

This means that the materials used are wherever possible from renewable sources and that at the end of life the redundant equipment can be disposed of safely with most of the base materials being recycled.

6.2.6 Maintenance

It must be recognised that both daylight and electric light within a building will depreciate with time. To minimise the effect of this a maintenance programme will need to be designed and implemented. The maintenance programme will also affect the lighting design and the designer will need to state the maintenance programme on which the design has been based, otherwise there could be problems when a client is comparing different design proposals. It will also be important for the client to be provided with a maintenance schedule so that they know what will need to be done. Chapter 21 discusses the various factors that need to be considered when developing a maintenance program.

6.2.7 Lighting costs

Costs are always a major concern for any project and it is important to consider these before any work is undertaken. Both the capital cost and the running, or operational, costs must be considered at the outset. If the two cost elements are not considered together in terms of life cycle costing, then a solution which has a low capital cost but a high operational cost could be more costly overall than an installation with a more expensive capital cost but a low operating cost. A conflict of interests may arise if the two cost elements are paid for from different budgets or organisations. This can happen with local authority projects. Here the designer needs to present a balanced view of the options to enable the clients to decide on the best approach.

The capital costs include the cost of the design process, the equipment and the installation process, both physical and electrical. It also includes the commissioning and testing of the installation. Allowance must also be made for any builders' work that forms part of the lighting installation. Any other costs that are particular to the lighting design need to be included. It is important that the capital cost is agreed at an early stage if a lot of time is not to be wasted. The capital cost should be challenged if the client's expectations seem to be unrealistic.

The operational costs include the cost of the electricity consumed, which comprises items such as standing charges, maximum demand charges and electricity unit costs. They will also include the cost of maintenance, which includes cleaning and relamping throughout the life of the installation. In some cases charges may have to be budgeted for the disposal of redundant equipment although this may be borne by the supplier.

6.2.8 Photopic or mesopic vision

The photometric quantities used to characterise lighting are all based on photopic vision (see Section 1.2). This makes sense for interior lighting where the luminances are usually high enough to ensure the visual system is operating in the photopic state but there may be problems for exterior lighting. This is because for adaptation luminances below about 3 cd/m^2 peripheral vision is operating in the mesopic state (see Section 2.2.2) and exterior lighting often produces luminances below this level. This is a problem because the spectral sensitivity of the peripheral retina changes continually during mesopic vision depending on the adaptation luminance, the peak sensitivity moving from the 555 nm to 507 nm as the adaptation luminance decreases to the scotopic state. There is no CIE mesopic observer so no system of mesopic photometry. In this situation, the simplest approach to ensuring good mesopic vision in exterior lighting is to use a light source with a scotopic/photopic (S/P) ratio greater than 1.5. Such light sources provide stimulation to both the cone and rod photoreceptors of the retina.