FGI / HIPAA / LEED / HCAHPS impact on Acoustically Friendly Buildings

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ACOUSTICAL, TECHNOLOGY, AND LIGHTING DESIGN

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ACOUSTICAL, TECHNOLOGY, AND LIGHTING DESIGN

An Architecture/Engineering Consulting firm specializing in Acoustics, Technology and Lighting Design for the Commercial, Corporate, Leisure, Public, Residential, and Healthcare Industries.

Raleigh Durham, North Carolina
Charlotte, North Carolina
San Francisco, California
Los Angeles, California
Orlando, Florida

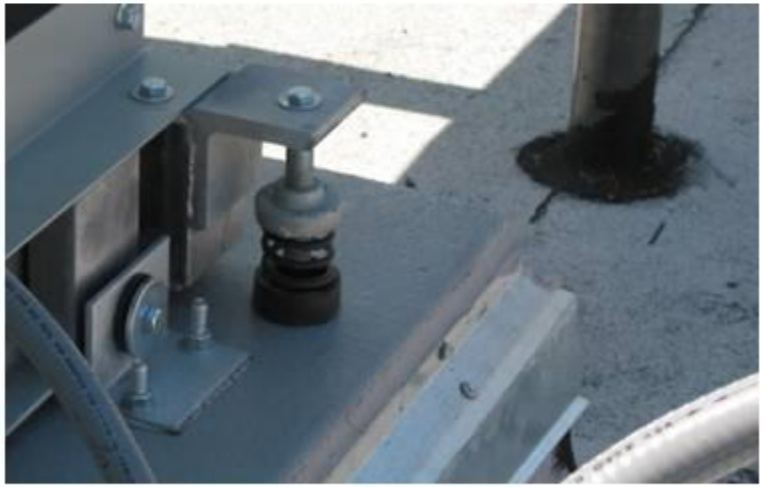

What do we do?

