17.3.2 Glare control

Glare control for outdoor lighting is quantified by the glare rating. Glare rating (GR) is given by the formula

$$GR = 27 + 24 \ln \frac{L_v}{L_e^{0.9}}$$

where: L_v = equivalent veiling luminance produced by the luminaires at the eye (cd/m^2)
L_e = equivalent veiling luminance produced by the environment at the eye (cd/m^2)

See Section 2.6.3 for more information on the calculation of equivalent veiling luminance.

For many applications, L_e is approximated by the formula $L_e = 0.035\, E\, \rho / \pi$ where ρ is the reflectance of the surface, e.g. a sports field, and E is the illuminance on the field (lx). For grass sports fields, a reflectance in the range 0.15 to 0.25 is appropriate.

The higher the glare rating, the greater is the visual discomfort. It is necessary to calculate glare rating for all critical viewing directions.

17.3.3 Light source colour properties

Light source colour properties are important for naming colours, something that can be significant where colour coding is used for identification. The ability to name colours accurately and confidently is determined by the light source spectral power distribution and the illuminance. Any light source with a CIE general colour rendering index greater than 60 will allow accurate and confident colour naming at the illuminances recommended for public spaces at night. High pressure sodium lamps allow accurate but less confident colour naming at the higher illuminances recommended for public spaces but both the accuracy and confidence decline at lower illuminances. Low pressure sodium lamps do not allow accurate colour naming under any illuminance and any confidence felt about being able to name colours is misplaced.

17.3.4 Loading areas

Many industrial premises have a loading bay (Figure 17.3). The two key points to remember about a loading bay is that there should be no glare to the driver backing up to the loading bay and when backed up the vehicle may cause shadows over the working area. Luminaires on a loading bay are exposed to the weather so they should have the appropriate IP rating (see Table 4.10). For loading bays with a canopy height less than 6 m, a suitable approach is to use pairs of luminaires fitted with fluorescent lamps, one mounted either side of the bay door. Where the canopy is more than 6 m high, luminaires using high intensity discharge lamps can be used instead of fluorescent lamps provided care is take to avoid glare to the driver. An alternative mounting position for such luminaires is at the front of the canopy aimed towards the bay door. To enable workers to see inside a vehicle it can be helpful to place a low wattage floodlight above the loading bay door. These luminaires should not be switched on until after the vehicle has been backed up. Care should be taken to minimise glare to workers leaving the vehicle.

Outdoor loading areas are usually lit by area floodlighting, either mounted on a building or on poles or masts. Such lighting should provide uniform illumination without glare to people working in the area, particularly fork lift truck drivers whose viewing direction may frequently be upward.