

Architectural Acoustics: A Guide to Integrated Thinking

Raj Patel

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Many texts begin with the same two words, “Architectural Acoustics,” with various subtitles or qualifiers of what is to come on the pages after. Author Raj Patel brings clarity to his intent in paragraph four of page 1, where he explains that this book is for those who wonder why and how acoustics is important to architectural design. In this focus, the book achieves its mark, as will be discussed below.

The author explains that the book was requested by RIBA and various architects who recognize the value of acoustics in architecture and saw an opportunity for fresh explanation from a leader of an organization that has had extensive influence on the architectural community. The book begins with 4 short sections that are more discussions of acoustics, followed by a section with extensive definitions and explanations of acoustical terminology for issues within, outside and impacting architectural projects. These 5 sections conclude on page 65, after which the reader is presented a broad range of case studies for project types ranging from assembly and performance spaces to healthcare facilities, workplaces, educational institutions, civic spaces, hospitality and residential buildings, transportation facilities and worship spaces. Each of these sections was contributed by colleagues of the author, who presumably specializes in each of these project types.

The first chapter provides a brief historic view of the intersection of acoustics and public spaces. While not an in-depth explanation of these relationships, it begins at the caveman era to set the basis for how humans have interacted with their environment. For those curious in acoustics, this can suffice for connecting the initial dots, but for those seeking further insight and knowledge, the bibliography will point you to the foundational information on these topics.

A discussion of soundscapes follows and provides a very brief introduction for the reader to this topic. This chapter defines the scales of soundscapes, starting from the city level and zooming into the room level. More importantly, the 4-page discussion highlights the three ways in which soundscapes are shaped to create the sensations that people can experience. A recent and monumental example of soundscape planning is used to highlight the approach, while other notable examples of soundscapes are also described in brief detail.

The third chapter uses 4 pages to highlight how sound and architecture interact to provide the occupant with the final experience. This section mentions what might be ARUP's greatest contribution to the architectural

community, which is their use of auralizations to convey the acoustical experience of their clients' designs and the acoustician's recommendations that are being proposed. Their basis for this focus is simple: sound is subjective. For one to make judgements of a design, it is not sufficient to view charts, graphs, and analyses of our industry's knowledge, but rather to hear the best prediction that can be made using the technology that exists. Patel proceeds to highlight how designers have the potential to leverage sound in far greater ways, depending on their capacity for creativity. Here is where the push for integrated thinking is covered, though without any significant emphasis. The chapter concludes by noting that sound within architecture will adapt through technology in many ways, yet to be seen.

Chapter 4 is a contribution from Craig Dykers, a founding partner of Snøhetta, who discusses how acoustics plays a critical, yet underappreciated, role in architecture. He highlights their firm's design of the acoustics for a performance space, restaurant kitchen and a library, all of which succeeded on the proper acoustical design that many occupants and users of these spaces may not fully appreciate. This is another great, albeit brief, connection supporting the subtitle for the book.

For readers who have digested the previous 27 pages and are looking to learn more about acoustics and its use in architecture, Chapter 5 delivers that promise. This chapter provides extensive explanations, graphics and diagrams of acoustical knowledge. Readers who are new to acoustics will find this chapter informative and helpful toward a better understanding of how sound is produced, quantified, perceived, propagated, isolated by assemblies, and interacts with in a room. To be clear, there are no formulas or tables of technical data for the reader to use toward applying these topics to actual projects; the information is intended more to enlighten the reader to the topics and discussions that an acoustical design expert would have with the project team. The author was clear on this at the beginning and to this point, many nontechnical readers (and even some with technical backgrounds and experience) will find this section useful to better understand how the details of acoustics influence the integrated design of projects.

With the introductory and technical chapters concluded, page 66 begins the case studies of the different project types. As mentioned earlier, these are contributed by numerous ARUP colleagues, who used a common organizational framework of providing a chart of the acoustical topics/concerns for the facility and their priority to these project types with commentary on each topic. A historical context of the architectural and acoustical design follows, highlighting the acoustical features that make these spaces successful. Once these have been covered, there are 3 or 4 case studies of publicly recognizable

projects or ARUP projects. For an architectural student, a mentor educating a young acoustician, or even a reader passionately interested in the acoustics of notable spaces, these case studies are excellent examples of how acoustics factors into the success of these projects, whether the sound is playing a role in the experience for the audience or occupant of the spaces and facilities or whether the sound may be impacting those around the project. The highlights of how the acoustical conditions were achieved are insightful for anyone designing similar spaces. The use of professional photography in this section is spectacular, but this also makes the amateur photography stand out as lacking (too dark and dull); hopefully, future reprints can improve on this aspect.

The bibliography supporting this text is a great list of both notable texts that provide the foundational technical theory, data and details on these topics and also websites of publications that provide contemporary documentation for the book.

This book should help those outside of the acoustical industry (architectural students, architects, and those interested in architecture) learn a far greater level of knowledge about how acoustics is crucial to be integrated in the design of architectural spaces. To this same audience, the text also

highlights what acoustic consultants are striving to accomplish and what they can do. To this end, Patel clarifies that acoustic consultants are an essential part of the design team, which these chapters do not intend to replace. The text will also help those engaging acoustical consultants to anticipate how they will contribute to the project. With the holiday season approaching, this would be a fantastic gift for the architect or designer who is curious about why and how acoustics should be integrated into the design of a project.

The text is likely to be interesting for a practicing acoustician to read, though more as a reference of what they should already know and be implementing with their clients, more than a technical reference of how to do what they do. A practicing acoustician would likely find the photographs and discussions within the case studies to be useful examples of acoustical design elements for solving acoustical challenges within the various project types that are shown.

*Reviewed by Jeff Fullerton, INCE Bd. Cert.
Department Manager, Acoustics.
Intertek.
Boston, MA*