Room Acoustics

Sound Isolation

Traffic Noise Control

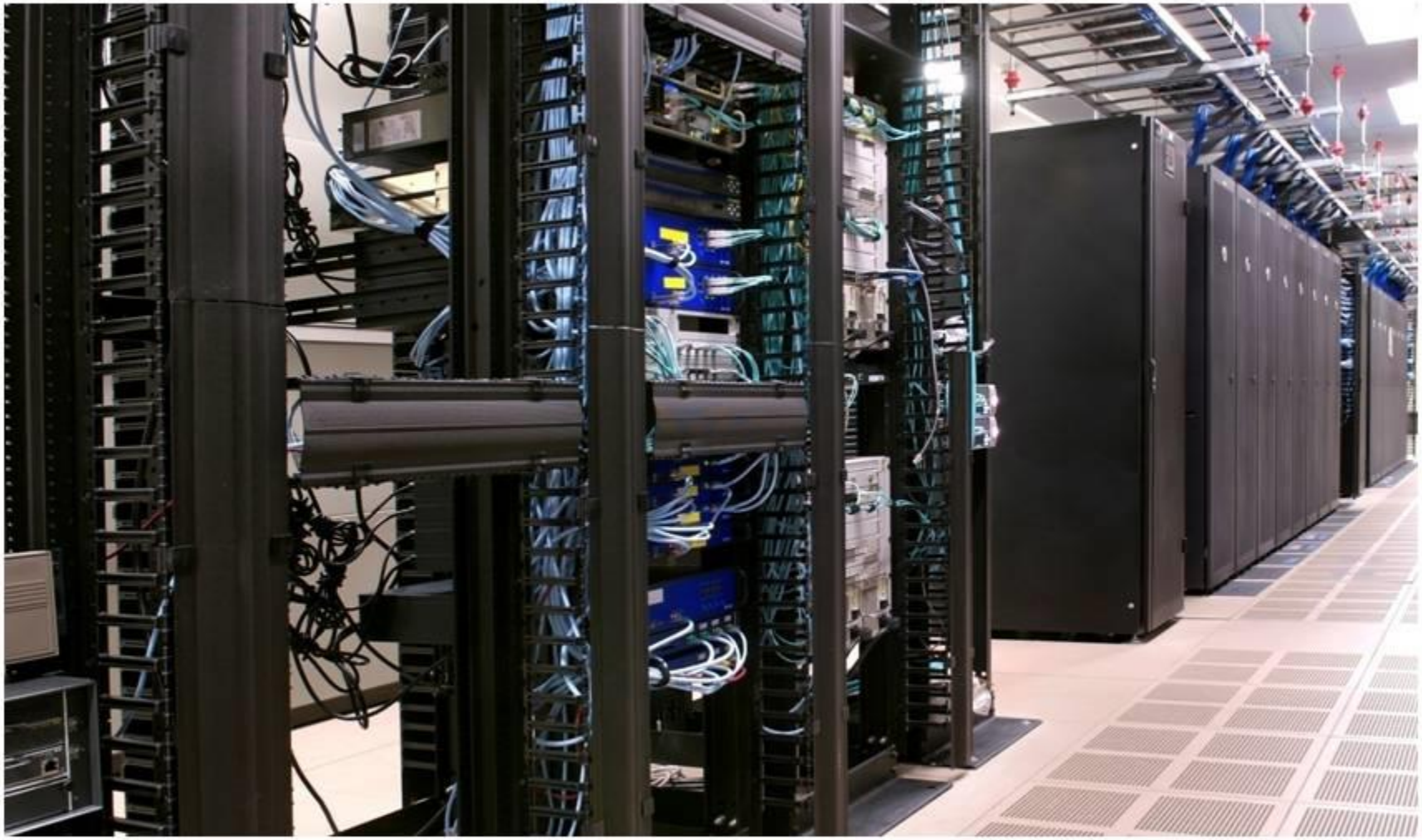
Mechanical Noise Control



Vibration Isolation

Lighting Design

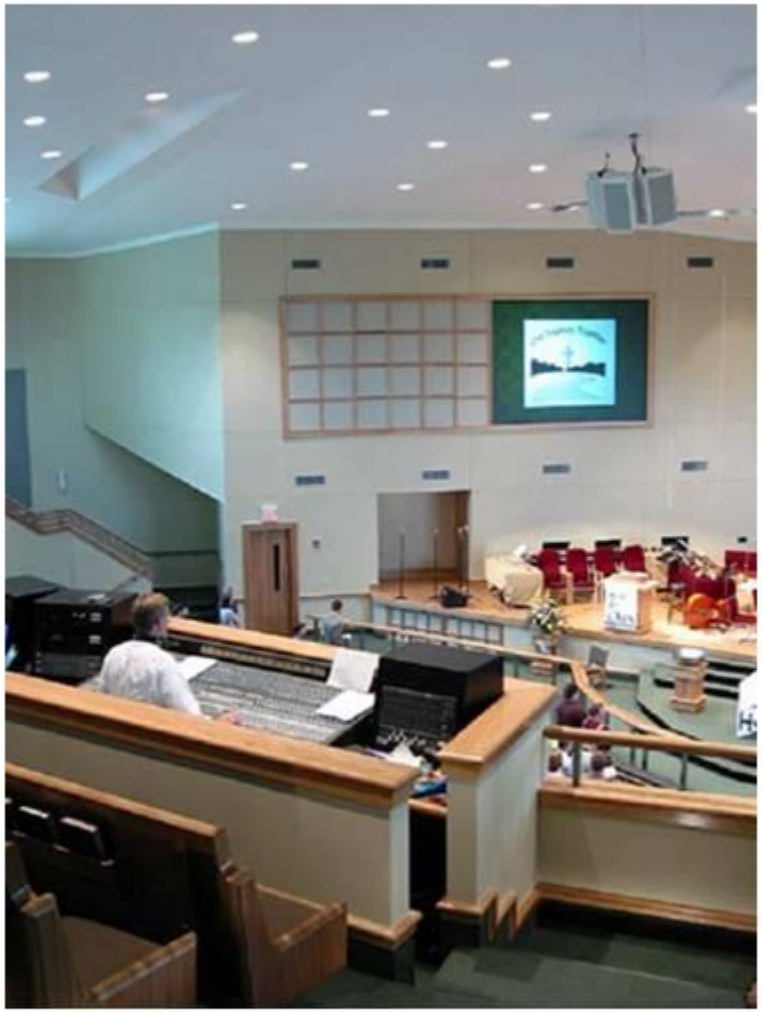
Security Design



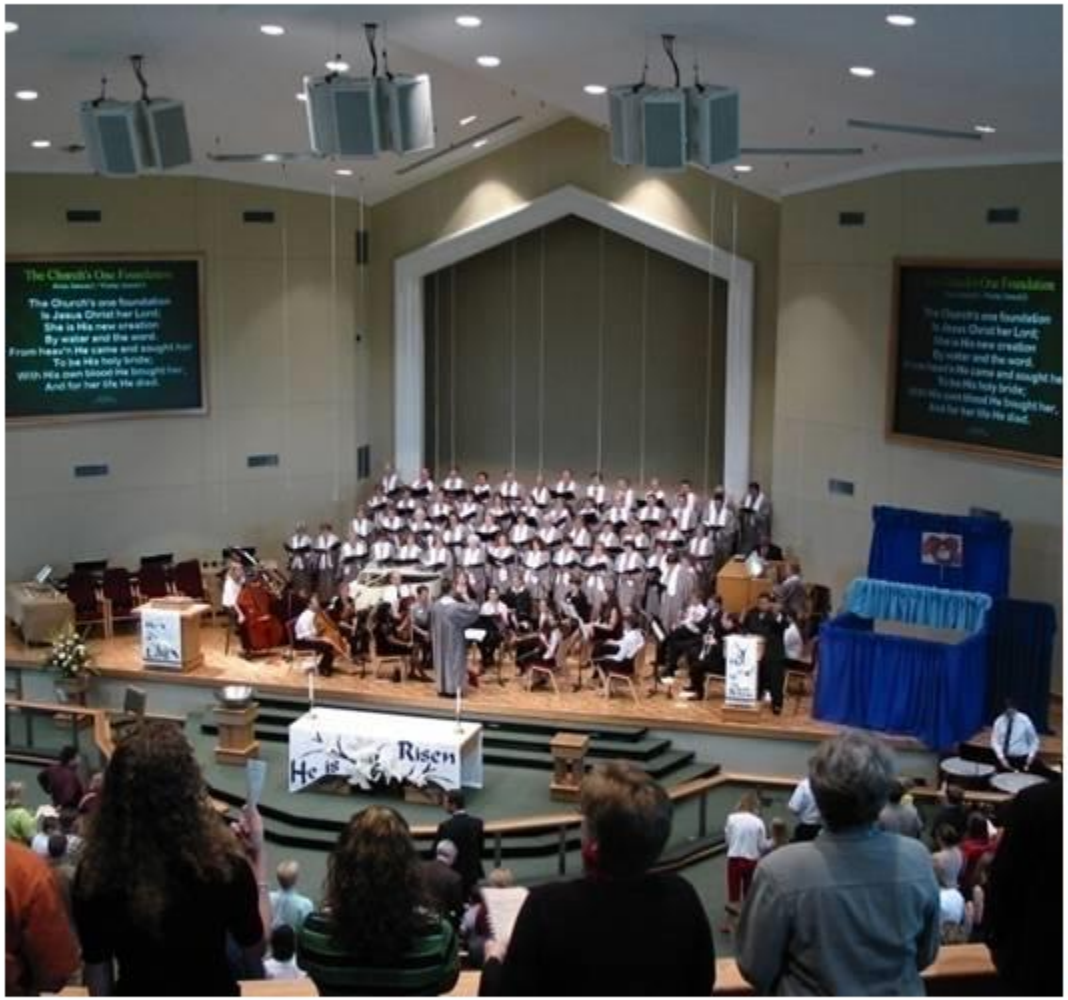
Structured Cabling

Video System Design

HEALTHCAREDESIGN



Audio System Design



Houses of Worship

Auditoriums

Commercial

Corporate

Housing

Theme Parks

Medical


JACK
OF ALL
TRADES
Happy Hal
PROPRIETOR

FGI / HIPAA / LEED / HCAHPS impact on

Acoustically Friendly Buildings

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Acoustically Friendly Buildings

- **This session explores how Health care / FGI / HIPAA / LEED / HCAHPS codes, regulations, and design guidelines impact the acoustical comfort of patients, their families, and building occupants. Participants will learn how acoustics has a positive impact on the design of healthcare facilities including hospitals and trauma centers, laboratories, and assistive living facilities.**

