Hawthorn Building

Penn State Altoona Campus

Altoona, PA

Walter Nichols

Lighting/Electrical Option

Faculty Advisor: Dr. Richard Mistrick

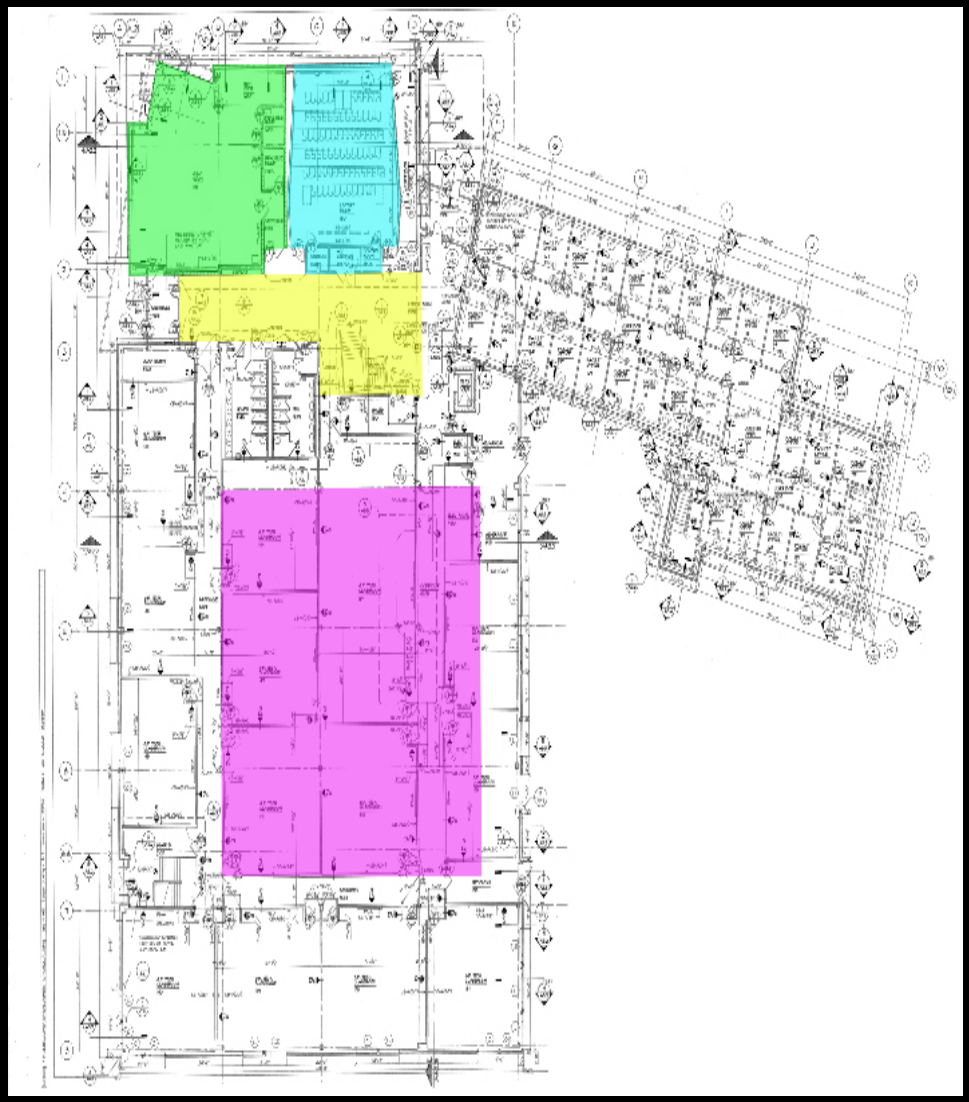
Building Overview

- 58,800 sq.ft.
- 2 Stories above grade
- Steel frame with curtain wall construction
- Replaced the old computer lab building on campus
- Uses include: computer labs, classrooms, faculty and staff offices
- Architect:
  WTW Architects of Pittsburgh, PA

Schematic Design

Selected Spaces

- Main Corridor and Stairwell
- Pechter Family Music Room
- Lecture Hall/Video Conferencing Room
- Computer Labs and Classrooms (2nd floor)



Schematic Design

Main Corridor/Stairwell

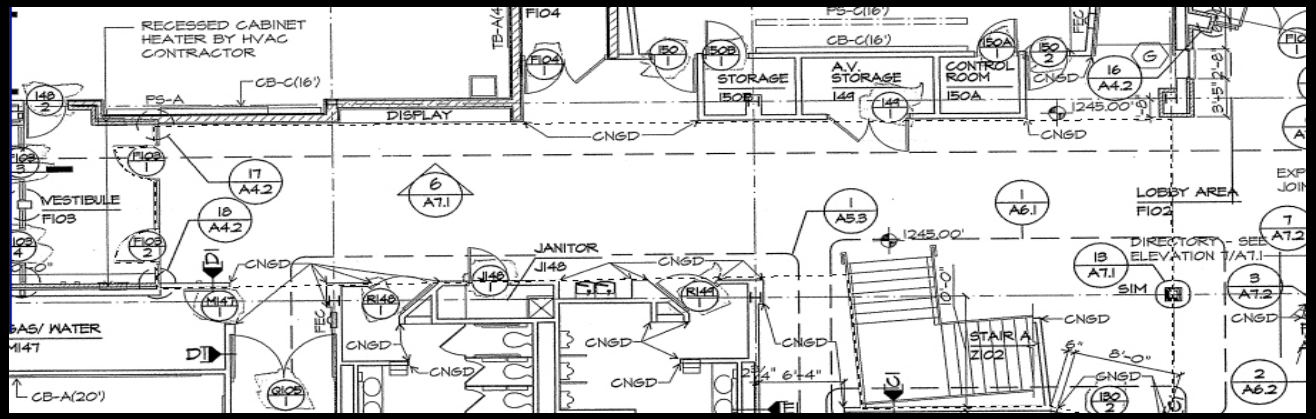
Schematic Design
Main Corridor

Architectural Characteristics

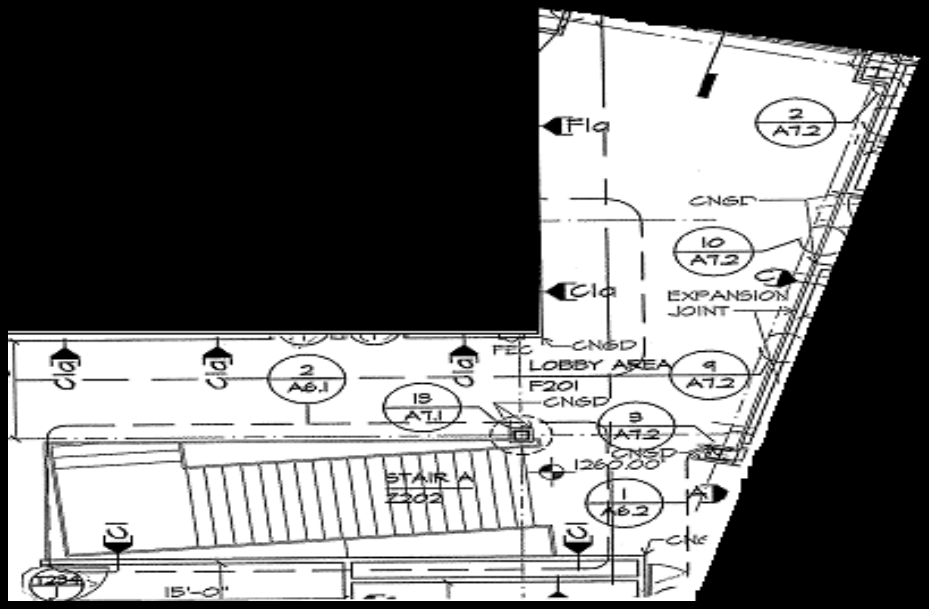
- Single story, but open to above at stairwell
- Student lounge on 2nd floor landing
- Complex floor tile pattern
- Flowing space with little to no seating on 1st floor area
- Calm and peaceful colors
- Finishes
  - white painted walls
  - earthy and natural colored floor tiles
  - white painted ceiling
- Furnishings
  - 1st floor – few chairs against the walls
  - 2nd floor – wood tables, chairs, and couches in student lounge area

