

# Guidelines for Design of an Office with Good Acoustics

A means for prospective owners, architects, and interior designers to provide good acoustics in open and closed offices



Charles C. Roy  
Robert C. Chanaud

# Table of Contents

## **Chapter 1: Privacy Concepts**

Acoustical Needs of Employees

Communication

Privacy

Community

Two Characteristics of Office Noise

Transient Sounds

Steady Sounds

The General Effects of Noise on People

Physical

Physiological

Psychological

Studies of Noise in the Office Environment

Opinions about Noise

Noise Complaints

The Fallacious Quest for Quiet

## **Chapter 2: Speech Privacy**

Types of Speech Privacy

Degrees of Speech Privacy

Secret Privacy

Confidential Privacy

Normal Privacy

Transitional Privacy

No Privacy

Objective Rating of Speech Privacy

The Most Important Concept in Achieving Speech Privacy

Three Factors that Determine Privacy

Speech Levels

Sound Attenuation

Background Sound Levels

Rating of the Factors

## **Chapter 3 Achieving Acoustical Privacy in Open Offices**

Factors that Reduce Speech Transmitted to Listeners

Transmission Loss Path

Reflection Path

Diffraction Path

Distance

Characteristics of Talkers

Gender

Voice Level

Orientation

## Physical Characteristics of the Office

- Ceilings

- Light Fixtures

- Panel Sound Transmission Class

- Panel Height

- Panel Noise Reduction Coefficient

- Carpeting

## Combining the Factors

- Workstations away from Walls

- Workstations against Walls/Windows

## Creating Privacy with Sound Masking

- Dynamic Acoustical Factors

- What is Sound Masking?

- Advantages of Sound Masking

- The Important Characteristics of Sound Masking

- The Reputation of Sound Masking

- The Masking Spectrum for Open Offices

- Creating Universal Privacy

- Creating Partial Privacy

- Integrating Masking with the Sound Attenuation

## Privacy from Other Sounds

- Traffic Noise

- Constant Level Sounds in the Office

- Office Machines

## Handling the Spatial Aspects of Privacy

## Handling the Temporal Aspects of Privacy

## How CCR ASSOCIATES Analyzes Open Office Designs

- Storing Physical Characteristics of the Space

- Storing Representative Masking Spectra

- Modeling the Office Design

- Modeling the Sound Attenuation

- Modeling the Sound Masking

- Evaluating Privacy Performance

## How CCR ASSOCIATES Measures Open Office Privacy

- Measuring Sound Attenuation

- Setting and Measuring Sound Masking Levels

- Evaluating Speech Privacy

## **Chapter 4: Achieving Acoustical Privacy in Closed Offices**

### Weaknesses of the Conventional Solution

- Walls

- Doors

- Windows

- Ceilings

- Combining the Factors

- Integrating Masking with the Sound Attenuation

## **Chapter 5: Medical Facilities**

Federal Regulations

Hospitals (Patient Room, Nursing Areas, and Corridor Noise)

Medical Suites

## **Chapter 6: Secure Facilities**

Federal Regulations

Protecting Windows

Protecting Walls

Protecting Doors

Protecting Air Ducts

Protecting Ceilings

Protecting Floors

How CCR ASSOCIATES Determines Secure Facility Performance