



SMEAL COLLEGE OF BUSINESS BUILDING

University Park, PA

Yena K. Han

The Pennsylvania State University

Architectural Engineering, Lighting/Electrical

Faculty Advisor: Richard G. Mistrick, Ph.D., P.E., FIES

05 DEC 2008

BUILDING OVERVIEW

ARCHITECTS Bower Lewis Thrower Architects
Philadelphia, PA

ASSOCIATE ARCHITECTS Robert A. M. Stern Architects
New York, NY

MEP ENGINEERS BR+A Consulting Engineers
Boston, MA

**CONSTRUCTION
MANAGER** Gilbane

\$68,000,000

PROJECT COST 210,000 SF

SCOPE Four above grade, one below grade

LEVELS July 2003 – July 2005

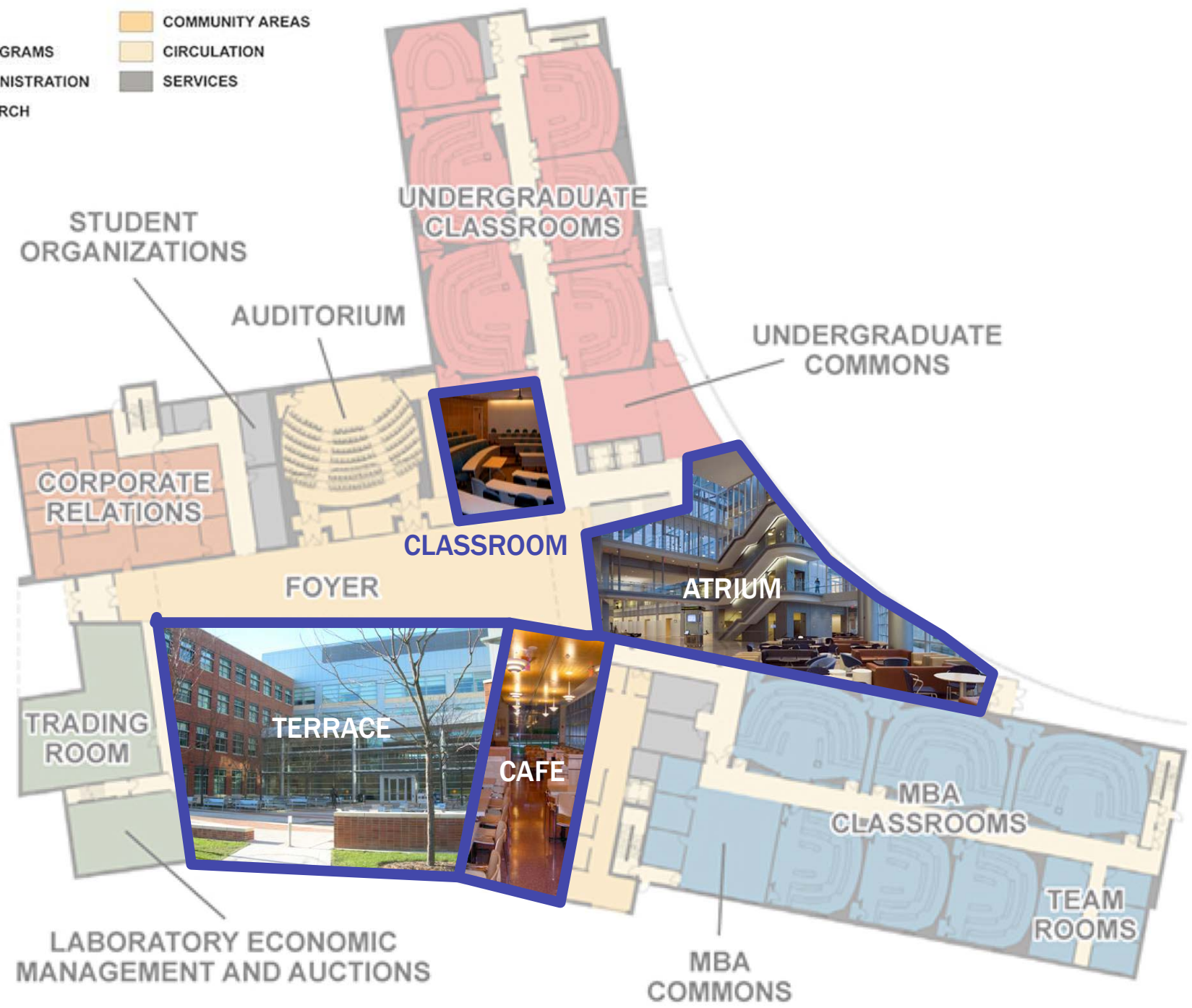
CONSTRUCTION September 30, 2005

SCHEDULE

DEDICATION DATE

BUILDING OVERVIEW >> PROJECT TEAM / DATA

- MBA PROGRAMS
- UNDERGRADUATE PROGRAMS
- LEADERSHIP AND ADMINISTRATION
- ACADEMIC AND RESEARCH
- COMMUNITY AREAS
- CIRCULATION
- SERVICES



