EOU Inlow Hall: Green Technologies & Practices
WHY BUILDINGS?

CO₂ EMISSION

Source: Energy Information Administration Statistics (Architecture 2030)
In the U.S. alone, buildings account for:

- **75%** of all electrical energy use
- **40%** of raw materials use
- **30%** of waste output
- **14%** of potable water consumption

Source: U.S. Green Building Council
People spend **90%** of their time indoors.

Indoor pollutant levels may be **2–5** times higher than outdoor levels.

Poor indoor air quality is one of the **top 5** health risks in the U.S. today. 

*Source: U.S. EPA*
WHAT
CAN GREEN BUILDINGS DO?

ADDRESS CRITICAL ENVIRONMENTAL ISSUES

• Climate Change
• Stormwater Management
• Water Efficiency
• Public Health
• Waste Disposal
WHAT CAN GREEN BUILDINGS DO?

- Energy Savings: 30%
- Carbon Savings: 35%
- Water Use Savings: 30-50%
- Waste Cost Savings: 50-90%

Source: Capital E
WHAT CAN GREEN BUILDINGS DO?

Increased Productivity

Less Absenteeism

Lower Operational Costs
GOALS
HIGH PERFORMANCE WORKPLACE

PROMOTE HEALTH & WELL BEING
Air quality
Daylighting
Thermal comfort
Cleanliness & maintenance
Occupant Health and Productivity
GOALS
HIGH PERFORMANCE WORKPLACE

FOSTER COLLABORATION
Flexible office layouts
Functional office systems and furnishings
GOALS
HIGH PERFORMANCE WORKPLACE

ACHIEVE OPERATIONAL GOALS

- Highly productive workspace
- Reduce energy & water use
- Facility payback
- Improve space utilization
- Employee recruitment & retention
LEED GOALS
WHAT LEED MEASURES

LEED CI (COMMERCIAL INTERIORS) VERSION 2.0

- SUSTAINABLE SITES
  (BASED ON EXISTING BUILDING)
- WATER EFFICIENCY
- ENERGY & ATMOSPHERE
- MATERIALS & RESOURCES
- INDOOR ENVIRONMENTAL QUALITY
- INNOVATION IN DESIGN

GOLD CERTIFICATION
MECHANICAL SYSTEM

Design Goals

- Energy Efficient
- No Compromise to Building Environment
- Not Experimental
- No Significant Increase in Maintenance Costs
- Standard Components
- Re-configurable
MECHANICAL SYSTEM

TYPICAL VARIABLE AIR VOLUME

Variable Air Volume (VAV)

- Re-circulates air throughout the building
- Prone to drafts

SUMMER
MECHANICAL SYSTEM
Active Chilled Beams
MECHANICAL SYSTEM
Active Chilled Beams

1. Primary air from air handler
2. Supply air induction nozzles
3. Induction air from space
4. Heating/Cooling coil
5. Supply air to space
MECHANICAL SYSTEM

VARIABLE AIR VOLUME vs. ACTIVE CHILLED BEAM

Active Chilled Beam with 100% Outside Air

- Same “operative” temperature perceived by occupants
- Dedicated Outside Air System (DOAS) provides constant airflow, optimized to avoid drafts
- 100% outside air, does not re-circulate air

DOAS = Dedicated Outside Air Supply
MECHANICAL SYSTEM

VARIABLE AIR VOLUME vs. ACTIVE CHILLED BEAM

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MECHANICAL SYSTEM
MECHANICAL FILTRATION

STANDARD FILTRATION

HIGH PERFORMANCE FILTRATION
MECHANICAL SYSTEM

BLINDS

WHY?

