



Title: **INDOOR THERMAL COMFORT GUIDANCE**

Purpose: This *Indoor Thermal Comfort Guidance* has been established to provide assistance for Departments who are presented with indoor environments that become thermally uncomfortable for employees due to heating, ventilation and air-conditioning (HVAC) system failure or other circumstances. This guidance has also been developed to assist Departments with facility conditions that may lead to actions outlined in the Thermal Comfort Index Directive memo issued by the Managing Directors Office (MDO).

Background: Realizing that a person's intellectual, perceptual and manual performance is highest when thermal comfort has been achieved. When environmental conditions are outside the thermal comfort zone, there is likely to be a reduction in performance levels and an increase in the likelihood of human error that may lead to injury. The most important factors that influence the thermal comfort of an individual are: air temperature, humidity, air movement, radiant heat, activity level and clothing. Many different combinations of the above variables can achieve thermal comfort, and the effect of any of these factors should not be considered independently, as the effect of each of them depends on the level and conditions of the other factors. In addition, it should be recognized that some people with pre-existing medical/health conditions such as heart problems, high or low blood pressure, respiratory conditions and kidney disease, may be particularly susceptible to adverse health effects from working in thermally uncomfortable environments.

Guidance: The following actions are recommended for:

**A. Department Heads, Managers, and Supervisors**

1. Investigate situations involving thermal discomfort.
2. Request that building management or the appropriate party repair or improve faulty or inadequate ventilation and air-conditioning systems where thermal comfort is affected.
3. Obtain actual temperature and humidity readings for work environments.
4. Request the Departmental Safety Officer to evaluate operations where building occupants are complaining of excessive thermal discomfort that cannot be resolved through working with building management.
5. Decide if workers should remain in or be removed from a workplace due to thermal discomfort.

## B. Employees and Visitors

1. Report thermal discomfort concerns to the appropriate person/supervisor.
2. Adhere to engineering, administrative and work practice controls given by the Department or Risk Management Division (RMD).

## C. Risk Management Division

1. Evaluate indoor environmental conditions and systems that control those affected areas when departments and building management cannot resolve issues of thermal discomfort.
2. Recommend appropriate engineering and administrative thermal comfort control measures.

### Maintenance of Thermal Comfort

The City's Thermal Comfort Index originates from the American Society for Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) Standard 55-1992, *Thermal Environmental Conditions for Human Occupancy*. According to this guideline, an acceptable range of indoor temperatures that would satisfy 80% of building occupants is as follows:

Thermal Environmental Conditions for Human Occupancy **for offices** and other work areas with similar activities are summarized below:

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F - 75.5°F	74.0°F - 80.0°F
40%	68.0°F - 75.0°F	73.5°F - 79.5°F
50%	68.0°F - 74.5°F	73.0°F - 79.0°F
60%	67.5°F - 74.0°F	72.5°F - 78.0°F

The temperature ranges listed above assume a sedentary work level and normal office clothing ensembles for the respective summer and winter ranges.

In addition to heat and humidity, indoor carbon dioxide (CO<sub>2</sub>) concentrations may be measured as an indicator of poor air circulation within a building where no mechanical ventilation is available or operable. ANSI/ASHRAE Standard 62-2001 can be used as a guide to determine acceptable CO<sub>2</sub> concentrations.

Department administrators are recommended to determine the temperature and humidity of their employees' indoor work environment through communication with building management, other appropriate parties, or information from measurement devices (i.e., via thermostat readings). An evaluation of the indoor work environment may include an assessment of air movement, the availability of operable windows, the use of exhaust or circulation fans, and/or the measurement of ambient carbon dioxide levels to signify poor air circulation. Departments

may also request that building management or the appropriate party repair or improve faulty or inadequate ventilation and air-conditioning systems where thermal comfort is affected.

### Administrative Actions

If the above-mentioned actions in the “Maintenance of Thermal Comfort” section do not lead to resolved thermal conditions (i.e.- if occupants remain extremely uncomfortable and work productivity is affected), the following appropriate administrative actions may be considered:

#### **a) Cooling Season**

- Provide alternative work that is less physically demanding.
- Vary work hours and/or use unscheduled work breaks.
- Improve ventilation and air movement by the provision of fans or evaporative coolers and/or by opening doors and windows if possible.
- Cease using heat-producing equipment to the extent possible.
- Provide window blinds/curtains or screens to reduce radiant heat.
- Provide relief breaks as needed in suitable area.
- Provide non-caffeinated liquids and advice on the importance of adequate fluid intake.
- Make appropriate adjustment to required dress code.
- Other possible short-term solutions appropriate to the area.
- Departmental Heads or designee may consider reassigning affected employees to other departmental locations not affected by environmental conditions or allow employees to leave, with the authority for administrative leave approved by the Departmental Head or the Managing Director’s Office.

#### **b) Heating Season**

- Provide supplementary heating.
- Control drafty conditions to the extent possible.
- Departmental Heads or designee may consider reassigning affected employees to other departmental locations not affected by environmental conditions or allow employees to leave, with the authority for administrative leave approved by the Departmental Head or the Managing Director’s Office.