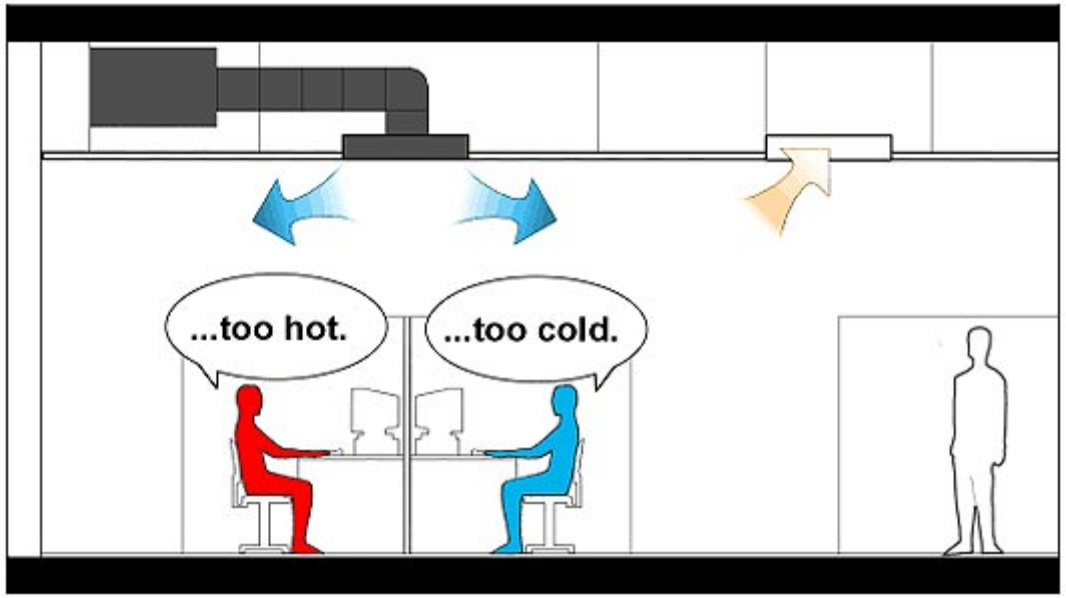
Indoor Environmental Quality
Overview

The Indoor Environmental Quality (EQ) category addresses:

- ❑ Indoor Air Quality
- ❑ Thermal, visual, and acoustic comfort



Indoor Environmental Quality
Overview

High-quality indoor environments:

- ❑ Enhance productivity
- ❑ Decrease absenteeism
- ❑ Improve the building's value
- ❑ Reduce liability for building designers and owners

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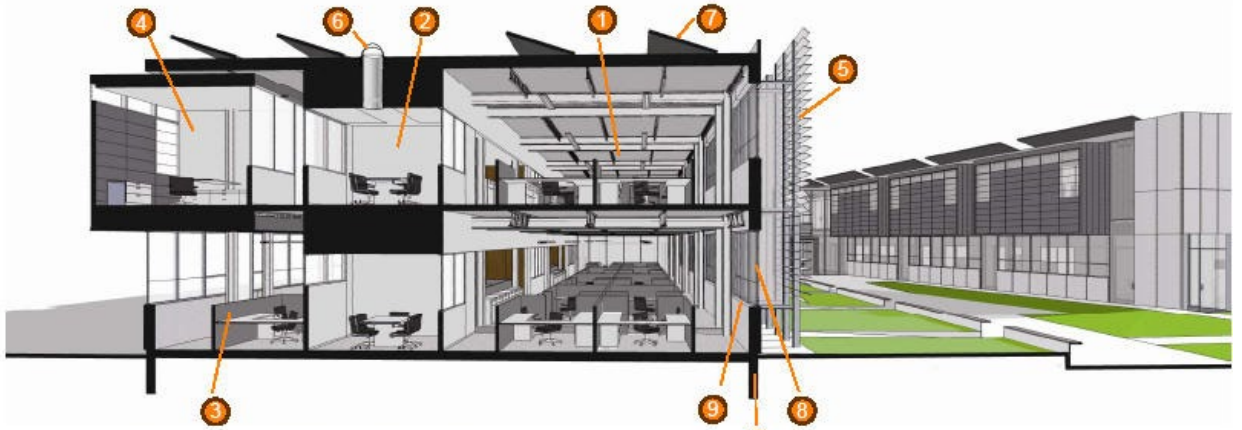
Floor Area Calculations and Floor Plans

For many of the credits in the EQ category, compliance is based on the percentage of floor area that meets the credit requirements.