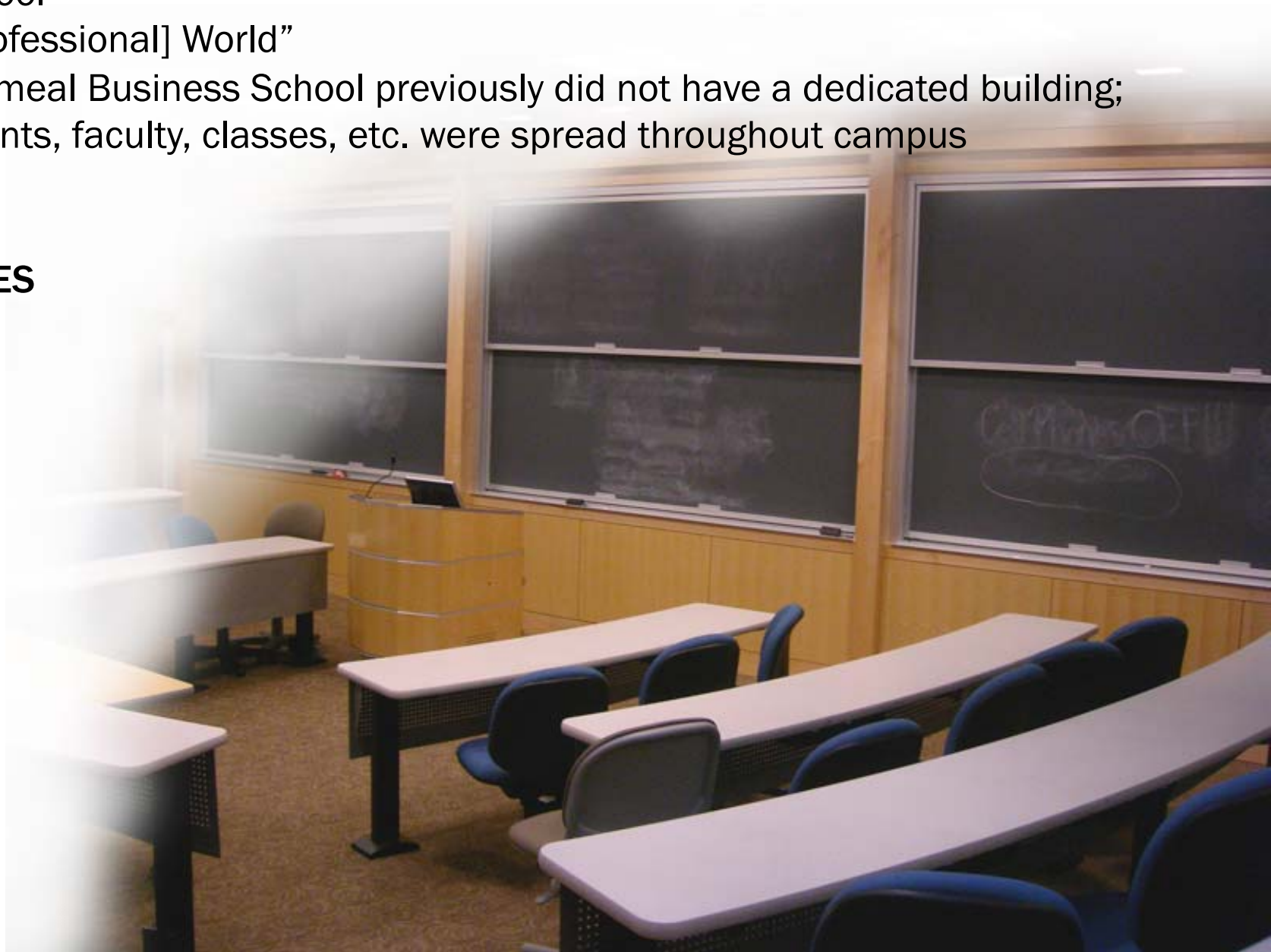
[BUILDING OVERVIEW >> LAYOUT](#)

EDUCATIONAL FACILITY

- Business School
- The “Real [Professional] World”
- Unity – the Smeal Business School previously did not have a dedicated building; students, faculty, classes, etc. were spread throughout campus

