**Iowa State University Facilities Planning and Management**

**Indoor Environmental Quality Guidelines**

**GOALS:**

* Provide and maintain acceptable indoor air quality, which is defined as: “Air in which there are no known contaminants at harmful concentrations as determined by cognizant authorities and with which a substantial majority (80% or more) of the people do not express dissatisfaction.” (ASHRAE 62-2007).
* Monitor and avoid indoor air quality problems during renovation, demolition, and construction activities.
* Provide occupants with operational control of lighting and HVAC systems whenever possible.
* Produce environments that enhance human comfort, well-being, performance, and productivity by reducing absenteeism and increasing employee satisfaction.

**STRATEGIES:**

**Indoor Air Quality**

#### Provide a Clean and Healthy Environment

* Comply with OSHA regulations that pertain to the design, operation, inspection and maintenance of ventilation systems: 8CCR5142 Mechanically Driven Health, Ventilation and Air Conditioning (HVAC) Systems to Provide Minimum Building Ventilation.
* Protect indoor environment from contaminants through
	+ Elimination of environmental tobacco smoke on the campus
	+ Prior to occupancy of new construction either perform a building flush-out by supplying a total air volume of 14,000 cubic feet of outdoor air per square foot OR conduct baseline IAQ testing using protocols consistent with ASTM standard methods or EPA compendium methods demonstrating that contaminants do not exceed concentration levels specified in LEED Reference Guide for Building Design and Construction.
	+ Measure and report via building automation systems the carbon dioxide (CO2) concentrations in order to maintain adequate outdoor air ventilation rates in buildings, and”
	+ Reduce particulate matter through use of high-efficiency filters on all outdoor air sources for building mechanical systems. .

#### Control Moisture to Prevent Microbial Contamination

* Where moisture precautions are needed, materials should be specified to discourage microbial growth.
* Address moisture control on the site, within the building envelope and inside the building.

#### Provide Ample Ventilation for Pollutant Control and Thermal Comfort

#### Attempt to adhere with the latest consensus standards that pertain to ventilation and thermal comfort by using control strategies to provide appropriate ventilation and thermal comfort:

* Recommend adhering with the latest consensus standards that pertain to ventilation and thermal comfort:

ASHRAE Standard 62-2007, Ventilation for Acceptable Indoor Air Quality

ANSI/AHIA Z9.5-2003, American National Standard for Laboratory Ventilation

ASHRAE Standard 55-2004, Thermal Environmental Conditions for Human Occupancy

* Provide continuous monitoring through use of our campus-wide building automation system that records and alarms the following points:
Carbon dioxide concentration
Room occupancy (to adjust outdoor air demand)
Temperature

#### Specify less harmful materials

Specify and install materials that release fewer and less harmful chemical compounds (low or no VOC-emitting materials) including paints, coatings, adhesives, flooring systems, ceiling tiles, and furniture systems to help ensure good indoor air quality.

**Human Factors**

#### Provide Appropriate Thermal Conditions

Address environmental and seasonal considerations for dry bulb temperature and radiant temperature profile, relative humidity, and occupants’ activities and modes of dress

#### Provide Effective Lighting

*Illuminance Levels*: Use design strategies and features to ensure that the illuminance Levels and Luminance Ratios are appropriate for the users, activities and tasks and are in compliance with Illumination Engineering Society standard.

*Color Temperature*: Use design strategies and features to ensure that color temperature, color rendering, and modeling of light are appropriate for the users, activities and tasks.

*Glare*: Use design strategies and features (e.g., selection of lighting fixtures, installation, and controls) to avoid glare in ways that support the program, user purposes, and preferences.

#### Provide Appropriate Building Acoustical and Vibration Conditions

*Vibrations*: Use design features and strategies to control sources of externally and internally induced vibrations from wind loads, passing traffic, interior foot traffic, building HVAC systems, and interior machinery.

#### *Noise Control*: Use design features and strategies to control sources of noise from mechanical and electrical equipment and from sources exterior to the building. Select wall assemblies with appropriate Sound Transmission Class (STC) ratings based on the conditions of the site, building program and activities. Noise elimination, control, or isolation from equipment should be addressed through acoustic zoning, equipment selection, construction, and appropriately designed ducts, piping, and electrical systems.

#### Attempt to adhere with the latest consensus standards that pertain to acoustic performance of mechanical systems by using strategies that adhere to:

* ANSI Standard S12.60-2010 Part 1, Annex A.1
2011 HVAC Applications ASHRAE Handbook, Chapter 48
AHRI Standard 885-2008

*Soundscapes*: Use design features and strategies to create appropriate sound reverberation levels, background sound levels, sound rendition, and speech interference levels.

#### Provide Views and Connection to Natural Environment

*Exterior and Interior Views*: Use design strategies to provide windows, skylights, and/or clerestories for outside view access from all work areas or regularly occupied spaces or to provide contact with patterns and textures of the natural world through interior recreations (e.g., atria, plazas, gardens, courtyards, plantings, and similarly restorative interior design treatments).

*Views:* Use design features and strategies to create connected interior and exterior views which provide the proper combinations of spaciousness, privacy, personal security, visual relief, and visual access to routes and settings within and to the outside of the building.