

## School Building HVAC Systems Recommendations

We understand that this is an uncertain time for school districts. With COVID-19 concerns and the changing environment, we know that schools are adapting HVAC system operations to protect the health and safety of their employees, staff, and students. These recommendations address both **OCCUPIED** and **UNOCCUPIED** school building scenarios.



### HVAC System Schedule for **OCCUPIED** Spaces

If portions of a building are operational to support food service or other critical needs, please refer to the **Operating Buildings During an Infectious Disease Crisis** guidelines on page 3.

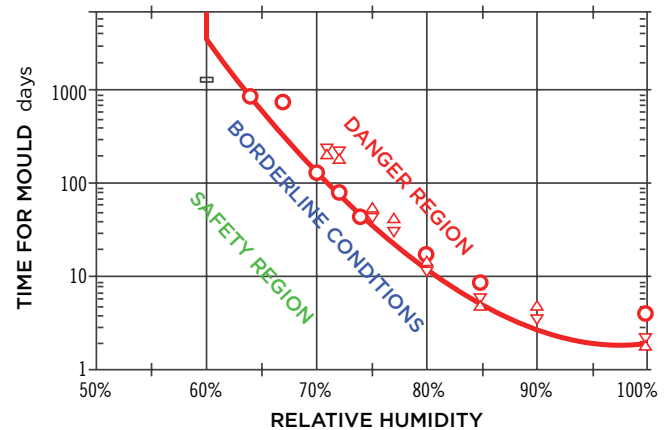
### HVAC System Schedule for **UNOCCUPIED** Spaces

Closed buildings present an opportunity to save on utility costs. However, buildings that are not in use but remain in constant occupied mode cause high humidity and mold issues. The risk is that your school district will spend money unnecessarily on additional energy and create a mold problem you are trying to avoid.

To save energy and prevent mold during building closure this summer, we recommend implementing your **normal extended break** or **holiday schedule**:

- Set your systems to operate in **UNOCCUPIED** mode.
- Enable your central cooling system so that chilled water is available whenever the average temperature in your building reaches 80 degrees (adjustable).
- Since the spaces are now in **UNOCCUPIED** mode, the outside air dampers should be closed when the units are running, to prevent hot humid air from entering the building.
- Keep the chilled water loop setting low, and cold enough for the units to wring out any humidity that could be in the building, without over-cooling the space. This process ensures the heating system is not needed for dehumidification.

American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) recommended range for relative humidity in K-12 schools is 40-60%.



Source: Canadian Conservation Institute

## School Building HVAC Systems Recommendations

Follow these **3 STEPS** to confirm your HVAC system and equipment are in good working order:

### 1 BUILDING AUTOMATION SYSTEMS

Check your building automation systems for **alarms, overridden points, or locked points**:

- **Determine why** any points or systems are in alarm, have been overridden, or locked at a specific setting.
- Where appropriate, **release or remove** the overrides or locked points.
- Consider **adding alarm points** to monitor your building during the extended shutdown period.

### 2 BUILDING WALK-THRU

If building access **IS PERMITTED**, walk-thru each facility to check for:

- Systems in operation that should **NOT** be in operation – keeping in mind that systems could be operating in *dehumidification mode* or *warm-up/cool-down mode*.
- Confirm large units and pumps are set to **"AUTO"** at the disconnect.
- Check for *water leaks, dripping fixtures, or leaking flush valves*.
- Check manually controlled HVAC thermostats not part of the BAS system:
  - Ensure schedules are set correctly (including daylight savings time changes)
  - Replace any batteries

### 3 AUDIT UTILITY BILLS

Audit utility bills for signs of **billing errors** or indication of leaks or faulty meters if you experience unusual energy consumption.

## School Building HVAC Systems Recommendations

### **OCCUPIED** Spaces: Operating Buildings During an Infectious Disease Crisis

The following recommendations are primarily intended for buildings and spaces that are open and in operation, as opposed to buildings and spaces that are closed for an extended period.

There is a broad variation of complexity, flexibility, age, and condition of HVAC systems in educational facilities. Consequently, any enhancements or modifications to equipment, systems or operations must be thoroughly analyzed by a qualified individual to ensure that they do not adversely affect the building environment. We recognize every school district is different. It may not be practical to implement some or all the recommendations, so it is incumbent upon school officials to utilize an integrated approach (considering cost, benefit, energy usage impact, maintenance, etc.) when evaluating each recommendation.



