

Applicability of the building envelope requirements of “Energy Efficient Building Code for commercial buildings in Sri Lanka” (EEBC)

This study simulates the potential energy consumption effects of the recently introduced “Energy Efficient Building Code (EEBC) for Commercial Buildings in Sri Lanka” and its applicability for Sri Lankan office buildings. It analyzes the building envelope and air conditioning aspects of the EEBC and the actual effect of the code towards energy saving. The relevant standards stipulated are critically analyzed.

For the purpose of the study, a “typical” multistory office building in Colombo is computer modeled. The “typical” case is developed by analyzing the current office building practices in

Colombo. The above model is simulated using a parametric energy/ comfort analysis software (DEROB-LTH) and the energy consumption and user comfort are analyzed. The results are then compared with a building designed according to the EEBC standards. Additionally, several changes are introduced to the base model to increase or reduce the “Overall Thermal Transfer Value” (OTTV) of the building envelope. Changes to the OTTV are achieved by manipulating the Wall material, Window material, Window area Orientation and Overhangs for windows. The results are obtained in terms of cooling load (kWh) and thermal comfort (Operative Temperature - OT and the Predicted Mean Vote - PMV).

It is shown that the upper limit of OTTV specified in the EEBC leads to MORE energy consumption than is the case at present. As such the compulsory application of EEBC will lead to more energy consumption than energy saving, at least in the short term. It is also shown that reducing the OTTV is practically possible if only the building practices could be slightly changed. Further, considerable energy could be saved if the stipulated indoor set point temperature of the EEBC could be increased. Recommendations related to the improvement of the EEBC from a Sri Lankan viewpoint are presented, in terms of OTTV and set point temperatures for commercial buildings.