

## HVAC Upgrade Recommendations to Re-occupancy Schools After Covid-19

The following is a Summary of the ASHRAE Epidemic Task Force Bulletin "Re-opening of Schools- After Shutdown" (Attached) Kyle Hasenkox in our Victoria office is a member of the ASHRAE Epidemic Task force that helped write these new guidelines and we are sharing this with School Districts across B.C. for their information and consideration in creating a safe environment. **Currently there is no evidence that suggests the virus is spread through the ventilation system** but it is believed that these additional measures will help with isolation during building occupancy.

In addition to cleaning and sanitization procedures within the school facilities the following changes to the operation, filtration and maintenance of ventilation systems, can reduce airborne exposure to SARS-Cov-2 (The Virus that Causes Covid-19), is recommended. These are only recommendations for consideration and are arranged in a series of steps from simple to complex. More stringent measures and information is available in the ASHRAE documents.

### A System Operational Changes

Changes to the operation of existing air-handling systems to provide more outside air is believed to provide a safer environment. Turning off air-handling system is not recommended.

- 1 Use existing ventilation systems to provide a morning flush for 2 hours M-F prior to building occupancy and at 100% outside air if possible.
- 2 Increase minimum outside air damper position of all existing air-handling systems during occupancy to double the current minimum outdoor air.
- 3 On all air-handling systems with CO2 sensors lower the set point to 800ppm.
- 4 On VAV systems adjust the VAV box minimum air flow settings to 75% of maximum. (Most VAV systems have a 30% to 50% minimum volume)
- 5 Increase the duration of all systems with occupancy sensors to run systems for a minimum of 2 hours. Or disable occupancy sensors.
- 6 On variable speed air-handling systems such as the gymnasiums, and other large single zones, run systems at 100% fan speed during occupancy.

### B Enhanced Air Filtration

In general is it recommended to increase efficiency of air-handling system filtration to MERV (Minimum Efficiency Reporting Value) 13 where possible. The Merv 13 filter will catch 75% of particles in the 0.3 to 1.0 micron size and 90% of particles in the 1.0 to 3.0 micron range of an airborne aerosol Covid virus.

- 1 Install new filters in all air-handling systems prior to full building occupancy.
- 2 Upgrade existing filters in all air-handling systems, roof top units, fan coils and unit ventilators to Merv 13 where possible. (2" filter rack required)
- 3 Upgrade filters racks if possible to take minimum 2" thick pleated filters (Merv 13). Some filter racks are only 1" thick and Merv13 requires 2" depth
- 4 Monitor filter status and change out filters on a more frequent basis than usual to ensure maximum filter efficiency.

### C Safe Maintenance Procedures

In general maintenance of mechanical systems should continue to ensure a high level of comfort and air-quality. Studies have shown that poor comfort and air-quality can cause stress on our immune system.

- 1 Establish work safe procedures and additional PPE for all filter change and maintenance personnel.
- 2 Review building room temperatures and address comfort issues where possible.
- 3 Ensure all air-handling systems are operational and achieving operating conditions and outside air volumes as per section 'A'
- 4 Set up trend logs, if not already in place, to monitor air-handling systems.

### D Temporary Isolation Area

It may be advantageous to isolate a student that is not feeling well or showing symptoms of Covid-19. In hospitals these are known as Isolation or Negative Pressure Rooms in which the entire area is held under negative pressure relative to adjacent spaces protecting other occupants.

- 1 Designate an area/room in the building which can be used as an isolation room and has an exhaust air system.
- 2 Walls above the ceiling space should be full height and sealed air tight if possible. Doors should be weather-stripped.
- 3 Install an exhaust system, if none exists, which can maintain negative pressure and vented directly to the outdoors.

### E System Monitoring

A building automation system is extremely valuable in setting up and continued monitoring of ventilation systems in the building. Critical alarms should be set up on system operation related to these measures.

- 1 Create a log of all system operational changes made to each of the ventilation systems so they can be set back to original parameters.
- 2 Set up critical alarms for all systems where ventilation rates and set points are not being achieved.
- 3 If possible create global variables that can be used to switch from normal to "enhanced ventilation" mode and add to system graphics.