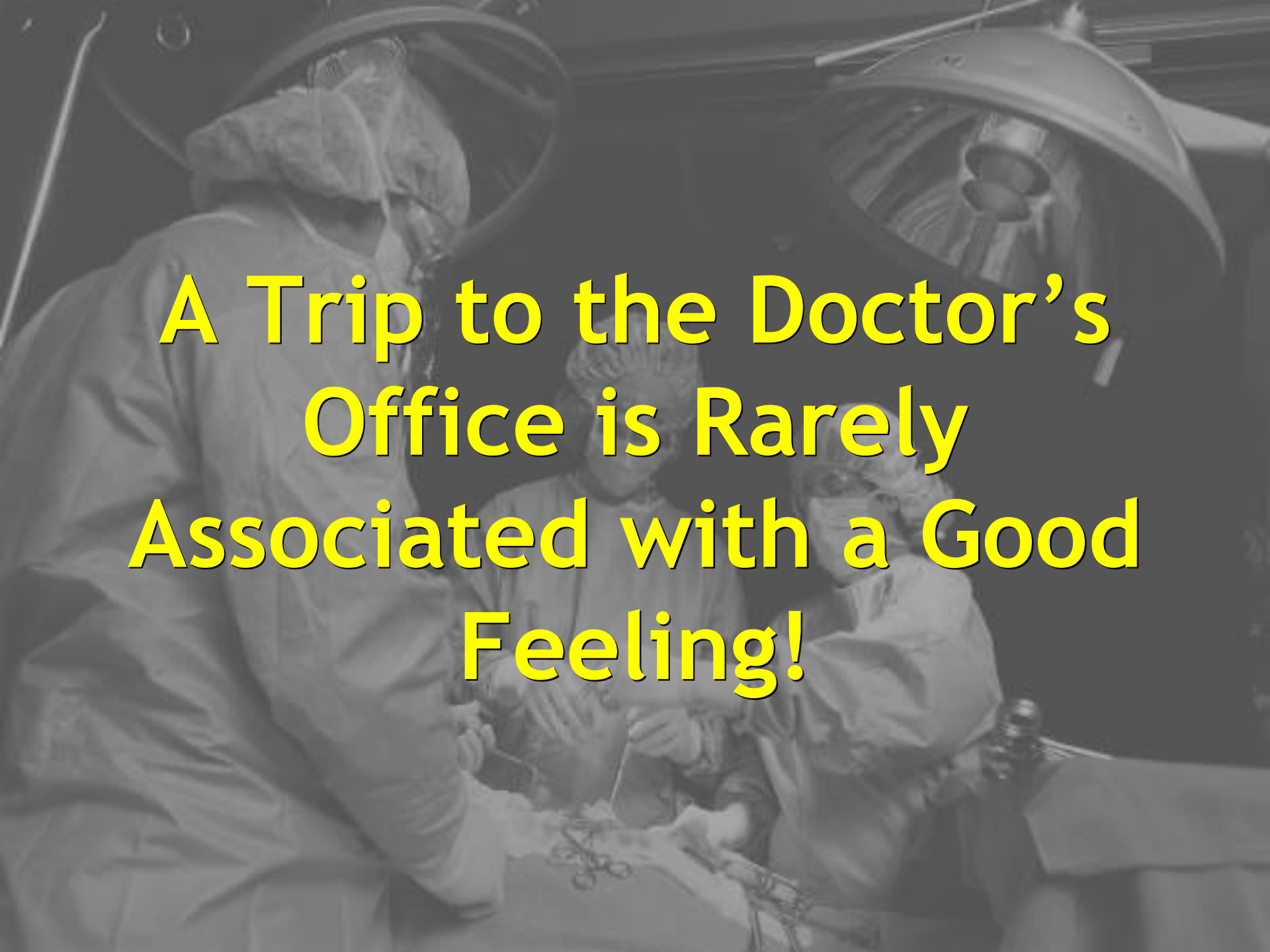
- **Objectives:**
  - **Review the codes, regulations, and design guidelines impacted by acoustical issues.**
  - **Learn solutions for making a building friendly for the occupants.**
  - **Learn solutions for making a building friendly for the environment.**
  - **Explore case studies**

- **AIA /CEU = one HSW/SD**

Housekeeping

- ADA Issues
- Questions
- AIA Credit
  - give me your card with note on back

So why does it all matter?


A Trip to the Doctor's Office is Rarely Associated with a Good Feeling!

Top 10 Complaints

1. It's To Cool
2. It's To Hot
3. It's Dirty
4. No Meeting Space
5. No Storage Space
6. Bad Air Quality
7. No Privacy
8. Parking Issues
9. Computer Issues
10. Noise Level / Too Noisy

IFMA: 1991, 1997, 2004

Top 10 Complaints

1. It’s To Cool
2. It’s To Hot
3. Noise Level / Too Noisy

IFMA: 2013

What is The Goal

- *Environmental complaints* – People complain about noise and odors or being too hot or too cold.

Healthfulness

Clean and healthy work environments with access to air, light, and water— and free of contaminants and excessive noise.

- **Integrated design process** – focused on adaptability and mobility, environmental issues, ergonomics, collaboration, privacy, and noise control.

Major Impact

- *Technology* – providing the right technological tools and support to work effectively.
- *Storage space* – supplying ample storage within close proximity to their desk.
- *Climate control* – allowing employees to control the workplace climate to provide comfort.
- *Quiet space* – minimizing noise that causes distractions and disruptions.

- Address staff requests for more privacy, less noise, more adaptability, and better environmental conditions.

Sustainable (or Healthfulness): Create workplaces using environmentally sustainable ("green") products and processes that provide a clean, healthy workplace environment, free of harmful contaminants and excessive noise, with access to quality air, light, and water. Specific recommendations include:

Preventing Falls for Patient and Resident Safety

Sue Ann Guildermann, RN, BA, MA
Director of Education, Empira
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952-259-4477

Empira

Internal Evidence & Clues:

- Mood status & cognitive changes, frequent napping, ↑ falls, ↑ agitation

=

<u>sleep deprivation #1</u>

Lesson learned:

if we can stop the noise, then we can reduce the falls.

Who or What is Steering the Ship?

- HIPAA
- HCAHPS
- LEED
- ASHE/FGI

Minimum Quality of Care

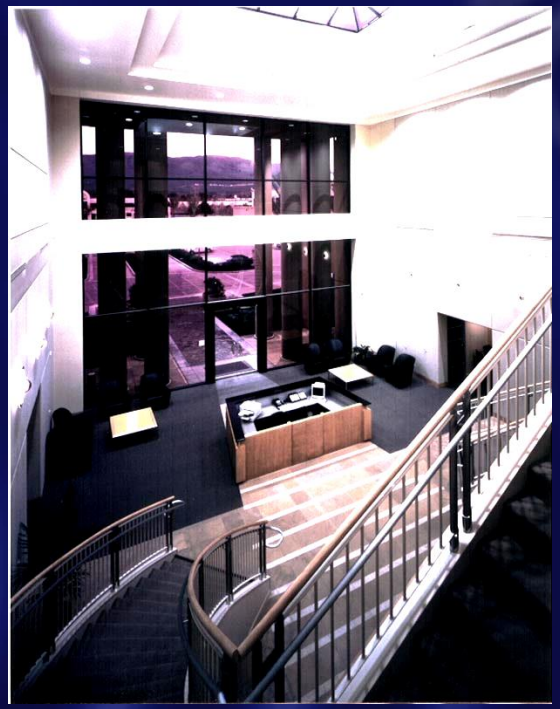
- State Medical Inspectors
  (DHSR / OSPOD / AHCA)
- Joint Commission on Accreditation of Healthcare Organizations (JCAHO)
- American Hospital Association
  (AHA / ASHE)
- Health Insurance Portability and Accountability Act (HIPAA)
- Internal Criteria from Medical Center
- Building Code (s)

HIPAA - Health Insurance Portability and Accountability Act


www.CartoonStock.com
search Dambam1481
"Your medical records are safe with us.
We take patient privacy very seriously."

