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# TECHNICAL ASSIGNMENT #3: SCHEMATIC LIGHTING DESIGN

Jason Weaver  
12/13/2007

# Background

*The central role of a college is to help students develop a worldview. The three things one needs to understand in order to develop a functional worldview are: the natural world, how the mind works, and the different systems humans have developed for using that knowledge to conduct their lives. There you have it: biology, psychology, and philosophy!*

*-LAWRENCE I. BONCHEK, M.D. P  
Franklin & Marshall Graduate '91*

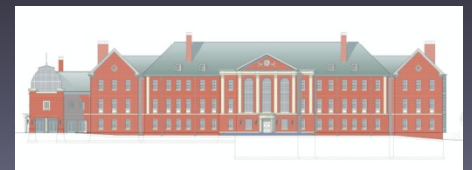
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# Background

- 3 stories above ground (4 total)
- 104,000 square feet
- Project Cost – approximately \$39 million
- Houses three departments (Biology, Philosophy, Psychology)
- Basement features a Vivarium for visual research

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# Key Building Functions

## Primary Functions:

- Learning and Research
- Professional Meetings and Events
- Student Meetings and Events

## Other Functions:

- Gathering
- Casual Dining
- Reading and Quiet Study

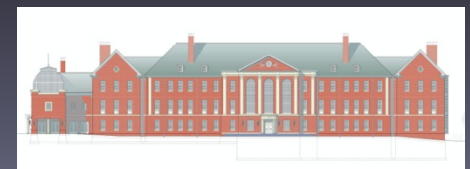
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# Campus Map



