Sound Control Manual − Sound Construction
Introduction

Never since the days of ancient Egypt and Rome, have the designers and builders of human−occupancy enclosures been as concerned with the psychological impact of their creations. Building design until recent decades was primarily devoted to fitting the building to the occupants' space needs and decorating it to the extent that the funds would allow. Frank Lloyd Wright probably was one of the first modern architects to consider the effects of design on the emotions of the occupant. Psychological factors since have become increasingly important considerations.

Today, building occupants demand controlled environments from the standpoint of sound, heat, light and space arrangement. It is now a proven fact, for instance, that an employee moved to pleasant surroundings will produce more. It is also accepted that sound−conditioned homes and apartments sell and rent faster, often for a higher price. These factors all contribute to money−in−the−pocket for the owner −− always of prime importance.

In addition, the effects of exposure to high sound levels on the hearing of individuals are well documented. Thus, federal regulations now limit the amount of exposure to which employees can be subjected in many types of manufacturing plants. People are becoming increasingly aware of the need to protect their hearing from serious permanent damage.

Until now, informantion sources on sound control in building construction have been difficult to locate. Many texts have been too theoretical; much information too narrow in scope.

This book contains only the theory necessary to explain the practical information used in fully implementing sound conditioning in buildings (except the critical design of very highly specialized applications, such as theaters and auditoriums, which require the services of specialized acoustical engineers). Incorporated in this work is the latest information from United States Gypsum Acoustical Research Facility at Round Lake, IL.

Drawn together at the Research Facility are sound conditioning engineers with the maximum experience in the field; pioneers who were working in sound control long before the public, architects and builders generally became alerted to the benefits and needs. Research background at United States Gypsum dates back to the 1920's.

The importance of knowledge in the field of sound conditioning is demonstrated frequently. Often unsatisfactory performance is brought about by an unconsidered but influential factor, even though the installation has been properly made. In other cases, improper installation robs the owner of the benefits he has paid to recieve. Total or partial neglect of sound conditioning in the design is all too frequent. All of these things have happened many times, giving the impression to some that sound control is an elusive entity.

But, sound can be controlled and the performance of sound−conditioning

construction can be predicted. All that is needed is an understanding of the factors influencing sound propagation and transmission, and a thorough analysis of the construction −− from design stage to occupancy.

Chapter 1 of this book provides the theory of sound that is required for proficiency in sound−conditioning construction. A complete analysis of acoustical room design and treatment is contained in Chapter 2. Chapter 3 deals with sound attenuation between rooms, including design and erection of partitions and floor−ceilings for control of airborne and structure−borne sound transmission.

The construction systems covered here have resulted from the research and development work of United States Gypsum, long the industry pioneer and leader in structural sound control. USG has assembled all available information on the subject, based on laboratory and field experience with its various product lines. Some applicable USG products and systems are listed under USG Acoustical Products.Complete details of these and other systems may be found in current USG Architectural Technical literature.