HIPAA

Lobbies and Patient Check In



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HIPAA

Patient and Procedure Rooms

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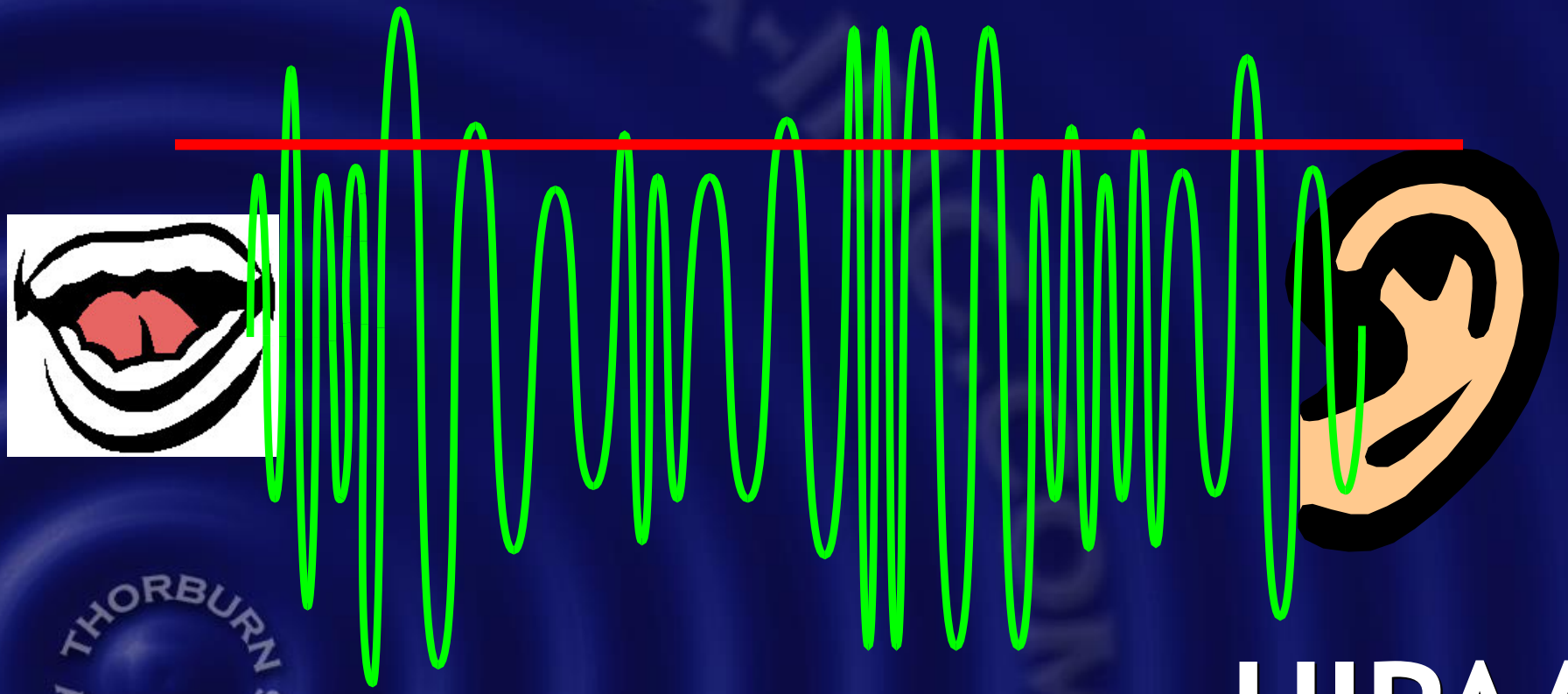
HIPAA

Signal To Noise
Articulation Index
Speech Privacy



HIPAA

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Did Max have it solved with the Cone of Silence?

HIPAA

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HCAHPS

Hospital Care Quality Information from the Consumer Perspective

"two individual items address the cleanliness and quietness of patients' rooms"

The ***Patient*** and ***their Families*** get to grade the Hospital!

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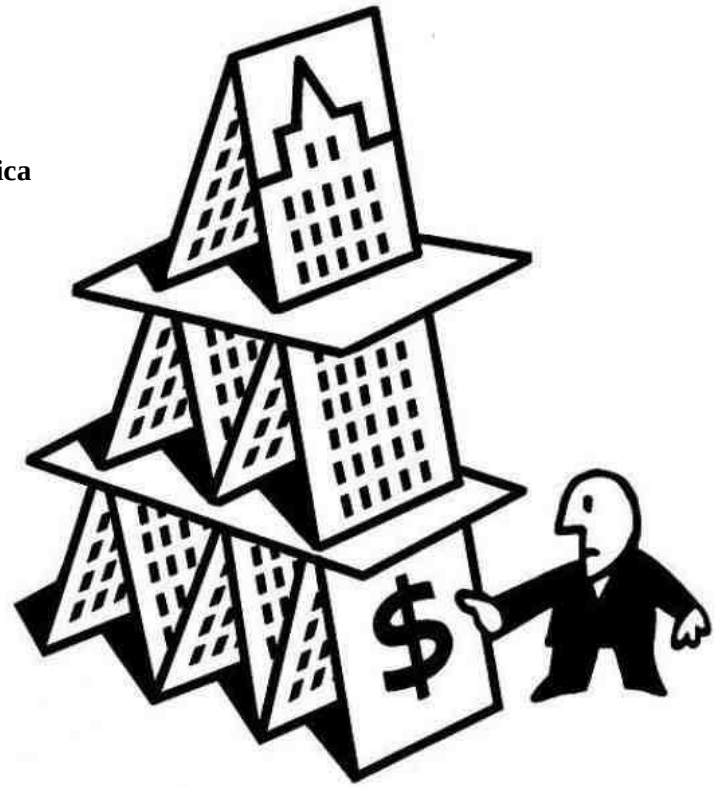
ICC INTERNATIONAL CODE COUNCIL

People Helping People Build a Safer World™

ASA

Acoustical Society of America



INCE

Institute of Noise Control Engineering

U.S. GREEN BUILDING COUNCIL LEED USGBC

ASHE

NCAC

NATIONAL COUNCIL OF ACOUSTICAL CONSULTANTS

Balancing the science of sound with art and human perception

LEED v4 for Healthcare

- **Developed to meet the unique needs of the healthcare market, including inpatient and outpatient care facilities and licensed long term care facilities.**
- **May also be used for**
  - **medical offices**
  - **assisted living facilities**
  - **medical education & research centers**

LEED v4 for Healthcare

- **Based on 2010 FGI Guidelines – Health Care Facilities**
- **No Prerequisites for Acoustics**
- **2 Credits possible EQ points**
  - **Option 1 Speech Privacy, Sound Isolation and Background Noise**
  - **Option 2 Acoustical Finishes, and Exterior Noise Levels**
  - **2010 SV Guidelines for Heath Care Facilities**

LEED v4 – FGI / ASHE for Healthcare

- **Reverberation**

Table 1.2-1

Design Room Sound Absorption Coefficients ($\bar{\alpha}$)

Space[1]	Design Coefficient[2]	Subjective Description
Private patient room	0.15	"Average" room
Multi-bed patient room	0.15	"Average" room
Corridor	0.15	"Average" room
Waiting area room	0.25	"Medium-dry"
Atrium	0.10	"Medium live" room
Physician's office	0.15	"Average" room
Treatment room	0.15	"Average" room

$.038^{\alpha} - RT_{60}(3\text{-}6)$

LEED v4 – FGI / ASHE for Healthcare

- **Cleanable Surfaces vs. Noise Build up vs. Speech Privacy**

Table 1.2-4

Design Criteria for Speech Privacy for Enclosed Rooms and Open-Plan Spaces[1]

Speech Privacy Goal	PI	AI	STI	SII
Enclosed rooms				
Normal	≥85%	≤0.15	≤0.19	≤0.20
Confidential	≥95%	≤0.05	≤0.12	≤0.10
Secure	Special consideration required.			
Open-plan spaces				
Normal (non-intrusive)	≥80%	≤0.20	≤0.23	≤0.25
Confidential[2]	Special consideration required.			

