ASSOCIATION OF
Texas College & University Facilities
PROFESSIONALS

Managing Metamorphosis, Building for Change

Session: 100207

Date: Thursday, October 2, 2014

Time: 10:00 am – 11:00 am

CONTINUING EDUCATION AIA

ASSOCIATION OF Texas College & University Facilities PROFESSIONALS

Managing Metamorphosis, Building for Change

Transformation of the Classroom for Critical Listening

Presented by:

- **Craig Reynolds, FAIA, BRW Architects**
- **Jeff Morris, Director of Undergraduate Studies, Texas A&M University**
- **Andrew Evertson, AIA, BRW Architects**

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Managing Metamorphosis,
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AIA

Transformation of the Classroom for Critical Listening

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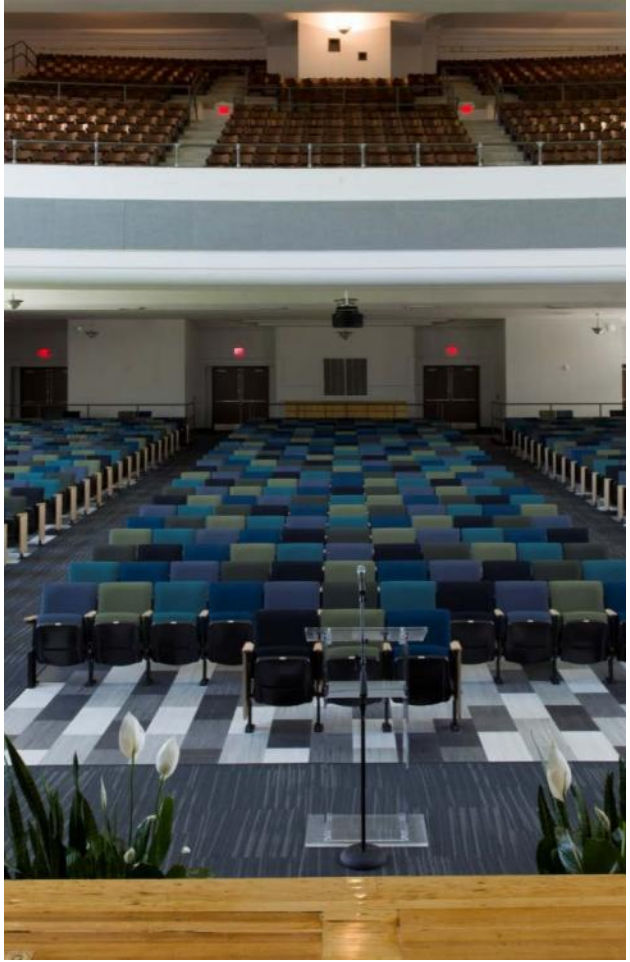
Design Considerations