Space categorization

Occupied versus unoccupied space

All spaces in a building must be categorized as either occupied or unoccupied.

- **Occupied spaces** are enclosed areas intended for human activities.

- **Unoccupied spaces** are places intended primarily for other purposes; they are occupied only occasionally and for short periods of time—in other words, they are inactive areas.

Regularly versus nonregularly occupied spaces

Occupied spaces are further classified as regularly occupied or nonregularly occupied, based on the duration of the occupancy.

Regularly occupied spaces are enclosed areas where people normally spend time, defined as more than one hour of continuous occupancy per person per day, on average; the occupants may be seated or standing as they work, study, or perform other activities.

For spaces that are not used daily, the classification should be based on the time a typical occupant spends in the space when it is in use.

For example, a computer workstation may be largely vacant throughout the month, but when it is occupied, a worker spends one to five hours there. It would then be considered regularly occupied because that length of time is sufficient to affect the person's well-being, and he or she would have an expectation of thermal comfort and control over the environment.

Occupied Space Subcategories

Occupied spaces, or portions of an occupied space, are further categorized as individual or shared multioccupant, based on the number of occupants and their activities.

- ❑ An individual occupant space is an area where someone performs distinct tasks.
- ❑ A shared multioccupant space is a place of congregation or a place where people pursue overlapping or collaborative tasks.

Occupied Space Subcategories

Occupied spaces can also be classified as densely or non-densely occupied, based on the concentration of occupants in the space.

- ❑ A densely occupied space has a design occupant density of 25 people or more per 1,000 square feet, or 40 square feet or less per person.
- ❑ Occupied spaces with a lower density are non-densely occupied.

INDOOR ENVIRONMENTAL QUALITY

LEED ADDRESSES THE FOLLOWING ISSUES RELATED TO INDOOR ENVIRONMENTAL QUALITY:

- Indoor air quality
- Lighting
- Acoustics
- Occupant experience

STRATEGIES FOR DESIGNING FOR GOOD INDOOR AIR QUALITY:

- **PROHIBIT SMOKING.** Institute a no-smoking policy for the building and around building entrances, operable windows, and air intakes.
- **DESIGN FOR PROPER VENTILATION.** Consider the number of occupants in each space and the activities they will be engaged in. Make sure that the ventilation system, whether natural or mechanical, is sized appropriately and can provide enough fresh air.
- **PROTECT AIR THAT COMES INTO THE BUILDING.** Locate air intakes away from likely exhaust sources, such as idling vehicles or smoking areas. Use air filtration to remove outdoor air contaminants. The filters should have high minimum efficiency reporting value (MERV) ratings. The higher the MERV rating the greater the particulates captured by the filter.
- **TEST FOR RADON OR OTHER ON-SITE CONTAMINANTS.** If present, include a ventilation system to address possible emissions.
- **DESIGN FOR ENTRYWAY SYSTEMS.** Use grilles, grates, or mats at building entrances to reduce the dust, dirt, and contaminants carried into the facility by people's shoes.
- **SPECIFY LOW-EMITTING MATERIALS.** Use materials with low VOC emissions.

STRATEGIES FOR IMPROVING INDOOR AIR QUALITY DURING CONSTRUCTION:

- **KEEP BUILDING CLEAN DURING CONSTRUCTION.** Follow good housekeeping and dust control during construction.
- **PROTECT MATERIALS AND EQUIPMENT.** Protect materials from moisture exposure, protect and cap ducts and mechanical systems.
- **CONDUCT A FLUSH-OUT.** Before occupancy, flush out off-gassed compounds and other contaminants left behind at the end of construction.