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# Selected Spaces

Work Space – Ecology Teaching Lab / Classroom

Circulation Space – Frey Atrium

Special Purpose Space – Bonchek Lecture Hall

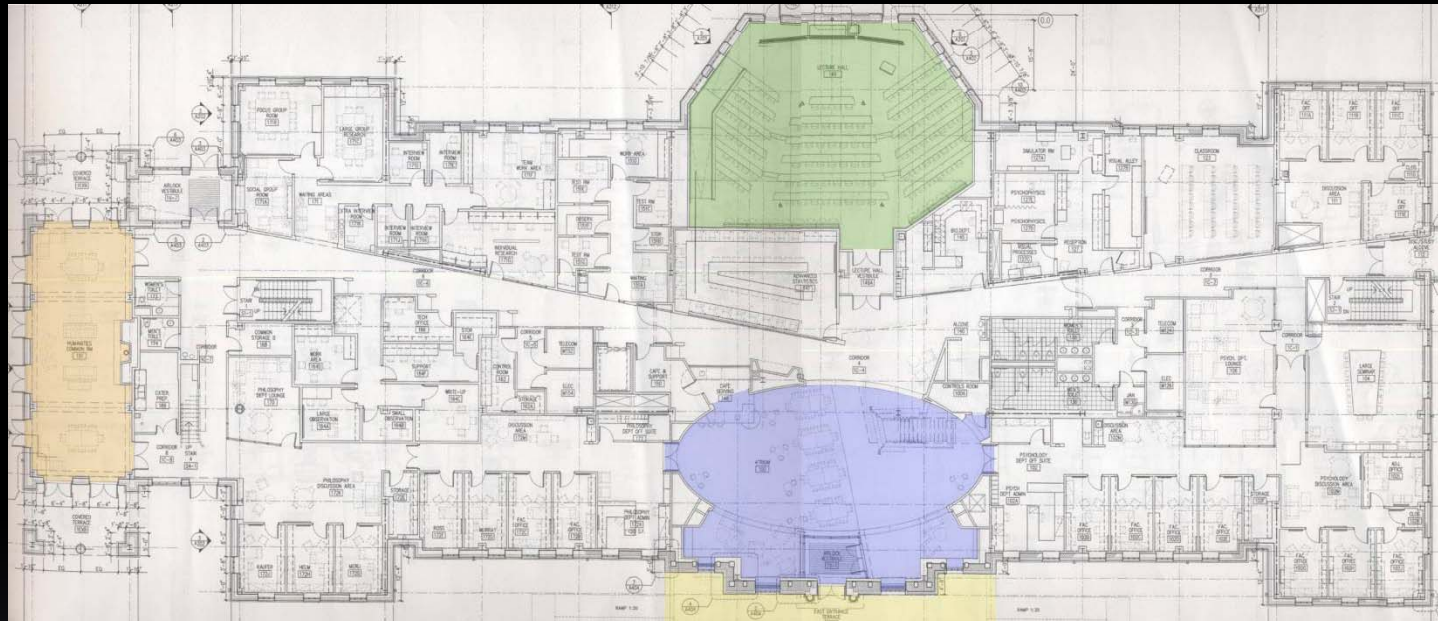
Exterior Space – Main Entry & Façade

Additional Space – Druker Family Humanities Common Room

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# First Floor



Laboratory

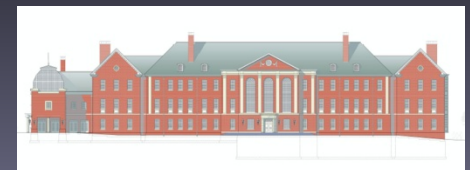
Atrium

Lecture Hall

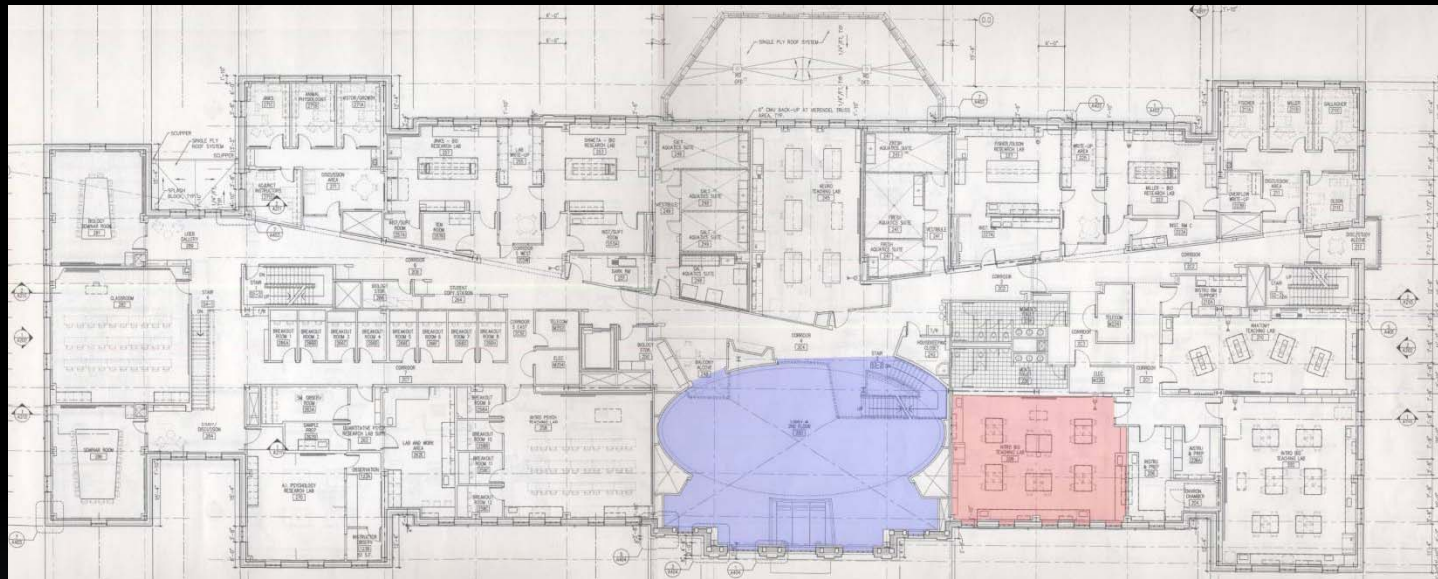
Façade

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# Second Floor



Laboratory

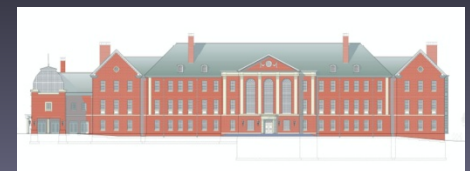
Atrium

Lecture Hall

Façade

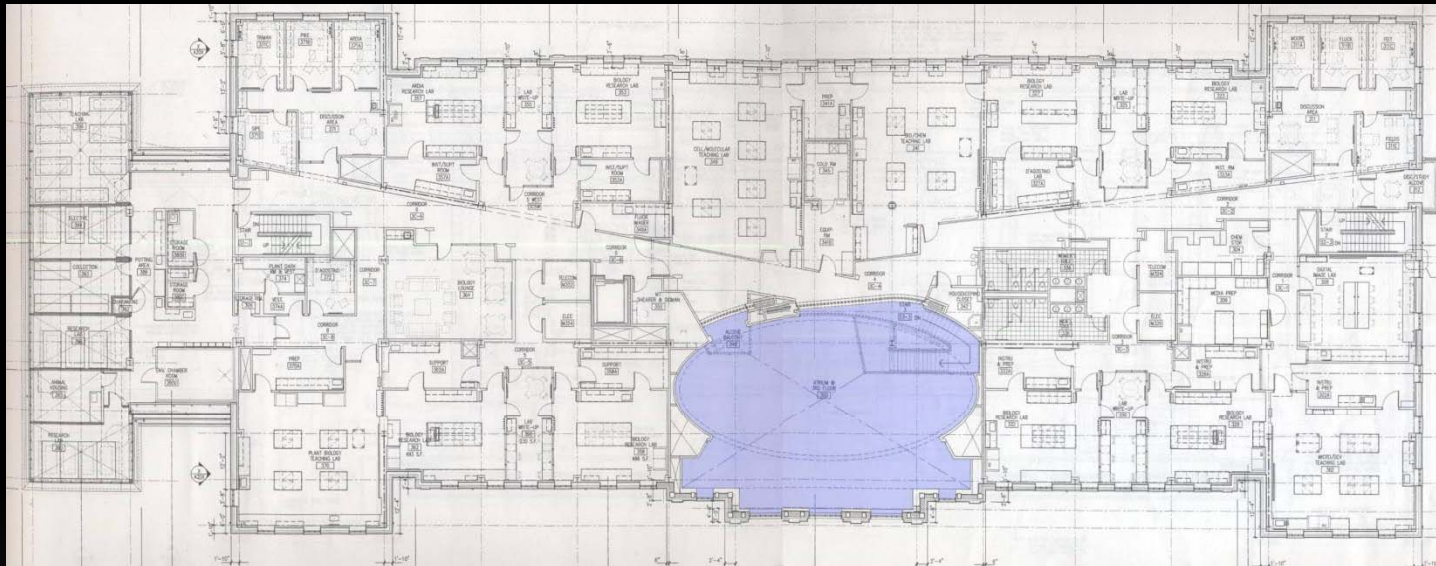
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# Third Floor



Laboratory

Atrium

Lecture Hall

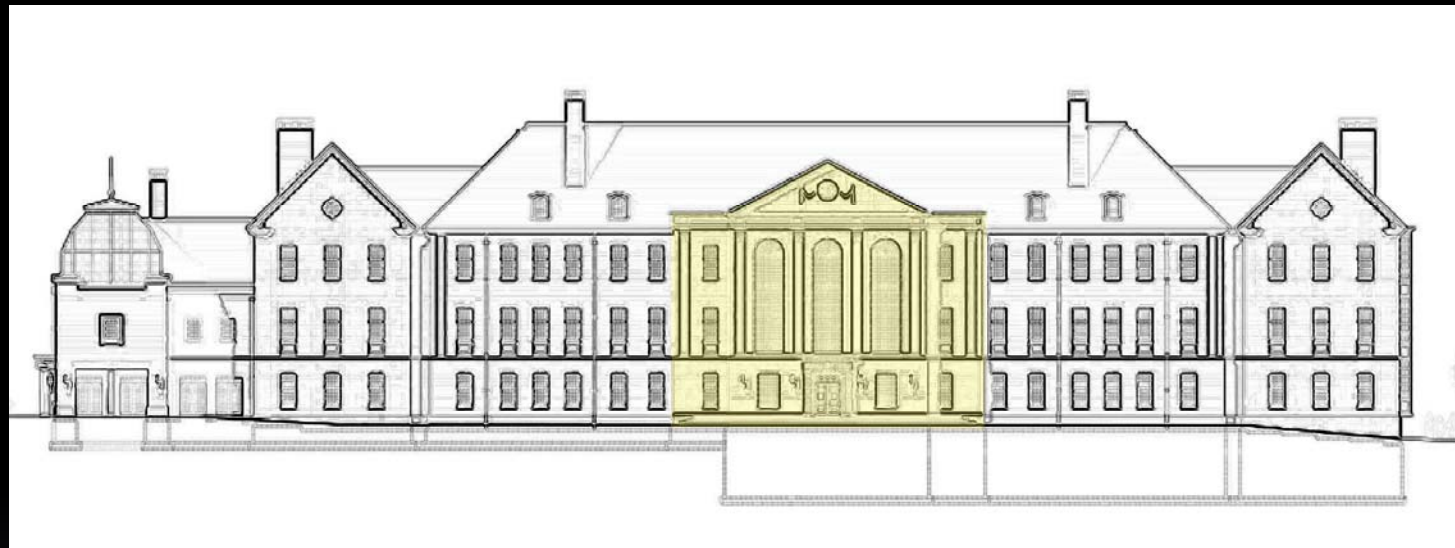
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# East Elevation



Laboratory

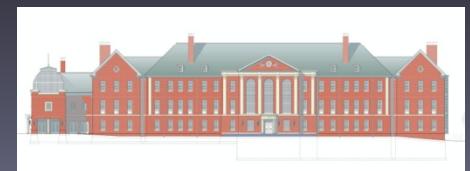
Atrium

Lecture Hall

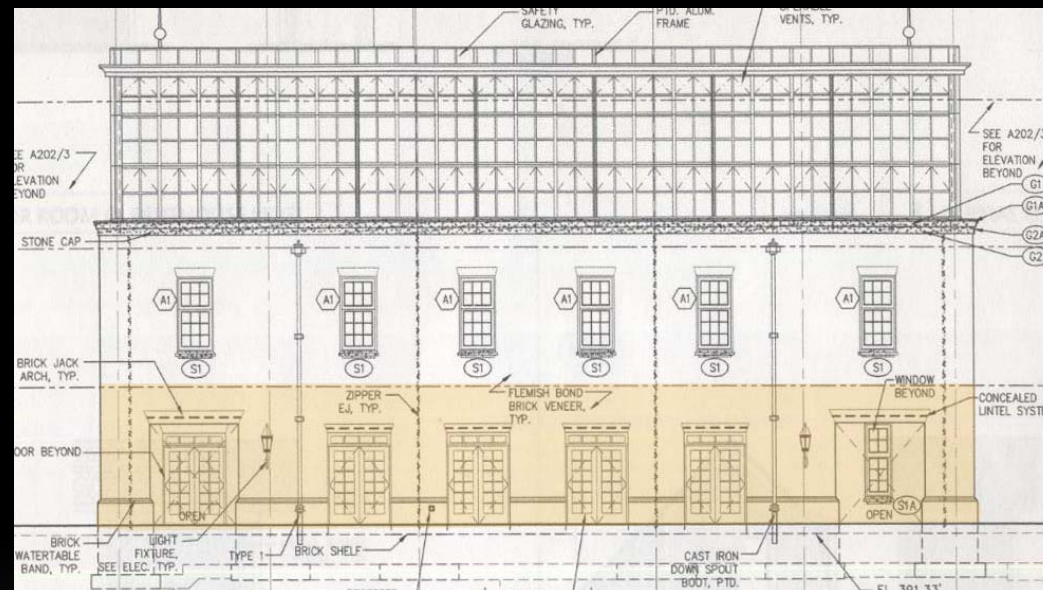
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# South Elevation



