

Review

Guidance material on the calculation of climatic parameters used for building purposes

(WMO Tech. Note No. 187)

By

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All through ages, the accumulated experience of local people used to prove adequate for designing buildings and for ensuring certain basic human comfort indoors. During the last few decades, however, demands on and expectation from indoor environments are increasingly becoming more numerous and exacting. To meet these, more refined tools are called for to aid designer's intuition. Fortunately, due to recent advances in scientific and technological realms, today we are in a position when large quantum of data on micro as well as global climate can be gathered continuously and accurately, analysed speedily, and synthesised appropriately for any specific requirement. Keeping in line with this trend, bulk of meteorological data is continuously being collected from stations spread world over. Its relevant processing and proper application in the design of buildings is of paramount importance. It is in this context that preparation of the Technical Note No. 187 containing guidance material on computation of climatic data to be used for buildings is a laudable stride in the right direction. This book, indeed is a useful tool for those concerned with climatic design of buildings and presents most suitable computational methods which are compatible with those used by international organizations like CIB, IAEA, IOB, IOS, etc. The presentation is highly technical and hence fairly good knowledge of climatology is required for utilising the information given herein. Since it is an English version of the original Russian text prepared by Prof. Kobysheva, terms like 'length of air flow lines' (page 6) which are otherwise not common, have crept in the text. The subject matter covered in this Technical Note is divided into five main chapters.

The Introductory chapter briefly gives the background and dwells upon reasons for use of climatological information and discusses various methods of its presentation. The main stages in the design work where climatological data should be taken into account are

identified in Chapter 2. These are : (i) site selection, (ii) wholistic study of the buildings, and (iii) detailed and specific designs and calculations. The basic principles involved in the use of climatic data during the course of aforesaid stages of building design are also covered.

Chapter 3 describe methods of selection of building sites *vis-a-vis* orientation, wind, solar radiation and degree of shading etc. Necessity of detailed knowledge of local climatological parameters has been emphasized and methods for preparing maps of micro-climatic winds, solar radiation and air temperature are discussed in detail.

Chapter 4 is devoted to the description of methods of regional climatic evaluation which includes general meteorological parameters like daily, monthly or annual averages. The need for converting data into specialised information such as number of degree days and duration of comfortable weather over the year, the mean annual illumination over a horizontal surface etc has been highlighted, and methods of its accomplishment have been discussed. This information is valuable in quantifying heating/cooling requirements of buildings as also for optimum design of fenestrations.

Information on determination of the effect of meteorological elements on building, particularly the load aspect related to wind, snow, temperature, driving rain etc is covered in Chapter 5. The data presented is useful for safe and functionally efficient design of buildings.

The book has fourteen appendices consisting of material related to the methods of preparation of maps of topography, vegetation, soil characteristics etc. Basic formulae for computation of solar radiation components on different surfaces and use of overlays and sun paths for estimation of radiation balance have also been clearly explained. Definitions of some of the terms used in the text are given in Appendix XII. The list is quite small and more terms could have been added to make it more meaningful. Presentation of the whole material in this book is in logical sequence with several worked out examples and nice tabulations. It is also supplemented by over 250 references which are well selected. As mentioned in the book itself, it is intended to be used primarily by climatologists. However, it is likely to be well received by a wider spectrum of users concerned with climatic design of buildings.

— S. K. MISRA