

ABSTRACT

As long as the sun remains the greatest single power for discomfort in our lives throughout the year, we must live with the problem of repelling its heat. In every part of Trinidad and Tobago, the sun forces its way into our buildings, and under some conditions it can turn an otherwise pleasant building into a minor inferno. The interior becomes overheated and retains its heat into the evening. Sometimes the climate inside the building is hotter than that outside.

The problem of excessive solar heat gain in our buildings can, of course, be easily solved with mechanical air-conditioning. But the overall costs of mechanical air-conditioning today are too high a price for anyone to pay for indoor comfort, especially in a country where (except in the densely built-up urban areas where wind speeds are low or where noise and dust nuisance can be trying) mechanical air-conditioning cannot be considered essential in well-designed buildings. There are — and always have been — some other ways to live with the tropical sun.

Our buildings can, and should, be designed according to the relationship of the sun and the wind to the building site. By simply orienting our buildings for maximum penetration of the prevailing breeze and protecting their interiors from the direct rays of the sun, we go a long way towards achieving year-round indoor comfort. The climate inside a building is also largely determined by the fabric of

the building. Building materials of low thermal conductivity (high thermal resistivity) are more suitable for the climate of this country than those of high thermal conductivity (low thermal resistivity).

Guidance in designing buildings according to the path of the sun and the direction of the prevailing wind in this country and for the climate of this country in general is given in the chapters that follow. In order to design for maximum breeze penetration in a building, an understanding of the behaviour of wind forces near the ground and around buildings is necessary. Similarly, in order to design for minimum solar heat penetration in a building, a knowledge of the thermal insulation properties of building materials is essential. The behaviour of wind forces near the ground and around buildings and the effects of solar radiation on the fabric of a building are therefore discussed in Chapter 1.

In spite of the widely held view to the contrary, it is quite possible to induce a comfortable environment in buildings designed for this country without necessarily having to resort to mechanical air-conditioning, certainly a more desirable one than are provided by many of our so-called professionally designed buildings. This thought lies behind the planning and design considerations in Chapter 2. The siting of buildings is a widely neglected aspect of building design in Trinidad and Tobago. The FLIFDECO housing development at Couva is a case in point and is cited in Chapter 3 to show the relationship between building orientation and indoor climate.

Selecting suitable materials for the construction of a building can make an enormous difference in comfort conditions inside the building. The merits and demerits of timber and concrete as used in the construction of the roofs of the NEA bungalows at Pleasantville and the THDL bungalows at Santa Rosa Heights respectively are considered in Chapter 4 in the light of the suitability of these building materials for the climate of this country.

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