#### Ventilation Recommendation

**Action 1:** Disable Demand Control Ventilation<sup>(1)</sup>

**Action 2:** Increase outdoor air ventilation rates as much as possible to maximize dilution of the return air stream<sup>(1,2)</sup>

*Investigate existing equipment functionality and capacities to identify the maximum amounts allowable to ensure temperature, humidity and building pressurization problems do not develop.*

**Action 3:** Install localized exhaust systems for source control in high risk areas. Examples of high-risk areas include a nurse's clinic or Special Needs Classroom<sup>(3)</sup>

*This will require design engineering along with a potential for significant costs. It may not be a viable option for many buildings.*

<sup>1</sup>. ASHRAE Guidance for Building Operations During the COVID-19 Pandemic (3/24/2020)

<sup>2</sup>. CDC - Interim Guidance for Businesses and Employers to Plan and Respond to COVID-19 (3/21/2020)

<sup>3</sup>. ASHRAE Position Document on Infectious Aerosols (4/14/2020)



#### Filtration Recommendation

**Action 1:** Change filters and clean coils, drain pans and the interior of air handling units according to manufacturer's instructions<sup>(1)</sup>

*Utilize proper PPE.*

**Action 2:** Install filters with increased efficiencies and enhanced particle filtration capability to the greatest extent possible, considering the limitation of the existing air handling equipment<sup>(2)</sup>

*Investigate the capability of the existing air handling equipment to accept deeper filters along with the fan capacities to accommodate the increased static pressures.*

**Action 3:** Install portable, free-standing high-efficiency particulate air (HEPA) filters with integral fans (portable room air cleaners) in high risk areas<sup>(2)</sup>

**Action 4:** Seal edges of filter racks<sup>(3)</sup>

*Consult the filter rack manufacturer's recommendations for acceptable materials and methods to employ.*

<sup>1</sup>. ASHRAE Epidemic Task Force - Checklist for School IAQ Operations (4/15/2020)

<sup>2</sup>. ASHRAE Position Document on Infectious Aerosols (4/14/2020)

<sup>3</sup>. ASHRAE Guidance for Building Operations During the COVID-19 Pandemic (3/24/2020)

## School Building HVAC Systems Recommendations



### Temperature Recommendation

**Action 1:** Maintain standard comfort conditions during occupied periods and standard setback/setup unoccupied space temperatures<sup>(1)</sup>

<sup>1</sup> ASHRAE Epidemic Task Force - Checklist for School IAQ Operations (4/15/2020)



### Humidity Recommendation

**Action 1:** Maintain space relative humidity (RH) between 40% to 60%. Scientific literature generally reflects the most unfavorable survival for microorganisms when the RH is between 40% to 60%<sup>(1)</sup>. Consider the addition of humidification equipment only when reviewed by a design professional to verify minimum RH setpoints will not adversely impact building or occupants by contributing to condensation and possible biological growth.

<sup>1</sup> ASHRAE Position Document on Infectious Aerosols (4/14/2020)



### Controls Recommendation

**Action 1:** Keep systems running longer hours to enhance the effects of increased ventilation and filtration<sup>(1)</sup>. Investigation is required to ensure that this measure will not cause relative humidity problems.

<sup>1</sup> ASHRAE Guidance for Building Operations During the COVID-19 Pandemic (3/24/2020)



### UVGI Statement

**Action 1:** While UV light (specifically UV-C) has been well studied in infection reduction, no definitive science is available regarding its effect on COVID-19. Therefore, no COVID-19 recommendation can be made at this time<sup>(1)</sup>.

UV lighting systems have been installed in air handling units to improve air quality by reducing certain viruses and bacteria, and also reducing the amount of microbial growth (such as mold) on cooling coils and drain pans. UV-C is harmful to all organic matter, including humans. Safety and maintenance issues must be addressed.

<sup>1</sup> ASHRAE Position Document on Infectious Aerosols (4/14/2020)

**If you have questions or require assistance, please [contact us](#).**

Information and recommendations regarding COVID-19 are continually evolving, as are the science, technology, and procedures for combating the virus. Performance Services will take reasonable efforts to make recommendations consistent with accepted industry, scientific and/or governmental standards in place at the time of such recommendations. However, Performance Services disclaims any and all liability with respect to COVID-19, including, but not limited to, damages, costs and/or expenses related to any exposure to, contraction and/or spread of the virus.