

OPTIMUM THERMAL DESIGN OF OFFICE BUILDINGS

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SUMMARY

Proper design and selection of building components at the early stages of the design process can greatly help in achieving thermal comfort with minimum reliance upon HVAC systems and, therefore, minimum energy requirements. Given today's complexities in building design as well as advances in computer technology, optimization techniques can be used as an aid to building designers in their decision making process. Office buildings are characterized by being 'internal-load' dominated with internal heat generation determining the need for energy to air-condition such buildings. This paper presents the results of applying an optimization model to the design of energy conserving office buildings in different climatic regions to test the impact of mainly envelope related parameters on the thermal performance of offices. Optimum sets of building design variables for three different sizes office building in four U.S. and two Saudi Arabian cities are presented with the objective of minimizing annual energy consumption for those buildings. © 1997 by John Wiley & Sons, Ltd.

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