

## Abstract

This research aims at study of effects of heat transfer into buildings with inclining glass walls for avoiding the direct solar radiation. The study is divided into four parts. 1) To study the effect of heat transfer through inclining glass walls comparing with the perpendicular glass walls facing to the South and the North. The south inclining glass wall inclines 45 degrees and the north inclining glass wall inclines 70 degrees. 2) To study the influence of surrounding which affects on the heat transfer through the inclining glass walls. 3) To study thermal properties of floor materials in front of the inclining glass walls. These three studies are the analyses of indoor air temperature, outside and inside glass surface temperatures in order to evaluate the efficiency of heat transfer. 4) To study the interior colour in order to adjust the illumination inside the room using inclining walls by simulation program called 3dsMax.

The results of the study about inclining glass walls which are compared with the perpendicular glass walls, when the sun declination is about  $15^\circ$  in April and May, indicates that there is a similar effect of direct solar radiation in the South and the North. The models which are set up above the ground floor show that the south inclining glass wall affects on decreasing temperature inside the study model, whereas, the north inclining glass wall has no effect on decreasing temperature inside the model, comparing with the perpendicular glass walls in both directions. The models which are set up on the ground floor with floor materials in front of the glass walls show that the inclining walls in the South and the North could avoid direct solar radiation, however; they receive much the radiation from environment. Considering to thermal properties of floor materials in front of the glass walls, the study shows that the higher reflectivity of materials caused the greater reflected radiation to the inclining glass walls. They are also much affected by heat from emittance, according to the higher absorptivity and higher emissivity.

Furthermore, the study about inclining glass walls using with interior colour shows that they help decreasing effect of daylight. Simulation models indicate that dark colour decreases the light reflection in the room and adjusts the illumination to be less bright on the working plane. In the deepest part of the room uses light colour to increase the light reflection and adjust the illumination to be brighter.

Although the inclining glass wall to avoid the direct solar radiation is able to decrease heat transfer through the glass walls, there is still the effect of radiation from environment. This research can be applied as a fundamental concept for building design using the inclining glass walls, considering the sun position and surrounding.