Indoor Environmental Quality
Indoor Air Quality (IAQ)

STRATEGIES FOR IMPROVING INDOOR AIR QUALITY DURING OPERATIONS AND MAINTENANCE:

- **ENSURE ADEQUATE VENTILATION.** Operate ventilation systems to supply ample outside air to the occupants. Follow the most recent industry standards, such as ASHRAE Standard 62, Ventilation for Acceptable Indoor Air Quality.
- **MONITOR OUTDOOR AIRFLOW.** Use an outdoor airflow measurement device that can measure and control the minimum outdoor airflow rate.
- **MONITOR CARBON DIOXIDE.** Use monitors and integrate them with a ventilation system that regulates the supply of air based on occupants' demand. With demand-controlled ventilation, air flow is automatically increased if concentrations exceed a setpoint.
- **CALIBRATE SENSORS.** Perform routine preventive maintenance, such as calibrating sensors and monitors, to ensure that accurate data are used to modulate systems.
- **PROHIBIT SMOKING.** Enforce a no-smoking policy in the building and around building entrances, operable windows, and air intakes. Communicate the policy to building occupants through building signage and tenant meetings.
- **DEVELOP AND IMPLEMENT A GREEN CLEANING POLICY.** To minimize the introduction of contaminants, outline procedures and goals for the custodial program at the facility. This policy should specify standards for selecting cleaning products and technologies, such as Green Seal standards, California Code of Regulations, and certification of cleaning equipment from the Carpet and Rug Institute.
- **CONDUCT CUSTODIAL EFFECTIVENESS ASSESSMENT.** Identify opportunities for improving building cleanliness and reducing occupants' exposure to potentially harmful biological and particulate contaminants.
- **USE ENTRYWAY SYSTEMS.** Have grilles, grates, or mats at building entrances to reduce the dust, dirt, and contaminants brought into the facility by people's shoes. Develop cleaning procedures to properly maintain the entryway systems.
- **USE INTEGRATED PEST MANAGEMENT.** A coordinated program of nonchemical strategies, such as monitoring and baiting, will reduce the need for pesticides and other potentially toxic contaminants.

