Undesirable high luminance reflections of the luminaires can be eliminated by choosing luminaires within the luminance limits specified in Table 9.7. The same luminance limits will minimise discomfort glare to occupants looking across the office. To eliminate overhead glare it is necessary to shield any direct view of high luminance light sources such as T5 fluorescents, or clear envelope metal halides. In addition, it is better not to use highly specular reflectors with such high luminance light sources as these reflectors can provide an image of the light source with almost the same luminance as the light source itself.

For comparable illuminance distributions on a horizontal working plane, direct lighting will almost always be more energy efficient than either indirect or direct/indirect lighting. However, the effectiveness of direct lighting may be compromised where there is a lot of obstruction from partitions in the space. It is also important to appreciate that surface mounted or suspended luminaires may interfere with air distribution in the office, thereby causing thermal discomfort. Coordination of luminaire layout and air distribution pattern is very desirable.

9.4.2 Indirect lighting

Indirect lighting uses luminaires where all, or almost all, of the light produced by the luminaire is reflected off some surface, usually the ceiling, before reaching the working plane. In the interests of energy efficiency it is important to ensure that the surface from which the light is reflected has a high diffuse reflectance, at least 0.7 and preferably 0.8 and higher. In the interests of colour rendering, it is important that the reflecting surface is spectrally neutral in colour. The lighting effect produced by indirect lighting is typically diffuse, without strong modelling or shadows. Therefore, it is important to use the office décor to provide some visual interest and variety. This can take the form of small areas of strong colour associated with architectural features or gentle spotlighting of interesting features such as artwork or notice boards.

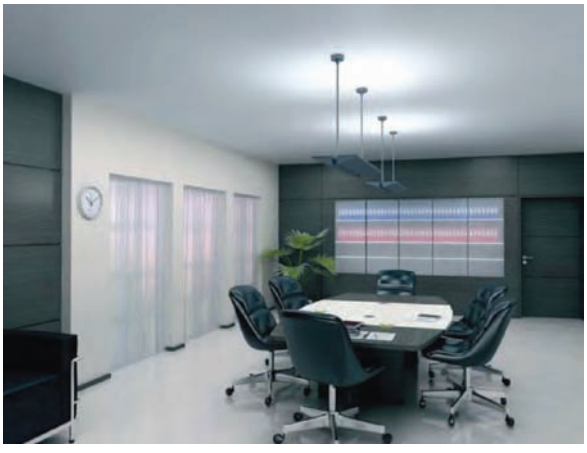

Figure 9.6
Indirect lighting in an office

Indirect lighting can be highly effective in a heavily obstructed office. Further, provided the maximum surface luminances given in Section 9.3.3 are not exceeded, there should be no problem with either discomfort glare to the occupants or high luminance reflection from screens.

Indirect lighting is most suitable for ceiling heights within the range 2.5 to 3.5 m. Indirect luminaires can only be used at ceiling heights in the range 2.3 to 2.5 m if careful attention is paid to light distribution to avoid high luminance spots occurring immediately above the luminaire. Ceiling heights greater than 3.5 m can be used but at extra cost in terms of installed power. Indirect lighting luminaires will usually be seen against the ceiling. To avoid excessive contrast, the outer surfaces of indirect luminaires should be light in colour.