SMEAL'S VALUES

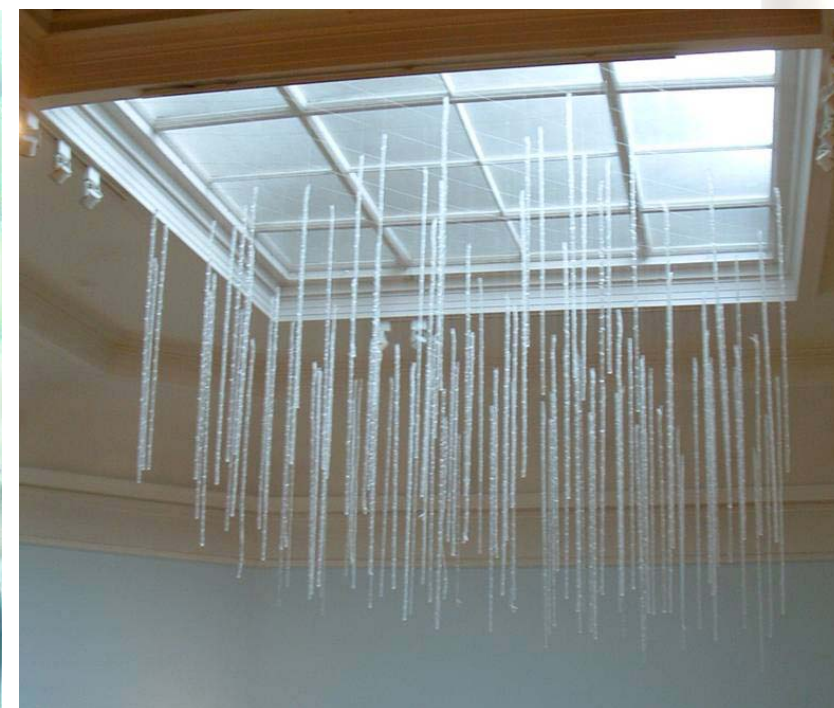
- Openness
- Transparency
- Community



DESIGNCONCEPT



Openness
Light/Airy
Transparency
Glow
Uniformity
Welcoming



OVERALL DESIGN CONCEPT

PRIMARY USES

- Circulation: maintain min. 5 fc on floor
- Meeting and Gathering Space: sensitivity to the aesthetics of the space
- Reading: provide more light at seating areas

SPACE CHARACTERISTICS

- Lots of **glazing** and **daylight** penetration
 - opportunity for energy savings through proper **daylighting integration** and controls.
- **Large and open space**
 - light **all surfaces**, not just the floor
- **Accessible** to students **24/7**
 - lighting **controls** system should be properly programmed to maintain adequate illuminance levels at all times.
- **Glossy floor**
 - lamp images from any open luminaires overhead could easily be reflected on the floor causing glare.
- **Glass donor wall & Kiosk**
 - points of interest that may want to be highlighted
 - should be sensitive of the **glossy** and **reflectivity** of glass if the elements are lit
- **Concept** of the the atrium being the connecting point of the two wings of the building and all four floors

