4.2 Luminance distribution

4.2.1 General

The luminance distribution in the visual field controls the adaptation level of the eyes which affects task visibility.

A well balanced adaptation luminance is needed to increase:

— visual acuity (sharpness of vision);

— contrast sensitivity (discrimination of small relative luminance differences);

— efficiency of the ocular functions (such as accommodation, convergence, pupillary contraction, eye movements, etc.).

The luminance distribution in the visual field also affects visual comfort. The following should be avoided for the reasons given:

— too high luminances which can give rise to glare;

— too high luminance contrasts which will cause fatigue because of constant re-adaptation of the eyes;

— too low luminances and too low luminance contrasts which result in a dull and non-stimulating working environment.

To create a well balanced luminance distribution the luminances of all surfaces shall be taken into consideration and will be determined by the reflectance and the illuminance on the surfaces. To avoid gloom and to raise adaptation levels and comfort of people in buildings, it is highly desirable to have bright interior surfaces particularly the walls and ceiling.

The lighting designer shall consider and select the appropriate reflectance and illuminance values for the interior surfaces based on the guidance below.

4.2.2 Reflectance of surfaces

Recommended reflectances for the major interior diffuse surfaces are:

— ceiling: 0,7 to 0,9;

— walls: 0,5 to 0,8;

— floor: 0,2 to 0,4.

NOTE   The reflectance of major objects (like furniture, machinery, etc) should be in the range of 0,2 to 0,7.

4.2.3 Illuminance on surfaces

In all enclosed places the maintained illuminances on the major surfaces shall have the following values:

— $\bar{E}_m > 50$ lx with $U_o \geq 0,10$ on the walls and

— $\bar{E}_m > 30$ lx with $U_o \geq 0,10$ on the ceiling.

NOTE 1   It is recognised that, in some places such as racked storage places, steelworks, railway terminals, etc., due to the size, complexity and operational constraints, the desired light levels on these surfaces will not be practical to achieve. In these places reduced levels of the recommended values are accepted.