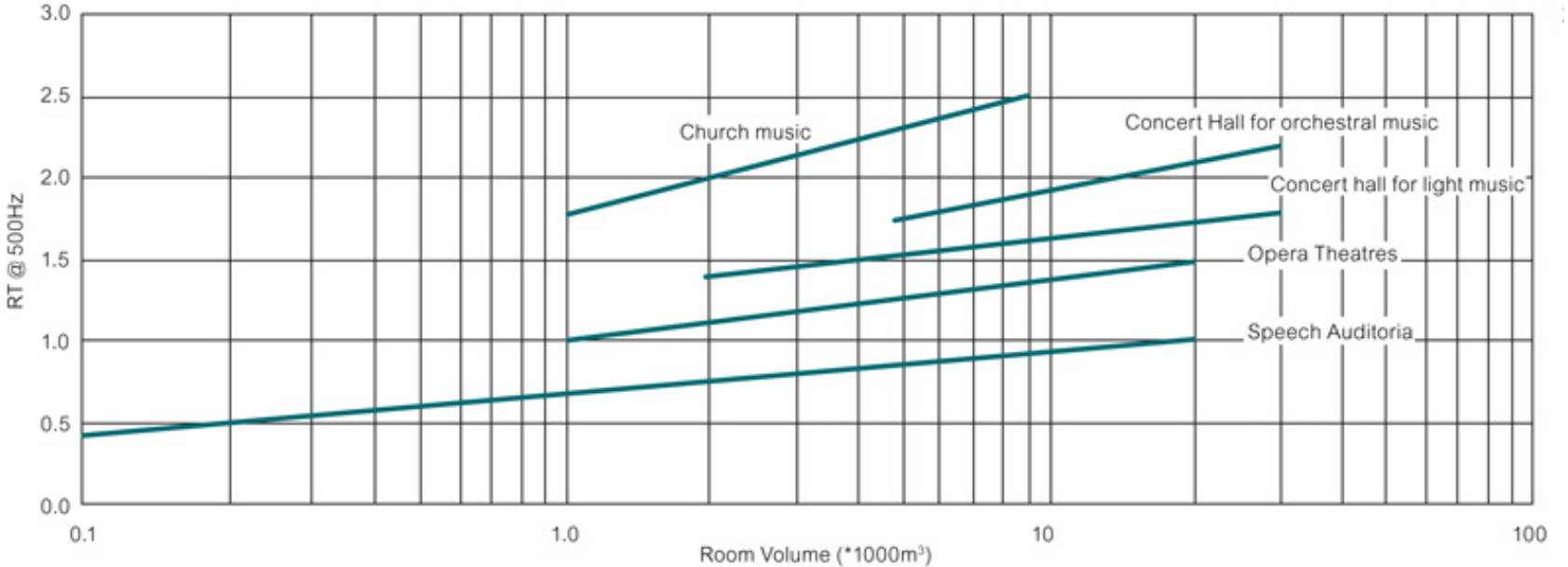
Design Considerations

NO REVERBERATION

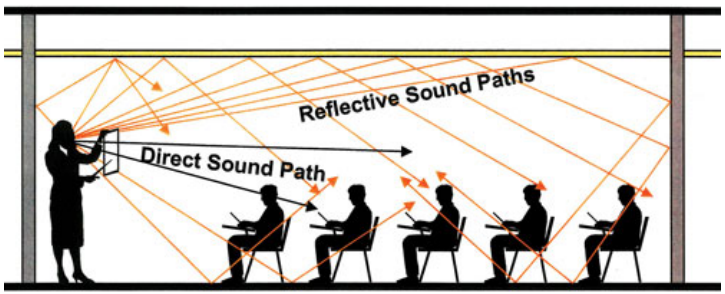
0.6s REVERBERATION TIME

0.8s REVERBERATION TIME

2.0s REVERBERATION TIME

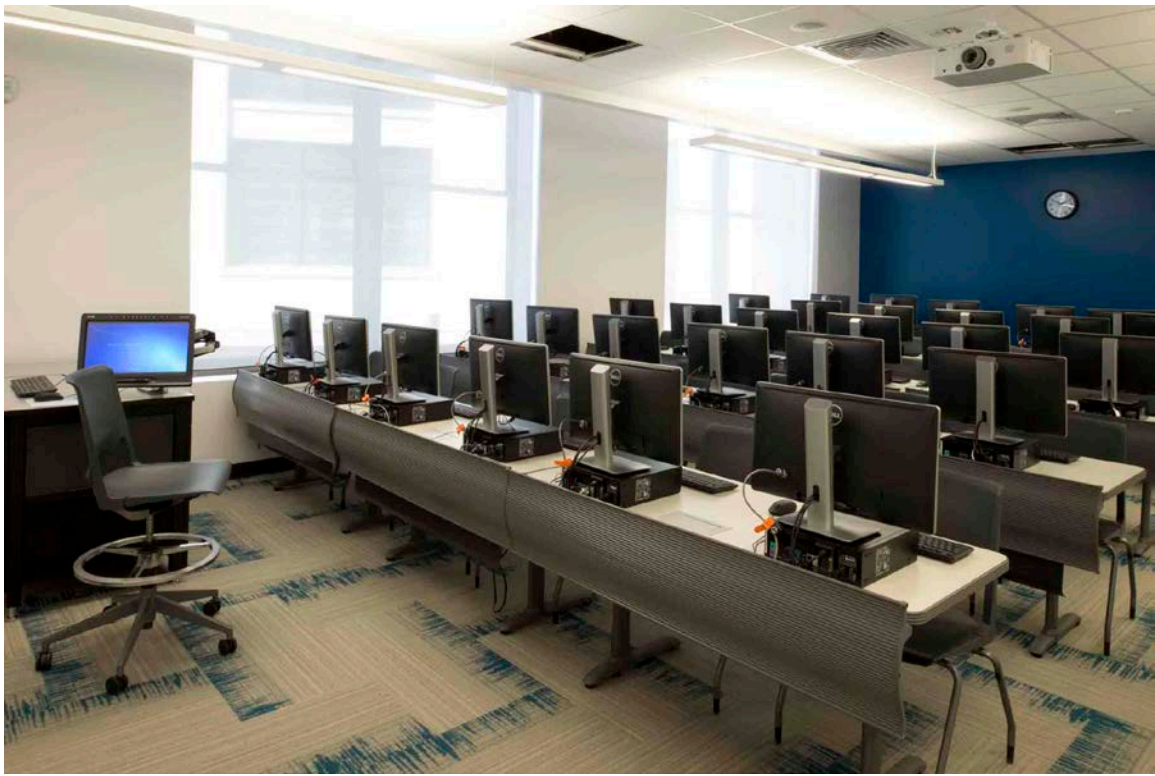


Reverberation Time

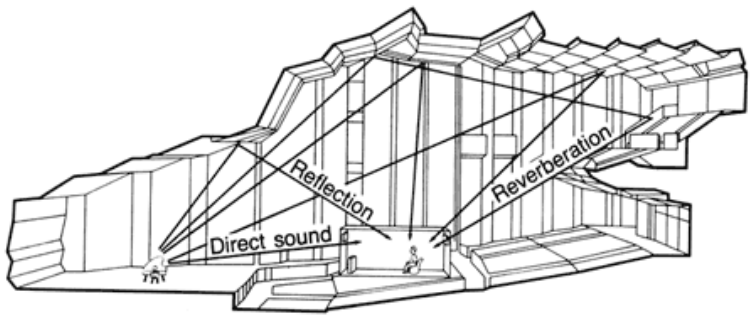


GENERAL LECTURE & INSTRUCTION