Schematic Design

Main Corridor



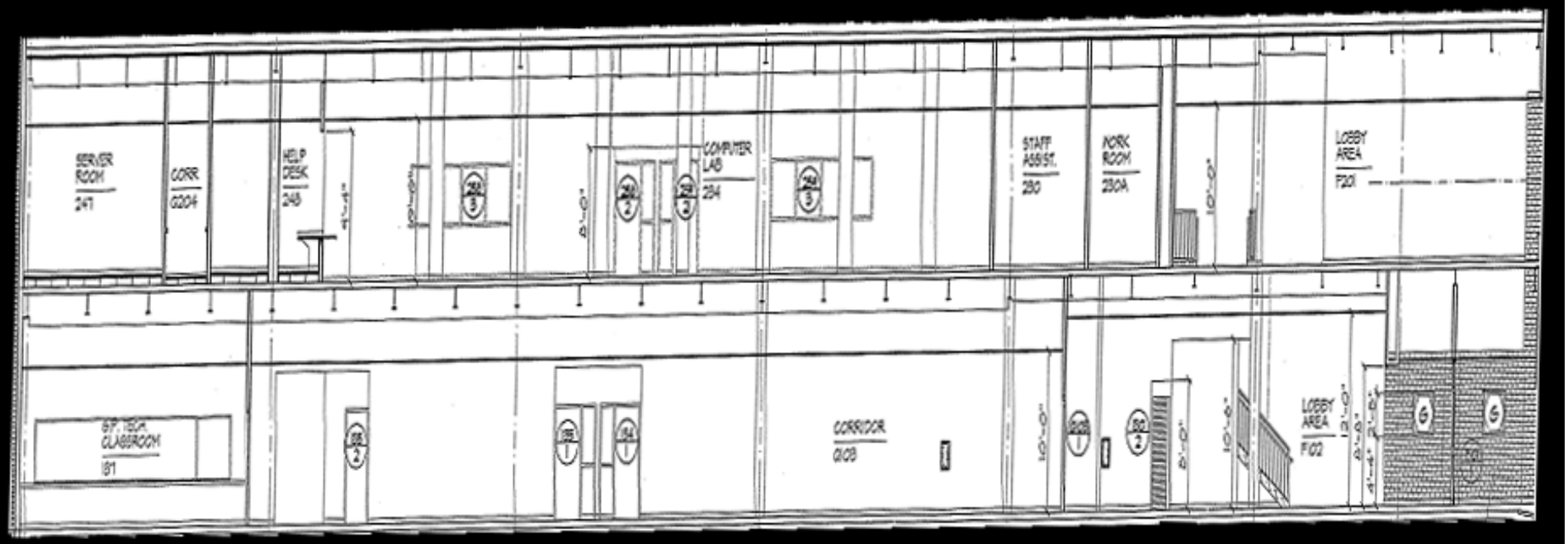
First Floor



Second Floor

Schematic Design

Main Corridor



Schematic Design

Main Corridor

Design Intent

- **Flows smoothly as you walk through**
- **Aesthetically pleasing**
  - ties together with the architecture
- **Provide accent lighting**
  - bulletin boards
  - guiding floor tiles
  - stairwell
- **Flexible control system**
  - occupancy sensor to turn lights out when building isn't in use
  - dimming in 2nd floor lounge area due to daylight contribution from windows via photosensor
- **Highlight surface characteristics**
  - provide a uniform wall wash
  - avoid harsh scallops

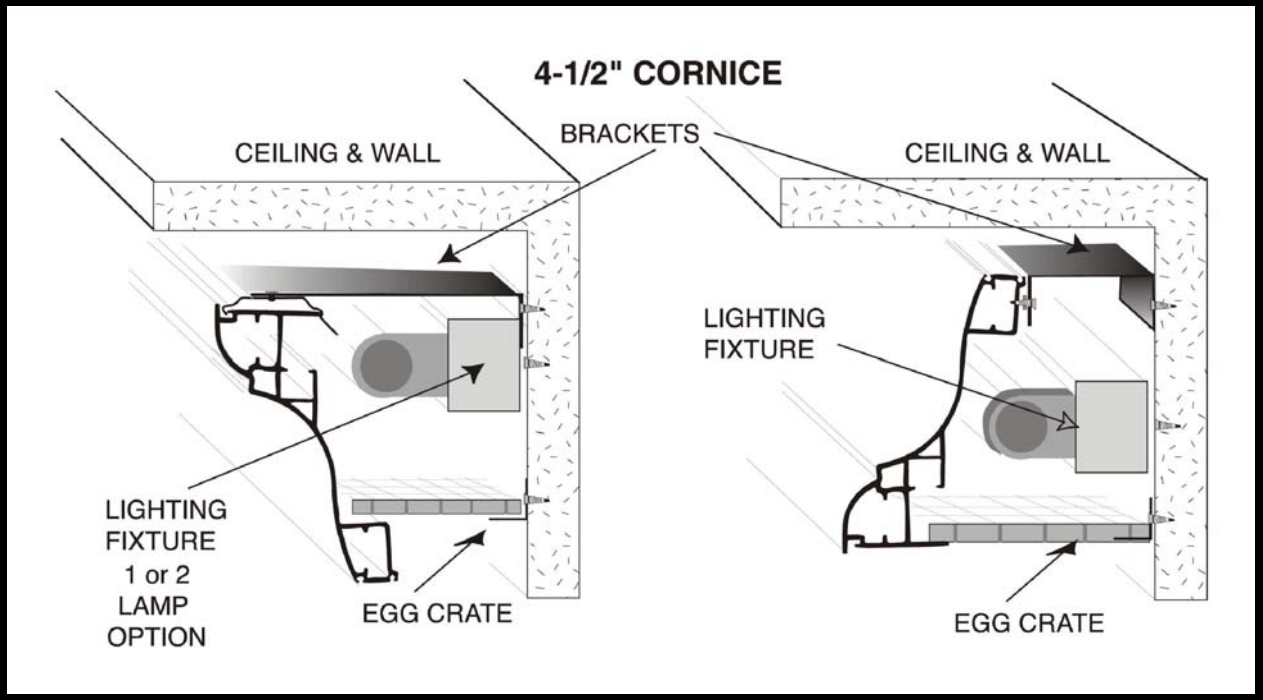
Schematic Design
Main Corridor

Design Solution

- **Wall mounted decorative cove light**
  - T8 80%/20% indirect/direct system @ 4100 CCT
  - makes the wall more decorative with the wooden strip while lighting the ceiling and floor
  - eliminates existing scalloping
  - hides luminaires
  - provides uniform wall wash
- **Recessed CFT downlights**
- **Daylight integration**
  - 2nd floor only
- **Dimming control system**
  - 2nd floor only