LEED v4 – FGI / ASHE for Healthcare

- **Cleanable Surfaces vs Noise build up vs Speech privacy**

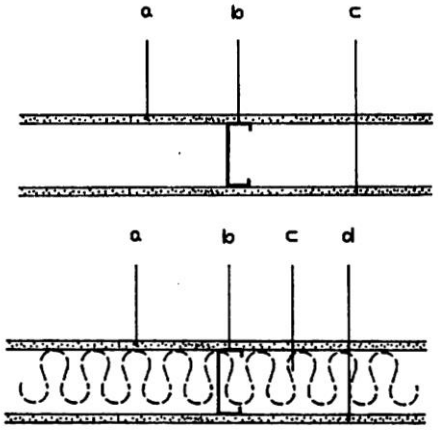
LEED v4 – FGI / ASHE for Healthcare

- Full Height Party Walls Required
- Building Systems in Hallways

- Noise Criteria
- Sound Transmission
- Speech Privacy

LEED v4 – FGI / ASHE for Healthcare

- **Walls**



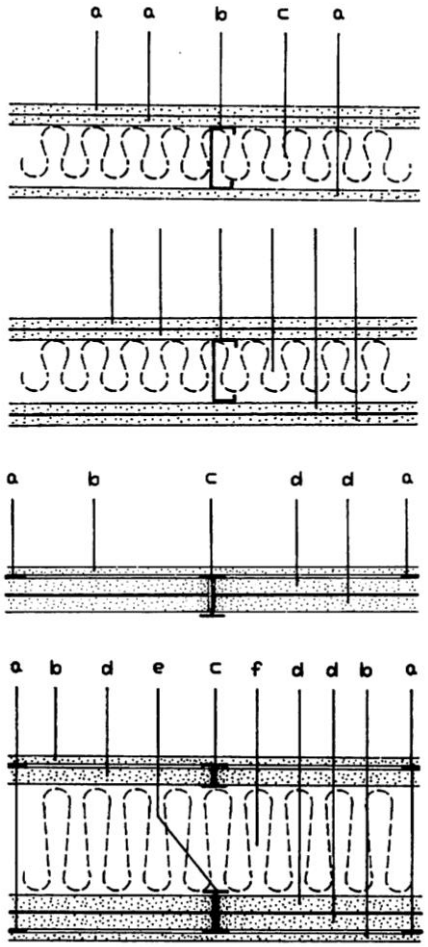


Table 1.2-3

Design Criteria for Minimum Sound Isolation Performance Between Enclosed Rooms

Adjacency combination		STC_c[1]
Patient room	Patient room (wall–same floor)	45[2]
Patient room	Patient room (floor–to–floor)	50
Patient room	Corridor (with entrance)	35[3]
Patient room	Public space	50
Patient room	Service area	60[4]
NICU room	Patient room	50
NICU	Corridor	50
Exam room	Corridor (with entrance)	35[3]
Exam room	Public space	50
Treatment room	Room	50
Treatment room	Corridor	35
Toilet room	Public space	45
Consultation room	Public space	50
Consultation room	Patient rooms	50
Consultation room	Corridor (with entrance)	35[3]
Patient room	MRI room	60[4]
Exam room	MRI room	60[4]
Exam room	Exam room (no electronic masking)	50
Exam room	Exam room (with electronic masking)	40[5]
Public space	MRI room	50

LEED v4 – FGI / ASHE for Healthcare

APPENDIX

Table A1.2-a

Categorization of Health Care Facility Sites by Exterior Ambient Sound

Exterior Site Noise Exposure Category	A	B	C	D
General description	Minimal	Moderate	Significant	Extreme
Day–night average sound level (Ldn) (dB)	< 65	65–70	70–75	> 75
Average hourly nominal maximum sound level (L01) (dBA)	< 75	75–80	80–85	> 85
Distance from nearest highway (ft)	1000	250–1000	60–250	< 60
Slant distance from nearest aircraft flight track 1 (ft)	> 7000	3500–7000	1800–3500	< 1800
	4000	2000–4000	1000–2000	1000
Distance from nearest rail line (ft)	1500	500–1500	100–500	< 100
Exterior shell composite STC rating (STC_c)[1]	35	40	45	50
Design goal for facility nighttime exterior equipment sound (dBA)[2]	45	50	55	60
Exterior patient seating areas	Generally acceptable noise level	Some shielding of principal	Generally not acceptable without special acoustical consideration	Generally not acceptable noise required

Synergies and Conflicts Between Sustainable Design and Acoustics

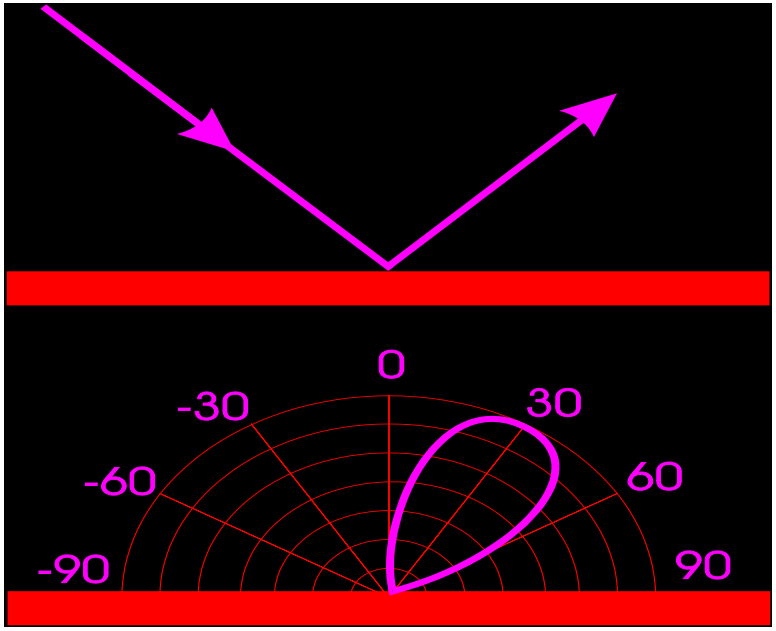
Recent research by GSA and the Center for the Built Environment