LIMIT REVERBERATION TIME
0.6 – 0.7 SECONDS

ANSI S12.60 – CLASSROOM ACOUSTICS



Reverberation



PERFORMANCE SPACE
CONTROLLED REVERBERATION TIME
UP TO 2.0 SECONDS

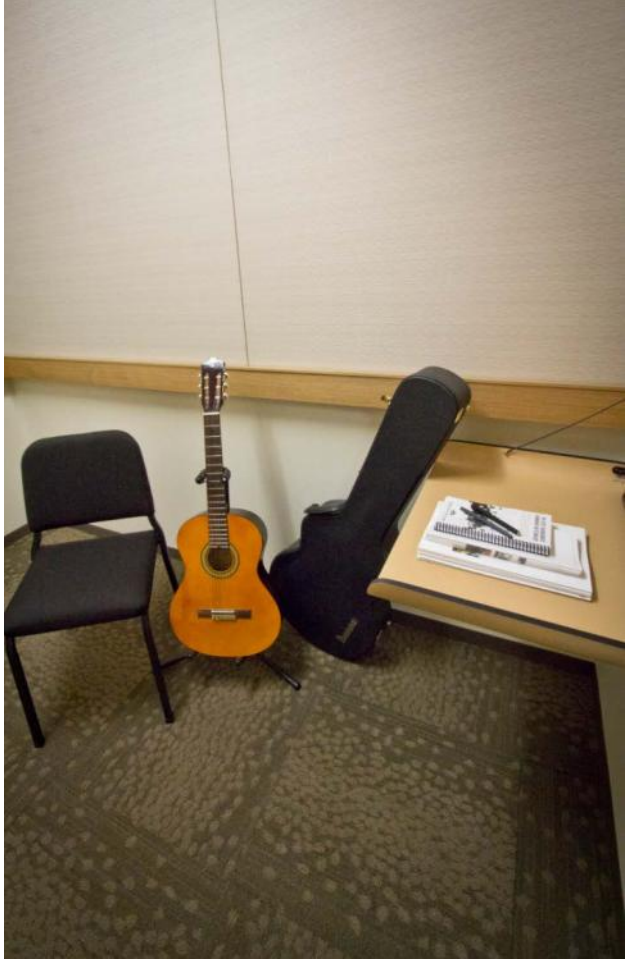
Reverberation

- **LIMIT REVERBERATION TIME THRU PROPER ABSORPTION / REFLECTION**
- **REDUCED MEP BACKGROUND NOISE**
- **ISOLATION FROM OTHER SPACES**