highly visible and public area, i.e., more than just a circulation space

- must be sensitive to the aesthetic appearance of the space is necessary

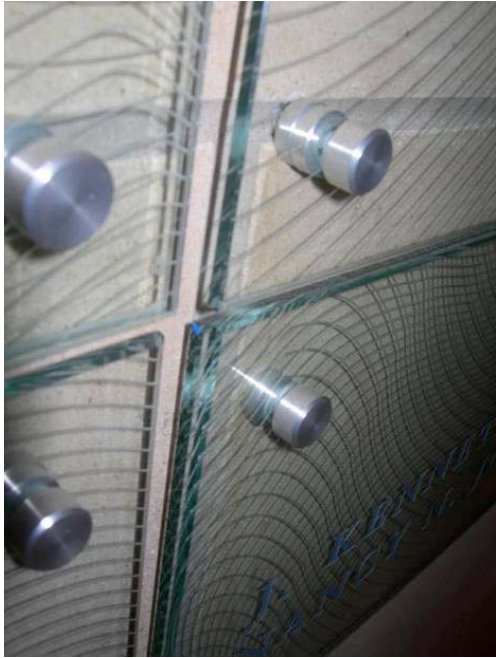


ATRIUM >> DESCRIPTION and DESIGN CONSIDERATIONS



ATRIUM >> DESIGN OPTIONS >> POINT OF INTEREST

SMEAL COLLEGE of BUSINESS BUILDING
UNIVERSITY PARK, PA
PENNSTATE



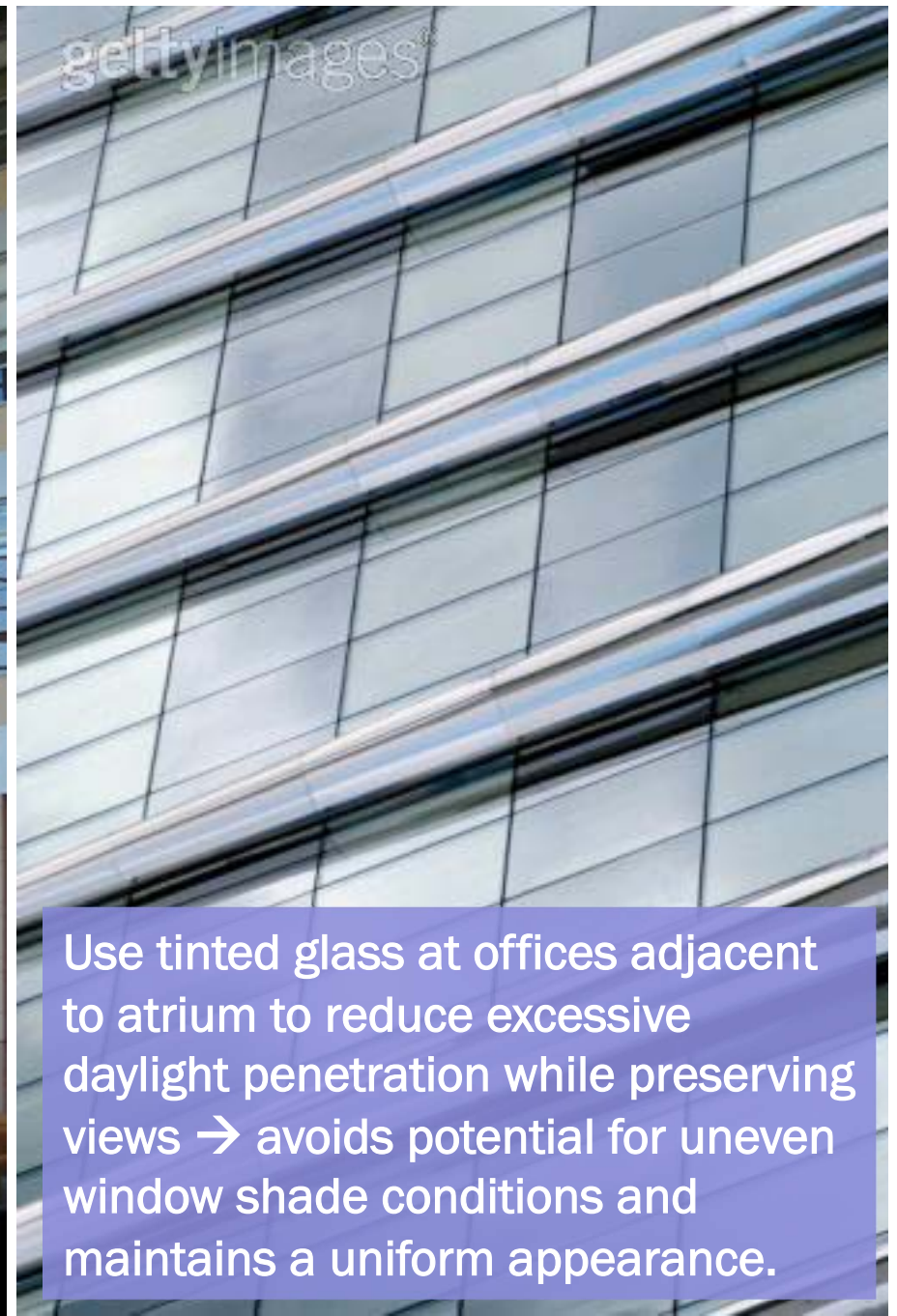
OPTIONS:

- Edge light
- Back light
- Don't light at all to achieve total uniform glow from exterior view of atrium

Current uneven lighting shown below.



ATRIUM >> DESIGN OPTIONS >> POINT OF INTEREST



Use tinted glass at offices adjacent to atrium to reduce excessive daylight penetration while preserving views → avoids potential for uneven window shade conditions and maintains a uniform appearance.

ATRIUM >> DESIGN OPTIONS



Light all surface to keep it looking bright, open, and airy. Avoid visibility of luminaires and lamps to avoid cluttering the visual planes.

