

MEMORANDUM

TO: Patrick K. Murphy, Assistant Director Construction & Maintenance

FROM: Jason P. Forsyth, P.E.

CC:

DATE: October 7, 2020

SUBJECT: Mechanical Operations Summary in Response to Covid-19

Per your request, the following provides a summary of Moseley Architects interactions with HCPS Construction & Maintenance (C&M) since March in response to the Covid-19 pandemic.

Prior to the pandemic, Moseley and HCPS C&M has met monthly for the past two years to review any recent engineering issues at any of the schools with most of the conversations focused on mechanical/HVAC systems. In addition, over the past three years Moseley has provided annual existing equipment assessment reports with the purpose of identifying equipment/systems to be renovated or replaced. The reports also provide estimated costs of construction for inclusion in the capital improvement planning (CIP) process.

The first meeting to discuss specific issues related to the pandemic occurred in July with weekly pandemic specific meetings commencing on August 4th to supplement the monthly meetings indicated above. The meetings have centered around the published guidance from industry organizations and how that guidance relates to HCPS students, teachers, and buildings. As the pandemic has evolved and more information gathered, the guidance has been continually updated where the weekly meetings have provided a means to digest the information and pivot if necessary.

There has been much discussion and concern related to mechanical/HVAC systems and the impact they may have on the health of building occupants. It should be noted the most important actions to limit the spread of viruses are not related to HVAC and include frequent disinfection of high touch surfaces, providing more opportunities and supplies for hand sanitation, use of personal protective equipment (PPE), social distancing, etc. It should also be noted, the virus cannot "grow" or originate within the HVAC systems like can be seen with mold or other biological growth. The virus would need to be introduced into the air by a person carrying the virus and thus the importance of following the precautions outlined by the CDC and other organizations.

The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) indicated the following in their first published position paper concerning the pandemic in late April, "Transmission of SARS-CoV-2 through the air is sufficiently likely that airborne exposure to the virus should be controlled. Changes to building operations, including operation of HVAC systems can reduce airborne exposures." Since then, ASHRAE developed a webpage that contains a lot of Covid information with specific sections on schools and in particular an entire section on re-opening schools. As referenced above, the published

information has been updated several times over the past months with the most current update on re-opening schools occurring in late August. The webpage can be found at the following address:

<https://www.ashrae.org/technical-resources/resources>

The addition of ultraviolet (UV) lights and improving central air filtration to the highest level compatible with existing equipment are two of many operational changes included by ASHRAE which could be considered by building owners in response to the pandemic.

As requested, Moseley Architects has evaluated adding UV lights to a typical elementary school, middle school, and high school to determine an estimated cost of construction. UV lights have been applied in HVAC systems for years to kill or deactivate pathogens and viruses, however the effectiveness against the SARS-CoV-2 virus is unknown at this time. Manufacturers of UV lights are in the process of testing the effectiveness but no published data has been released. The following estimates are based on information obtained from existing drawings. Actual costs of construction will vary depending on type of HVAC systems and specific existing conditions at each school. The estimates can be used to determine rough order of magnitude of costs of construction, however, to determine specific costs of construction for each school, site visits and evaluations of each school would need to be completed.

Estimated Costs of Construction per School:

Elementary School (based on Colonial Trail ES) - \$27,000

Middle School (based on Short Pump MS) - \$34,000

High School (based on new JR Tucker HS/Highland Springs HS) - \$65,000

Also requested was an evaluation of upgrading filters at a typical elementary school, middle school, and high school to determine an estimated cost of construction. The feasibility of replacing existing filters with MERV 13 or 14 filters depends on the type of HVAC systems, the capacity of the existing fan motor to accommodate the additional pressure drop, along with several other factors. Due to these factors it is not feasible to determine an estimated cost of construction for a typical school. In order to determine this information, the equipment at each school would need to be evaluated by a professional engineer which would take a significant amount of time and cost considering HCPS is comprised of 72 schools. However, per ASHRAE guidelines the HCPS maintenance personnel have been inspecting the existing equipment to ensure the proper MERV rating filters are installed, filters are installed properly, filter racks are sealed to prevent bypass of unfiltered air, and filters are replaced on regularly scheduled program.

The above is for informational and educational purposes only and to provide a general understanding of the potential impacts of COVID-19 and other pathogens and does not provide specific medical or treatment advice. It is intended to offer guidance regarding potential best practices in addressing such infectious pathogens. Adherence to any of this content will not ensure success in every situation. Furthermore, this content should not be interpreted as setting a standard of care or be deemed inclusive of all appropriate measures and methods of care. The ultimate judgment regarding the propriety of any specific means and methods must be made by the school system in light of all the circumstances presented by its requirements and those of the individual users and occupants, and the known variability, constant changing, and biological behavior of said pathogens. The above reflects the available information and technologies at the time it was prepared. The results of future studies and findings may require revisions to this content to reflect such new data. Accordingly, Moseley Architects does not warrant the accuracy or completeness of this information and assumes no responsibility for any injury or damage to persons or property arising out of or related to any use of this brochure, its content, or for any errors or omissions.