Daylight

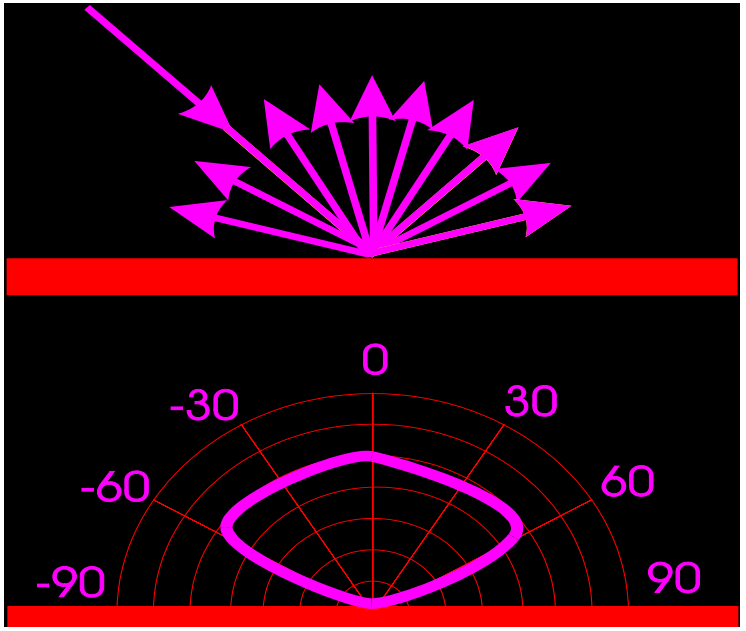
GSA San Francisco Federal Building

Daylight
Impact of Hard Surfaces

Reflection

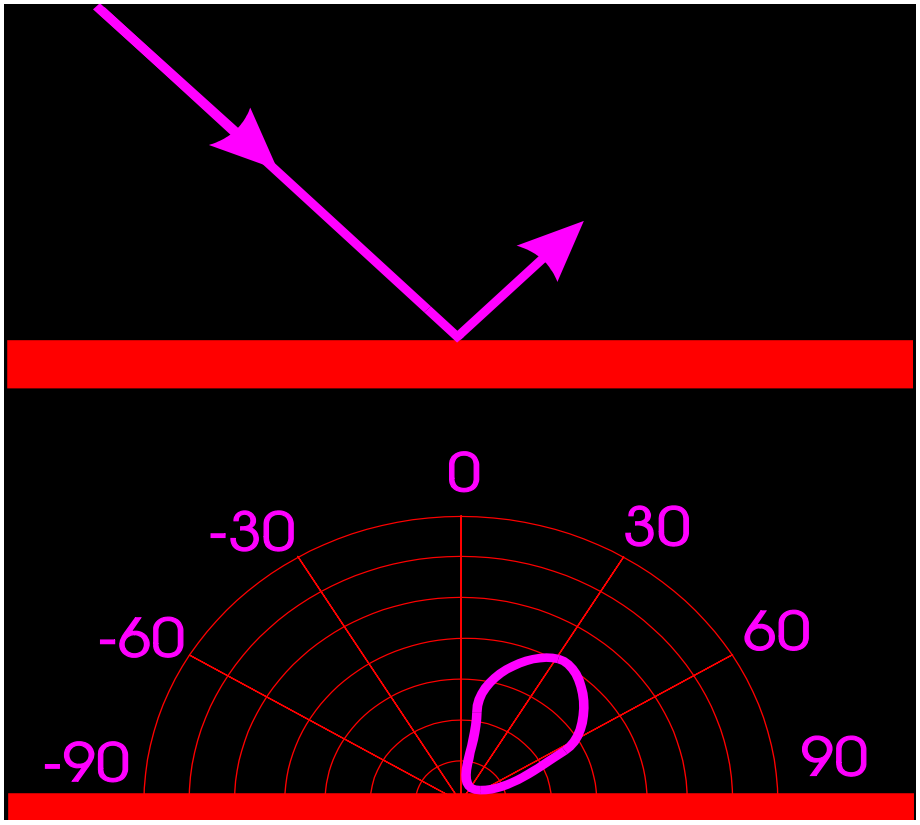


Diffusion

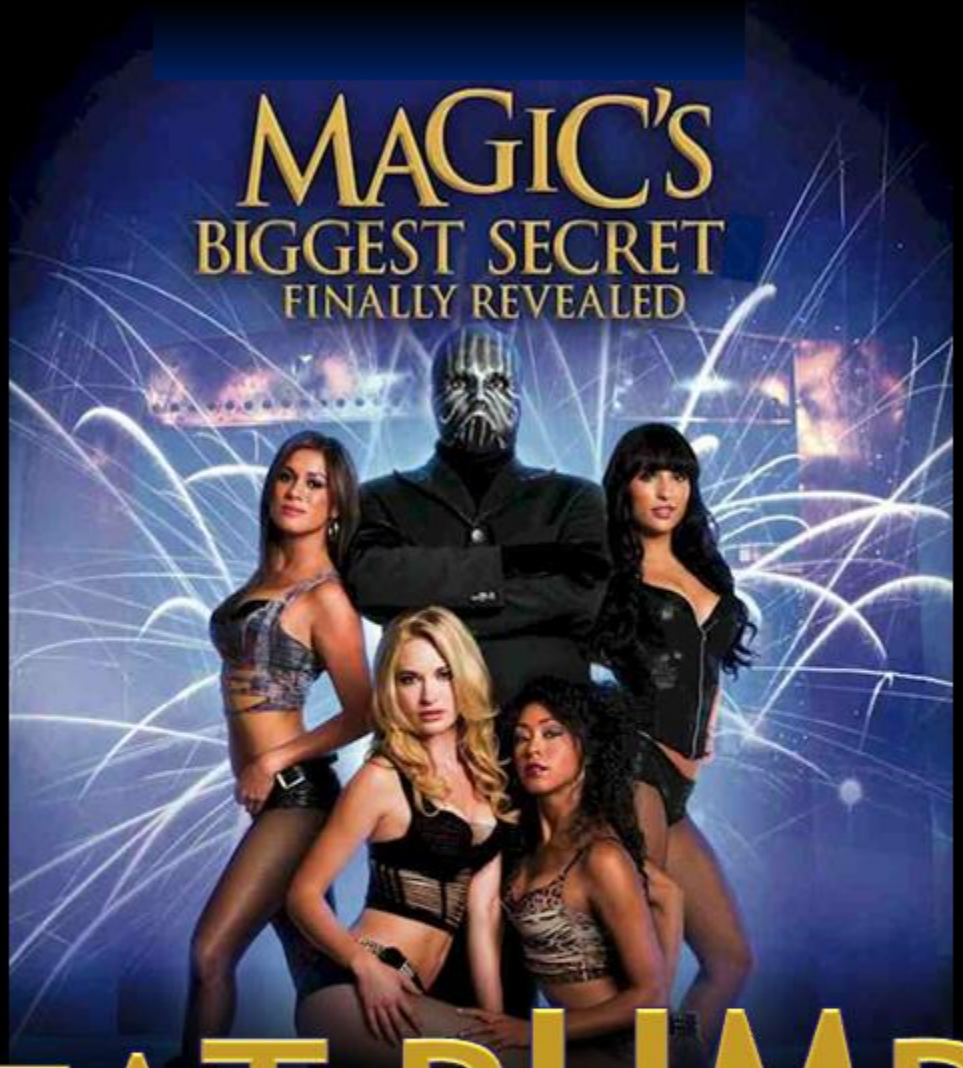


Daylight
Impact of Soft Surfaces

Absorption

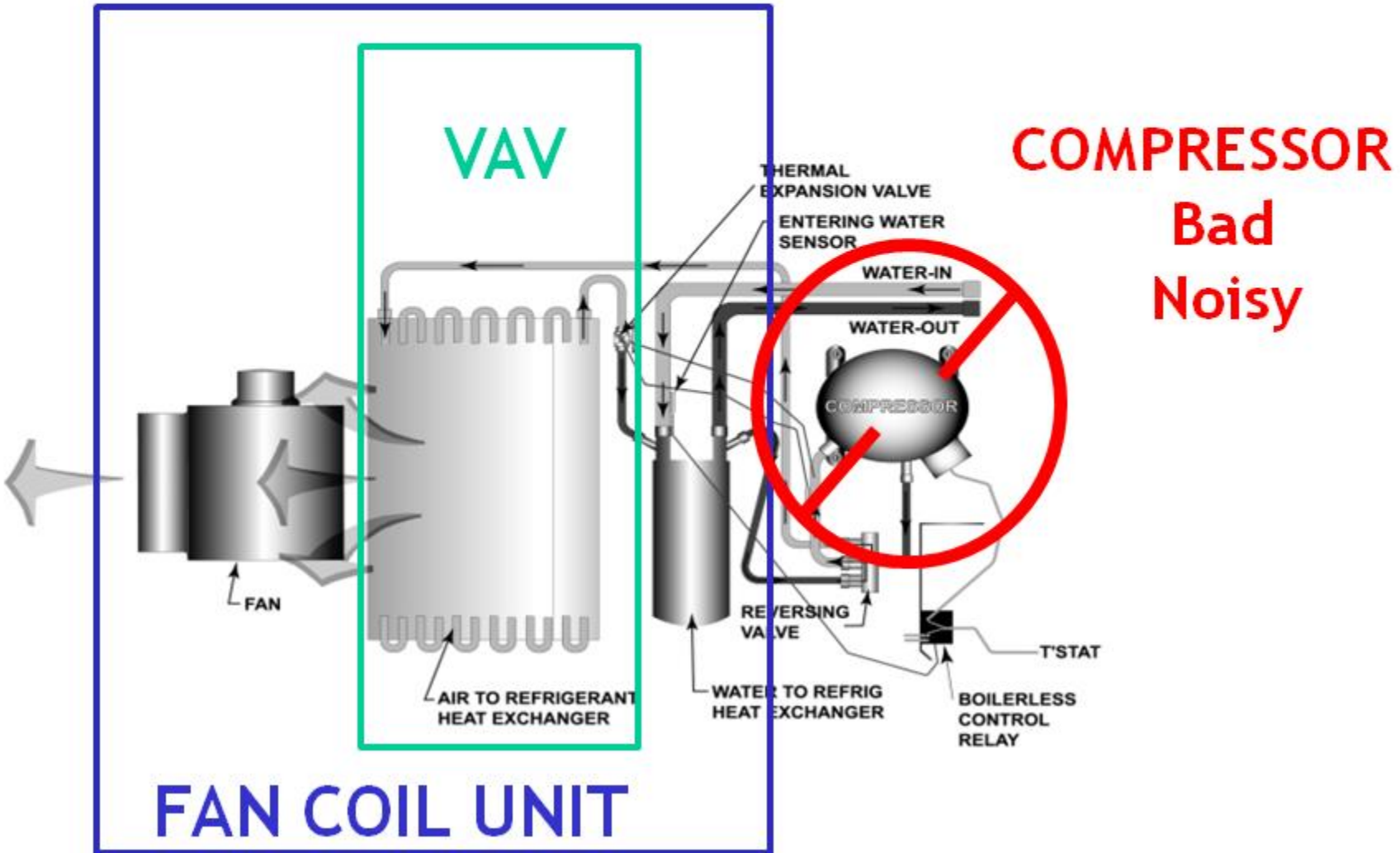


Thermal Comfort
Mechanical Noise Control



HEAT PUMP's

HEAT PUMP's



COMPRESSOR
Bad
Noisy

CASE STUDIES

Acoustical Criteria

- **Room Acoustics**
  - Promote Early Reflections
  - Eliminate Echoes
- **Sound Isolation**
  - Reduce Intrusion from Exterior Noise
  - Contain Noise Created in Loud Spaces
- **Mechanical Noise & Vibration Control**
  - Evaluate Mechanical Systems
  - Control System Noise and Vibration
- **Site Noise**
  - Traffic
  - Central Plant
  - Helicopter

