps also.

Further, the design of electrical installations will have to consider main intake siting and the physical layout of cabling so it would be helpful to take the advice of an accredited electrical contractor at an early stage. This aspect might not be relevant to your situation, but it's best to check in advance.

Wherever possible and practicable, consider fitting person sensors to outside lights.

### **Project design starts with an Audit of lighting needs: existing, and potential**

I suggest that a small group of people be given the following ten questions as the basis for idea-gathering. This can inform a subsequent Specification for Quotations.

Think wide and big. It doesn't matter if an unachievable wish list emerges: it will self-regulate as a scheme builds up, and may change direction. The main thing is to gather ideas, even (or especially) if several people produce the same thoughts, and get a feel of how lighting can be important to worship and other activities. Let the ideas themselves generate new possibilities.

1. Which identifiable areas in the church need to be lit, and for what purpose(s)?
2. What sort of lighting is needed in each (task, accent, dressing, safety – any or all of these aspects)?
3. Do activities in these areas take place independently from other areas, perhaps at different times of day (eg visitor / worship)?
4. Does it matter, or would it help, if light from one area 'spilled' into another?
5. Are the different areas used by different groups of people (mid-week Communion, Sunday School, refreshment and fellowship after services, prayer chapel, etc)?
6. Do any of these areas need to be lit individually (several switches)?
7. Do these areas need lighting at different levels on occasion (dimmers)?
8. Which areas of lighting can be controlled by a single control? (switch, dimmer, channel on an electronic controller.)
9. Is there any activity not so far possible that could be achieved or helped by extra light or a different approach to lighting (eg separate spotlighting for a recital area)?
10. If the existing lighting is not improved, does that affect worship now (indeed, are existing light levels 'legal' under the Equalities Act?), and will it affect worship possibilities for the future, welcome, outreach, how visitors see the church and how groups use it, and so on?

I am happy to visit to discuss this with the Vicar, churchwardens, church members, and the inspecting architect.

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