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Reviewed by Daniel Willis

## Fundamentals of Building Construction

Materials and Methods

by Edward Allen; illustrated by Joseph Iano  
New York: John Wiley & Sons, 1999,  
Third Edition

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SINCE THE FIRST EDITION of Edward Allen's *Fundamentals of Building Construction* was published in 1985, the book has become as ubiquitous as tracing paper in schools of architecture. Now in its third edition, Allen's book is the standard text in building construction courses, not only in architecture but also in engineering, construction, and real estate courses. Its publisher's website claims that over 10,000 students use the text every year. The most obvious reason for this popularity—and I personally sell about seventy copies of Allen's book each year, by requiring my students to buy it—is that it is clear, thorough, and reasonably complete. I suspect that its clever niche marketing plays an equally important role. For example, one might be tempted to claim that the dearth of information on mechanical and electrical construction, or on conveying and communication systems in buildings, is an oversight in an apparently comprehensive book. But upon closer consideration one realizes that *Fundamentals of Building Construction* dovetails neatly with another Wiley offering, the equally popular *Mechanical and Electrical Equipment for Buildings*, by Benjamin Stein, now entering its ninth edition. And, in a similar way, by providing detailed explanations of materials and methods, Allen avoids

head-to-head competition with Frank Ching's mostly graphic *Building Construction Illustrated*.

A third reason for the book's popularity—its ability to span the worlds of architecture, engineering, and property development—is that it is at once effective and inoffensive. Allen presents the material in straightforward fashion, using clear illustrations and well-conceived tables, with a minimum of sermonizing. But the author pays a price for this matter-of-factness: if my second-year undergraduate architecture majors are any indication, students find the book intolerably dull. I am forced to employ a mix of threats, coercion, and surprise quizzes to make them actually read it. This is not unusual in a textbook, and I have some explanations for this particular case; but first I want to evaluate the new edition on its own terms.

The third edition has six more chapters than its predecessor. Some are truly new, others the result of reorganizing material from the earlier versions. Wiley's promotional blurb extols the use of CAD drawings for the first time, along with the dubious claim that they are included for their "greater precision." In the case of the newly CAD-drafted structural steel connections, the illustrations in this new edition are indeed an improvement. More photographs of buildings by famous architects are included here, presumably to introduce a measure of design awareness. Given that the book this volume (in all its editions) has replaced in many curriculums, Caleb Hornbostel's *Materials and Methods of Contemporary Construction*, is out of print, and that other offerings, such as Harold Bennet Olin's *Construction: Principles, Materials, and Methods*, are intended for professionals rather than students,

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Allen's third edition is likely to remain the champion in this heavyweight (\$89.95) division. Other noteworthy improvements include the dividing of the overlong masonry chapter into three chapters, the inclusion of a chapter on light-gauge steel framing, and better coverage of cladding systems and interior finishes.

The glaring omission of this volume is the absence of commentary on the environmental impacts of building construction. When I started receiving promotional mailings for the new edition, I assumed that it was ideally timed to include this relevant material. But here one finds only token references to environmental concerns. To the list of "four basic questions" which the author argues a building's designer must ask to select its materials, Allen notes that "increasingly engineers and architects are adding a fifth question to this list: What is best for the environment?" This comment appears on page 12, after which the issue is pretty much abandoned for the remaining 840 pages. Given the book's many useful tables, one might have expected a summary at the start of each chapter—similar to those in the AIA's excellent *Environmental Resource Guide*, another Wiley publication—of the environmental impacts of each building system. *Fundamentals* also ignores viable green building methods, such as adobe, rammed earth, or straw-bale construction. Also, most of its illustrations are of new buildings, which contradicts the ever-growing percentage of architectural projects that involve the preservation, restoration, and reuse of existing structures. I am not sure why Allen has chosen this path. As a reader of the newsletter he distributes to "tech teachers," I assume he is neither naive nor unaware. I can only imagine that the author and his publisher were concerned that many of the students who read this text every year might have been alienated by the inclusion of disturbing questions about industrialized building production, unfettered development, or even the constraints that materials and environments impose on "pure" architectural form.

This leads me back to my students' complaints about previous editions of the book. Contrary to some of my teaching colleagues, I do not consider construction to be an inherently boring topic. As I've often observed—participating in "hands-on" construction exercises with my students, watching craftspeople exercise their skills, or undertaking my own construction projects—*building is fun*. Give a child a set of Lego blocks and he or she, once the system is mastered, will soon be building impressively challenging constructions. Industrialized building production, however, runs counter to this human impulse, seeking to eliminate uncertainty and replace risk with efficiency. If building itself is not dull, building reduced to neutral technique certainly can be. So Allen is caught in a bind. If he extols craftwork, experimentation, love of materials, and the joy of improvisation, he runs counter to the conventions of contemporary production. The result might be a fascinating book, but not one which 10,000 students per year would be required to read.

