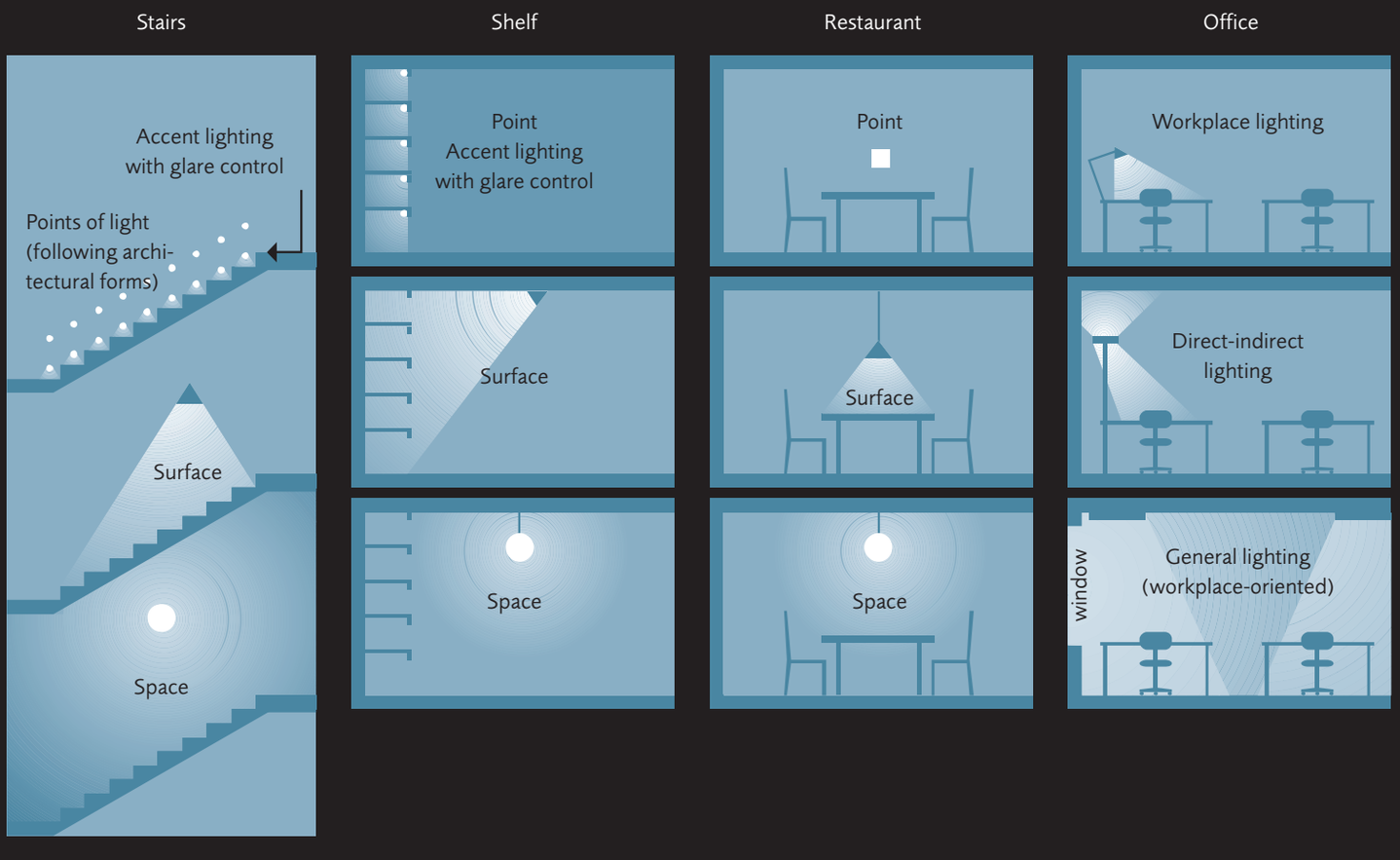
Series (4):

Designing the light for a project



Short preface

In the last issue of PLD we presented the control of luminous flux as the most important property of a luminaire. In this section, the position of the luminaire in the space is defined. The space is regarded – in part or as a whole – as a series of surfaces which reflect light.

Graphic design: Kerstin Schröder, Peter Zickermann, Bielefeld

Series (4): Designing the light for a project

Designing the light for a project

When designing the light for a project, the lighting designer must make a basic decision about the dimensions of the light in the space

- point(s) of light
- illuminated surface(s)
- illuminated space

As a rule, the light source itself acts as a signal when applied alone as a point of light, and as a directional aid when organised in rows. If a series of luminaires is installed parallel to a flight of stairs, this row of points of light dominates the functional flow of the space. If the luminaires are installed between the tread and the rise so that the eye does not look directly into the light sources, the material flight of stairs become a stairway of light and dominate the space in a different way. When lighting a staircase, it is important to ensure that the luminaire is positioned so that the tread is brighter than the rise. The contrast in luminances helps the human eye to read the stairs and the individual steps.

In the case of integral shelf lighting, it is possible to create clear perceptual differences between the wall that is lined with shelves and the other surfaces in the space. This involves intricate design work and expense, but is justified when the shelves house valuable items. The principles involved when illuminating surfaces and illuminating a three-dimensional space are the same as those applied in the example with the flight of stairs.

In restaurants, points of sparkling light create the atmosphere, a luminaire suspended above the table surface provides functional light, and ambient lighting (overall illumination) sobriety and objectivity. These three types of lighting are typically used in "exclusive restaurant", "domestic situation" and "canteen" environments.

Whereas in restaurants, a high-quality visual environment is required, in office spaces it is functional visual performance that is most important. The working plane should be well lit, and carefully harmonised contrasts of all surfaces within the field of vision are the prerequisites for good work. The balance of direct and indirect light is especially important in this area. When designing the lighting for offices with personal workstations (with computer monitors) the standards and regulations pertaining to the respective countries should be referred to. In the case of special applications, however, standards should be taken as guidelines.

Closing remark

The above text and the illustrations do not suffice to deal with the wide range of products available, and different luminaire technologies and lighting engineering techniques, not to mention the abundance of regulations, stipulations and recommendations. The basic task consists of defining the function of the space and deciding how the light is to be used in the space. This is the job of the lighting designer.

The first step involves purposefully using the amount of light emitted by the light sources, luminaires and light guides. The second step is controlling the light by selecting the surfaces which will reflect it, provided the lighting designer is in a position to influence this. The third step is the most difficult: light is inseparably linked with perception, and perception is inseparably linked with the space.

Lighting design is therefore, in the broad sense of the term, spatial design.

Prof. Gero Canzler