The Language: Reverberation Time

- **The length of time it takes sound to decay 60 decibels, or to one millionth (1/1,000,000), of its peak sound level!**
  - **Relationship between Volume and Absorption surface area.**
  - **Higher volume = longer reverberation time**

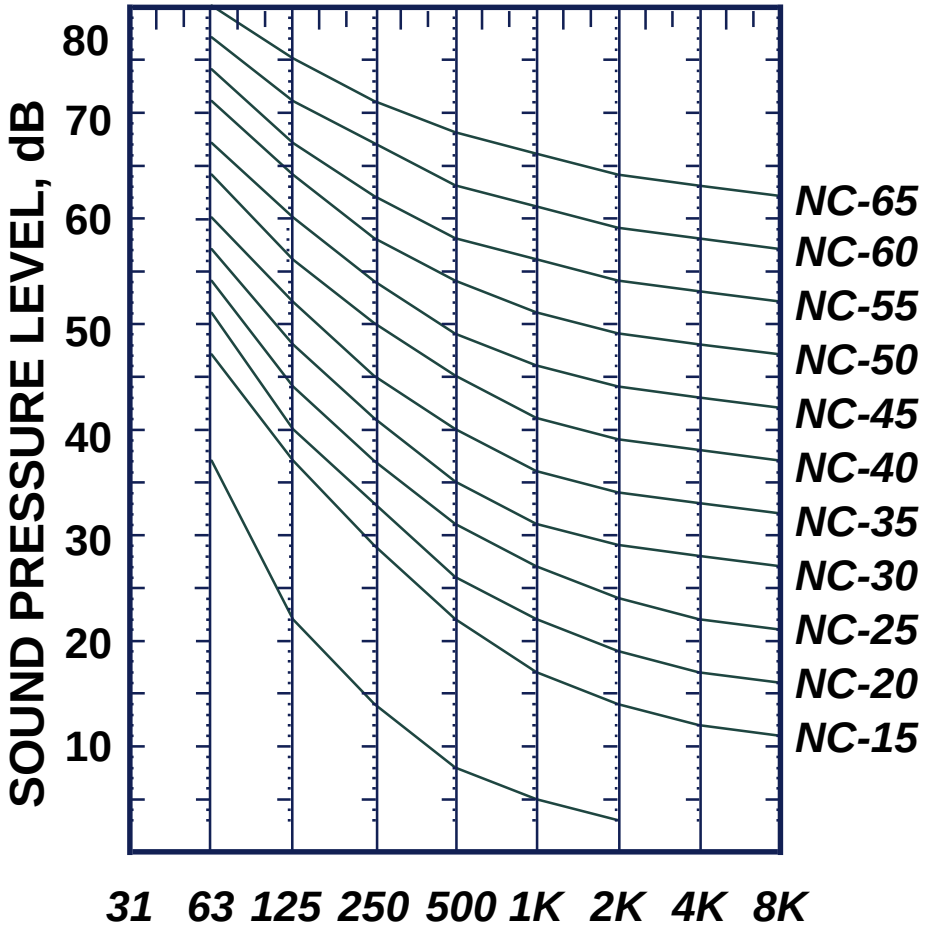
$$RT60 = .05V/A$$

The Language: Sound Transmission Class (STC)

- **Sound is blocked by partitions with mass**
- **Sound can also be blocked by two lightweight partitions separated by a large air space**

The Language: Background Noise

Noise Criteria (NC) Ratings



Amount of noise mechanical system makes in a room

Moderately fair listening conditions

Lobbies, Labs, Open Plan Offices

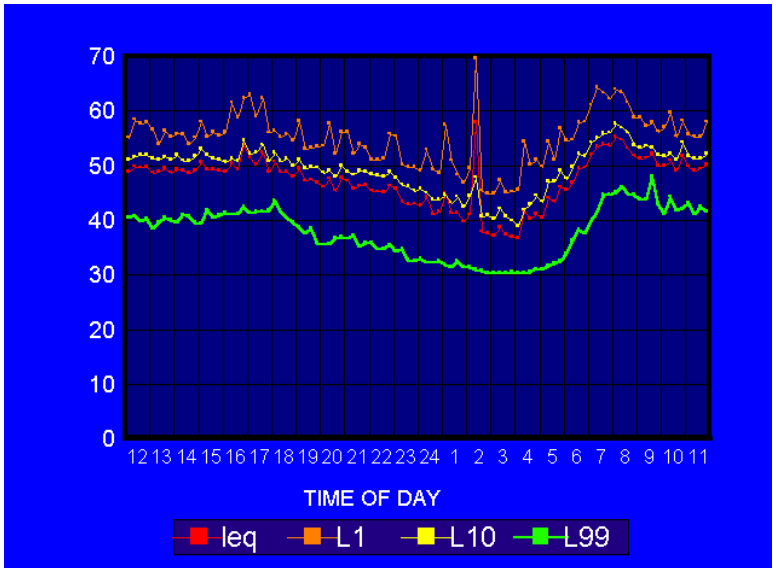
Large Offices, Reception Areas,
-For moderately good listening conditions