Laboratory

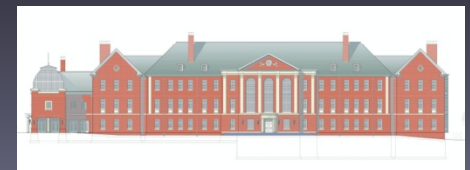
Atrium

Lecture Hall

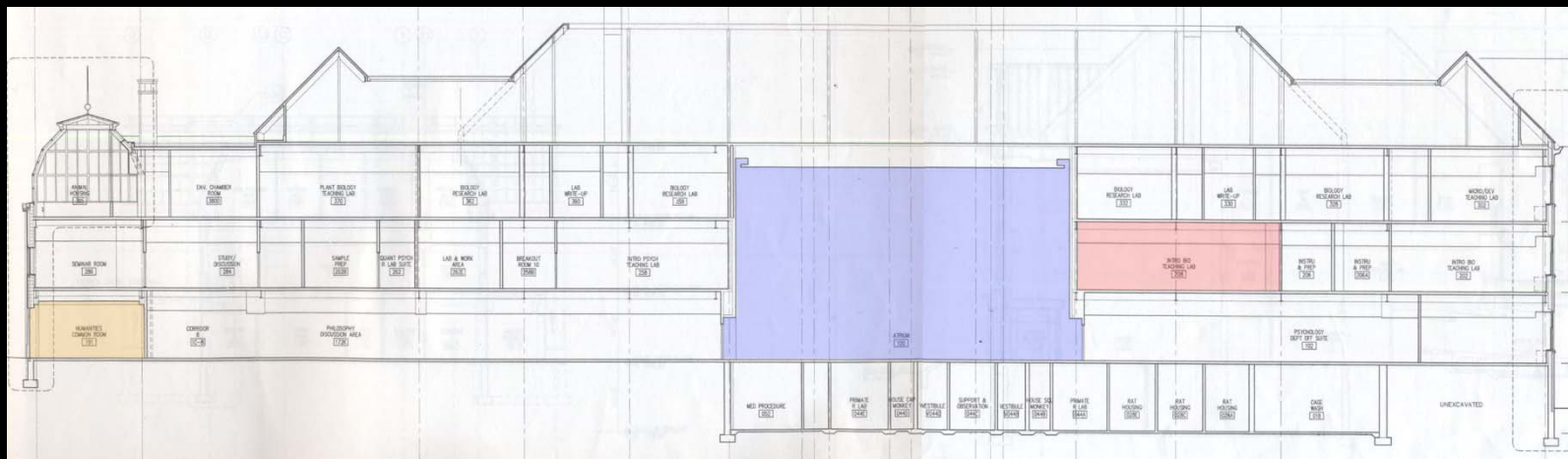
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# Sections



Laboratory

Atrium

Lecture Hall

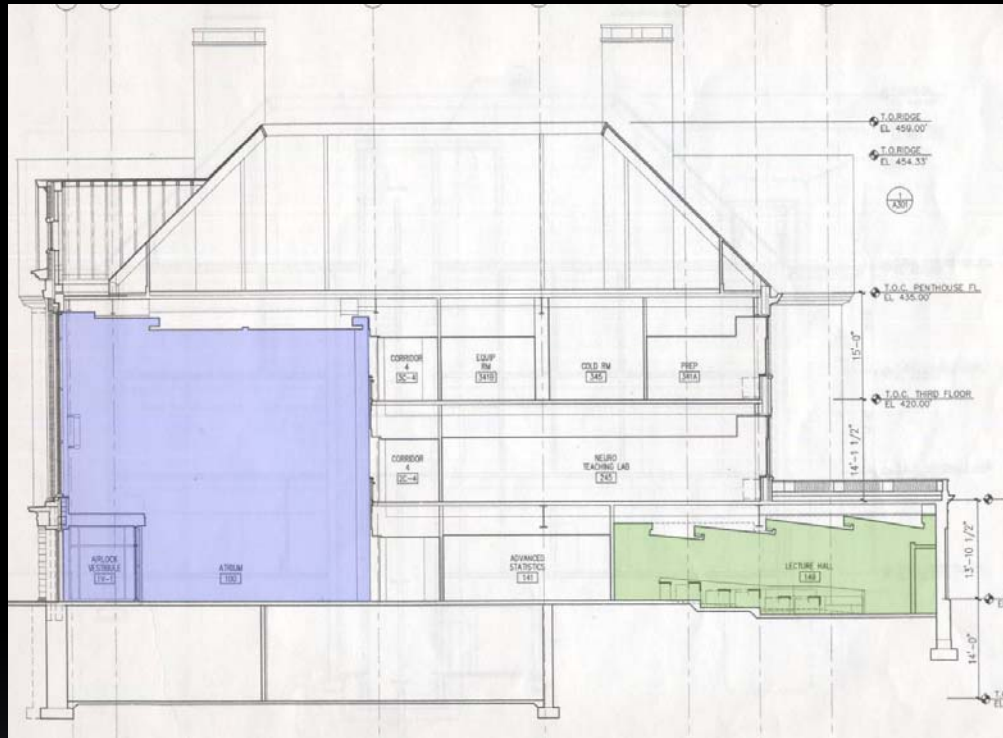
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# Sections



Laboratory

Atrium

Lecture Hall

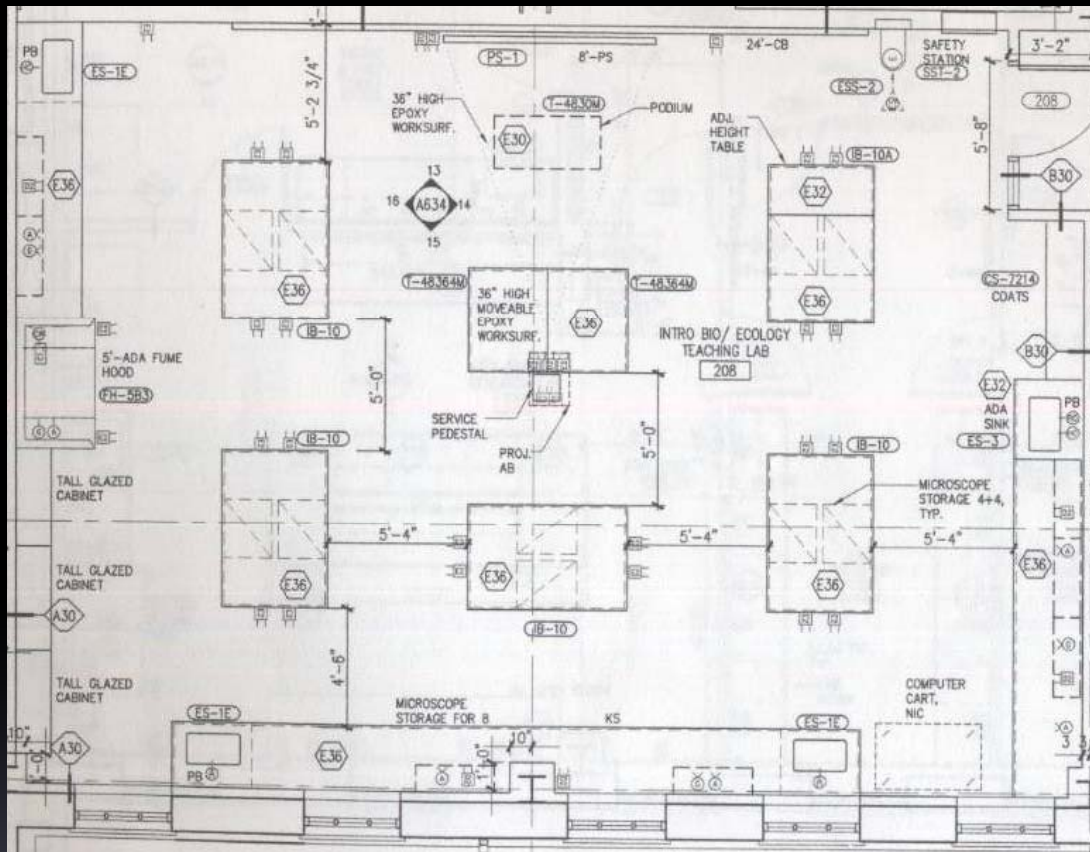
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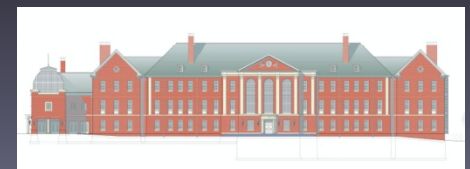
# Ecology Teaching Lab



## Space Features:

- Fixed workstations w/ black epoxy worksurface
- 24' black chalkboard at front
- Full height cabinetry on side walls
- Various safety and other laboratory equipment

