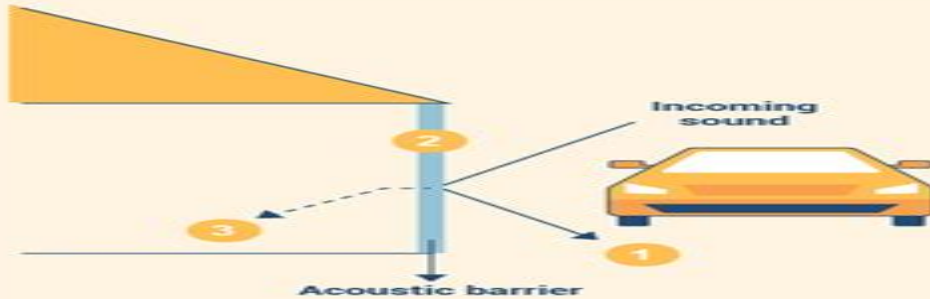


ARCHITECTURAL ACOUSTICS IN BUILDING DESIGN

A building is designed to control sound, by amplifying or reducing noise levels where necessary.

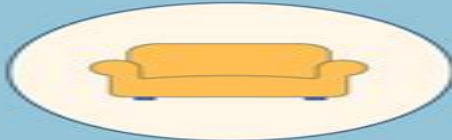
HOW SOUND TRAVELS



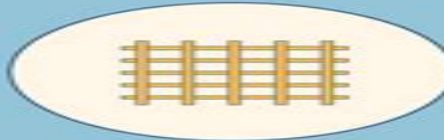
- 1 REFLECTION**
Sound hits a surface and bounces back off of it.
- 2 ABSORPTION**
Sound hits a surface and some of it is absorbed.
- 3 TRANSMISSION**
Sound that isn't absorbed or reflected passes through the material, such as a wall.

WHAT IMPACTS SOUND ABSORPTION?

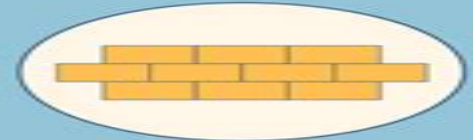
MATERIALS



Soft and porous materials absorb more sound.



Fiberglass absorbs the most sound.

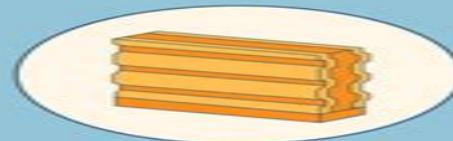


Concrete absorbs the least sound.

OTHER FACTORS



Higher levels of humidity result in more sound absorption.



Denser structures absorb higher sound frequencies than less dense structures.

Architectural Acoustics Architectural Acoustics

William J. Cavanaugh, Joseph A. Wilkes



Architectural Acoustics Architectural Acoustics:

Architectural Acoustics William J. Cavanaugh, Joseph A. Wilkes, 1999 Comprehensive up to date coverage of principles materials and technologies Architectural Acoustics provides the vital information that architects engineers and all concerned with the built environment need to control and direct wanted or unwanted sounds within and around buildings A team of internationally recognized experts presents the very latest information on acoustical materials technologies design criteria and methods for a wide variety of applications including airports and other transportation facilities theaters churches and concert halls classrooms lecture halls and libraries music practice rooms and recording studios sports venues and all types of residential commercial and industrial buildings This comprehensive reference is one of the few books of its kind to include richly detailed case studies that demonstrate real world applications of acoustic principles materials and methods Nearly two hundred photos and illustrations further elucidate specific principles applications and techniques Topics covered include Basic principles of architectural acoustics Acoustical materials and methods Building noise control applications

Architectural Acoustics William J. Cavanaugh, Gregory C. Tocci, Joseph A. Wilkes, 2009-11-16 Get the leading guide to acoustics for architects engineers and interior designers A widely recognized comprehensive reference to acoustic principles for all concerned with the built environment Architectural Acoustics Second Edition provides design professionals with up to date information on basic concepts acoustical materials and technologies for controlling wanted or unwanted sound within and around buildings Written by a team of internationally recognized experts and experienced consultants this Second Edition covers fundamental acoustic principles design criteria acoustical materials control strategies and methods for a wide variety of building types including educational healthcare recreational residential commercial industrial and transportation facilities Particular attention is given to places for listening and performance such as theaters churches concert and recital halls outdoor arenas classrooms multiuse auditoria libraries music practice and rehearsal rooms recording and broadcast studios sports venues home theaters and other spaces that people meet to communicate and enjoy performance Updated throughout this edition features New information on acoustical standards and guidelines for sustainable building design Additional richly detailed case studies demonstrating real world applications including the acclaimed Walt Disney Concert Hall and many other building types Nearly 200 photos and illustrations that further elucidate specific principles applications and techniques New developments in sound reinforcement and audio visual systems and their integration in room design Progress in research and future directions in acoustical modeling With fundamental conceptual understanding of basic acoustical principles provided by Architectural Acoustics Second Edition building designers can confidently create aesthetically and aurally pleasing spaces while avoiding problems that could be very costly if not impossible to solve later

