

4174181325 : MAJOR BUILDING TECHNOLOGY

KEY WORD : DAYLIGHTING / DAYLIGHTING FACTOR / SIDE LIGHTING DESIGN

SUREEPAN SUPANSOMBOON : AN INVESTIGATION OF FACTOR EFFECTING
NATURAL SIDELIGHTING ILLUMINATION FOR GENERAL BUILDING . THESIS ADVISOR
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Sidelighting is commonly used in building. Problems in design with sidelighting are level of inside illumination at working plane far from the window is not enough and luminance ratio between the area near the window and the distant area is too much. However, because of the lack of understanding of the sidelighting, the use of daylighting is not so beneficial. This research, therefore, is to investigate the influences and the relation of variations which effect on the effective using of sidelighting and to suggest a design which can be really applied for building.

This study was conducted by measuring interior illumination in models under natural sky and then analyzing the following variations. There are : sky condition, sun geometry, ground reflectance, ground area, ground surface, window area, window level, interior reflectance, interior surface, room width, room length, ceiling height and interior reflection pattern.

The research results were shown that general room width and length cause slightly sidelighting effect compared with other variations. Otherwise, the most important variation is interior reflectance, not only it causes sidelighting efficiently but it also takes an influence towards other variations. Sidelighting efficiency depends on major influences: internally reflected component, sky component and ground component. If interior reflectance is high, light will come in to the room deeply. Internally reflected component takes an effective influence. Sky component will cause effect when high window is used. High window helps light shining into the working plane deeply. In the case of ground component, if the light comes in to the ceiling deeply, it will be getting more beneficial. Besides, there are other aspects that were studied in details but since they don't take so much influences comparing with the mentioned above, it is omitted hereby.

The results of this research can be certainly applied for constructing design tool, nomograph. It is beneficial for designer used to predict illumination level easily without calculation and it causes clear understanding of concrete usage of natural sidelighting for building.