17.4 Approaches to exterior workplace lighting

17.4.1 High mast floodlighting

Many large area sites, such as container terminals, railway marshalling yards and car storage areas use high mast floodlighting. A smaller number of high masts are preferred over a larger number of lower masts for reasons of economy and because they allow greater freedom of movement in the area illuminated.

The most economical mast height is usually between 20 and 30 m. At greater heights, the costs of the masts increase greatly while at lower heights, the numbers of masts, lamps and luminaires increase dramatically. A lower mast height can be justified where there is extensive obstruction.

The usual light sources for high mast lighting are either high pressure sodium or metal halide discharge lamps. The luminaires used are floodlights with the light distribution matched to the proposed spacing of the masts. The luminaires should be suitable for the atmospheric conditions. This means that, at the very least, the luminaire should have the necessary IP number (see Table 4.10) and may require protection against corrosion and explosive atmospheres.

17.4.2 Integrated lighting

Oil refineries, cement plants and similar sites are usually lit by integrating the lighting into the plant (Figure 17.5). This is typically done by selecting a luminaire with a very wide light distribution, both up and down, and bolting it onto convenient parts of the structure so as to light all parts of the structure. The result is that too often the plant is lit up like a Christmas tree.

Figure 17.5
A cement plant with lighting integrated into the structure

Increased sensitivity to light pollution should mean that this approach is no longer acceptable. It is still necessary to integrate the lighting into the structure but to reduce light pollution it is necessary to be more careful about the type of luminaire selected, more informed about suitable locations for those luminaires and more adventurous about the control of the lighting at night. The luminaire selected should provide a predominantly downward light distribution, ideally within 70 degrees about the downward vertical. This more restricted light distribution will require more care in the positioning of adjacent luminaires to ensure they are providing enough light for safe access and work, without leaving dark spots. As for controls, the number of people working at night to keep the plant running is often small and they are unlikely to want access to all parts of the plant at all times. Simple switching controls located in a control room can be used to light those parts of the plant in which people are working, as necessary.