Classrooms / Lecture

- **FLEXIBLE FINISHES**
- **ENSURE ACOUSTIC PRIVACY**
- **OFFICE STUDIOS FOR PRIVATE INSTRUCTION**

Office Acoustics



- **INCREASED ACOUSTIC ISOLATION**
- **REDUCED MEP BACKGROUND NOISE**
- **ADJUSTABLE ACOUSTIC TUNING ELELMENTS**

Critical Listening

- LIMIT REVERBERATION TIME THRU PROPER ABSORPTION
- REDUCED BACKGROUND NOISE
- ISOLATION FROM OTHER SPACES

Rehearsal

- **FOCUS ON INDIVIDUAL INSTRUCTION IN A GROUP SETTING**
- **FLEXIBLE FINISHES**

Music Labs

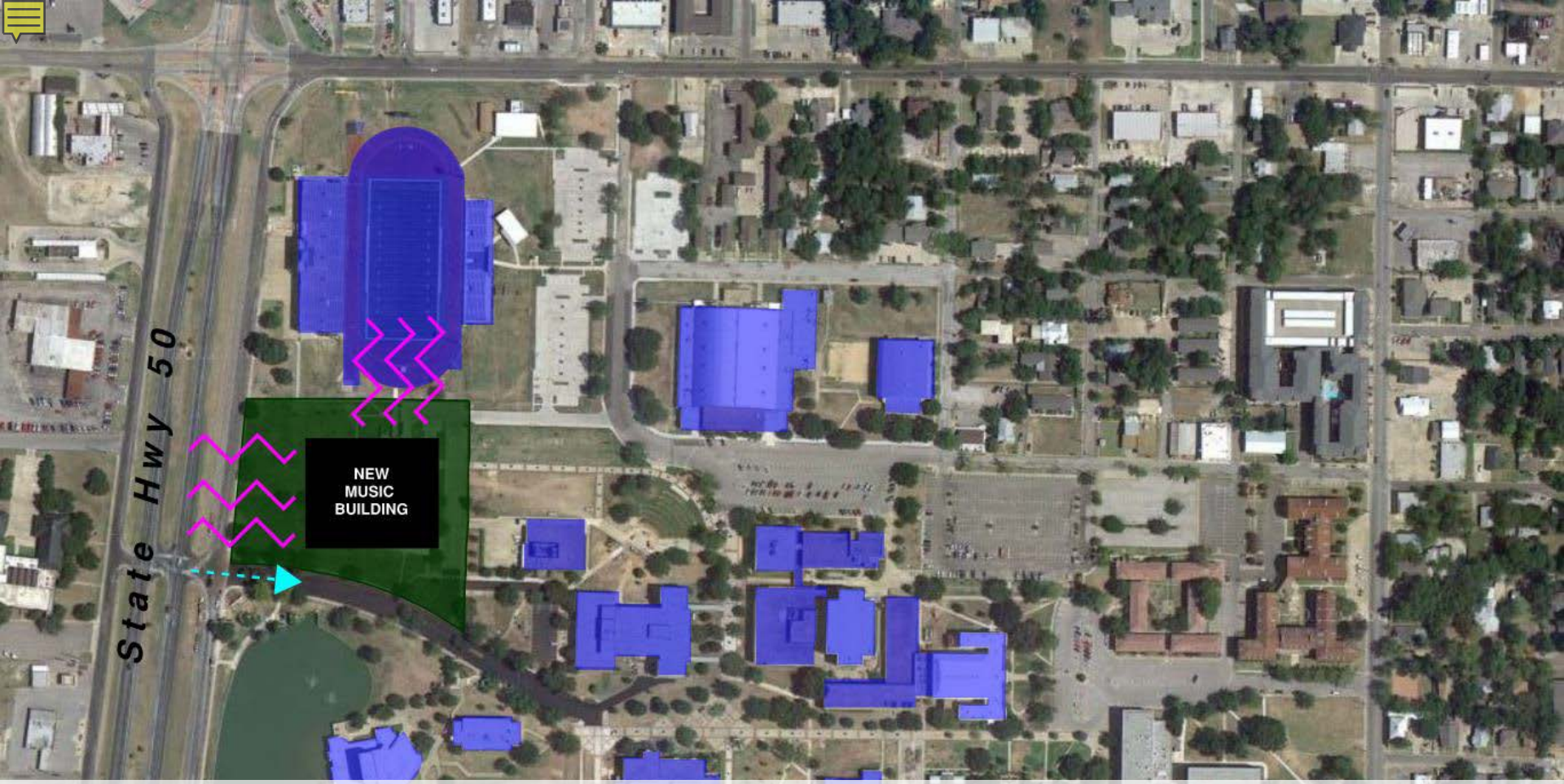
Performance

- **HIGHEST LEVELS OF ISOLATION**
- **LOWEST PERMISSABLE BACKGROUND MEP NOISE**
- **CONTROLLED REVERBERATION THRU DIFFUSION AND ABSORPTION**