Private Offices, Classrooms, Libraries
-For good listening conditions

Auditoriums, Conference Rooms
-For very good listening conditions
Concert Halls, Churches
-For excellent listening conditions

Exterior Noise

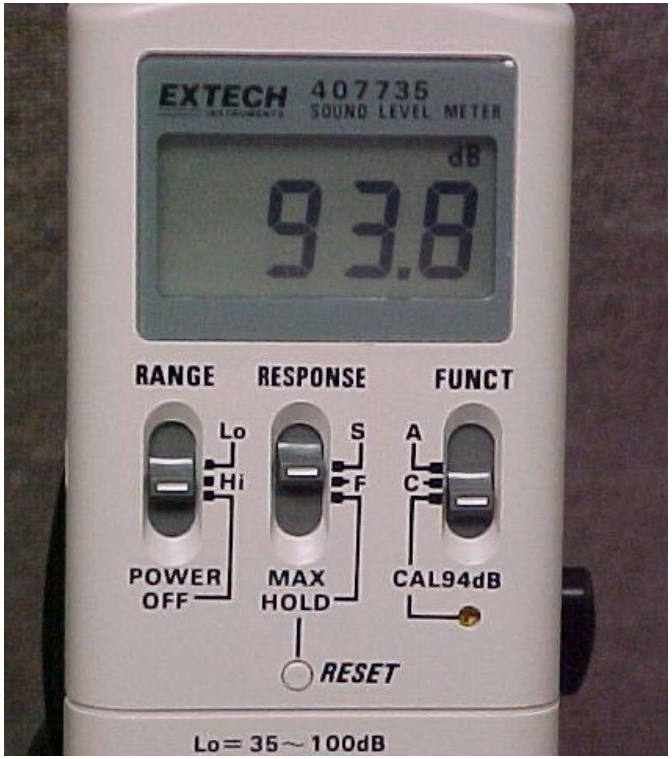
How loud is your site?



Building Code

Design Goal

45 Ldn / 45 dBA day



Acoustical Site Planning

Major Roads

ER Entrance

CUP and
Loading Docks

Parking Garage
Acoustical Buffer

Residential

What Part of "Don't Do This" Did They Not Understand?

Generator Noise Source


CTS
CWR
CWS
CHILLED WATER RETURN

Loading Dock Issues

- Time of day
- Size of trucks

ER / Trauma Issues

- Helipad – Life flights
- Ambulance Runs

LEED v4 – FGI / ASHE for Healthcare

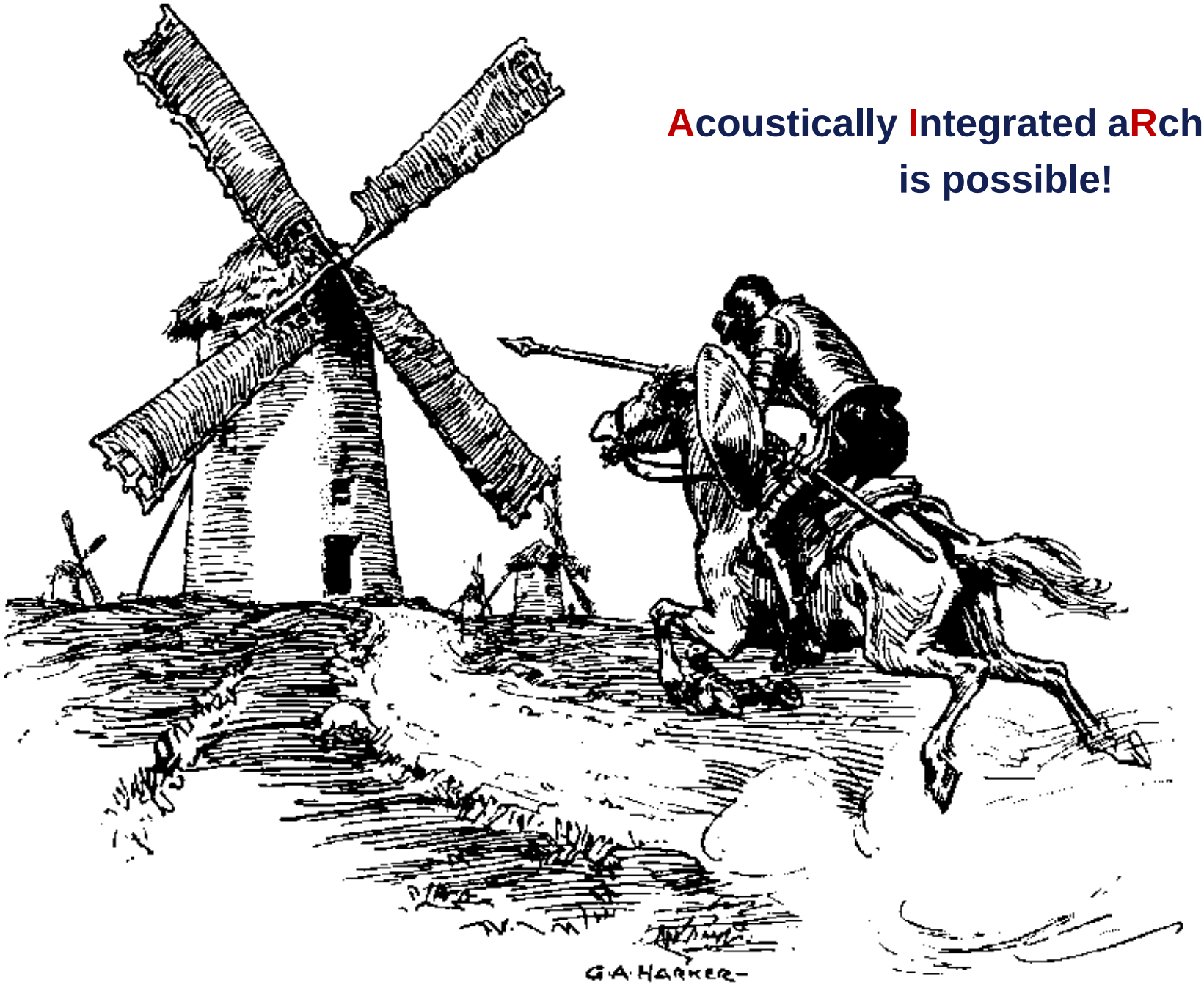
- **Facility / Process Noise**


BERCHTOLD
SKYTRON
4000
HERCULES
Dräger
Narkomed 640


MR
Positioning Kit


TELETOM700

Acoustically **I**ntegrated a**R**chitecture is possible!



Questions

THANK YOU!

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