ATRIUM >> DESIGN OPTIONS

PRIMARY USES

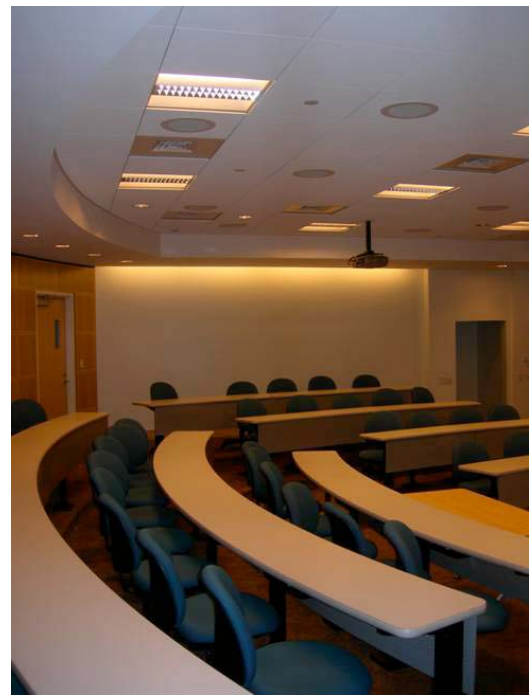
- Classes: 50 fc at work plane; controls flexibility for varying lecture conditions
- Special Lectures/Presentations: Controls flexibility to accommodate speakers presentation and preferences

SPACE CHARACTERISTICS

- Blackboard and white video projection screens
 - uniform illuminance at vertical surfaces without glare
- Tiered and semi-circular seating arrangement
 - important to avoid direct glare and have good source/task/eye geometry, but will be difficult because of the seating arrangement
- Dark carpet, dark front wall (wood with double-height blackboards), dark back wall (acoustical wood)
 - more light necessary to make up for low surface reflectances to ensure adequate illuminance levels at work plane.
- Fully enclosed room; no windows; higher floor with lower ceiling (soffit) at back of room
 - Reduce visual clutter and light all surface to make the space appear brighter and larger



use wall grazer or perimeter wall slot for vertical surface illumination



use shielded linear wall washers or create soffit and hide wall washers in ceiling



CLASSROOM >> DESIGN OPTIONS



- Use direct/indirect fixtures with diffuse lenses over louvers to help spread the light and brighten ceiling while still providing light down on to the work surfaces.
- Utilize special ceiling system to better organize all ceiling devices in order to achieve a cleaner ceiling plane to help brighten it.

PRIMARY USES

- Dining: adequate illuminance for light reading but not overly bright; this is a space where people will want to relax and enjoy themselves so attention should be paid to the aesthetic quality of the space
- Serving Food: non-uniform lighting desired to allow for sufficient contrast in brightness levels → brighter areas help to direct customers' attention, dimmer areas are preferred in the seating areas so the diners can feel more comfortable

SPACE CHARACTERISTICS

- Food displays and serving areas
 - refrigerated/heated display equipment and furniture have built in lighting fixtures; no additional accent lighting necessary but ambient lighting should still consider good color rendering
 - serving areas need more light or decorative light to direct customers' attention to those area, including the coffee bar where the prepared coffee drinks will be served
- **Menus on wall**
 - higher vertical illuminance compared to surrounding area so the menus can be read from afar
- **Cashier Area**
 - higher horizontal illuminance ~30 fc for counting money and reading food labels
- Decorative colored and textured **glass** wall
 - point of interest that may want to be highlighted but must be sensitive of the **glossy** and reflectivity of glass