Allen *has* written interesting books, such as the delightful *Stone Shelters*, a study of vernacular masonry practices in Italy. Allen also writes persuasively in his above-mentioned newsletter, *Connector*. In the Spring 1999 issue, for instance, he eloquently editorializes against the tendency of some architectural programs to water down construction education. And in a newsletter accompanying *Fundamentals* (which, like all well-conceived textbooks, is as much a system as a book, including an instructor's manual, exercises for students, and illustrations that can be downloaded from the publisher's website), Allen includes the following item: "Ick. Now a manufacturer is *marketing a single-ply roof membrane that's been imprinted to look like asphalt shingles*. It is being pushed for use on modular and mobile homes. This looks like a serious contender in the race to invent cheaper, meaner, chintzier materials. I won't embarrass the miscreant company by publishing its name. Onward and ever downward. . . ."

I can only wish that *Fundamentals* it-

self contained similar snippets of forthright opinion to rouse students' imaginations. The author occasionally manages to slip in a few diluted criticisms, such as when he laments the "spatial monotony" that results from the over-reliance on trusses to frame gable roofs. Of course, such digressions, if plentiful, would undermine the detached tone expected of a textbook. Textbooks usually take pains to disguise their assumptions—for example, by dispensing with footnotes or detailed references. In this regard *Fundamentals* is no different, for it too is based on an unacknowledged theory—the theory that building is (or ought to be) a species of industrialized production, a purely instrumental operation. In this, Allen is merely describing the status quo. Were the author wholeheartedly committed to this theory, however, he would not be saying "Ick" to what is, after all, simply an instance of "value engineering."

That "Ick" raises troubling questions, invoking the specter of Ruskin and suggesting the need for an *ethics* of construction that would extend beyond the efficient production of functional commodities. This crucial issue is beginning to get the attention it deserves, for instance, in Edward Ford's two-volume *The Details of Modern Architecture*, and in recent books by Karsten Harries and Kenneth Frampton, as well as in the more thoughtful writings about sustainability. Allen is clearly both qualified and eager to contribute to this debate, yet in his textbook he (usually) restrains himself from doing so. Given its intended audience, this is not a decision I am willing to fault. But for those who know the range of his writings, Allen's wavering commitment to the practices he describes gives *Fundamentals* a schizophrenic aspect. For example, along with the illustrations of work by famous architects (as always, no guarantee of quality), the book features images of some dreadful buildings. Design studio critics will cringe when they come across the Dryvit-clad bank on page 713, or, on page 637, a mirrored-glass hotel that is as dated as a leisure suit.

Indeed, why the writer who, in *Con-*

*nector*, rails against architecture taught as “theatrical set design” would include the Eric Owen Moss building shown on page 203 is a mystery; perhaps he is aiming to satisfy student taste for the trendy. Even the few but admirable mentions of vernacular building practices—Mauritanian brick domes, thatched roofs—fail to acknowledge how out-of-step these constructions are with the comparatively mindless assembly of prefabricated parts that is characteristic of even the most formally inventive contemporary building. This placing of bad buildings next to good, of industrialized production next to vernacular, of Eric Owen Moss alongside Louis Kahn, produces a false equivalence among examples of widely divergent philosophy and quality.

Perhaps it would be unfair to ask that Allen’s book do what no other I know has yet done: to show only buildings that are both well designed *and* sensitively built. To compile such a volume would be a heroic task; only a sensibility equally attuned to *both* design and construction can heal the rift between the studio and technical courses in the curriculum. Ford’s excellent books come close, but they are not comprehensive enough for a textbook. Along with some other, more narrowly focused books, such as Eggen and Sandaker’s *Steel, Structure, and Architecture*, they provide a glimpse of how design sensitivity can bear upon the practice of constructing buildings. The third edition of *Fundamentals* shows some signs of moving in this direction, and in this regard it remains far superior to Ching’s *Building Construction Illustrated*, which offers only generic examples of buildings.

So I still intend to use *Fundamentals* in my teaching, mostly because, when Allen and the illustrator, Joseph Iano, write that “we believe that ours is the best book of its kind on the planet,” I cannot disagree. Any misgivings I hold about their book apply just as strongly to its few competitors. Flawed it may be, as all books surely are, it is still better illustrated, more “student friendly,” and more comprehensive than anything else I have found. I know many professionals who keep the book as a reference, and

many recent graduates who use the book as a study aid for the licensing exam. The third edition will remain the backbone of my courses, but I will supplement it with the relatively inexpensive *A Primer on Sustainable Building*, some articles of my own on the sociocultural aspects of making buildings, various writings by Italo Calvino, Gaston Bachelard, and others, and with studies of work by Gaudí, Scarpa, Serra, and Christo, and anything else that I can think of that will give my students an appreciation of the joy of making—and of its relevance to design.

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*Daniel Willis* is associate professor of architecture at Pennsylvania State University and author of the recently published *The Emerald City and Other Essays on the Architectural Imagination*.