Digital Recording

- HIGHEST LEVELS OF ISOLATION
- LOWEST PERMISSABLE BACKGROUND MEP NOISE
- LIMITED & EVENLY DISTRIBUTED REVERBERATION

Design Considerations



External Factors

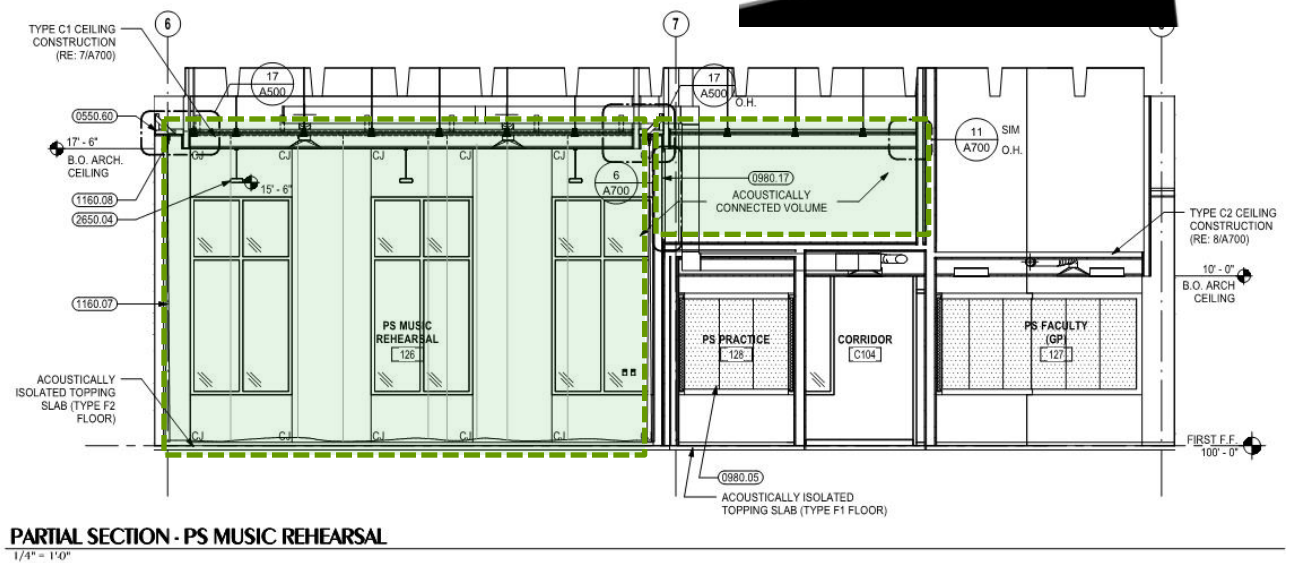
Internal Adjacencies

SPACE / ROOM	INTERIOR TREATMENT	REDUCE SOUND FROM INSIDE TO OUTSIDE	REDUCE SOUND FROM OUTSIDE TO INSIDE
OFFICES FOR PRIVATE MUSIC LESSONS	Mitigate reverberation to reduce exposure to loud sounds and to avoid performers' instincts to adjust to the room's acoustics	Mitigate nuisance/interference with communications in public areas and mitigate sound penetrating critical listening spaces	Mitigate distractions
FACULTY AND STAFF OFFICES		Extend walls to hard ceiling in offices handling sensitive information (e.g., FERPA data)	Mitigate distractions
RECORDING STUDIO: CONTROL ROOM	Diffuser behind listening position to avoid short echoes creating illusions of spatialization and frequency spectrum; tune for short but even reverberation	Mitigate nuisance/interference with communications in public areas and mitigate sound penetrating critical listening spaces	Mitigate transmission from recording rooms to allow critical listening of the recording; mitigate transmission from outside to enable critical listening
RECORDING STUDIO: RECORDING ROOMS	Tune for short but even reverberation unless making a strategically "live" area	Mitigate nuisance/interference with communications in public areas and mitigate sound penetrating critical listening spaces	Critical for recording
RECORDING STUDIO: MACHINE ROOM		Keep active-cooled equipment from interfering with recording and critical listening	
CLASSROOM	Mitigate reverberation for intelligibility and critical listening to recordings	Mitigate nuisance/interference with communications in public areas and mitigate sound penetrating critical listening spaces	Mitigate distractions
REHEARSAL ROOM	Mitigate reverberation in small rooms to reduce exposure to loud sounds; acoustic volume extension can simulate larger venues	Mitigate nuisance/interference with communications in public areas and mitigate sound penetrating critical listening spaces	Mitigate distractions
PERFORMANCE SPACE	Tune for even reverberation		Keep outside sound from interfering with/distracting from the performance
WORKSHOP	Mitigate reverberation to reduce exposure to loud sounds	Mitigate nuisance/interference with communications in public areas and mitigate sound penetrating critical listening spaces	