CAFÉ >> DESCRIPTION and DESIGN CONSIDERATIONS

- Lots of glazing and daylighting



cove lighting

flashy/decorative
pendant at bar



downlighting at cashier area

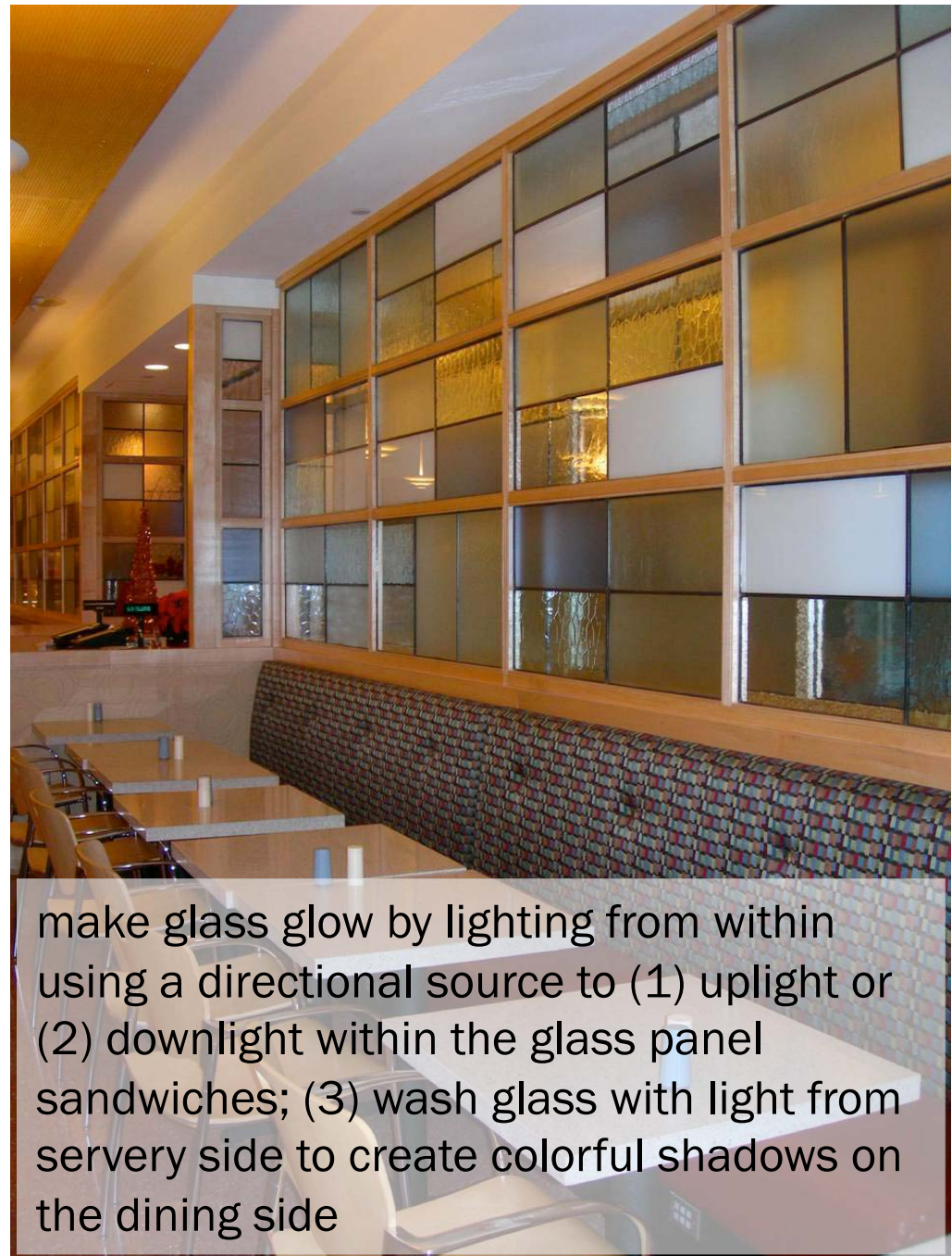
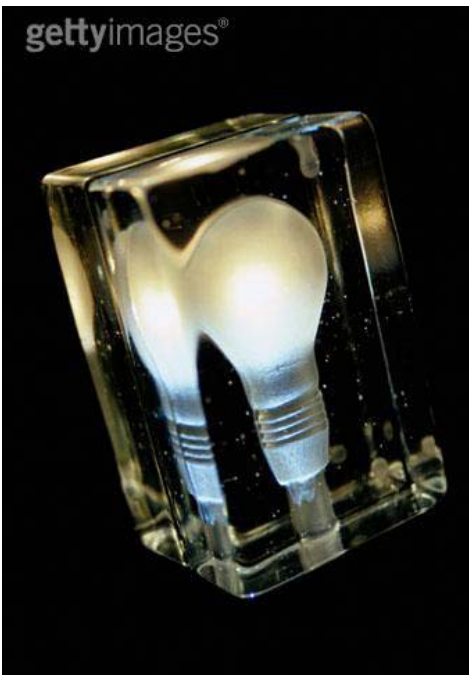


linear downlights for ambient lighting with adjustable accent lights to highlight vertical surfaces as needed



1. use small aperture recessed downlights to hide in ceiling and be less intrusive
2. back light patterned perforated panels and provide downlighting at perimeter
3. high output cove lighting at edge of panels