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# Ecology Teaching Lab



## Primary Tasks:

- Learning and Teaching
- Experimentation and Safety

## Task Locations:

- Workstations
- Chalkboard
- Podium

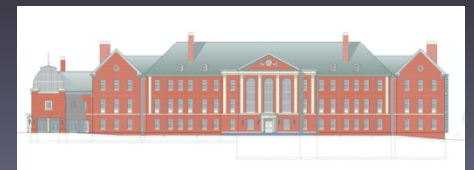
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# Ecology Teaching Lab



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# Ecology Teaching Lab



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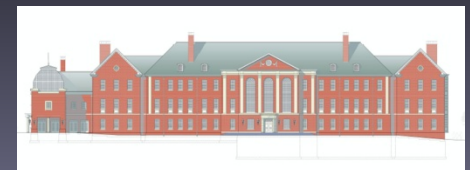
# Ecology Teaching Lab

## Design Criteria:

- **Color Appearance and Color Contrast**
  - Critical for experimentation
- **Light Distribution on Task Plane**
  - Needs to be as even as possible across workstations
- **Luminances of Room Surfaces**
  - Chalkboard needs to be fairly bright
  - Primary tasks are very low reflectance
- **Modeling of Faces and Objects**
  - Also critical for experimentation as well as learning



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# Ecology Teaching Lab

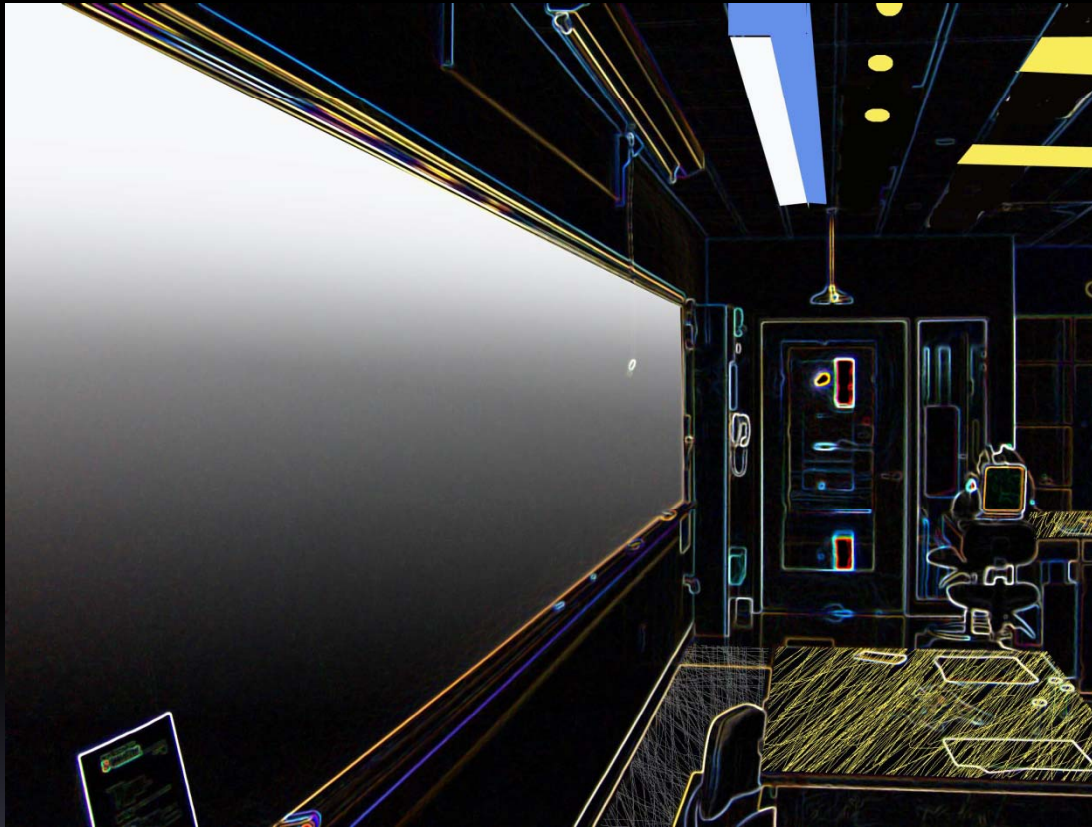


- Recessed linear fluorescent lighting over workstations
- Additional recessed downlights over sink and outer benches
- Wallwashers for cabinetry

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# Ecology Teaching Lab

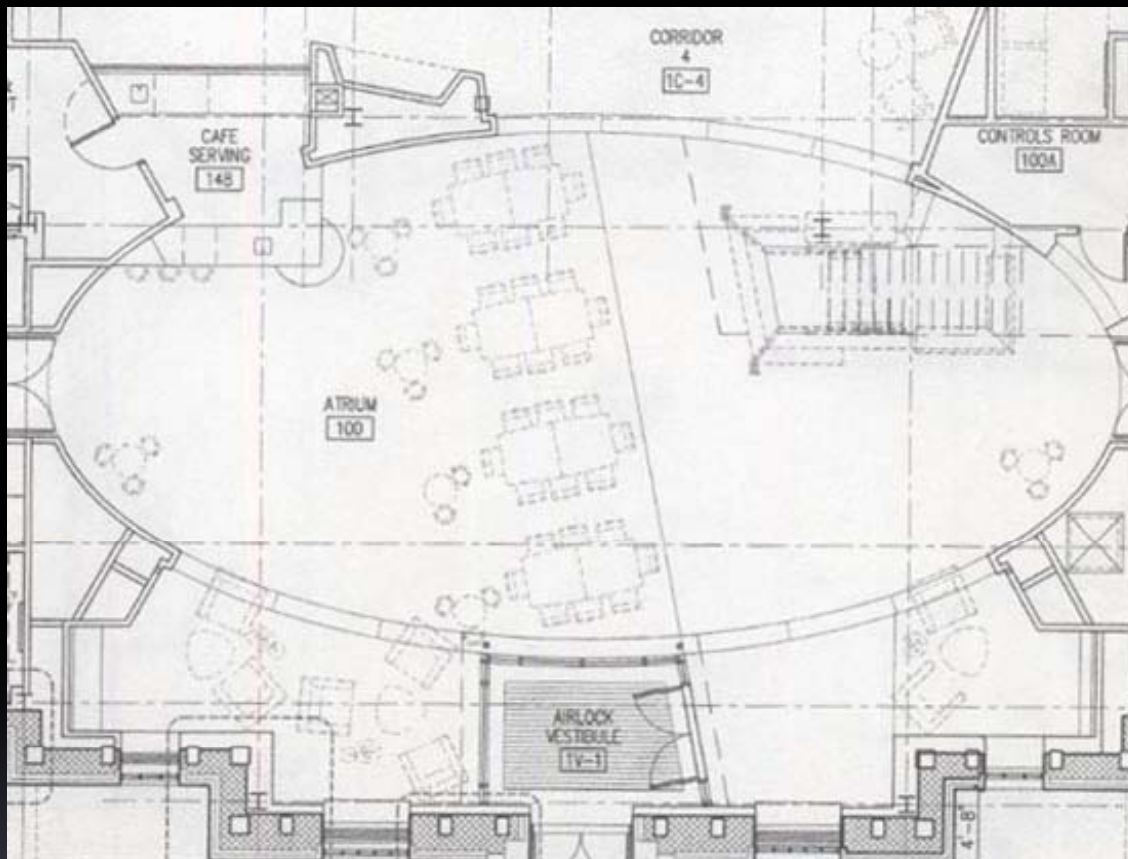


- Recessed linear fluorescent lighting over workstations
- Additional recessed downlights over sink and outer benches
- Wallwashers for cabinetry
- Low profile fluorescent wallwasher for chalkboard

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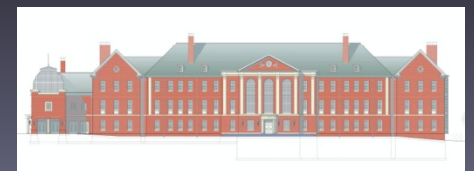
# Frey Atrium



