

THIRD EDITION

BUILDING SYSTEMS FOR INTERIOR DESIGNERS



CORKY BINGGELI, ASID



WILEY

Building Systems for Interior Designers

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Preface

The first edition of *Building Systems for Interior Environments* arose from my need for a textbook to use in teaching interior design students that gave them the understanding and skills to work with architects and engineers. This third edition of *Building Systems for Interior Environments* updates the role of interior designers as part of the building design team, and addresses their special needs for information on today's building system design and equipment.

Interior designers today work closely with other design and construction professions to provide functional, sustainable, and healthy buildings. Sophisticated digital control systems permit design that supports varied occupancy and work styles and schedules. This results in more individualized control of the interior environment, which is conducive to worker satisfaction and productivity.

Sustainable design supports a holistic approach to building systems, where the older territorial distinctions between the various building system and architectural/engineering disciplines are opening up. Existing buildings are being adapted and reused for new purposes. The impact of energy efficiency and water conservation in buildings is widely recognized. This third edition of *Building Systems for Interior Environments* reflects these changes.

In addition, the third edition benefits from the comments of experienced educators as to the best ways to organize and focus the information. The updated contents are arranged to flow smoothly in an order that facilitates the teaching process.

Part I looks at environmental conditions and the site, the building envelope and the building design process, sustainable design, the interaction of the human body with the built environment, and how building codes protect us. Part II addresses building forms, structures, and elements including floor/ceiling assemblies, walls, stairs, windows, and doors. Part III introduces acoustic design principles and architectural acoustics. Part IV addresses water supply, waste, and reuse systems, as well

as plumbing fixtures and appliances. Part V covers principles of thermal control, indoor air quality, ventilation, and moisture control, and heating and cooling. Part VI explains electrical system basics and electrical distribution, as well as lighting systems. Part VII concludes the book with coverage of fire safety design, conveyance systems, and communications, security, and control equipment.

More than 40 percent of the third edition's text is new. This edition contains over 485 illustrations, approximately 260 of which are new and 160 redrawn or revised. There are also over 175 tables, 125 of which are new or significantly revised. References to related materials in other chapters are included. Tips indicating material of assistance and interest to interior designers are also included. Key terms are defined in the text and indicated in **bold**. Quotations from architectural and engineering sources aid in understanding the perspective of other design professionals.

Interior designers need to understand the viewpoints and respect the expertise of other design professionals. *Building Systems for Interior Designers* provides the information they need to do this, without delving into engineering calculations. It focuses on the parts of the building design process that most affect the occupants' functional needs, and provides a technical but readily understandable foundation for the design of interior spaces. Residential as well as commercial and institutional spaces are included.

Building Systems for Interior Designers is listed by the National Council for Interior Design Qualification (NCIDQ) as a reference for preparation for the NCIDQ exam. The third edition is supplemented by online materials including an Instructors Manual with knowledge areas, topics for discussion, and definitions of key terms, PowerPoint presentations for each chapter, and a Test Bank with sample questions. Supplemental material is available at www.wiley.com/go/bsid3e.

Corky Binggeli, ASID
Arlington, MA

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I especially want to thank my editors, Paul Drougas, Lauren Poplowski, and Seth Schwartz, their able assistants Michael New and Melinda Noack, and production editor Amy Odum.

The feedback of my colleagues and students is invaluable in assuring that this edition meets their needs. I especially

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As is the case with all my books, I am indebted to my husband, Keith Kirkpatrick, for his support and assistance. He puts up with my obsessive focus, makes sure I am properly fed, and gives solid advice when I'm struggling with a decision. Keith also reviewed and commented on all of the illustrations. Thank you, Keith!

PART

I

THE BUILDING, THE ENVIRONMENT, AND HEALTH AND SAFETY

Interior designers today work closely with other design and construction professionals to provide functional, sustainable, and healthy buildings. Sustainable design is supporting a holistic approach to building systems, and older territorial distinctions between various architectural and engineering disciplines are opening up. Existing buildings are valued for the materials and energy they embody, and many projects involve the renovation of building interiors.

Interior designers are increasingly working as part of environmentally aware design teams. Sustainable design involves interior designers observing the impact of a building's site, climate, and geography on its interior spaces. Building interiors are increasingly open to natural settings and views, and the interior designer's work may bridge interior and exterior spaces. Wise energy use dictates awareness of how sun, wind, and heat or cold affect the building's interior.

While focusing on building elements that affect interior designers, *Building Systems for Interior Designers, Third Edition* addresses this multidisciplinary approach to building design. We begin our study of building systems in Part I by looking at the relationships among the environment, the building, and human health and safety.

Chapter 1, "Environmental Conditions and the Site," looks at climate change, energy sources and consumption, and how site conditions affect building design.

Chapter 2, "Designing for the Environment," investigates the building envelope and the role of insulation in heat flow. Energy efficient design, the building design process, and sustainable design are introduced.

Chapter 3, "Designing for Human Health and Safety," addresses the interaction of the human body with the built environment and how building codes protect us.