TowerPinkster

Architecture · Engineering · Interiors

MEMO

DATE: August, 12, 2020

TO: Steve Gross

FROM: Lyal Ward, P.E., LEED-AP

RE: Return to School Indoor Air Quality (IAQ)

TowerPinkster was asked by the Vicksburg Community Schools to provide recommendations on how to achieve 10 cfm/person of ventilation air flow and how to incorporate MERV 13 filters into the existing equipment.

In regards to achieving the 10 cfm/person of ventilation air flow, we evaluated the existing equipment and determined that it is capable of providing the requested airflow. Our recommendation would be to hire a Test and Balance (TAB) Contractor to go through the existing equipment and balance to the 10 cfm/person of ventilation air flow as requested. TowerPinkster will provide the TAB Contractor with the outdoor airflow needed at each piece of equipment.

After reviewing the existing equipment it was determined that a majority of the equipment could not physically accommodate the MERV 13 filter and others could not handle the additional pressure drop the filter would exert. We then started looking into alternative solutions to provide an improved IAQ solution.

Some of the options we looked at were:

- Humidification
- Ultraviolet germicidal irradiation (UVGI)
- Bi-polar ionization (BPI).

Humidification was determined to not be plausible on the majority of the classroom equipment and too expensive to install and maintain.

UVGI was also ruled out because the basic UVGI system only treats static surfaces such as filters and coils. Increasing the UGVI system density to also treat the air stream would increase utility and maintenance costs which make them non-practical.

The last strategy we looked at was Bi-Polar Ionization (BPI). BPI treats the air stream by adding charged particles into the air stream which causes smaller particles to attach creating larger particles that can be collected by the filter or fall out of the air stream to be cleaned by standard cleaning procedures. BPI has also been proven to break down viruses and bacteria rending them inert within minutes.

Some of the common misconceptions with BPI are:

- It creates ozone in the space. BPI products come with a UL867 listing that requires units to have been tested to not produce or emit ozone.
- Increased CO_2 in the space. We have the ability to increase the ventilation to avoid high CO_2 concentrations.
- Falls short of ASHRAE 62 standard. This is looking at the BPI as the only source for IAQ. We look at it as an additional source and do not rely on it exclusively.
- BPI is unreliable. These products have no moving parts, require little maintenance, and have a 15 year life span.

This type of system has been in the United States since the 70's serving critical buildings such as hospitals, nursing homes, and courts building. Recently with the improvement of technology it has started being used in schools and office buildings. We have personally implemented this system in our Grand Rapids and Kalamazoo offices along with two of our Engineers having it in their homes.

In conclusion, TowerPinkster's recommends that, in addition to hiring a TAB Contractor to achieve the 10 cfm/person of ventilation air flow, each piece of equipment that has a fan and serves occupiable space be provided with a BPI system. This system provides the best cost and maintenance while also allowing the BPI systems to be transferred to newer equipment in the future.