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SITE LAYOUT PLANNING FOR DAYLIGHT AND SUNLIGHT

A guide to good practice

SECOND EDITION

Paul Littlefair



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SUMMARY

This guide gives advice on site layout planning to achieve good sunlighting and daylighting both within buildings and in the open spaces between them. It is intended to be used in conjunction with the interior daylight recommendations in the British Standard *Code of practice for daylighting*, BS 8206-2. It contains guidance on site layout to provide good natural lighting within a new development; safeguarding of daylight and sunlight within existing buildings nearby; and the protection of daylighting of adjoining land for future development.

A special section deals with site layout for passive solar buildings that use the sun as a source of heating energy. Guidance is also given on the sunlighting of gardens and amenity areas. Issues like privacy, enclosure, microclimate, road layout and security are briefly reviewed. The appendices contain methods to quantify access to sunlight and daylight within a layout.

This guide is a comprehensive revision of the 1991 edition of *Site layout planning for daylight and sunlight: A guide to good practice*. It is purely advisory and the numerical target values within it may be varied to meet the needs of the development and its location. Appendix F explains how this can be done in a logical way, while retaining consistency with the British Standard recommendations on interior daylighting.

Acknowledgements

This guide was produced following an extensive period of consultation with architects, planning officers, consultants, professional institutions and government officials. Special thanks to Joe Lynes and John Basing, who helped to formulate some of the original guidance here, and to Dr Peter Defoe of Calfordseaden LLP who suggested changes to Appendix E Rights to light.

The contributions of all concerned are gratefully acknowledged.



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HOW TO USE THE GUIDE

Before using this guide, read the Introduction on page 1 which sets out the scope and nature of the guidance.

Summary of content

Terms and definitions

A glossary of terms and definitions used within the guide is on page viii.

Designing for good daylighting and sunlighting within a new development

Refer to Section 2.1 in Section 2 *Light from the sky*, section 3.1 in Section 3 *Sunlighting*, and Appendix C. Section 4 explains how to plan for winter solar heat gain. If there is a conflict with other requirements, Section 5 gives advice.

Protecting the daylighting and sunlighting of existing buildings

See Sections 2.2 and 3.2. Appendix E explains rights to light.

Daylighting of land adjoining a development

This is covered in Section 2.3. Section 3.3 deals with sunlight in gardens and other open spaces between buildings.

Trees and hedges

Appendix H gives guidance on trees and hedges.

Environmental impact assessment

Appendix I explains how to apply the guidance on environmental impact assessment.

The other appendices contain calculation methods and data to help assess the daylighting and sunlighting within a site layout.

GLOSSARY

Average daylight factor (ADF)	Ratio of total daylight flux incident on the working plane to the area of the working plane, expressed as a percentage of the outdoor illuminance on a horizontal plane due to an unobstructed CIE standard overcast sky. Thus a 1% ADF would mean that the average indoor illuminance would be one hundredth the outdoor unobstructed illuminance.
CIE standard overcast sky	<p>A completely overcast sky for which the ratio of its luminance L_γ at an angle of elevation γ above the horizontal to the luminance L_z at the zenith is given by:</p> $L_\gamma = L_z \frac{(1 + 2 \sin \gamma)}{3}$ <p>A CIE standard overcast sky is darkest at the horizon and brightest at the zenith (vertically overhead).</p>
Daylight, natural light	Combined skylight and sunlight.
No sky line	The outline on the working plane of the area from which no sky can be seen.
Obstruction angle	The angular altitude of the top of an obstruction above the horizontal, measured from a reference point in a vertical plane in a section perpendicular to the vertical plane.
Probable sunlight hours	The long-term average of the total number of hours during a year in which direct sunlight reaches the unobstructed ground (when clouds are taken into account).
Sky factor	Ratio of the parts of illuminance at a point on a given plane that would be received directly through unglazed openings from a sky of uniform luminance, to illuminance on a horizontal plane due to an unobstructed hemisphere of this sky. The sky factor does not include reflected light, either from outdoor or indoor surfaces.
Vertical sky component (VSC)	Ratio of that part of illuminance, at a point on a given vertical plane, that is received directly from a CIE standard overcast sky, to illuminance on a horizontal plane due to an unobstructed hemisphere of this sky. Usually the 'given vertical plane' is the outside of a window wall. The VSC does not include reflected light, either from the ground or from other buildings.
Working plane	Horizontal, vertical or inclined plane in which a visual task lies. Normally the working plane may be taken to be horizontal, 0.85 m above the floor in houses and factories, 0.7 m above the floor in offices.

SITE LAYOUT PLANNING FOR DAYLIGHT AND SUNLIGHT

Fully revised and updated, this guide gives advice on site layout planning to achieve good sunlighting and daylighting both within buildings and in the open spaces between them. Widely used during the planning and design stages of building development, the new edition of BR 209 is a 'must have' for building and planning professionals.

What's new?

- provides a new method for assessing obstruction to daylight
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- gives advice on obstruction and orientation of solar thermal and photovoltaic installations
- outlines the effects of dense urban areas, trees and hedges on buildings.



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