Architectural Acoustics Marshall Long, 2014-02-05 Architectural Acoustics Second Edition presents a thorough technical overview of the discipline from basic concepts to specific design advice Beginning with a brief history it reviews the

fundamentals of acoustics human perception and reaction to sound acoustic noise measurements noise metrics and environmental noise characterization In depth treatment is given to the theoretical principles and practical applications of wave acoustics sound transmission vibration and vibration isolation and noise transmission in floors and mechanical systems Chapters on specific design problems demonstrate how to apply the theory including treatment of multifamily dwellings office buildings rooms for speech rooms for music multipurpose rooms auditoriums sanctuaries studios listening rooms and the design of sound reinforcement systems Detailed figures illustrate the practical applications of acoustic principles showing how to implement design ideas in actual structures This compendium of theoretical and practical design information brings the relevant concepts equations techniques and specific design problems together in one place including both fundamentals and more advanced material Practicing engineers will find it an invaluable reference for their daily work while advanced students will appreciate its rigorous treatment of the basic building blocks of acoustical theory Considered the most complete resource in the field includes basic fundamental relations derived from first principles and examples needed to solve real engineering problems Provides a well organized text for students first approaching the subject as well as a reliable reference for experienced practitioners looking to refresh their technical knowledge base New content for developing professionals includes case studies and coverage of specific focus areas such as audio visual design theaters and concert halls

Applied Architectural Acoustics Michael Rettinger, 1947 Architectural acoustics is not purely functional It combines the scientific with the artistic It provides the architect with forms and treatment of high esthetic appeal Today it is no longer necessary to copy buildings of reputedly good hearing conditions it is no longer necessary to be tradition bound Great flexibility exists in achieving identical results by dissimilar methods a flexibility which will become greater still as new acoustic materials are developed and novel methods of construction invented This book is directed to architects engineers contractors and all those connected with the planning and the construction of buildings in which acoustics has been given preference It is not a text book for colleges It is not fundamentally analytical A handbook for the man in the field it was kept practical without however shunning important theoretical matters In this book special attention is given to the acoustics of rooms in which sound is either recorded such as motion picture studios or broadcasting stations or is reproduced electrically such as motion picture theaters or monitoring rooms

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Environmental and Architectural Acoustics Z. Maekawa, 1993-11-25 This book is a guide to the practical technology involved in achieving a more acceptable acoustic environment for human life

Architectural Acoustics Illustrated

Michael Ermann, 2015-01-20 Unite the science of sound and the principles of design to enhance any space Architectural Acoustics Illustrated translates the quantitative and qualitative content of acoustics into the graphic language of architecture This highly visual guide includes over 350 illustrations that outline the physics of sound and the best design practices for limiting or mitigating noise in buildings by using the latest in materials and techniques Each chapter includes a summary checklist of design guidelines to help prevent mistakes and oversights and the Instructor's website offers video animations demonstrating acoustical concepts Designed as a first look at the interaction of sound and space the book explains the principles of architectural acoustics and their practical applications providing a comprehensive guide for designing with acoustics in mind Architectural acoustics is more than just concert halls it may determine building placement division of interior space exterior construction and even siting When addressed early in the design process the resulting space can be free of unwanted sound and promote good hearing if left unaddressed the problems with the space can lead to lawsuits and costly post construction remediation Architectural Acoustics Illustrated helps designers solve most acoustical problems in advance by enabling readers to Understand the physical science underlying the behavior of sound Consider the interactions of sound and space in the initial design approach Mitigate building sounds such as those produced by HVAC and plumbing with early design planning Design spaces for listening and incorporate acoustics best practices into every plan The highly visual format of the book helps readers grasp complex concepts quickly and thorough discussion of each concept's real world application ties the science directly into the design process All design professionals need to have a fundamental understanding of acoustics and Architectural Acoustics Illustrated is a comprehensive practical guide in an easy to read format

Architectural Acoustics Ana Jaramillo, Chris Steel, 2014-10-24 The application of good acoustic design can seem daunting to designers when trying to understand the often complex physics of sound control The ever increasing number of standards and performance criteria that can be requested on new developments further complicates acoustics for architects Architectural Acoustics part of the PocketArchitecture series provides the fundamental theory and understanding of acoustics and applications of effective detailing for specific building types and conditions in an accessible and clear technical guide The book provides a compact and understandable introduction to the fundamentals of building and architectural acoustics definitions of suitable acoustic performance criteria for a wide range of common buildings and room types guidance on specification and detailing of the most suitable construction types in North America and the UK This book is both a handy rule of thumb on acoustics for anyone involved in the design or construction of buildings as well as an essential addition to any architect's reference library

Architectural Acoustics Egan, M. David Egan, 2003 *Concepts in Architectural Acoustics* M. David Egan, 1972 Architectural Acoustics Clifford Melville Swan, 1921

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