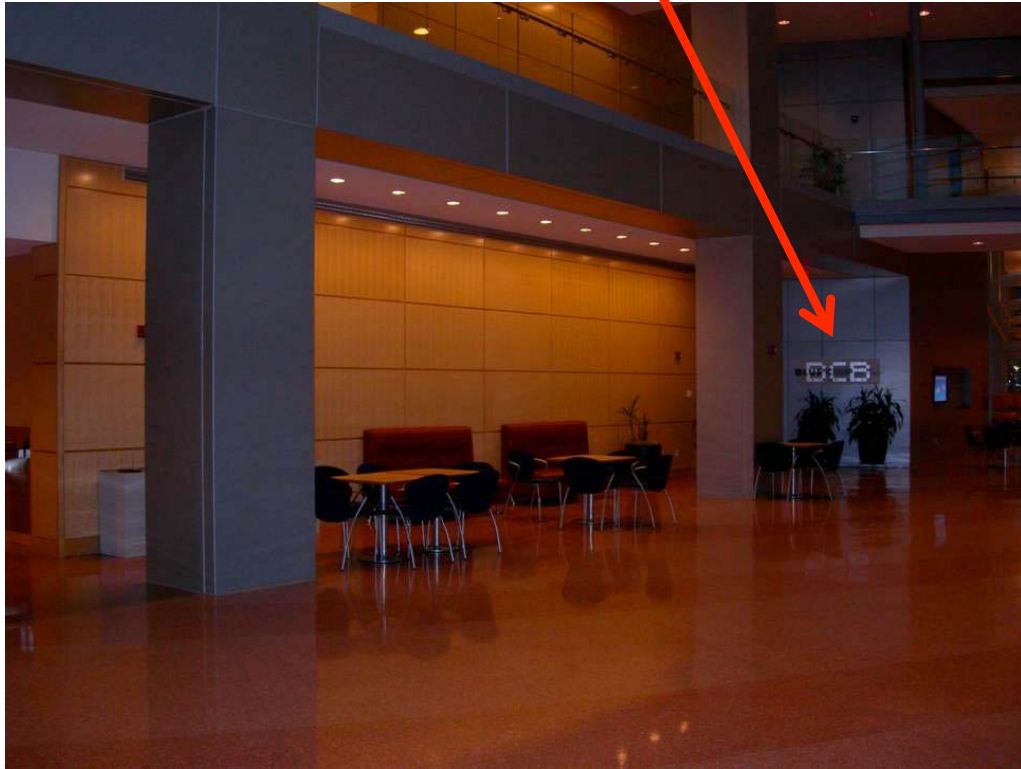




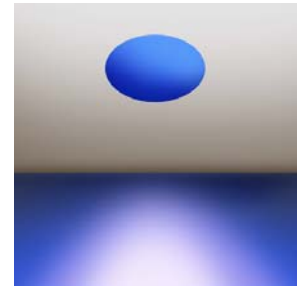
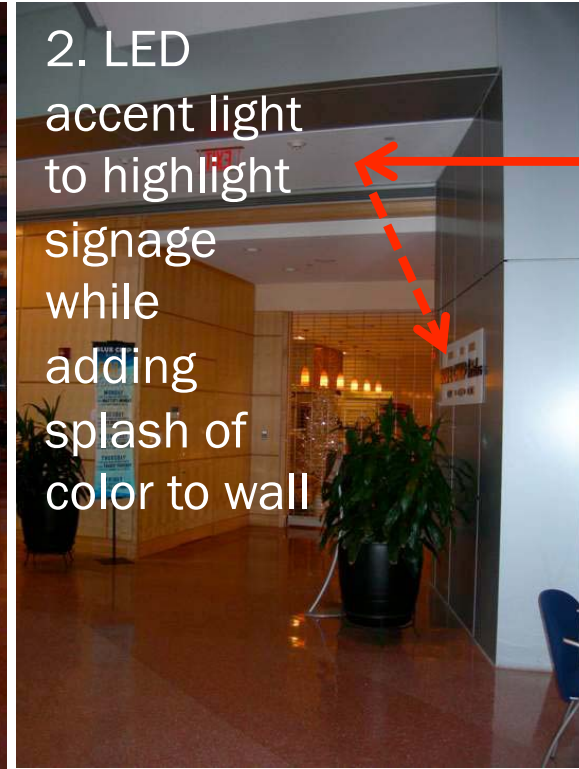
make glass glow by lighting from within using a directional source to (1) uplight or (2) downlight within the glass panel sandwiches; (3) wash glass with light from server side to create colorful shadows on the dining side

CAFÉ >> DESIGN OPTIONS >> THREE METHODS

1. create a niche behind the signage and back light for a glowing cove light effect



2. LED accent light to highlight signage while adding splash of color to wall



3. fully wash entire wall from ceiling to floor to make it glow apart from the rest of the space

PRIMARY USES

- Main Entrance from Campus: appearance of luminaires important so that they do not intrude on the space during the day when the lights are not needed; glare control very important as the darkness of night creates a condition for very high contrast with a bright lamp

SPACE CHARACTERISTICS

- Planting Beds and Bronze Statue
 - points of interest that may want to be highlighted
- Circulation
 - average of 1 fc (min 0.1 fc) desired at all pathways with relative uniformity
 - avoid direct glare because of potential for uncomfortably high contrast with night darkness
- Benches and Seating Area with Tables
 - adequate lighting levels important so the pedestrians are aware of the many elements in the space (i.e., so people will not bump into them)
 - these will not be used at night so no particular attention needed
- Brick, limestone, and aluminum materials
 - limestone and aluminum provide relatively good surface reflectance; more light may be needed at brick areas
- Lots of glazing
 - must be sensitive of exterior light trespassing into the building
 - fewer exterior fixtures than normal may be enough to provide adequate path lighting because light from the interior will spill out on to the terrace (building is open 24/7 so

