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SAFETY ALERT

No. 13-02 HEATING, VENTILATION AND AIR CONDITIONING SYSTEMS & INDOOR AIR QUALITY June 2013

Indoor air quality (IAQ) inside schools, offices and other workplaces is important not only for student and staff comfort but also for health. Poor IAQ may be attributed to symptoms like headaches, fatigue, trouble concentrating, and irritation of the eyes, nose, throat and lungs. Often, buildings themselves are seen as the culprit when dealing with on-going indoor air quality issues.

What we find when investigating the source of the problem is that the heating, ventilation and air conditioning (HVAC) system may be the issue or may be making the problem worse by distributing a nuisance odor or contaminant throughout the building. Often times the remedy to addressing a problem can be increasing ventilation through HVAC system. The key to maintaining a healthy indoor environment is proper ventilation in controlling air pollutants while ensuring thermal comfort.

Addressing IAQ issues begins with understanding how HVAC systems work. While we do not expect everyone to understand the complexities of HVAC systems, just knowing the basics can go a long way in addressing IAQ problems. HVAC systems may include boilers, furnaces, chillers, cooling towers, air conditioners, exhaust fans, ductwork and filters. A well-designed HVAC system controls temperature and relative humidity for thermal comfort, distributes adequate amounts of air to meet ventilation requirements and isolates or removes odors and other contaminants through pressure control, filtration and exhaust fans. Not all HVAC systems are designed to accomplish all of these functions. Some buildings rely only on natural ventilation or a passive system.

Most air handling units distribute a mixture of outdoor air and recirculated indoor air. Thermal comfort and ventilation needs are met by supplying "conditioned" air, which is a mixture of outdoor and indoor air that has been filtered, heated or cooled and sometimes humidified or dehumidified. In general, 20% of the air supplied by these units is from outdoors, although it can be adjusted as needed. There are no regulations that dictate indoor temperature requirements. The District defers to the recommended indoor temperature range of 68° to 75° F by the American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) Standard 55-1992.

There are established requirements for minimum ventilation rates within the California Building Code. They vary based on building type and use but generally require four air exchanges per hour. When rooms are closed off without proper ventilation, the air is commonly described as stale or stuffy. This is a result of not enough outdoor or 'fresh" air being introduced. A build-up of carbon dioxide levels (which is the gas you exhale when breathing) can result. This is common when doors and windows are closed and the ventilation system has been turned off.

Now that you have a basic understanding of HVAC systems, what do you do with this information? The following tips are designed for building occupants to ensure that HVAC systems are used to provide a comfortable learning and working environment:

1. Ensure ventilation is on and running when buildings are occupied. Many units are able to run in "fan mode only" if heating or cooling is not desired.
2. Make sure to turn on timers so ventilation will run when rooms are occupied and turn them off when rooms are empty.
3. Ensure outdoor air intakes and supply vents are not obstructed. Often times, vents are covered because it's too cold for the occupants. Instead of covering the vents, adjustments to the thermostat should be made.
4. Ensure idling vehicles do not park near outdoor air intakes. Exhaust can be picked up by the HVAC system and introduced into the building. Whenever odors are reported, checking possible outdoor sources like dumpsters or odors coming from off site can help occupants determine the source quickly.
5. Ensure heat generating equipment such as copiers and printers are not located next to your thermostat. The HVAC cooling system will run constantly to try and decrease the room temperature which is not actually as high as the thermostat is reading.
6. Maintain temperature setting at a moderate level that is comfortable to most occupants.

If you believe your HVAC system is not operating properly, advise your Plant Manager to make a trouble call to the Maintenance and Operations Branch at 213-745-1600.

For additional tips and assistance in maintaining a healthy indoor learning and working environment, please contact the Office of Environmental Health & Safety at 213-241-3199 or www.lausd-oehs.org.

We also highly recommend the Environmental Protection Agency's (EPA) Indoor Air Quality Tools for Schools Program which provides a common-sense guide to prevent and solve the majority of indoor air quality problems with minimal cost which is designed to be implemented at the site level. For more information on this program contact District Nursing Services at 213-202-7580. You may also refer to *Reference Guide 5354.0 Implementation of the EPS's Tools for Schools Program to Improve Indoor Air Quality* or the EPA's website at http://www.epa.gov/iaq/schools/.

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