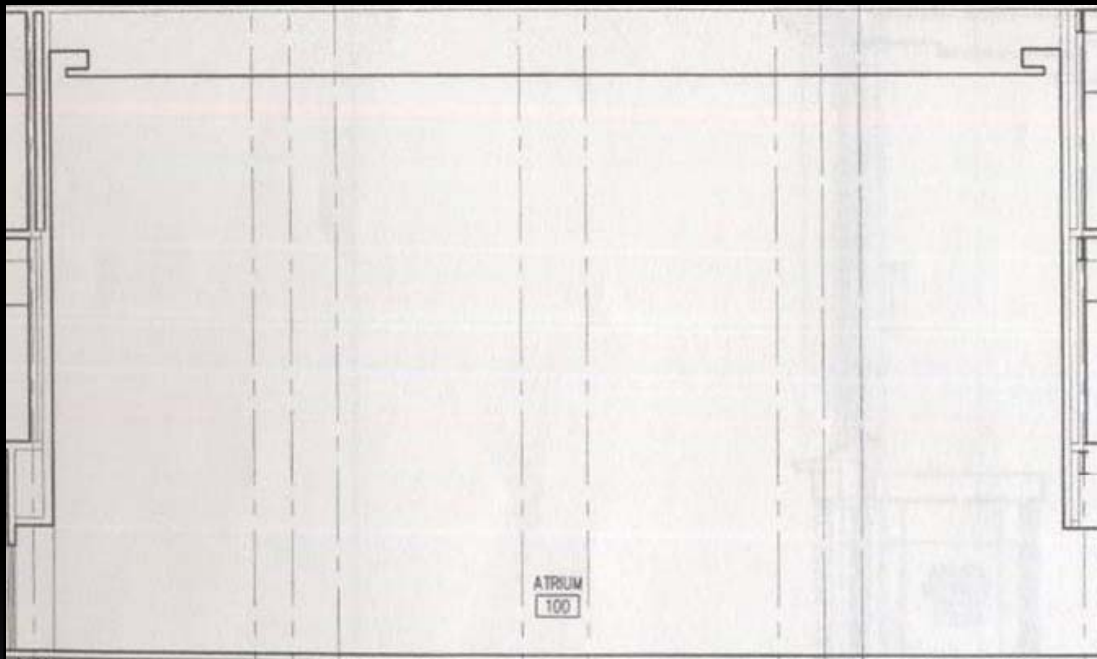
## Space Features:

- 3 story curved white gypsum walls with large windows
- Slotted wood ceiling with cove
- Small café
- Open corridors and balconies
- Carpeted seating and eating area, terrazzo for egress areas

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# Frey Atrium



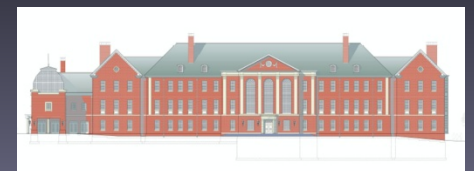
## Primary Tasks:

- Egress
- Reading/Talking
- Eating

## Task Locations:

- Tables
- Seating Area
- Entry

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# Frey Atrium



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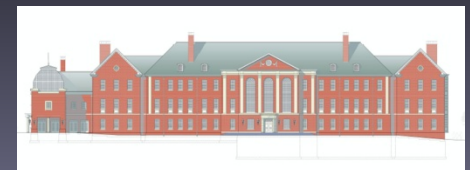
# Frey Atrium

## Design Criteria:

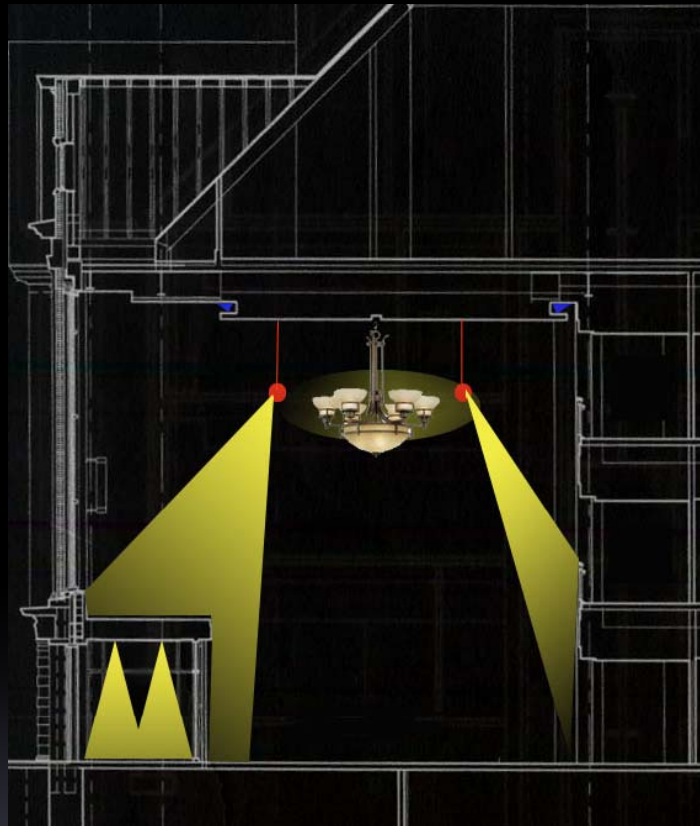
- Appearance of Space and Luminaires
  - First space guests and most users see
  - Needs to be impressive aesthetically
  - At the same time, needs to be relaxing
- Daylight Integration and Control
  - Large glass area may allow
  - Morning sun may be an issue
- Points of Interest
  - Highlighting work areas, balconies, and banner
- System Flexibility and Control
  - Sufficient light is required for 24 hours a day
  - Several functions in space



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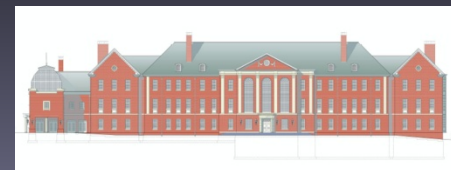


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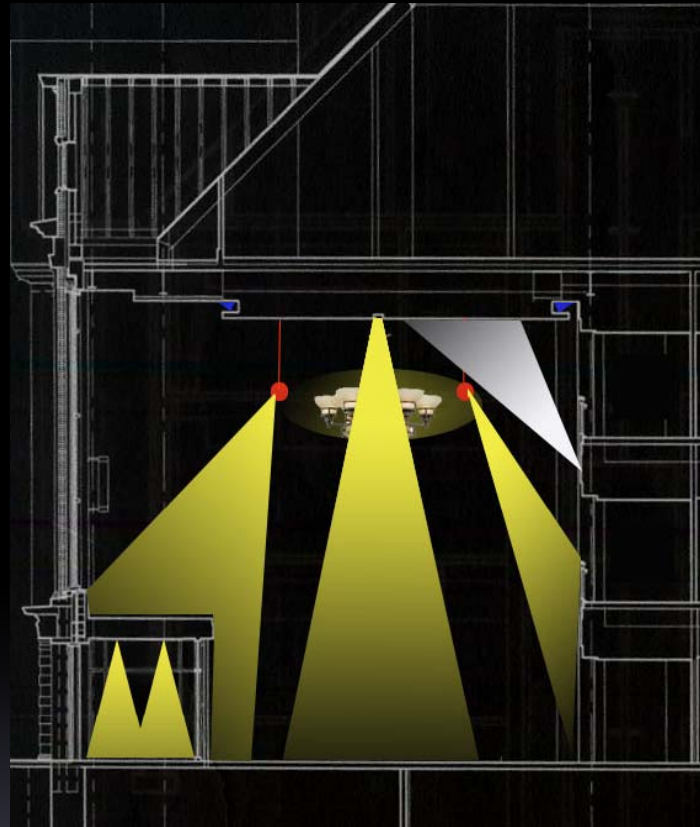


- Directional and adjustable pendant lighting with center chandelier
- LED cove lighting (able to do blue, yellow, and white for different scenes)
- Downlighting for vestibule

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# Frey Atrium



- Directional and adjustable pendant lighting with center chandelier
- LED cove lighting (able to do blue, yellow, and white for different scenes)
- Downlighting for vestibule
- Center HID downlighting for 24 hour use
- Uplighting to accent wood ceiling
- Glowing sconces to add interest to walls

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# Frey Atrium



## Table Lighting Options

- Mount from Center of Table
- Mount to Side of Table
- Hanging Track Lighting System