FIRST FLOOR PLAN

Interior Finishes

Incorporating Technology

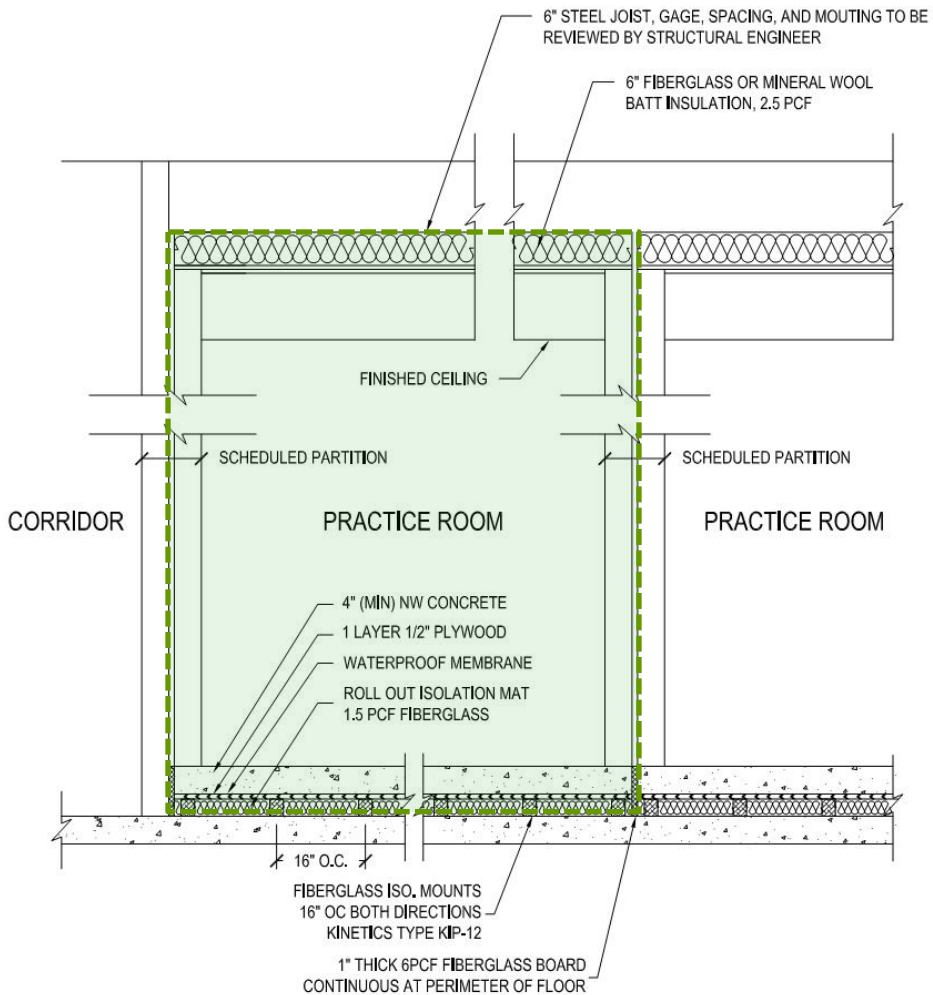


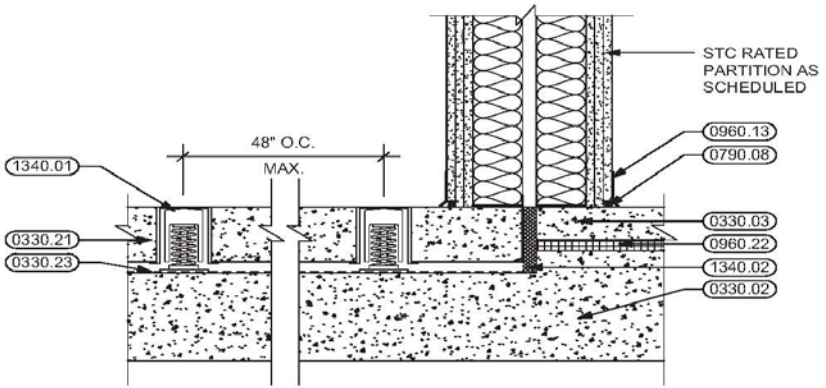
PARTIAL SECTION - PS MUSIC REHEARSAL

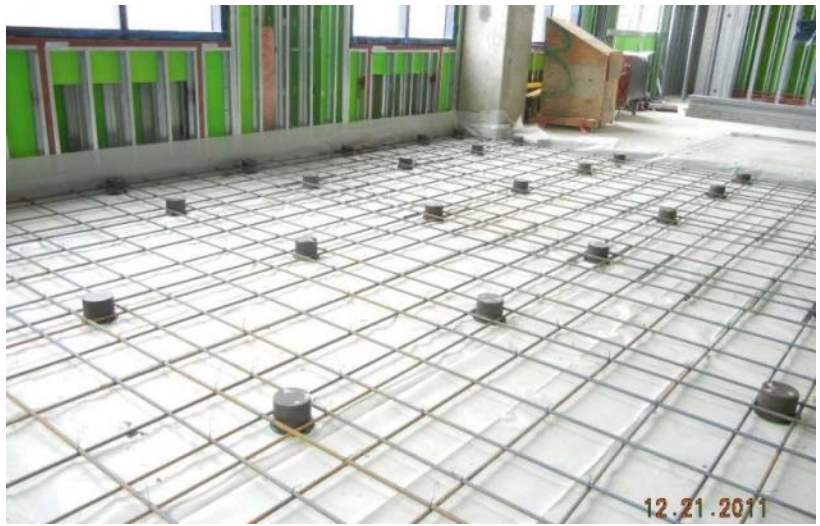
1/4" = 1'-0"

Case Study

Construction Continuity


6" STEEL JOIST, GAGE, SPACING, AND MOUTING TO BE REVIEWED BY STRUCTURAL ENGINEER
6" FIBERGLASS OR MINERAL WOOL BATT INSULATION, 2.5 PCF
FINISHED CEILING
SCHEDULED PARTITION
SCHEDULED PARTITION
CORRIDOR
PRACTICE ROOM
PRACTICE ROOM
4" (MIN) NW CONCRETE
1 LAYER 1/2" PLYWOOD
WATERPROOF MEMBRANE
ROLL OUT ISOLATION MAT
1.5 PCF FIBERGLASS
16" O.C.
FIBERGLASS ISO. MOUNTS
16" OC BOTH DIRECTIONS
KINETICS TYPE KIP-12
1" THICK 6PCF FIBERGLASS BOARD
CONTINUOUS AT PERIMETER OF FLOOR