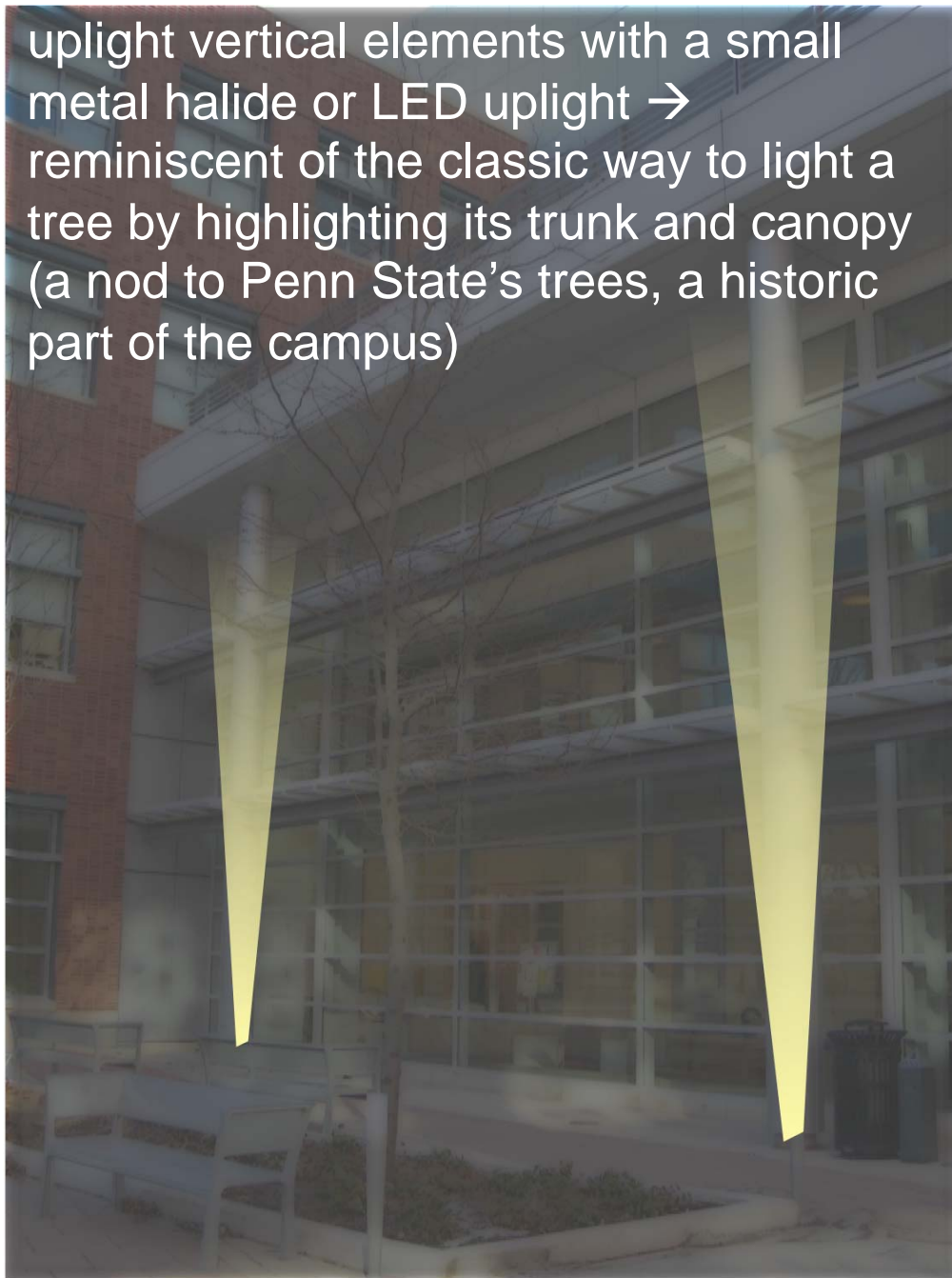


TERRACE >> TERRACE ELEMENTS



TERRACE >> DESIGN OPTIONS

uplight vertical elements with a small metal halide or LED uplight → reminiscent of the classic way to light a tree by highlighting its trunk and canopy (a nod to Penn State's trees, a historic part of the campus)



TERRACE >> DESIGN OPTIONS

glowing pebbles in planting beds to create visual interest



TERRACE >> DESIGN OPTIONS

A photograph of a modern building's interior, featuring large glass windows and several tall, cylindrical columns. The scene is bathed in a cool, blue light. A semi-transparent purple horizontal band is overlaid across the middle of the image. The text "Thank You" is written in a black, italicized serif font on the right side of this band.

Thank You