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# Frey Atrium



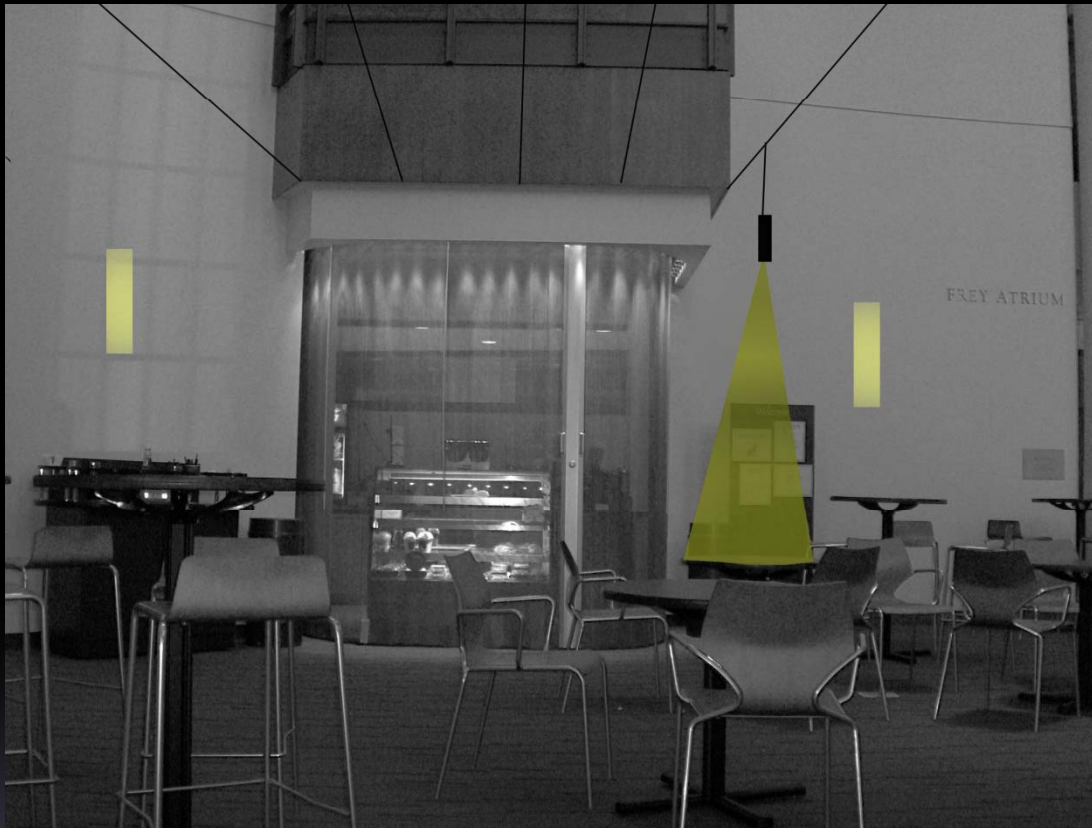
## Table Lighting Options

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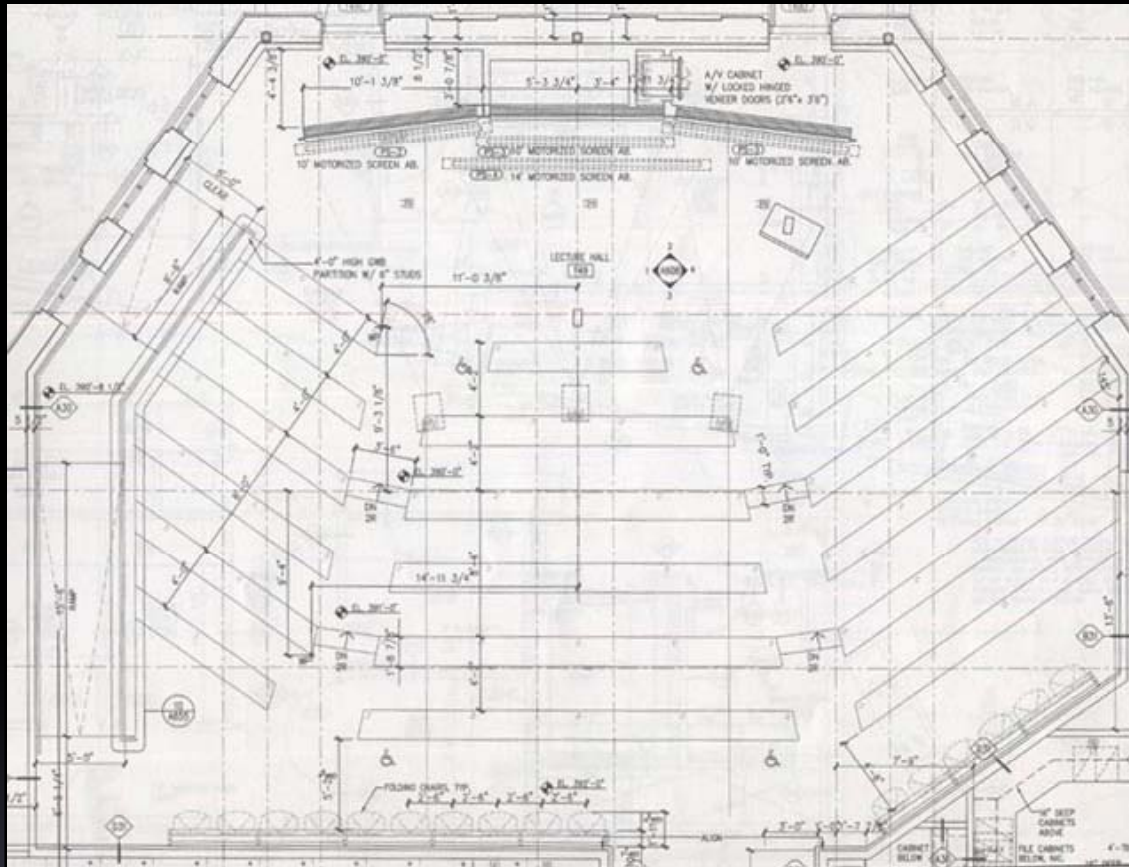
## Table Lighting Options

- Mount from Center of Table
- Mount to Side of Table
- Hanging Track Lighting System

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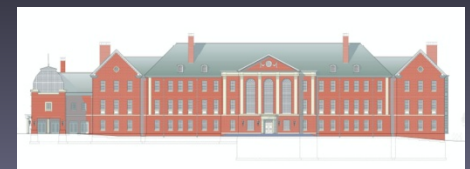
# Bonchek Lecture Hall



## Space Features:

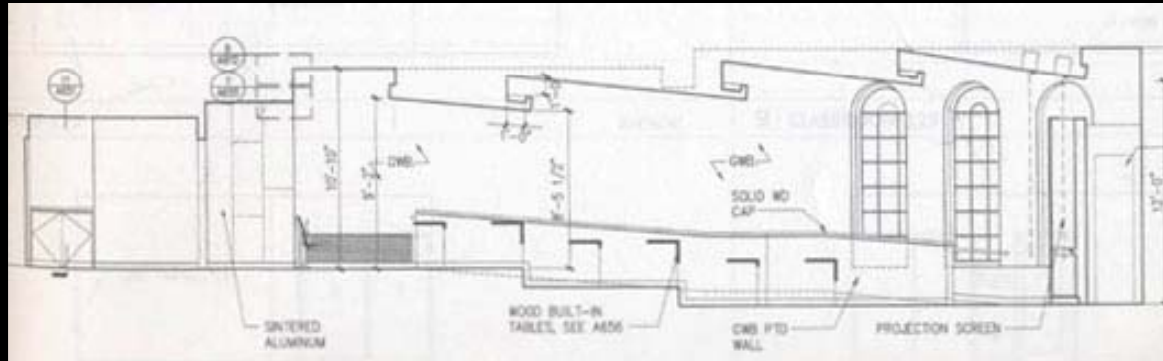
- Fixed desks/tables w/ tan worksurface, and wood sides & accents
- Black chalkboard and motorized projection screen at front
- Fixed podium at front
- Back seating without tables in front of sintered aluminum panels

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# Bonchek Lecture Hall



## Primary Tasks:

- Guest Lectures
- Regular Classes and Presentations

## Task Locations:

- Tables
- Chalkboard
- Podium
- Projection Screen

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# Bonchek Lecture Hall



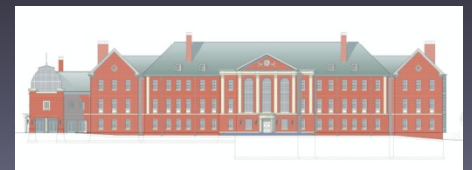
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# Bonchek Lecture Hall