Indoor Environmental Quality
Lighting, Acoustics, Occupant Experience

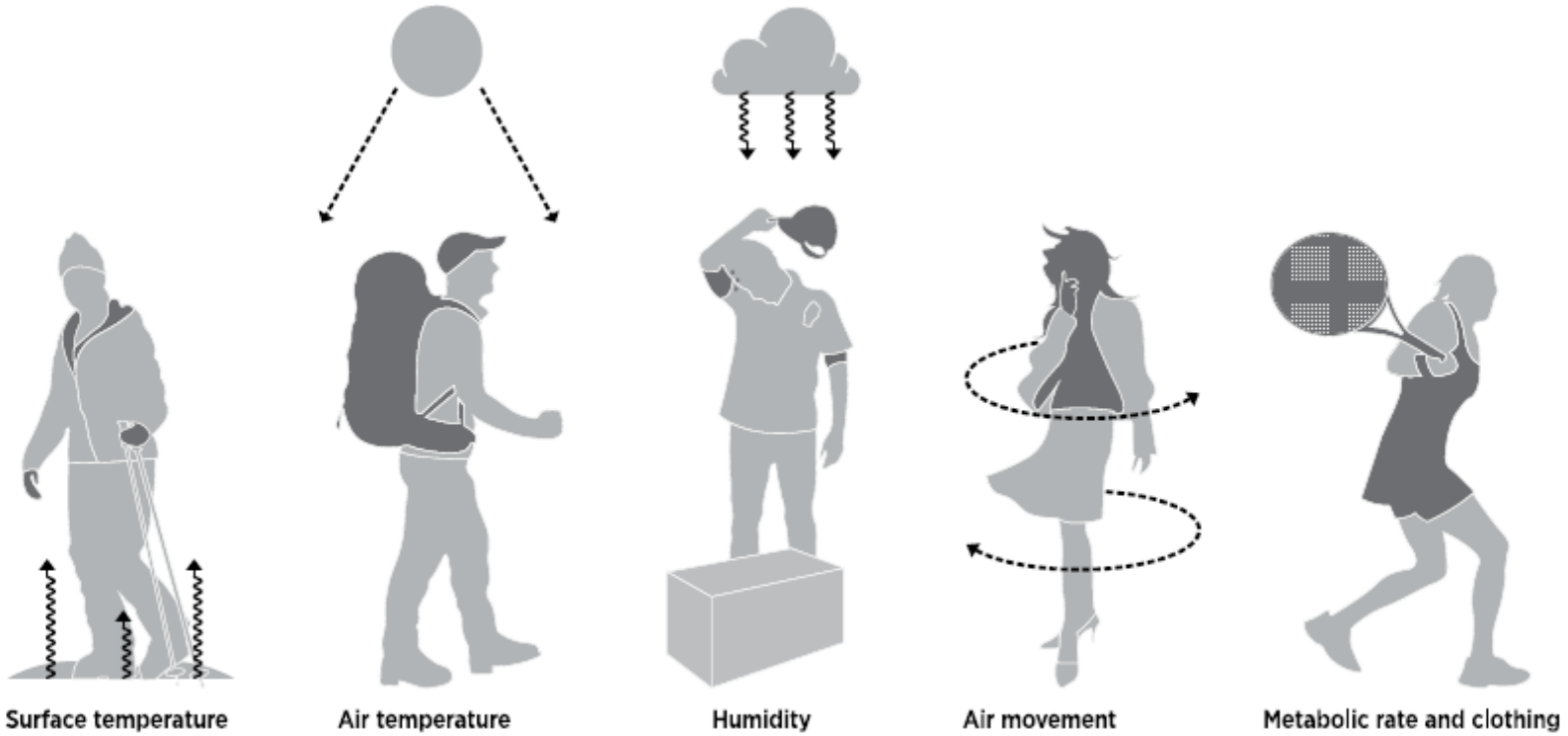


Figure 1. Primary factors that affect thermal comfort

Indoor Environmental Quality
Lighting, Acoustics, Occupant Experience

STRATEGIES FOR IMPROVING OCCUPANTS' COMFORT AND CONTROL:

- **USE DAYLIGHTING.** Design the building to provide ample access to natural light and views for the occupants. Optimize access to views by using low partitions and vision panels.
- **INSTALL OPERABLE WINDOWS.** If possible, provide windows that can be opened to the outside. To save energy, sensors may be included to inform the HVAC system to shut down if a window is open.
- **GIVE OCCUPANTS TEMPERATURE AND VENTILATION CONTROL.** In mechanically ventilated buildings, provide thermostats that allow occupants to control the temperature in their immediate environment. Provide adjustable air diffusers that allow occupants to adjust the air flow as well.
- **GIVE OCCUPANTS LIGHTING CONTROL.** Provide adjustable lighting controls so that occupants can match lighting levels to their tasks. These may be designed in combination with daylight and occupancy sensors to conserve energy.
- **CONDUCT OCCUPANT SURVEYS.** Use valid survey protocols to assess occupants' satisfaction with the indoor environment. Evaluate results to identify areas of dissatisfaction and prepare a corrective action plan to make the necessary operational changes.
- **PROVIDE ERGONOMIC FURNITURE.** Include furniture that is adjustable to prevent repetitive stress injuries.
- **INCLUDE APPROPRIATE ACOUSTIC DESIGN.** Use soft surfaces and other strategies to ensure that sound levels remain comfortable for the activity level of the space.

INDOOR ENVIRONMENTAL QUALITY

Indoor Environmental Quality (EQ)

Adaptation	NC	CS	S	R	DC	WDC	HOS	HC
Total	16	10	16	15	16	16	16	16
Minimum Indoor Air Quality Performance	req	req	req	req	req	req	req	req
Environmental Tobacco Smoke Control	req	req	req	req	req	req	req	req
Minimum Acoustic Performance	--	--	req	--	--	--	--	--
Enhanced Indoor Air Quality Performance*	2	2	2	2	2	2	2	2
Low-Emitting Materials*	3	3	3	3	3	3	3	3
Construction Indoor Air Quality Mgmt Plan	1	1	1	1	1	1	1	1
Indoor Air Quality Assessment	2	--	2	2	2	2	2	2
Thermal Comfort	1	--	1	1	1	1	1	1
Interior Lighting	2	--	2	2	2	2	2	1
Daylight	3	3	3	3	3	3	3	2
Quality Views*	1	1	1	1	1	1	1	2
Acoustic Performance	1	--	1	--	1	1	1	2