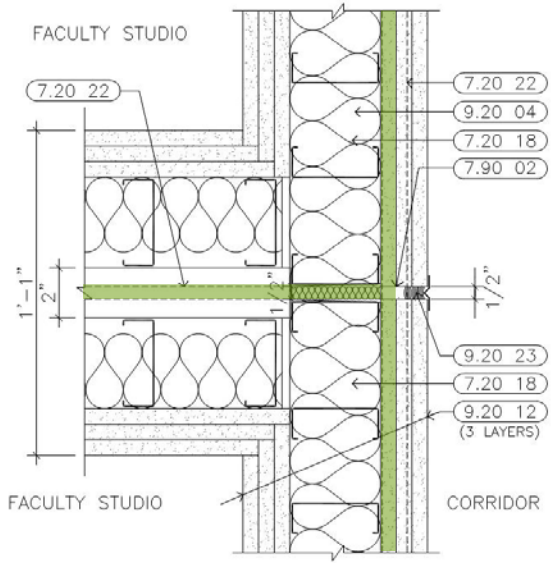




Structural Issues

STRUCTURAL-BORN VIBRATION

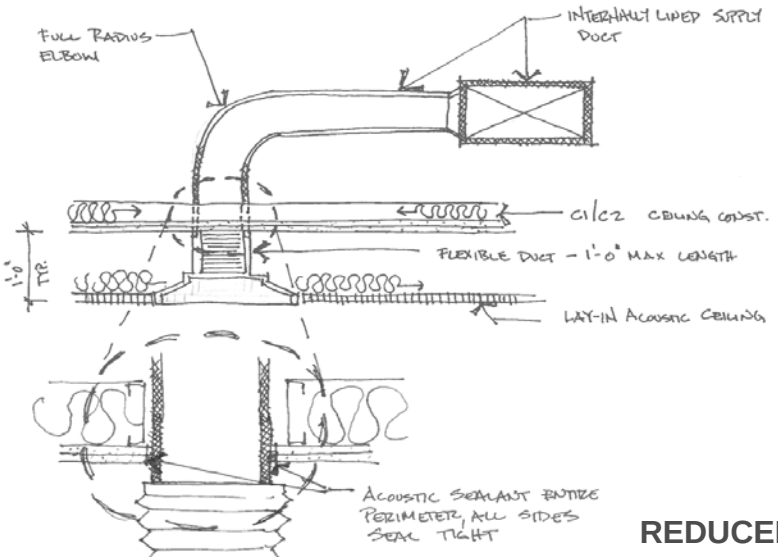
- ISOLATE FLOORS, WALLS, CEILINGS
- BUILDING EXPANSION JOINTS FOR CRITICAL SPACES



ACOUSTIC ISOLATION

- **BUILDING UP MASS IN ASSEMBLIES**
- **ISOLATE VIBRATION FROM ROOM TO ROOM**
- **STAGGERED CONSTRUCTION**
- **SEALING WALLS**

Architectural Issues



Mechanical Issues

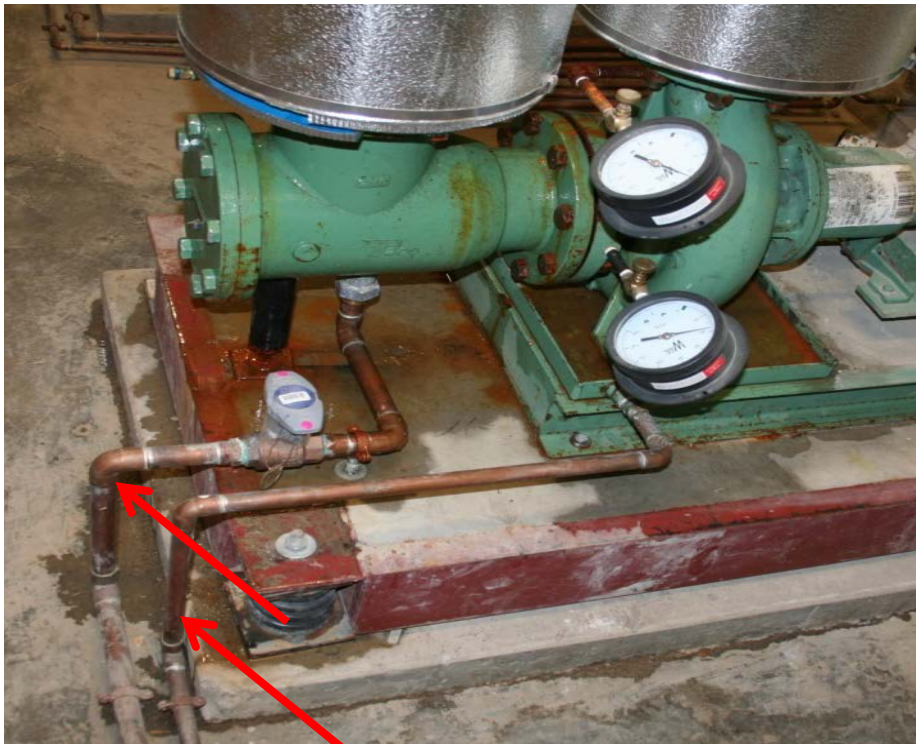
REDUCED BACKGROUND NOISE

- **REDUCED AIR VELOCITIES**
- **REDUCED AIR TURBULENCE**
- **INCREASED DAMPENING**
- **REDUCED VIBRATION**

Electrical Issues

REDUCED BACKGROUND NOISE

- REDUCE TRANSMISSION OF STRUCTURAL-BORN VIBRATION
- MITIGATE PENETRATIONS IN ASSEMBLIES
- ISOLATE EQUIPMENT / LIGHTING NOISE



Vibration Control

REDUCED VIBRATION

- **FLEXIBLE CONNECTIONS TO EQUIPMENT**
- **SPECIFYING THE RIGHT EQUIPMENT SUPPORTS / ISOLATION MOUNTS**

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Seminar Evaluation

We hope you enjoyed this session…

Please take a moment to complete the evaluation form. *Thank you!*

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