
STANDARDS & CODES

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Introduction

The use of standards goes back a long way (BSI started in 1901). Standards were originally developed to ensure interchangeability of components and to reduce the number of different types of any given object that were necessary. The SLL Code goes back to 1936 when it provided very simple guidance on how much light was needed for a given task. Since those days the role of standards and the Code has evolved and we now have a comprehensive framework of documents that seems to have something to say about almost every aspect of lighting practice. The objective of this paper is to explain the role of standards and codes in modern lighting practice and ask questions about why we have such documents and where do they come from.

There are lots of standards that are in place to ensure the safety and compatibility of lighting equipment, however, this paper will focus lighting application standards as it these documents that impact on our day to day lighting design.

The Need for Guidance

There is an argument that there is no need for standards in the area of lighting design we just need to ensure that all lighting designers are competent and let them get on with it. There are a number of people in the industry that advocate this approach but after some thought it is clear such an approach has a number of drawbacks. The most obvious problem is that without some form of guidelines would it be possible to assess the quality of the work of a lighting designer? Moreover, what would be the basis of the design provided by designers and how would designers establish competency?

Implicitly all design is a compromise between the positive and negative impacts of lighting. On the plus side lighting can create a pleasant atmosphere and allow people to perform the necessary visual tasks. On the negative side lighting costs money and resources and may cause glare and light pollution. Given the ever changing world of energy costs, new lighting technology, new working practices and demographic changes the correct balance for lighting is constantly changing. With this constant change it would be an almost impossible job for a single lighting designer to keep reassessing what constitutes good lighting practice.

Thus some framework of lighting recommendations is necessary to support lighting the trouble is that once that framework is known about by clients and specifiers then it very soon becomes the contractual basis on which much lighting design is performed.

The Role of Standards, Codes and Guidance

In general standards either specify particular ways to provide lighting or give limits on various parameters of the light provided. Fortunately we have now got to the point where there are very few standards that specify the details of the lighting system, instead standards are written in terms of the lighting parameters that need to be achieved by the lighting. This is a good way of doing things as it permits a level of flexibility in the approach to providing the necessary lighting. However, there are a couple of problems with this approach. Firstly is the problem faced by the standards makers, they have to be certain that the targets they are setting are achievable in a wide range of circumstances. This can mean that certain target values are set lower than they otherwise would be. The second problem is that setting a target value for a particular lighting parameter does nothing to explain how

such a value may be achieved in practice. These weaknesses of standards are covered by the SLL Code and the SLL guidance documents.

The SLL Code contains a digest of all of the main lighting application standards but there are comments about where it is better to go beyond the recommendations of the standard. The code also supports lighting standards by giving a fundamental definition of all of the light technical terms used in standards ensuring that it is possible to assess if a particular scheme meets the requirements set. The SLL Handbook and the SLL LG series of guides provide detailed advice on how to achieve particular lighting results in a wide range of situations.

The Limitations of Codes and Standards

Codes and Standards tend to discuss lighting design in a numerical way. However, what lighting design is trying to achieve is a positive human response to the lit environment being provided. Whilst the illuminance values are useful in considering if a particular visual task may be easy or not it is impossible in standards to discuss what style of lighting is necessary to make a particular room look attractive. Peter Boyce¹ has suggested a simple set of criteria by which the quality of particular lighting schemes may be judged, the criteria are:

- **bad lighting** is lighting that which does not allow you to see what you need to see quickly and easily and/or causes you discomfort
- **indifferent lighting** is lighting which does allow you to see what you need to see quickly and easily and does not cause discomfort but does nothing to lift the spirit
- **good lighting** is lighting that allows you to see what you need to see quickly and easily and does not cause visual discomfort but does raise the human spirit

Looking at the above criteria it is clear that the best that any numerical recommendation can hope to achieve on its own is indifferent lighting. This means that it is not realistic to think of standards promoting good lighting. It is more the case that they can stop bad lighting. However, guidance documents can assist the lighting designers in their quest for lighting quality by flagging up the issues that need to be considered for any particular application, but it is only the skill of the designers that in the end can deliver good lighting.