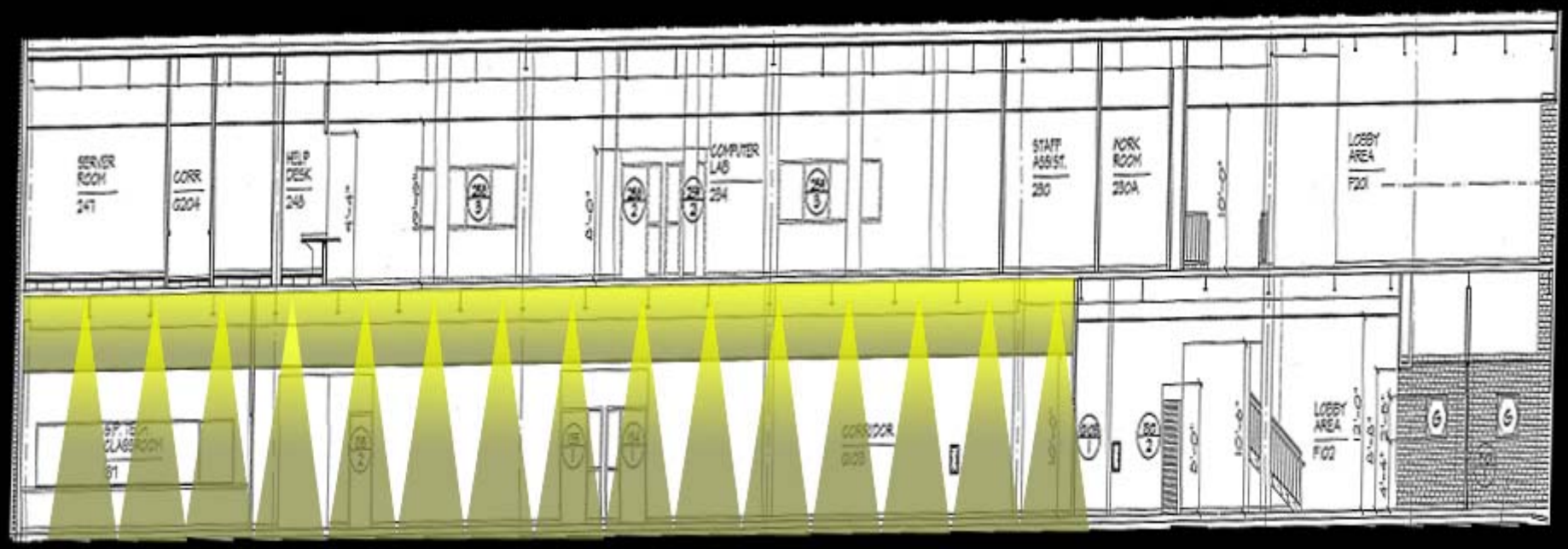
Schematic Design
Main Corridor

Wall Mounted Cove Light Details



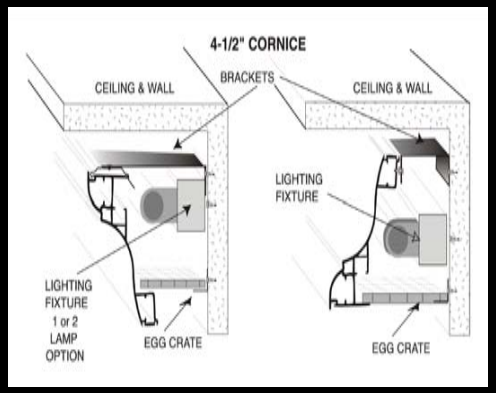
Schematic Design

Main Corridor



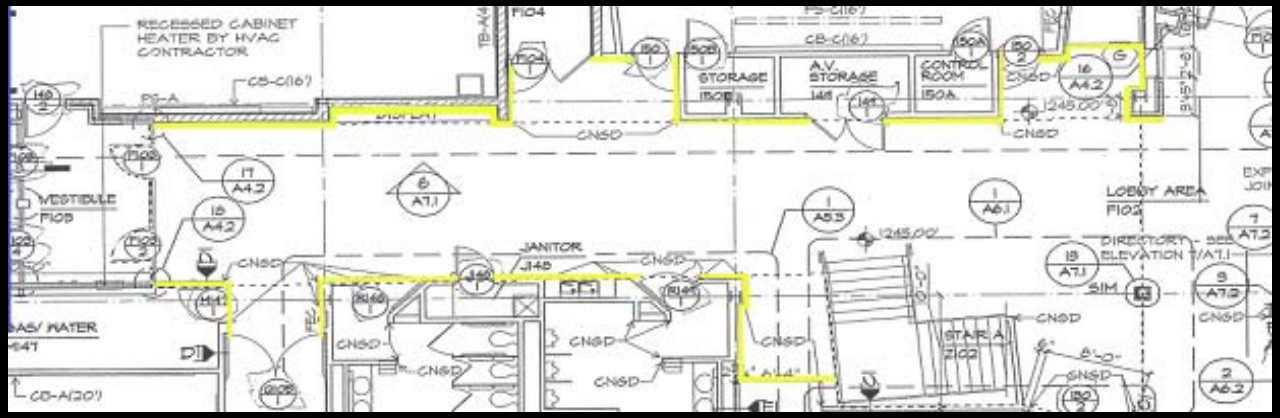
Schematic Design
Main Corridor

Luminaire Selection



Cove light

Application image



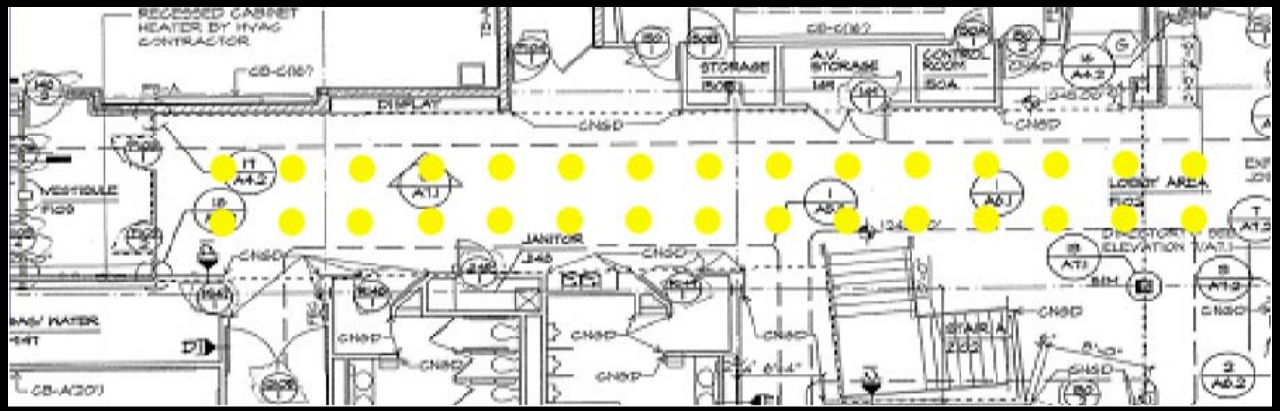
Plan view with cove light

Schematic Design
Main Corridor

Luminaire Selection

Down Light

Application image



Plan view with downlights

Schematic Design

Pechter Family
Music Room

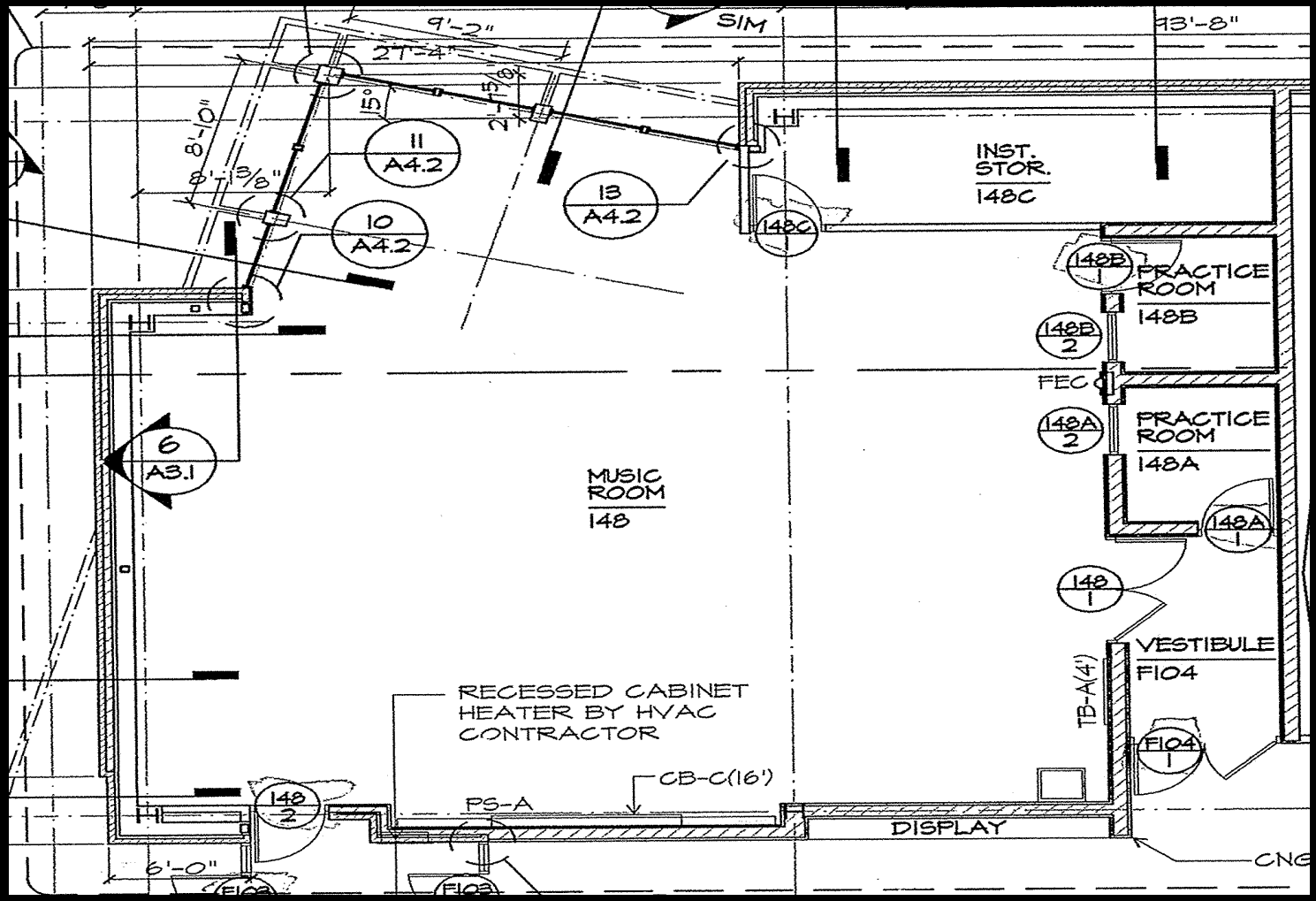
Schematic Design
Pechter Family Music Room

Architectural Characteristics

- Single story with 15' high open ceiling
- Acoustical panels on ceiling and walls
- Mechanical ductwork above acoustical panels (from 10' to 15' high)
- Daylight contribution from large windows in rear of the room
- Flanked by storage and practice rooms
- Finishes
  - white painted walls with brown acoustical panel tiling pattern
  - gray tile floor
  - white acoustical panel ceiling
  - black ceiling in mechanical space
- Furnishings
  - metal chairs
  - white tables
  - blackboard in front of classroom

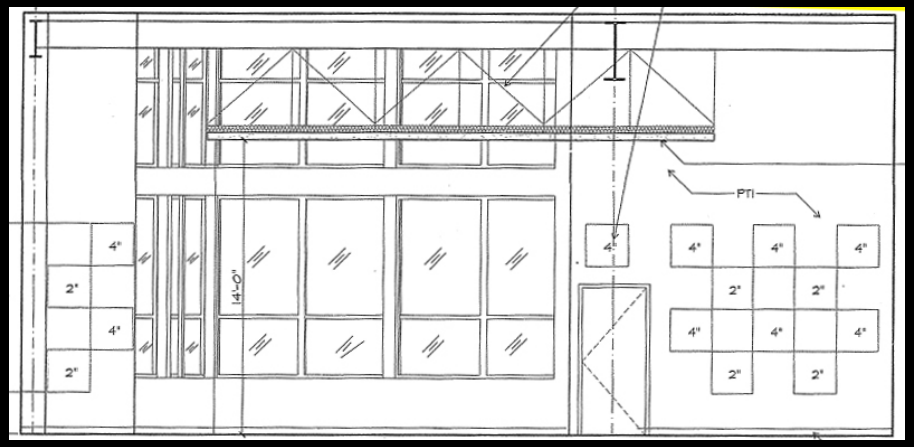
Schematic Design

Pechter Family Music Room



Schematic Design

Pechter Family Music Room



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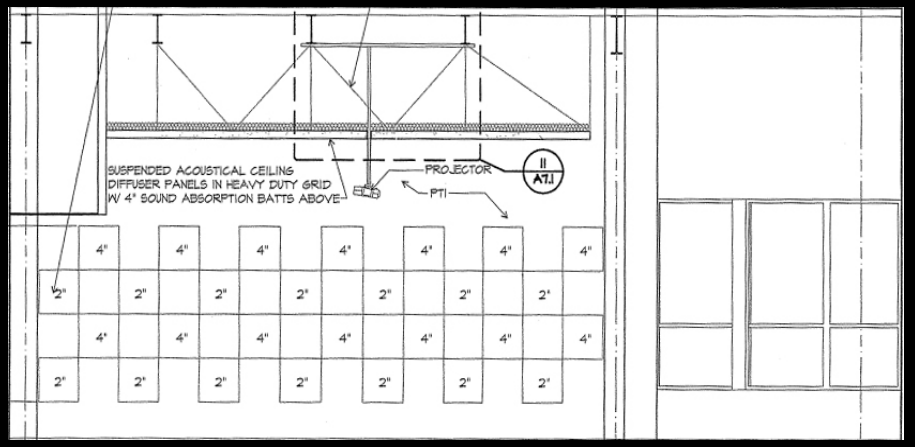

