

## Ventilation Practices Related to COVID-19

### Andover Public Schools

Ventilation is one part of the necessary multifaceted approach to reducing the transmission of COVID-19. The DESE Fall Reopening Facilities and Operations Guidance contains some recommendations on how to approach the subject of ventilation and HVAC systems, however the EPA refers to ASHRAE for more specific guidance as they are the standard for HVAC design.

#### - **Guidelines and meeting standards**

Our schools all have HVAC systems in place which were designed to meet the ASHRAE Standards. Earlier this year, ASHRAE formed the ASHRAE Epidemic Task Force, Schools and Universities, which provided guidance to “Follow current ASHRAE 62 Standards or local ventilation standards for minimum outside air requirements.”

In general, classrooms have individual Unit Ventilators (UVs) which bring outdoor air into the space. The quantity of outdoor air is controlled by the measure of CO<sub>2</sub> in the space, and is monitored by the Town wide Building Management System (BMS).

Common areas, offices, and the classrooms in new buildings; have centralized systems which provide HVAC to a group of spaces. These units are also controlled by our BMS.

For centralized systems, the ASHRAE Epidemic Task Force recommends to “Increase outside air to maximum allowable without compromising indoor thermal comfort for learning environments”, which is what the equipment is designed to provide.

#### - **Windows**

The DESE Guidance states to “open windows or doors (when appropriate and safe)”. This guidance is meant for facilities or spaces that are not equipped with an HVAC system that is functioning as designed. Opening windows is not meant to be a first course of action and can be a detriment to the proper function of the HVAC system due to pressurization issues.

#### - **Filters**

The ASHRAE Epidemic Task Force recommends following the 2019 ASHRAE Standard and using the highest Minimum Efficiency Reporting Value (MERV) filter applicable for the HVAC unit. The 2019 ASHRAE Standard for schools is to have MERV 8 to 13.

Currently, Town wide, MERV 8 filters (MERV 14 in some locations) are used in all HVAC equipment and are replaced every 3 months as part of the regular preventative maintenance program during the school year.

Unit Ventilators, in most classrooms, generally operate with a MERV 8 filter which meets the ASHRAE Standard.

#### - **CO2 and DCV**

HVAC standards dictate quantities of outdoor air necessary for ventilation and good indoor air quality. A typical calculation of outdoor air volume for a space is determined by the number of occupants designed to utilize the space, and this is what equipment is specified for. Since outdoor air needs to be heated or cooled to meet human comfort standards, the concept of controlling the quantity of outdoor air based on actual occupancy was established as an energy saving strategy and is also used to ensure good indoor air quality. This is called demand control ventilation (DCV).

In Andover schools, the HVAC equipment utilizes DCV to ensure good indoor air quality, and as an energy saving measure so that outdoor air is not unnecessarily conditioned when occupants are not present in the space.

The ASHRAE Epidemic Task Force recommends introducing the maximum possible outdoor air and disabling DCV as a control measure. Andover's integrated BMS system which monitors CO2 levels can act as a barometer to the quantity of outdoor air being brought into each space.

It is important to note that in the event that a classroom's CO2 sensor were to become faulty and reading a high value, the outdoor air damper is programmed to be fully open to bring in the maximum quantity of outdoor air.

#### - **Actions**

- Daily flush prior and post occupancy: Start HVAC systems (in occupied mode) a minimum of 2 hours prior to occupancy and run 2 hours post occupancy.

#### **References**

The Massachusetts Department of Elementary & Secondary Education (2020/07/22). Fall Reopening Facilities and Operations Guidance. <http://www.doe.mass.edu/covid19/on-desktop.html>