Where Do Standards and Codes Come From?

Essentially standards are created by getting together people with a lot of experience in a given field allowing them to discuss the issues involved and then drafting a set of recommendations. The problem is that as time has gone by a lot of different bodies have grown up that write standards and thus there is a bit of complexity in working out who is responsible for what.

Most nations have their own standards body, in the UK this is BSI and in Ireland NSAI is the body. National standards bodies may create standards of their own and they are also responsible for publishing international standards within their own country.

In Europe CEN (Comité Européen de Normalisation) is responsible for lighting applications standards. There are 33 member nations in CEN, the 27 EU members, 3 EFTA countries together with Croatia, Macedonia and Turkey. All members of CEN may participate in developing and voting on standards and they are obliged to publish all CEN standards and remove any local standards that conflict with CEN standards.

At an international level the International Standards Organisation (ISO) is responsible for lighting standards. However, most international lighting standards are drafted for ISO by the CIE (Commission Internationale de l'Éclairage) which is an international expert body on lighting and then the documents are assessed and voted on by ISO members. Standards produced by ISO may be adopted by National Standards Bodies, however, it is a matter of choice rather than compulsion. Table 1 lists the main lighting applications currently available in the UK.

Source	Standard
ISO	BS ISO 23539:2005 Photometry. The CIE system of physical photometry BS ISO 15469:2004 Spatial distribution of daylight — CIE standard general sky
CEN	BS EN 12193:2007 Light and lighting. Sports lighting BS EN 12464-1:2011 Light and lighting. Lighting of work places. Indoor work places BS EN 12464-2:2007 Lighting of work places. Outdoor work places BS EN 12665:2011 Light and lighting. Basic terms and criteria for specifying lighting requirements BS EN 13032-1:2004 Light and lighting. Measurement and presentation of photometric data of lamps and luminaires. Measurement and file format BS EN 13032-2:2004 Light and lighting. Measurement and presentation of photometric data of lamps and luminaires. Presentation of data for indoor and outdoor work places BS EN 15193:2007 Energy performance of buildings. Energy requirements for lighting BS EN 13201-2:2003 Road lighting. Performance requirements BS EN 13201-3:2003 Road lighting. Calculation of performance BS EN 13201-4:2003 Road lighting. Methods of measuring lighting performance
BSI	BS 667:2005 Illuminance meters. Requirements and test methods BS 7920:2005 Luminance meters. Requirements and test methods BS 8206-2:2008 Lighting for buildings. Code of practice for daylighting BS 4589-1:2013 Code of practice for the design of road lighting Part 1: Lighting of roads and public amenity areas

Table 1: The source of the main lighting applications standards

The problem for lighting practitioners is that 16 standards listed above may need to be considered alongside local legislation to do with health and safety and energy use and so life may quite complex working out what to do in a given set of circumstances. It is for that reason that the latest version of the SLL Code² has been designed to provide the significant content from the majority of the standards listed above whilst also giving details of the legislation that lighting designers may encounter.

Conclusion

Like it or not as lighting designers we are going to have to live with standards and codes. They may not promote good lighting but if followed sensibly they do eliminate bad lighting. Perhaps the biggest problem with standards is that people who know nothing about lighting think they just have to apply one small part of a standard and they will have created an acceptable lighting scheme. In fact for good lighting you are always going to need a good lighting designer, one who knows the subject well enough to occasionally break the rules set out in standards and the code.

References

¹ Boyce P. R. *Lighting Quality: The Unanswered Questions*. Proceedings of the first CIE symposium on lighting quality, Ottawa 1998.

² SLL Code for Lighting 2012, ISBN 9781906846213, (<http://www.sll.org.uk/publications/sll-publications/item/sll-code-for-lighting> accessed 28/01/13)