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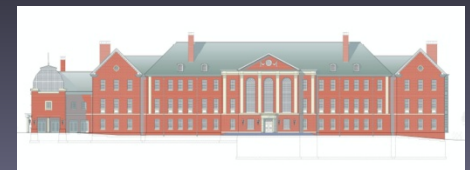
# Bonchek Lecture Hall

## Design Criteria:

- **Appearance of Space and Luminaires:**
  - Guest lectures and presentations here
- **Light Distribution on Task Plane:**
  - As even as possible on desks
- **Modeling of Faces and Objects:**
  - Critical in presentation area (on lecturer and demonstrations)
  - Also needs to be fairly good on audience
- **Special Considerations (VDT/Projection Screen):**
  - Need to keep as much light off screen as possible
  - Require separate scenes and good optical control of fixtures



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# Bonchek Lecture Hall

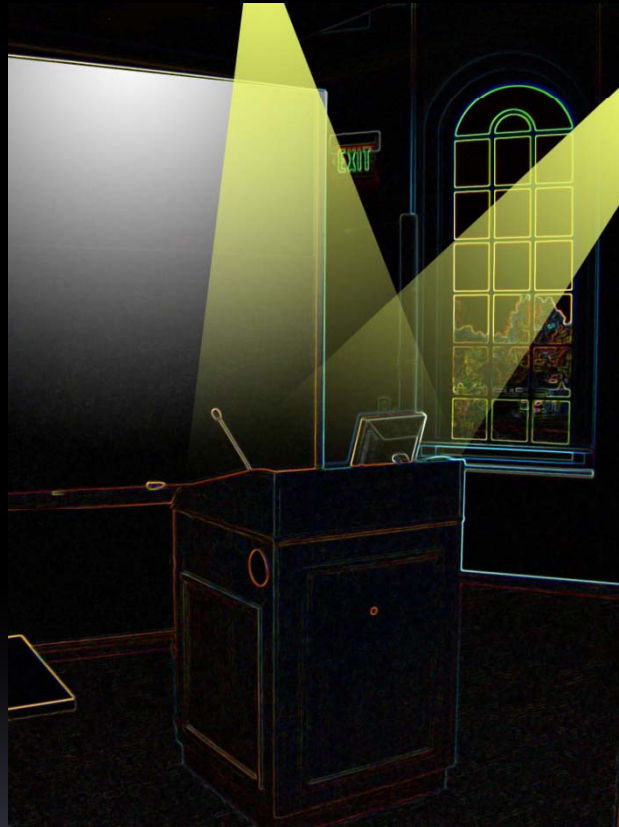


- Recessed fluorescent just in front of and over tables
- Wallwashers to accent texture on back walls and for future displays
- Linear fluorescent cove fixture with forward throw optics

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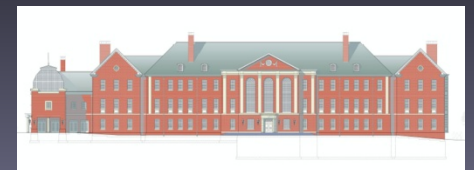


# Bonchek Lecture Hall

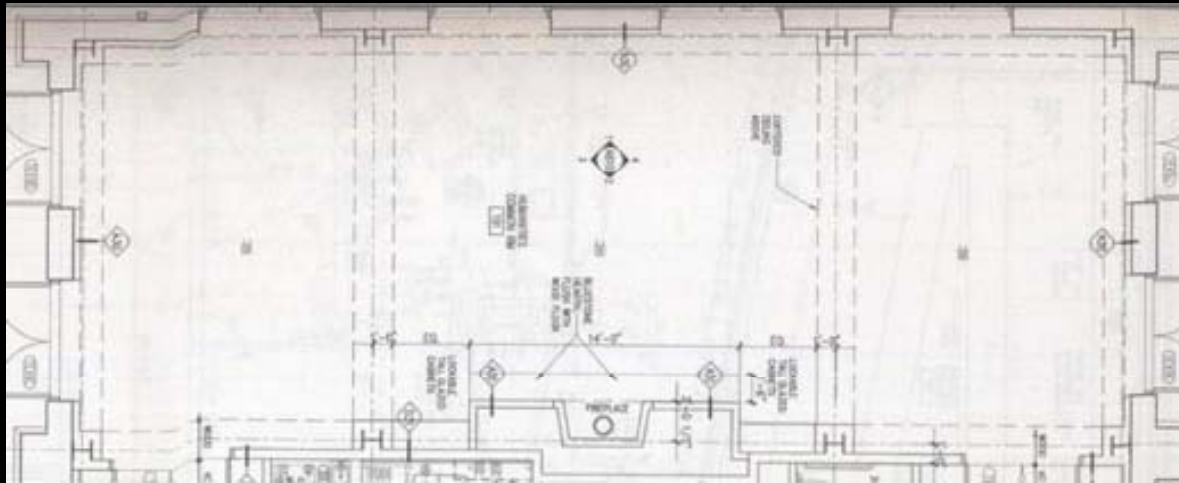


- Directional spotlights in front of podium for speaker
- Shielding for any front luminaires to keep light away from projection screen
- Linear chalkboard light

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# Humanities Common Room



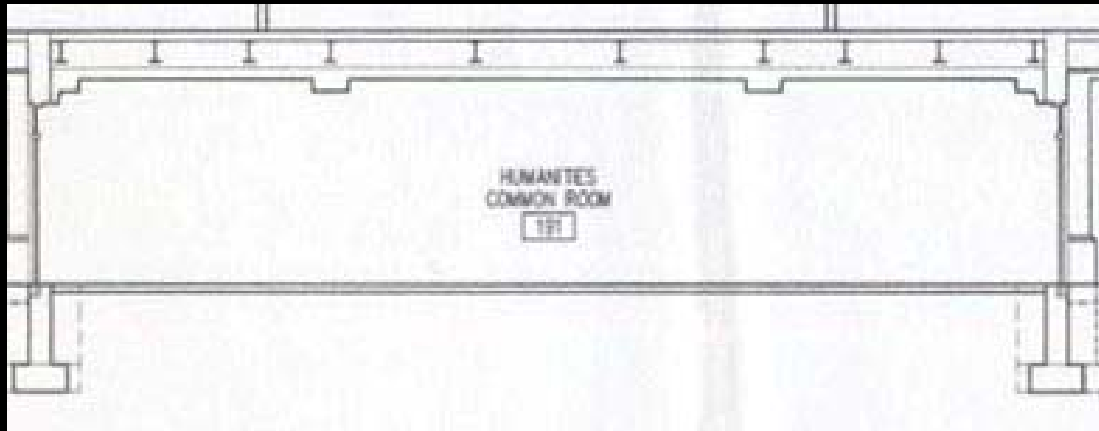
## Space Features:

- Fireplace with white painted mantel and bluestone hearth
- Movable chairs, sofas, and tables
- Motorized projection screen in front of fireplace
- Dark wood floor with glossy finish
- Acoustical plaster ceiling, yellow walls with white wainscoting

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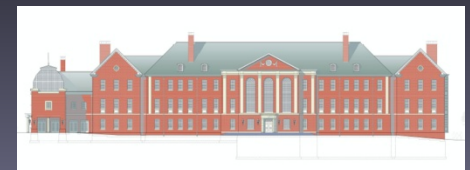
## Primary Tasks:

- Student and Organization Meetings
- Quiet Study and Group Work

## Task Locations:

- Fireplace
- Projection Screen
- Tables

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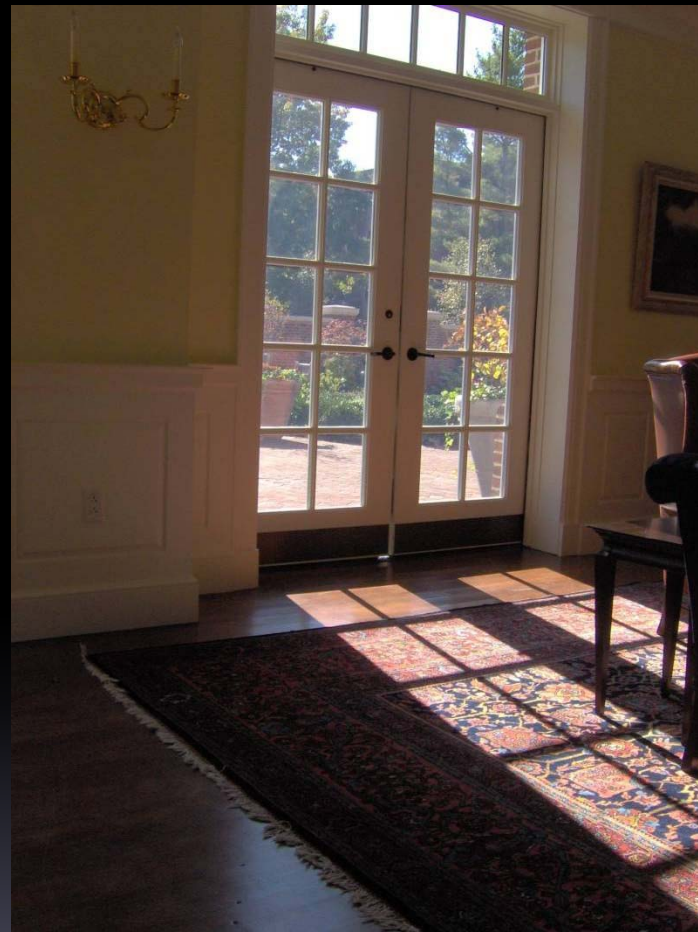
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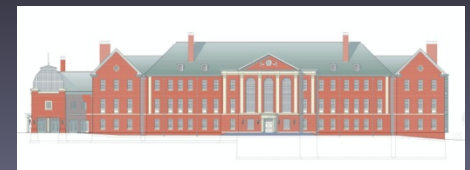
# Humanities Common Room

## Design Criteria:

- **Appearances of Space and Luminaires**
  - Very high quality of finishes, luminaires need to match
- **Daylight Integration and Control**
  - South end of building, large glass area on French doors
  - Daylight can overwhelm the space (500+ fc possible throughout space)
- **Light Distribution on Surfaces:**
  - Non-uniformity on the walls (relaxation)
- **Points of Interest:**
  - Fireplace is focal point for the room
- **System Control and Flexibility:**
  - For meetings and for informal use
  - For daytime and nighttime use



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# Humanities Common Room



- Decorative surface mounted fixture in center of each high ceiling
- Striplights in new cove to light edges of high ceiling
- Sconces mounted on each column

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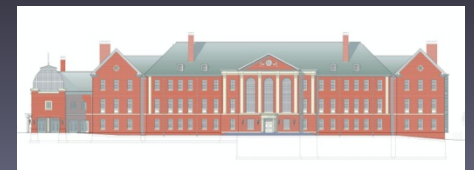


# Humanities Common Room



- Decorative surface mounted fixture in center of each high ceiling
- Striplights in new cove to light edges of high ceiling
- Sconces mounted on each column
- Adjustable-height pendants over tables

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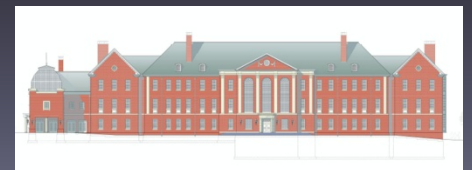


# Humanities Common Room



- Decorative surface mounted fixture in center of each high ceiling
- Striplights in new cove to light edges of high ceiling
- Sconces mounted on each column
- Adjustable-height pendants over tables
- Recessed wallwashers for artwork and fireplace
- Daylight control

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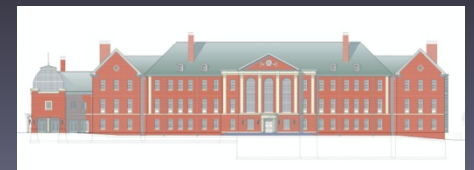


# Façade / Main Entry

- Georgian Revival style
  - Symmetry



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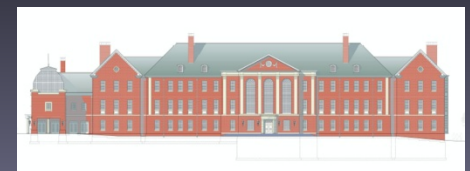


# Façade / Main Entry

- Georgian Revival style
  - Symmetry



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# Façade / Main Entry

- Georgian Revival style
  - Symmetry
  - Elaborate and centered entry



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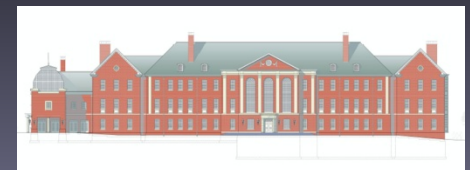


# Façade / Main Entry

- Georgian Revival style
  - Symmetry
  - Elaborate and centered entry
  - Pilasters



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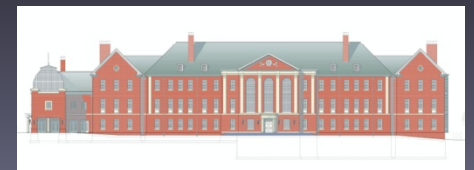


# Façade / Main Entry

- Georgian Revival style
  - Symmetry
  - Elaborate and centered entry
  - Pilasters
  - Double-hung sash windows subdivided with thick muntins



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# Façade / Main Entry

- Georgian Revival style
  - Symmetry
  - Elaborate and centered entry
  - Pilasters
  - Double-hung sash windows subdivided with thick muntins
- Goal was to match the styling of current buildings on campus,
- At the same time, making a statement on the campus and giving the building a sense of distinction

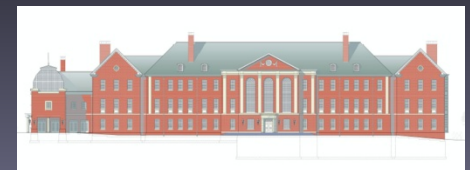
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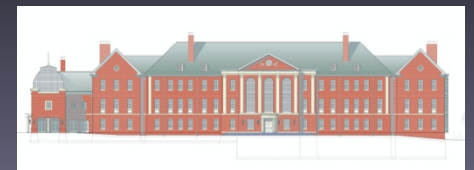
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# Façade / Main Entry



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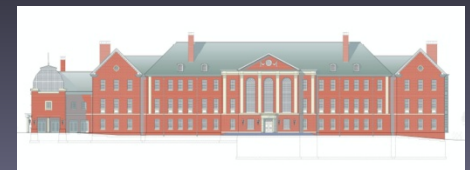
# Façade / Main Entry

## Design Criteria:

- Appearance of Space and Luminaires:
  - Façade needs to make a statement for F & M
  - Showing both college pride and sophisticated style
- Direct Glare:
  - Disability glare can hinder sense of security
- Modeling of Faces and Objects:
  - Also critical for security and for aesthetic appeal of facade
- Points of Interest:
  - Pilasters, pediment, entry way



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# Façade / Main Entry



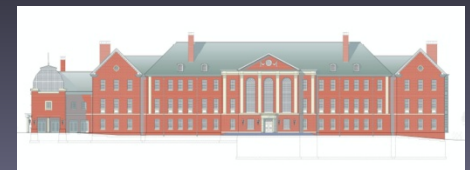
- Blue LEDs to highlight pilasters and to convey school colors

- Fluorescent ramp lighting recessed into ramp walls

- Glowing pediment

- Poles/bollards at low heights to light walkways

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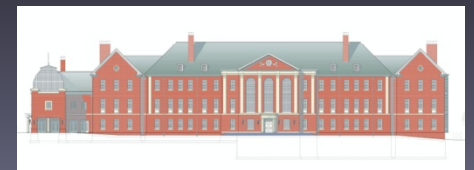


# Façade / Main Entry

- Interior glows from 24-hour lighting in Atrium



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# Façade / Main Entry



- Interior glows from 24-hour lighting in Atrium
- Bollards to light walkways
- Door highlighted with downlights

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# Façade / Main Entry



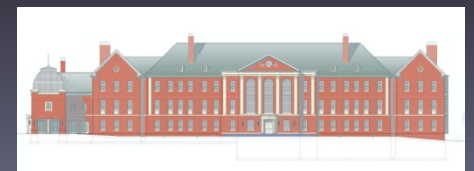
- Interior glows from 24-hour lighting in Atrium

- Bollards to light walkways

- Door highlighted with downlights

- Steps highlighted with LEDs recessed into risers

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Thank you for your time!

Questions?

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