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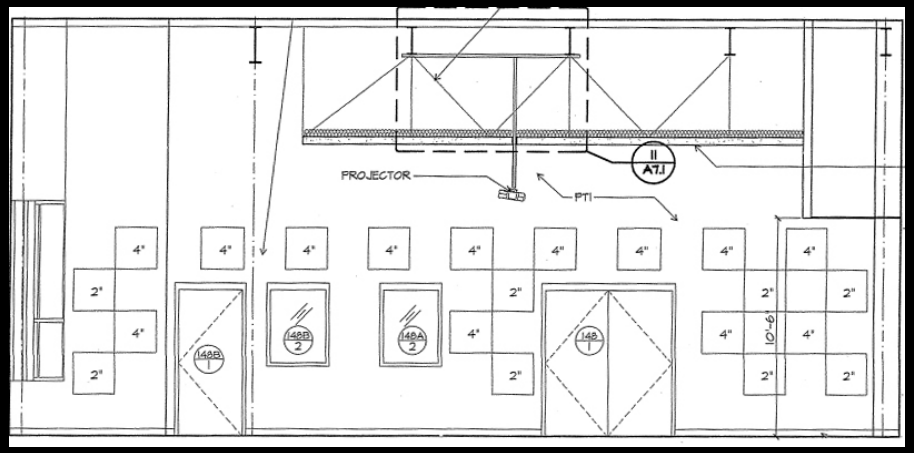

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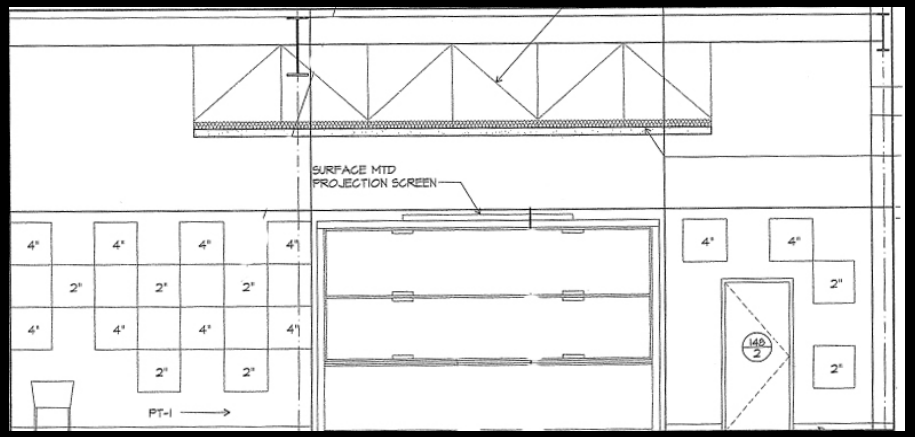


Section 4

Schematic Design

Pechter Family Music Room

Design Intent

- **Aesthetically pleasing**
  - architecturally pleasing fixtures
- **Provide accent lighting**
  - black board
- **Flexible control system**
  - occupancy sensor to turn lights out when room isn't in use
  - dimming due to daylight contribution from windows via photosensor
- **Task lighting**
  - student desks
  - music stands
- **Other considerations**
  - maintain acoustical ceiling panels

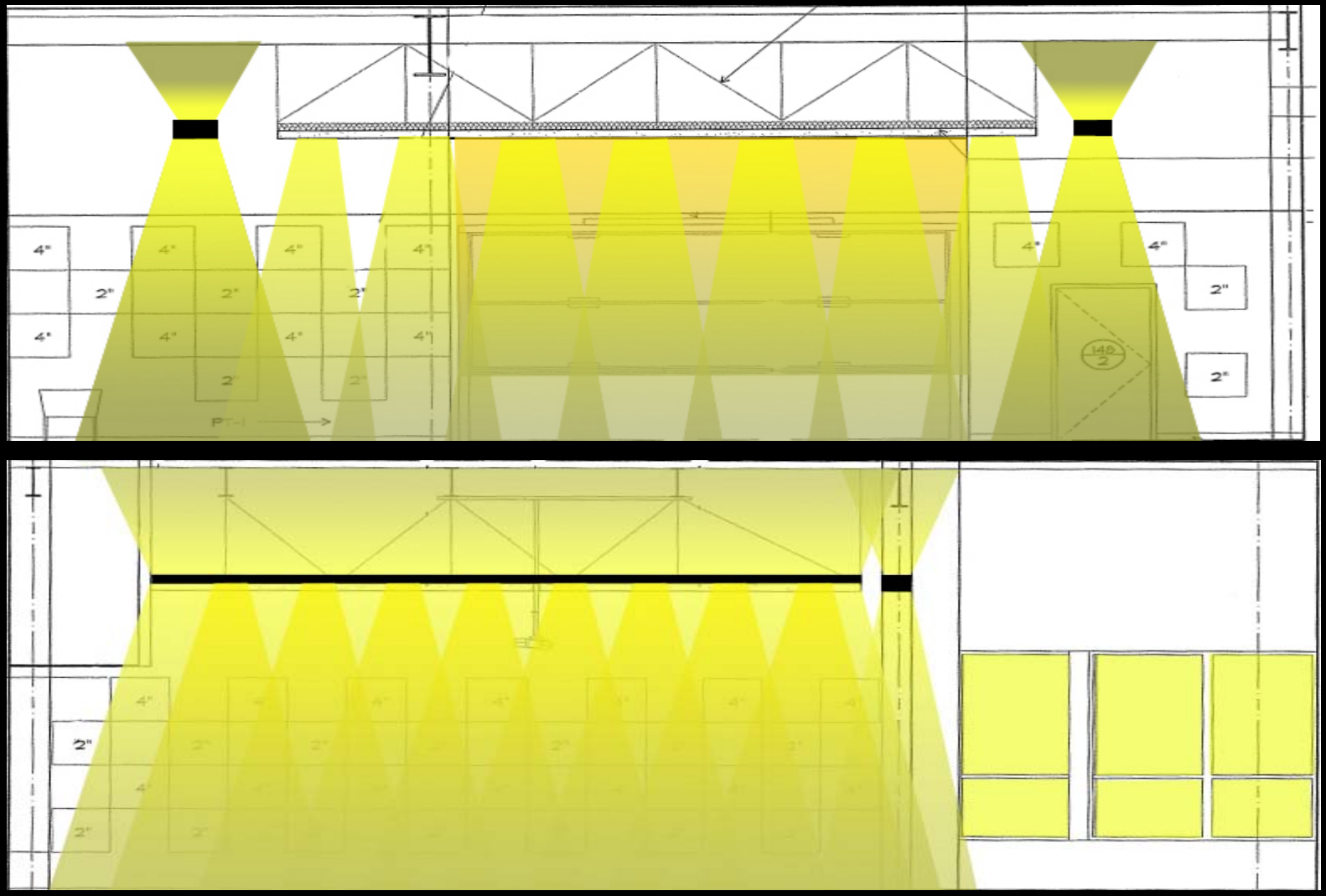
Schematic Design
Pechter Family Music Room

Design Solution

- **Keep existing parabolic fixtures**
  - maintains acoustical panels
  - reverberation times won't be incorrect
  - maintains a clean look over the middle of the room
  - 3500 CCT
- **Suspended direct/indirect fixtures along perimeter**
  - adds "architectural flare"
  - acts as a guide to lead around the outside of the room
  - 3500 CCT
- **Wallwash for blackboard**
  - recessed wallwasher
  - provides extra light for reading tasks
  - 3500 CCT
- **Dimming control system**
  - lights can be dimmed during daytime due to daylight
- **Daylight integration**
  - rear to the middle of room only
- **Keep existing troffers in 2 practice rooms**

