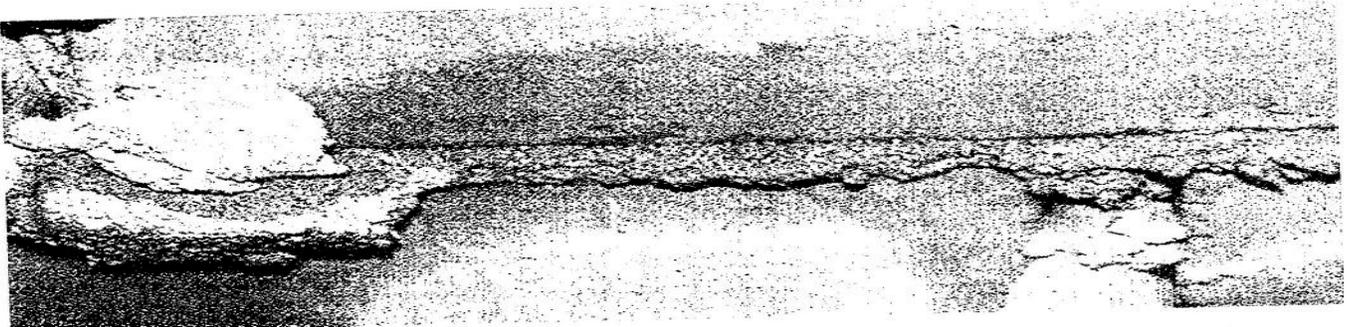


Methods of Building Physics

Mark Bomberg¹, Tomasz Kisilewicz² and Christopher Mattock³



The average energy use of MURBs in 1990 in Vancouver was 315 kWh im² year. It continued to decline and in 2002 reached 250 kWh/(m² year)(see Finch et al.,(2010). The shock, however, was to find that this energy level is equivalent to buildings in the 1920s. The masonry buildings without insulation, built nearly one hundred years ago, consumed as much energy as a shiny, glass-clad building constructed today. Yet, today we have so many measures to reduce energy consumption like thermal insulation, thermal mass, air barriers, high performance glazing systems etc.

This book is a script for students that shows how building physics moved from its beginning as a scribe for construction failures to become a Cinderella of 21st century. Building physics shows a growing discrepancy between performance tested in laboratory and that under service conditions. We see 20 - 30 percent effects of environmental factors. Yet, this difference fades out when one compares the difference in the real energy use in multi-unit building to the estimate obtained in laboratory. The same wall in a dwelling may show more than 10 times higher deviation.

Perhaps easier is to explain the same phenomenon when we compare airtightness of materials and systems. If airtightness of a material is given 100 % in a laboratory test, we typically measure a value 10 times lower in the laboratory test on the wall and even 100 times lower value when the same assembly is part of a real building enclosure and is tested under the field conditions. Why is it so?

The boundary conditions in a multi-unit dwelling depend on the connectivity of air space in the whole building.

“Methods of Building Physics is an excellent reference text that has simplified understanding the concepts of heat air and moisture flow in building materials and whole buildings so that practicing professionals such as architects and engineers can use it. The reference bibliography is also fantastic.”

Wagdy Anis, FAIA, LEED AP, Anis building enclosure consulting, Waltham, MA 02452

This book (368 pages) is a first step dealing with the road to the next generation of low energy buildings that are more focused on high quality environment for people. In doing so durability of the shell, energy efficiency and carbon emission are automatically included.

Order in the US from Dr. David Yarbrough dave@rdservices.com and in Canada from dr, Mark Bomberg mark.bornberg@gmail.com. Price: one copy \$50, three copies or more \$45.

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