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**Testimony of Mr. Corey Metzger, P.E.
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New Jersey Assembly Health Committee
Hearing on the Public Health Aspects of School Reopening
during the COVID-19 Public Health Emergency**

Thank you for the opportunity to speak before you today. I appreciate that Assemblyman Conway is holding a hearing on this important subject and I thank the committee members for their time and attention. My name is Corey Metzger, and I am an ASHRAE volunteer member serving on ASHRAE's Epidemic Task Force, which was formed to develop and deploy technical resources to address the challenges of the COVID-19 pandemic and possible future epidemics related to the effects of heating, ventilation, and air-conditioning systems on disease transmission. I also serve on ASHRAE technical committee 9.7 – Educational Facilities, and I am the current Chair of the ASHRAE Conferences and Expositions Committee. In 2012, I founded Resource Consulting Engineers, LLC, in Ames, Iowa, which designs mechanical, plumbing and fire protection systems for numerous building types. Thank you again for inviting me to participate in this virtual meeting.

ASHRAE, founded in 1894, is a global society committed to shaping tomorrow's built environment today. Our 55,000 members include about 1,000 in New Jersey. ASHRAE focuses on improving building systems, energy efficiency, indoor environmental quality, refrigeration and sustainability through research, standards writing, publishing, certification and continuing education.

ASHRAE's Epidemic Task Force was formed in March 2020 and has developed guidance on building reopening related to ventilation, filtration, air cleaning, and water systems for several building types and operational conditions, including for school facilities. Guidance from the Schools Team was initially released in early May, and an update to this guidance was issued in July.

Before diving into the specific guidance for school reopening, I'd like to first provide some background on why building HVAC systems matter in the context of the coronavirus. The primary pathway by which SARS-CoV-2, the virus that causes the COVID-19 disease, is spread is believed to be large virus-laden droplets, many of which fall to the ground near the infected individual. That is why the practice of social distancing and wearing masks is so critically important. However, at least some viral transmission appears to occur as the result of exposure to smaller aerosol particles, which can and can remain suspended in the air for extended periods of

time. Concentrations of aerosolized viral particles may increase in spaces without adequate ventilation or filtration, and these particles may be redistributed to other spaces by building HVAC systems. The extent to which transmission through aerosolized particles causes the disease is not completely known. However, we do know that transmission of the coronavirus through the air is sufficiently likely that airborne exposure to the virus should be controlled. Changes to building operations, including the operation of heating, ventilating, and air-conditioning systems, can reduce airborne exposures.

As part of ASHRAE's Epidemic Task Force, I lead a group of 12 experts in collecting, reviewing, analyzing and disseminating information to reduce the risk of transmission of COVID-19 in school facilities by reducing concentrations of infectious aerosols. Two weeks ago, we issued updated guidance to help prepare educational buildings to resume occupancy. The guidance provides practical information and checklists to school districts and university campus environmental health managers, facility managers, administrators, technicians and services providers. The [41-page presentation](#), which I have provided to the committee, addresses several different aspects of building systems, including inspection and maintenance, ventilation, filtration, air cleaning, energy use considerations, and water system precautions. In applying this guidance, it is important to recognize that many different HVAC system types are used in educational facilities, so adaptation of these general guidelines is necessary. We also recommend consulting with a qualified design professional for detailed analysis.

ASHRAE recommends providing a good supply of outside air, in accordance with ASHRAE Standard 62.1-2019, to dilute indoor contaminants. This is a first line of defense against aerosol transmission of the coronavirus. Use of at least a MERV-13 rated filter is also recommended, if it does not adversely impact system operation. If MERV-13 filters cannot be used, portable HEPA air cleaners in occupied spaces may be considered. Other types of air cleaners including germicidal ultraviolet air disinfection and electronic air cleaners may also be considered to supplement ventilation and filtration. It is important that technologies and specific equipment be evaluated to ensure they will effectively clean space air without generating additional contaminants or negatively impacting space air distribution. Finally, with many school facilities being unoccupied for some time, these buildings could have stagnant water, and water systems should be flushed to remove potential contaminants. Utilizing ASHRAE Standard 188 and Guideline 12 can help minimize the risk of water-borne pathogens such as legionella.

I appreciate the committee looking into these important matters with schools, and I thank you for your consideration of ASHRAE's comments. Protecting the health, safety and welfare of the world's students, faculty, and administrators from the spread of the coronavirus is essential to protecting the entire population. I welcome your questions and would be happy to provide additional information to help New Jersey's schools resume safe operations.