7.2 Daylight availability

Daylight varies in both amount and spectrum with sun altitude and atmospheric transmission. This means that the availability of daylight will vary with the season of the year and the nature of cloud cover. Figure 7.3 shows how the illuminance on a horizontal plane provided by daylight varies with the time of year and the time of day. Details on the availability of daylight can be found in SLL Lighting Guide 10 and Littlefair and Aizlewood (1999)

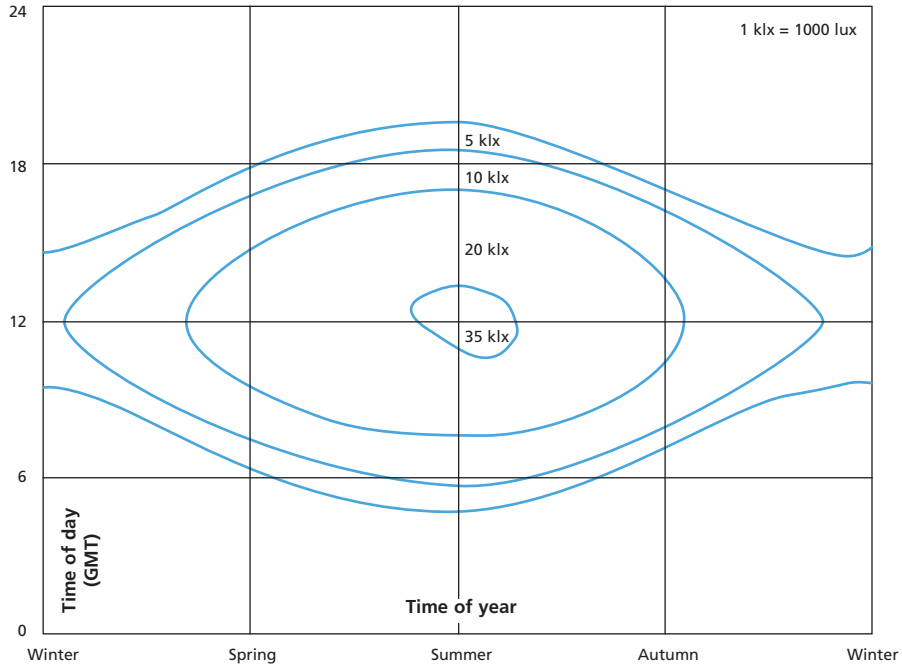

Figure 7.3 The illuminance on a horizontal plane provided by daylight varies with the time of year and the time of day

Of course, these illuminances are measured on an unobstructed horizontal plane. In a building, the amount of daylight available will depend on the position and size of the windows or rooflights. The contribution of daylight inside a room is given by the daylight factor in conjunction with the daylight availability. This can indicate a minimum, a range or an average. The daylight factor is defined as the ratio of the illuminance at a point within a building to the illuminance on an unobstructed horizontal surface at the same position. Daylight factor is usually expressed as a percentage.

For determining the minimum contribution of daylight to an interior, it is usual in temperate climates like that of the UK to assume the luminance distribution of the sky follows the CIE Standard Overcast Sky. (Figure 7.4) This assumption eliminates sunlight from consideration. For the Standard Overcast Sky, daylight factor is the sum of three components; the sky component, the internally reflected component and the externally reflected component (Figure 7.5). The sky component is the light that reaches the measurement point directly from the sky. The internally reflected component is daylight that arrives at the measurement point after reflection inside the room. The externally reflected component is daylight that arrives at the measurement point after reflection outside the room.