

tagged by the staff. For this reason, dimmer systems are often preferred. Photocells and other sensing circuitry must incorporate a delay to prevent sporadic and disruptive switch-offs, while still responding immediately when a switch-on is called for.

Any control system must ensure that acceptable lighting conditions are always provided for the occupants. Safety and visual effectiveness and comfort must take priority over energy saving.

The Lighting Industry Federation publishes an *Applications Guide*, which deals with this subject matter in further detail.

3.8 Detailed planning

When the overall design has been resolved in general terms, detailed calculations are required to determine such things as the number of luminaires, the glare index, the final cost and so on. When the design has been completed, a check should be made to see how well the original objectives have been met. If this shows that the design is unsatisfactory in some regard, the only course of action is to revise the design until a suitable solution is found. This iterative procedure is a normal part of the design process.

The main calculations that may have to be carried out during the design process are detailed in the following sections of:

- Costs and energy use
- Maintained illuminance
- Average illuminance
- Specification and interpretation of illuminance variation
- Discomfort glare
- Emergency lighting.

3.8.1 Costs and energy use

The most powerful constraints on any design are financial – how much will the scheme cost to install and operate?

Initially it is necessary to establish realistic economic and energy budgets commensurate with the design objectives. At all stages of the design, capital costs and running costs must be scrutinised and controlled. The economics and energy use of the lighting system must be considered within the total building energy use.

3.8.1.1 Financial evaluation

The methods of financial assessment employed by the designer must be acceptable to the client. This can cause difficulties, because grants, tax benefits, tariffs, accounting methods and other factors can vary.

Comparisons are often made with an existing scheme or an alternative design. If the comparison is to be meaningful, the schemes must be designed to equitable standards. The principles of several methods of financial evaluation are discussed in Financial appraisals (see CD).