Schematic Design

Pechter Family Music Room

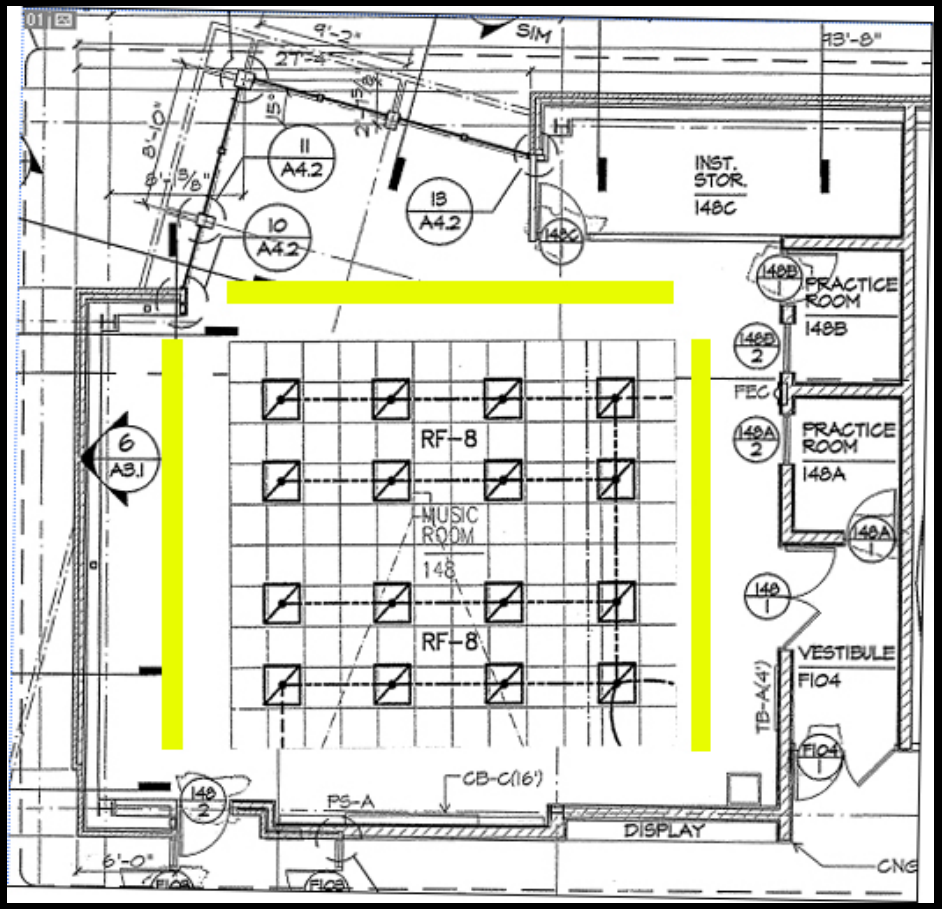


Schematic Design
Pechter Family Music Room

Luminaire Selection

Suspended
Direct/Indirect

Application image

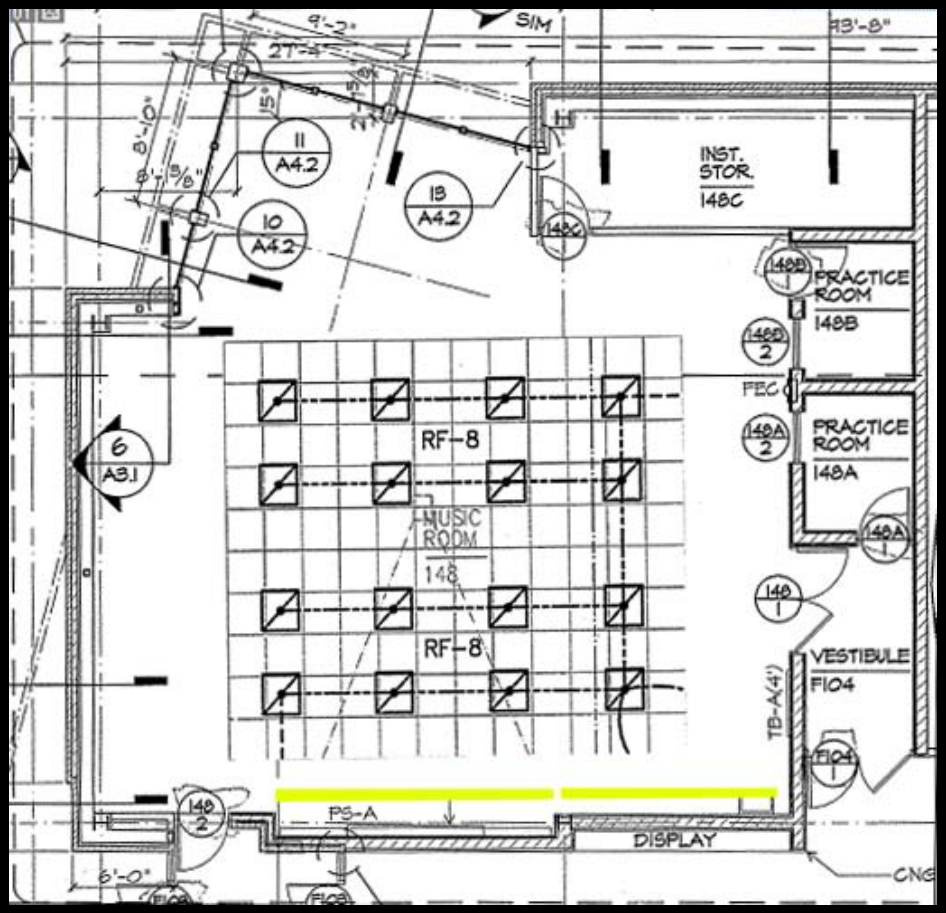


Schematic Design
Pechter Family Music Room

Luminaire Selection

Recessed Wallwasher

Application image



Schematic Design

Lecture Hall / Video Conferencing Room

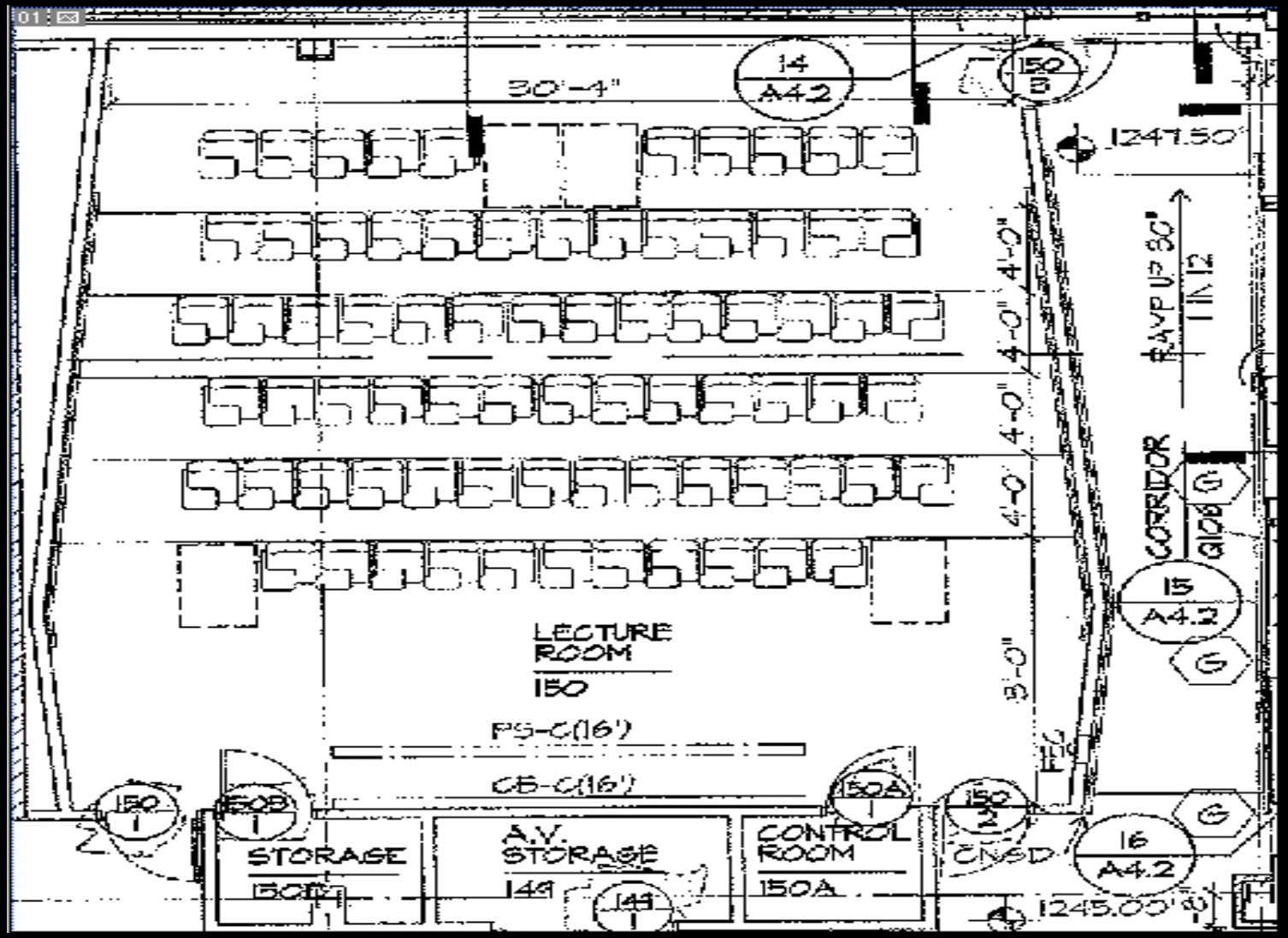
Schematic Design
Lecture Hall/VC Room

Architectural Characteristics

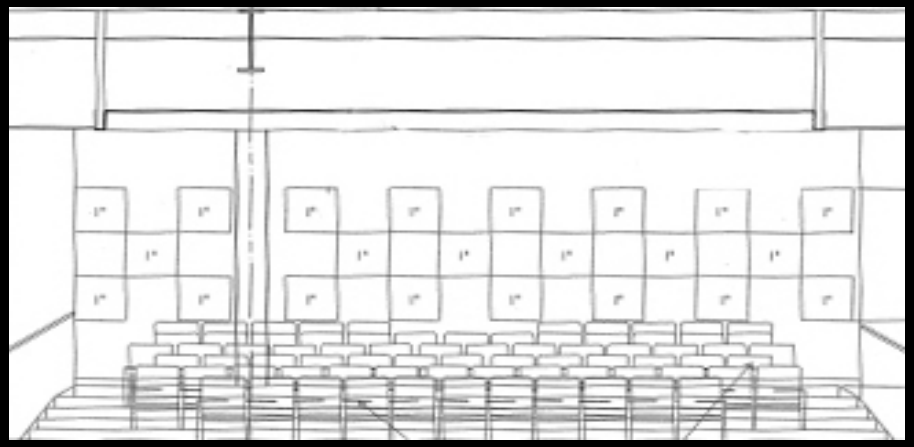
- Single story with 15' high ceiling
- Acoustical panels on side and back walls
- Auditorium style raked seating
- Finishes
  - brown/gold painted walls
  - gray carpeted floor
  - white painted ceiling
- Furnishings
  - blue plastic chairs
  - fold up desks
  - blackboard in front of classroom
  - podium in front of classroom

