

C835105 : MAJOR BUILDING TECHNOLOGY

KEY WORD:

DAYLIGHT UTILIZATION / SHADING DEVICES / COOLNESS INDEX / DAYLIGHT TRANSMISSION

KANOKWAN USANNO : THE APPROPRIATE OF SHADING DEVICES FOR CLASSROOMS · DAYLIGHT UTILIZATION AND HEAT GAIN REDUCTION. THESIS ADVISOR : ASSIST.PROF.

SOONTORN BOONYATIKARN, Ph.D. 160 pp, ISBN 974-636-753-6

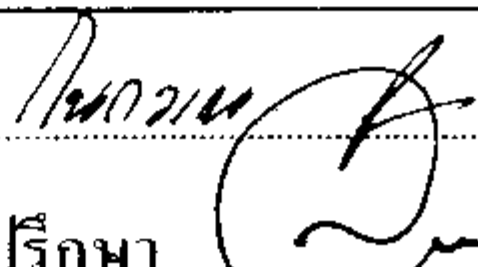
The study of the appropriate shading devices for the classroom focuses on daylight utilization and heat gain reduction in hot-humid climate 14 N. The experiment was conducted by design shading devices for classroom openings on the northside eastside, southside and westside to study daylight quantity and daylight distribution in those classrooms with 13 typical shading devices. The 13 typical daylight models composed of 3 categories; horizontal shading device/vertical shading device and combination of horizontal/vertical shading device. The research was conducted in the skydome and the 13 typical daylight models were built to study daylight quantity. Required artificial light and cooling load from these models was calculated to compare total energy consumption. Sky condition in the skydome was simulated as clear sky. The position of the light source referring to the sun was fixed at the same position of the sun on 21 March, 22 June, 23 September and 22 December (equinox, summer solstice and winter solstice) which represents to the days through the year. Azimuth angle and altitude angle were used to fix the position of light source and the experiment started at working time 8.00 - 16.00.

The results of the experiments indicate the appropriate of the shading devices in each direction is different. Northside openings derive less effect from solar radiation than other sides. The use of horizontal overhang can block the sun but result in total energy consumption no different from non-opening classrooms. The use of high performance glazing in which high coolness index (The ratio of daylight transmission : shading coefficient) can reduce total energy consumption to 60% of non-opening classroom is the appropriate shading device in this orientation. Eastside and westside openings derives more effect from solar radiation than others. The most appropriate method is using high performance glazing with the combination of overhang, louvre and vertical shading devices. For southside openings : the appropriate shading devices is overhang-louvre shading devices. From the research : This method result in 70% of total energy consumption in comparison to non-opening classroom.

ภาควิชา สถาปัตยกรรมศาสตร์

สาขาวิชา เทคโนโลยีทางอาคาร

ปีการศึกษา 2539

ลายมือชื่อนิสิต 

ลายมือชื่ออาจารย์ที่ปรึกษา 

ลายมือชื่ออาจารย์ที่ปรึกษาร่วม 