Close blinds prior to direct sun penetration

• Helps to reduce solar heat gain

• Helps to reduce glare
LIGHTING SYSTEM

DAYLIGHTING

Direct / Indirect suspended luminaire with continuous dimming ballasts

15’ – 0” Daylight Zone

Daylight responsive lighting controls provide natural light, reduce energy consumption
LIGHTING SYSTEM

LIGHTING FIXTURES

HIGH PERFORMANCE LIGHTING SYSTEMS

• Energy efficient
• Better visual comfort
LIGHTING SYSTEM

TASK LIGHTS

PERSONAL LED
TASK LIGHTS

• Individual controllability

• Highly energy efficient
Occupyancy controls improve energy efficiency, extend operational life of systems
PLUMBING SYSTEM

FIXTURES

WATER EFFICIENT FIXTURES

High Efficiency Toilet: 1.28 gpf
Low Flow Urinal: 0.5 gpf
Lavatory Faucet: 0.5 gpm
Breakroom Sink: 2.2 gpm

• Reduces potable water consumption
• Reduces long term operational and maintenance costs
**ENERGY**

**ENERGY SAVINGS**

- **Code Building**
  - 23% EQUIPMENT & MISC
  - 11%
  - 13%
  - 9%
  - 42%

- **EOU with energy conservation measures**
  - 19% EQUIPMENT & MISC
  - 0.8%
  - 7%
  - 4%
  - 13%
  - 21% SAVINGS
  - 35%

*Electric Energy Sub metering: real time electric use data*
INTERIOR DESIGN
OPEN SPACE PLAN

• Increase workplace flexibility & collaboration
• Easy reconfiguration of equipment /furniture
• Rearrange plan to adapt to changing organizational needs (less waste)
• Improved access to natural daylight and outdoor views
MATERIALS

DURABLE MATERIALS

• Improves performance of building
• Reduces cost and environmental impact of replacement and maintenance
MATERIALS
RECYCLED / REUSED / REGIONAL

• Reduce environmental impact due to new material extraction and transportation
• Support local and regional economy
• 30% of products used come from recycled materials
• 48% of products used come from the local sources
MATERIALS
LOW-EMITTING FURNITURE & FINISHES

• Use of healthy building products and materials
• Reduce emissions and off-gassing from finishes
• Maintain healthy indoor environment
• Building flush out to eliminate indoor air pollutants from furniture & finishes
INTERIOR DESIGN
WALK OFF MAT

WHY?

• Stops outdoor contaminants from entering workplace
• Ensures healthier indoor air quality
• Reduce maintenance and flooring replacement costs for entire building.
ACTIVE PARTICIPATION
MECHANICAL SYSTEM
THERMAL COMFORT

WHY?

• Affects occupant health and productivity
• Survey reflects if the system is operating as designed
• Helps benchmark performance against similar buildings

PLEASE GIVE US YOUR FEEDBACK!
(both negative and positive)
WE ARE INTERESTED IN YOUR THERMAL COMFORT!

EOU THERMAL COMFORT SURVEY

Instructions:
For each question below, indicate your response by marking the box that corresponds with your level of satisfaction. For any response valued less than neutral (0), please elaborate on the nature of the complaint.

How satisfied are you with the temperature in your workspace?

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Overall, does your thermal comfort in your workspace enhance or interfere with your ability to get your job done?

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General Information
On what floor do you spend the most time in this building?

- Basement
- 1st Floor
- 2nd Floor
- 3rd Floor
- 4th Floor

In a typical week, how many hours do you spend in your workspace?

- 10 or less
- 11-30
- More than 30

In which area of the building is your workspace located?

- Open Office
- Private Office

To which direction do the windows closest to your workspace face?

- North
- West
- South
- East

OPTIONAL: identify the location of your workspace:
GREEN CLEANING

- Reduce operation and maintenance costs
- Use of environmental friendly cleaning products
- Reduce indoor chemicals & pollutants
- Enhance health and well being of staff and occupants
GREEN EDUCATION

Educate occupants and public about building's green design approach

Highlight sustainable features

Use building as a learning tool for other campus projects
THANK YOU!

Questions / More Information:

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