Schematic Design

Lecture Hall/VC Room

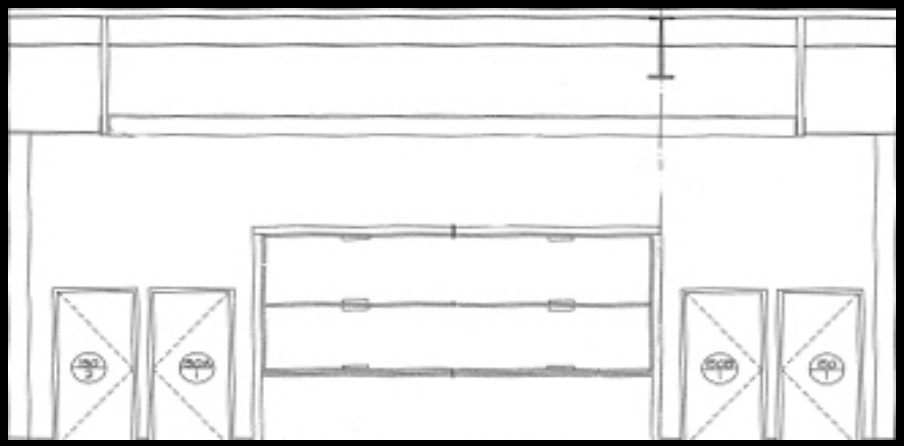


Schematic Design
Lecture Hall/VC Room



Section 1

Section 2



Section 3

Schematic Design
Lecture Hall/VC Room

Design Intent

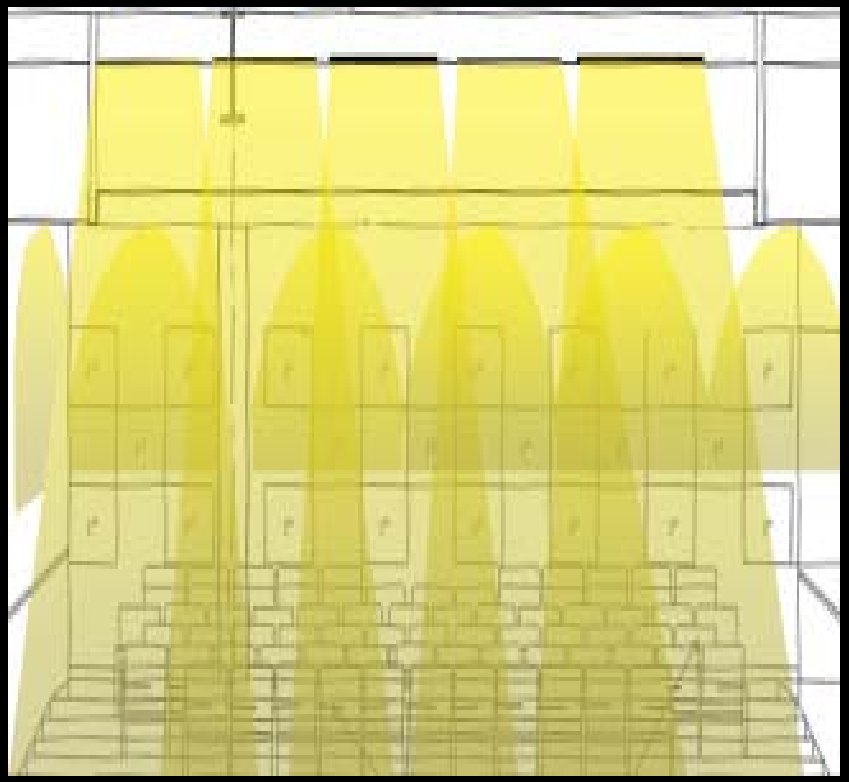
- **Peaceful on the eyes**
  - remove the existing harsh shadows, scallops, and non-uniform washes
- **Provide accent lighting**
  - black board
- **Flexible control system**
  - occupancy sensor to turn lights out when room isn't in use
  - zone controls and scene selections for different classroom uses including video conferencing
- **Task lighting**
  - student desks
  - black board
- **Other considerations**
  - facial rendering for video conferencing
  - 3:1 background to face illuminance ratio

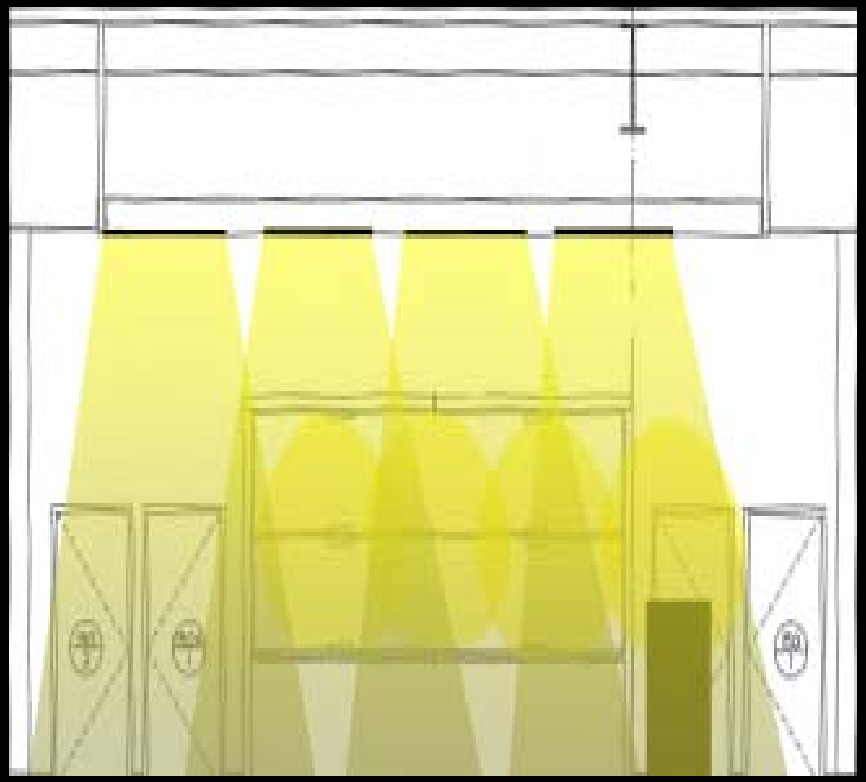
Schematic Design
Lecture Hall/VC Room

Design Solution

- **Recessed troffers**
  - provide more light than existing downlights
  - provide light over a larger area
  - provides better facial rendering of the students for the teacher
  - removes unwanted scalloping on some of the walls
  - 4100 CCT
- **Recessed downlight wallwash**
  - provides additional light to the perimeter of the room
  - provides additional light onto the stairs of the raked floor
  - 4100 CCT
- **Track mounted spotlights for blackboard and facial rendering**
  - use metal halide spot lights
  -good color rendering
  - longer life than incandescent lighting
  - CCT of around 4100k to match the rest of the classroom
- **Zone control system**
  - turn on and off certain lights when they aren't needed
  - allows for multiple scene selections

Schematic Design
Lecture Hall/VC Room





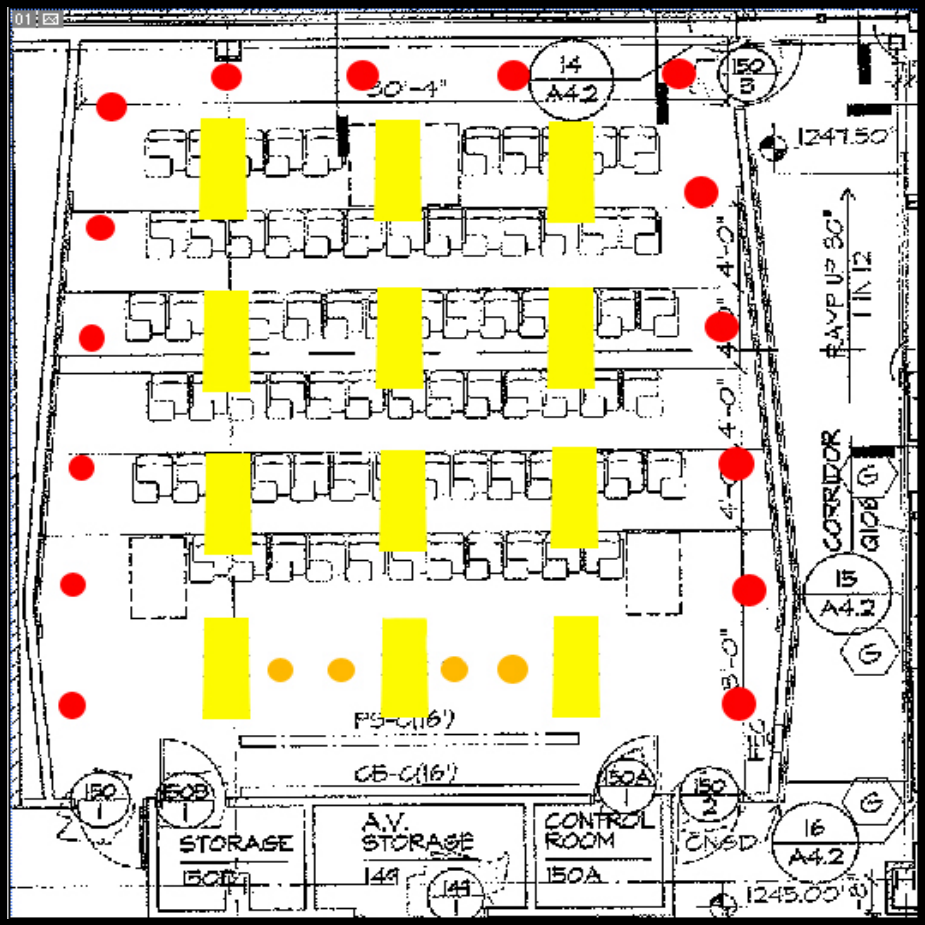
Schematic Design
Lecture Hall/VC Room

Luminaire Selection

Recessed lensed troffer

Track mounted metal halide spot

Recessed CFT wallwasher



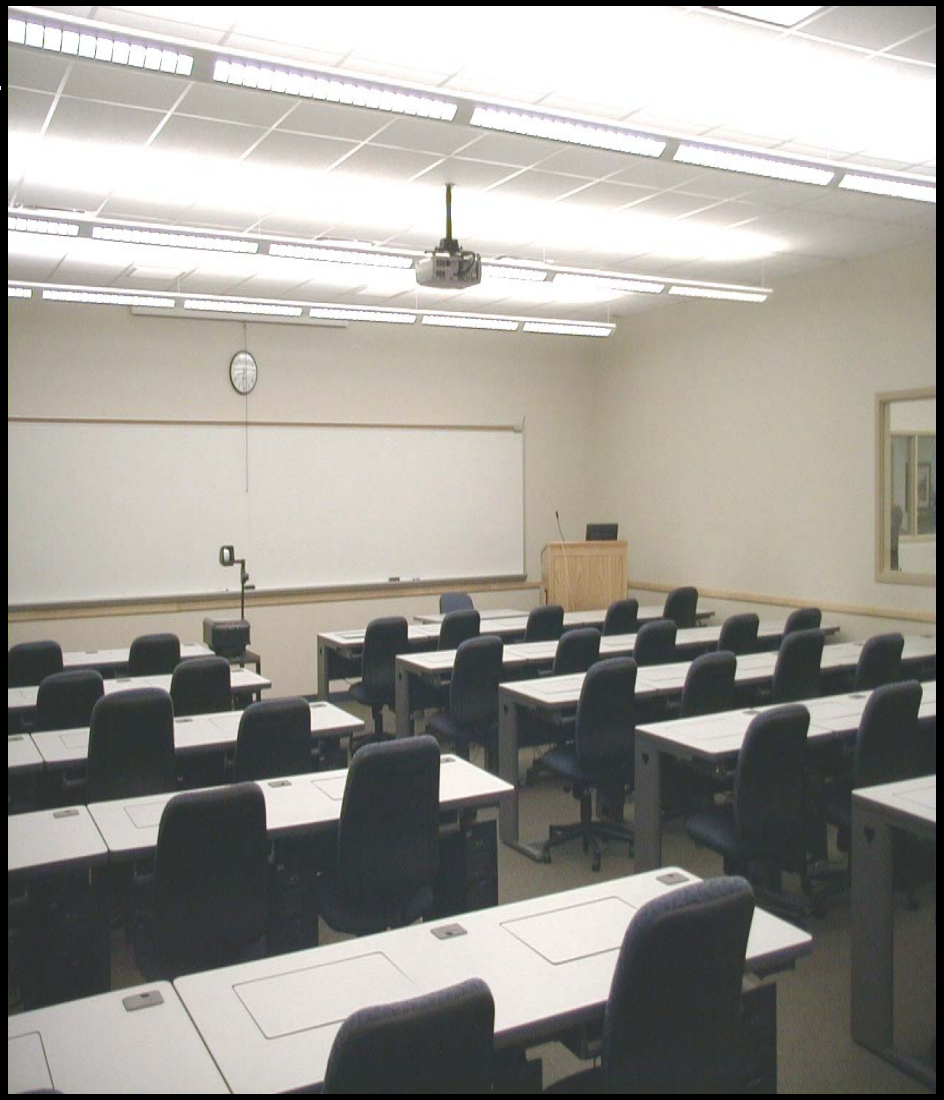
Schematic Design

Computer Labs and Classrooms

Schematic Design
Computer Labs and Classrooms

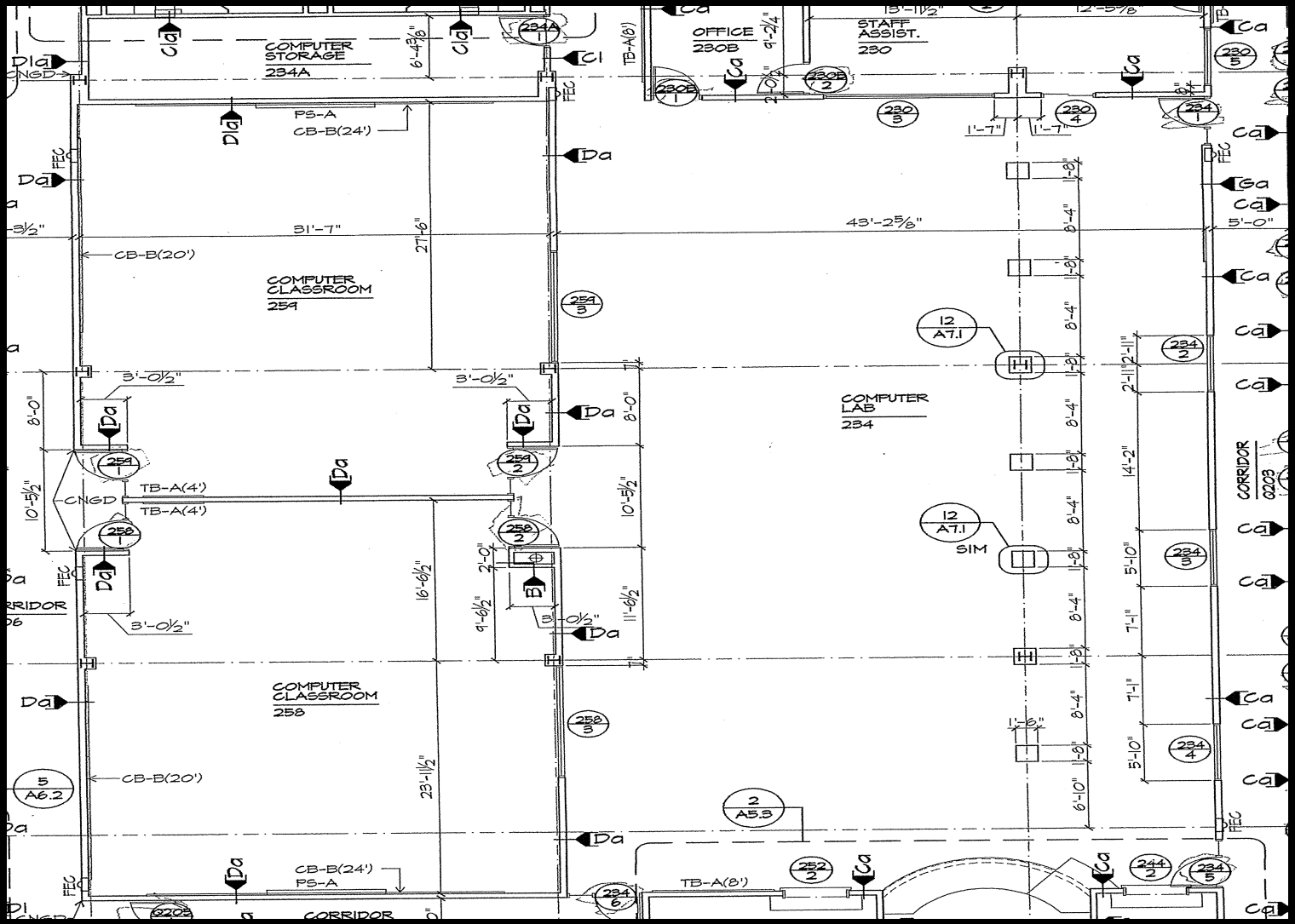
Architectural Characteristics

- Single story with 10' high ceiling
- Finishes
  - white painted walls
  - brown carpet
  - white painted ceiling
- Furnishings
  - blue computer chairs
  - fold up desks with laptops
  - whiteboard in front of classroom
  - podium in front of classroom
  - projector hanging from ceiling



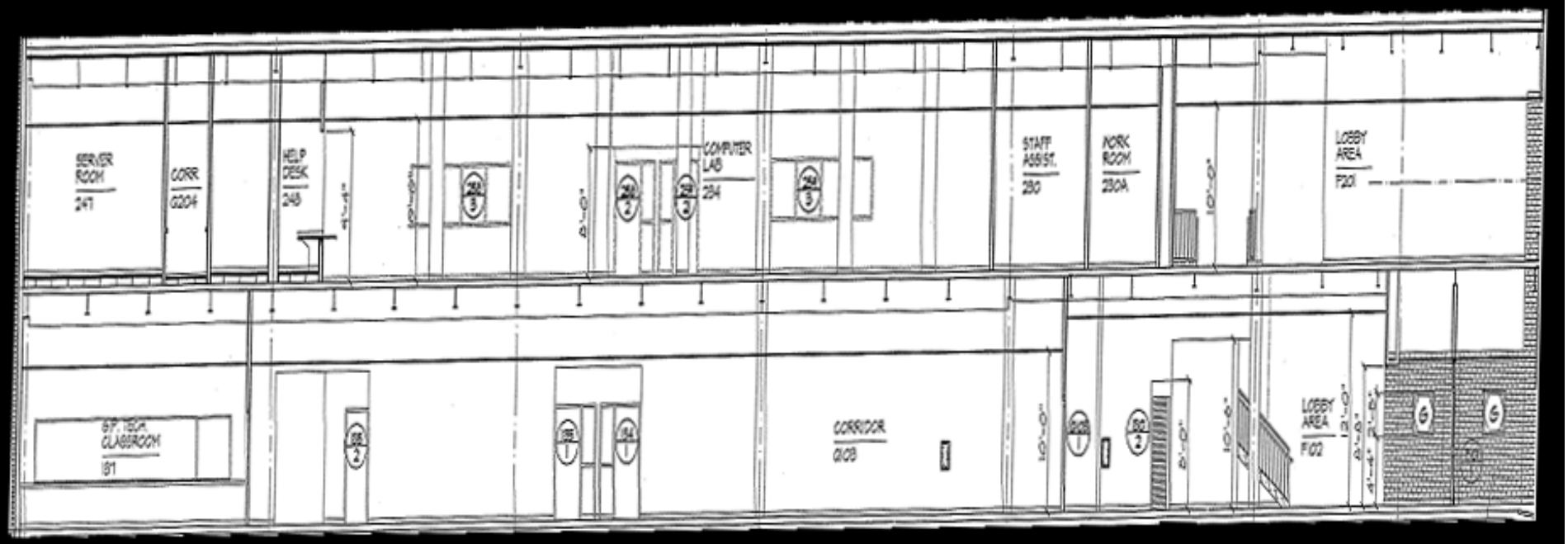
Schematic Design

Computer Labs and Classrooms



Schematic Design

Computer Labs and Classrooms

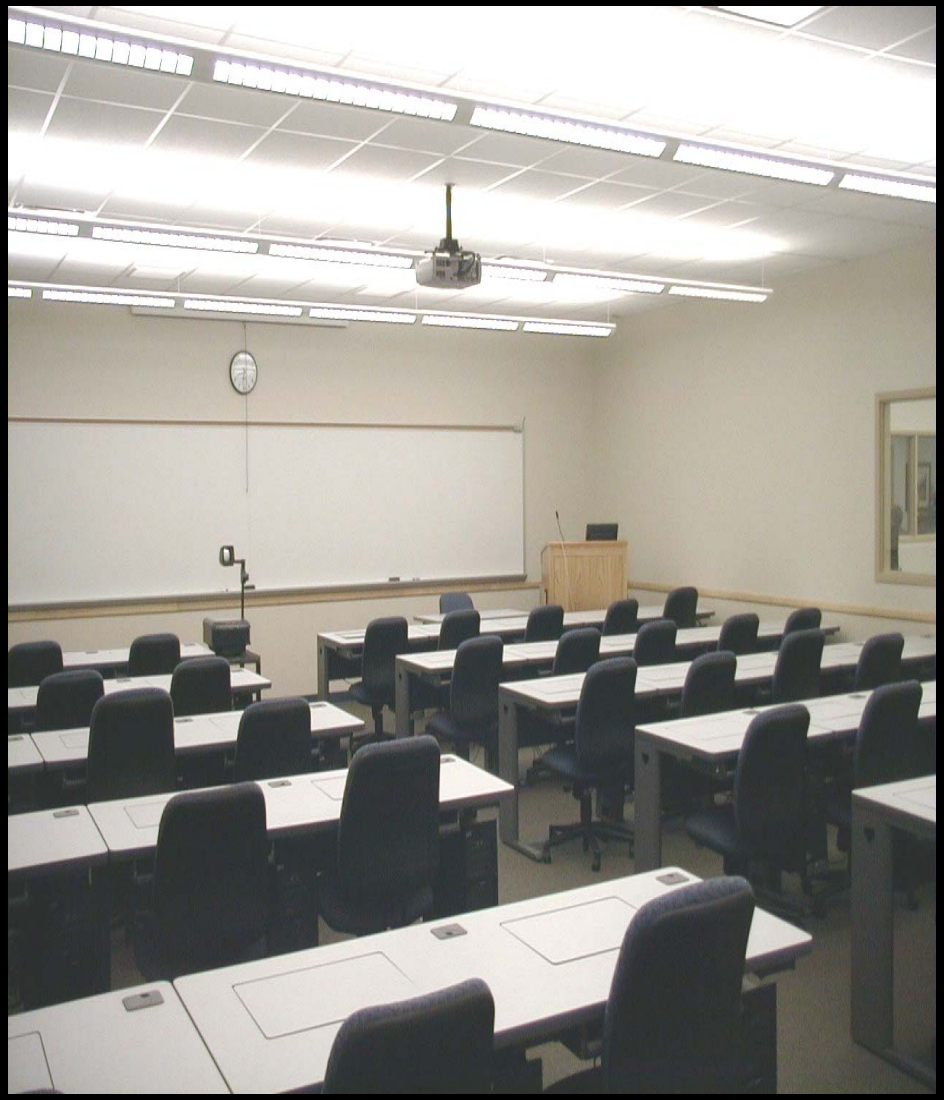


Schematic Design

Computer Labs and Classrooms

Design Intent

- **Provide accent lighting**
  - white board
- **Dimming control system**
  - allows lights to be dimmed or turned off when not needed (i.e. while overhead projector is being used)
- **Occupancy Sensor**
  - dims or turns lights off when classroom space isn't in use
- **Task lighting**
  - student desks
  - white board
- **Other considerations**
  - avoid shadows on laptop screens
  - avoid unwanted glare on laptop screens



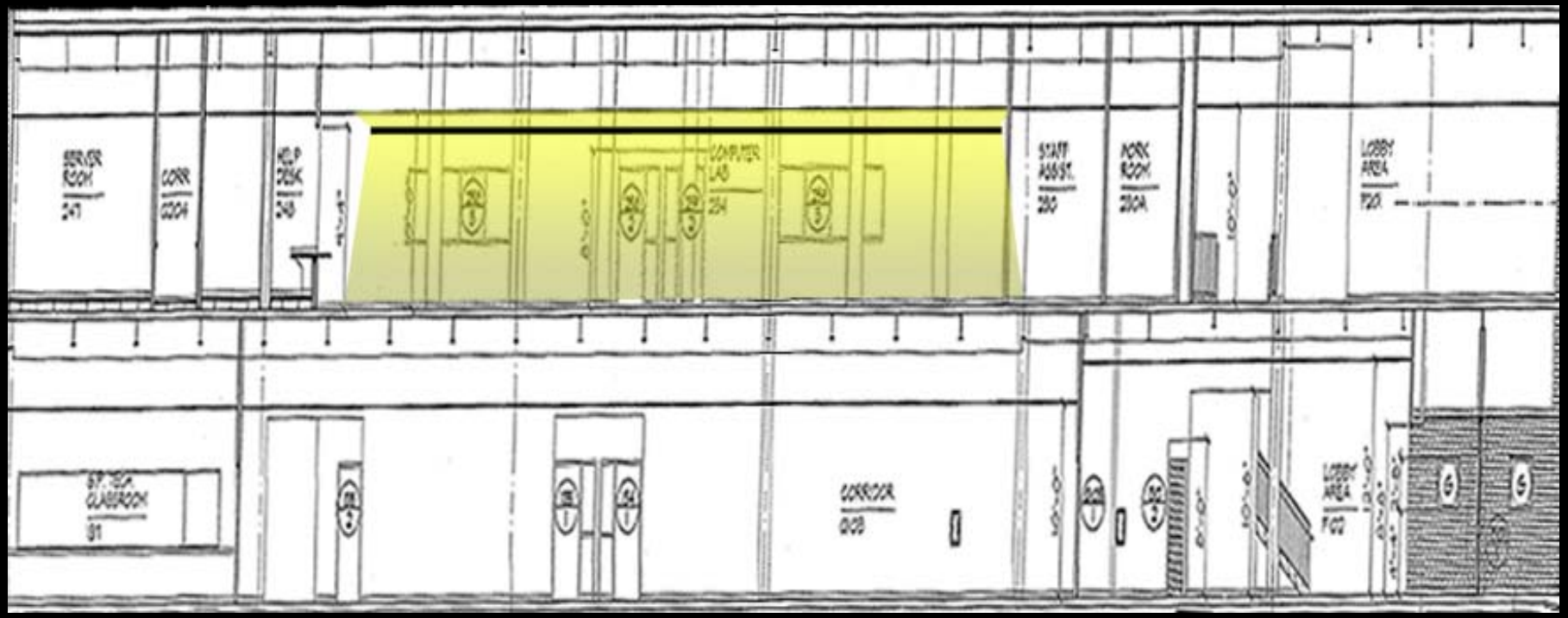
Schematic Design
Computer Labs and Classrooms

Design Solution

- **Recessed downlight wallwash**
  - provides additional task light onto the whiteboard
  - provides additional facial rendering of the teacher
  - 3500 CCT
- **Suspended indirect/direct fixtures**
  - provides adequate levels of light on the workplane
  - prevents unwanted glare and shadows due to having mainly uplight
  - direct component provides some direct light for writing tasks
  - 3500 CCT
- **Dimming control system**
  - lights can be dimmed when full output isn't needed
  - allows for flexibility if teacher or class doesn't want full output
- **Occupancy control system**
  - dims or turns lights off when classroom space isn't in use
  - saves energy
  - provides extra security with expensive computer equipment

Schematic Design

Computer Labs and Classrooms

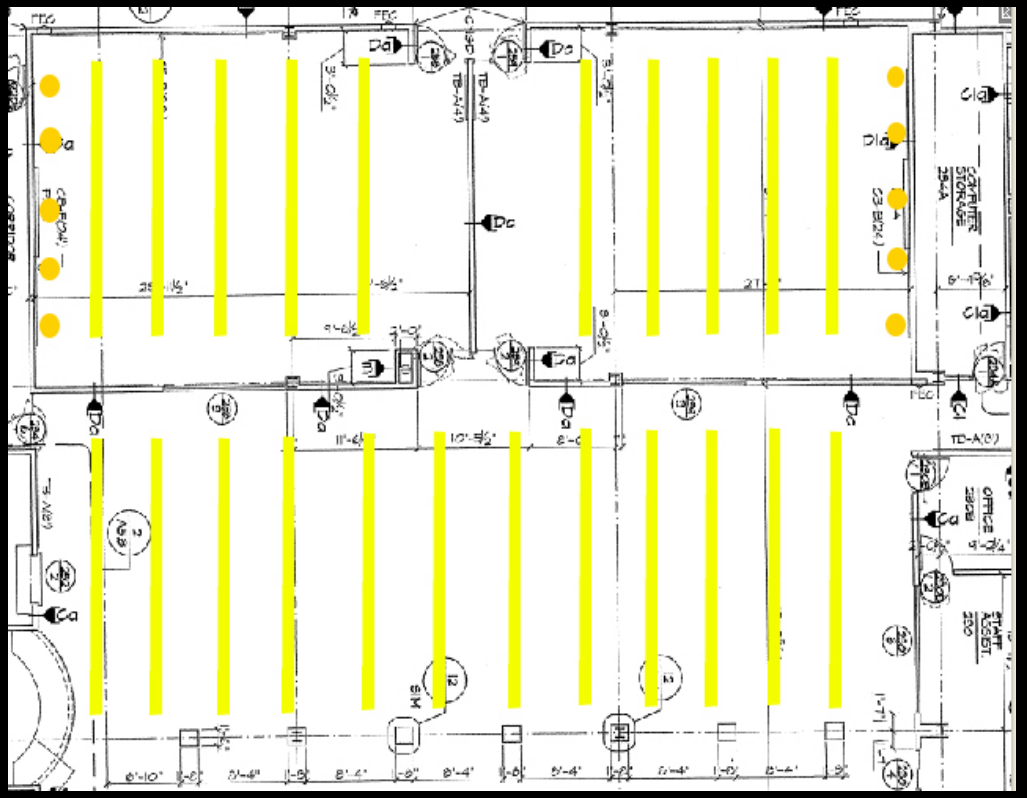


Schematic Design
Computer Labs and Classrooms

Luminaire Selection

Suspended indirect/direct

Recessed CFT wallwash



Questions or comments?