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July 15, 2022

Mr. Michael Lane
Environmental Health & Safety Manager
Office of Court Management / Facilities Management & Court Capital
Lowell Justice Center
370 Jackson Street
Lowell, MA 01852

RE: HVAC System Filter Inspection, Roderick L. Ireland Courthouse, 50 State Street, Springfield, Massachusetts (EH&E 25633)

Dear Mr. Lane:

Environmental Health & Engineering, Inc. (EH&E) provides this report to the Massachusetts Trial Court Office of Court Management regarding the findings from the HVAC system filter inspection project for the Roderick L. Ireland Courthouse located at 50 State Street, Springfield, Massachusetts (the Building).

MAIN AIR HANDLING UNITS

Ventilation and thermal conditioning for 50 State Street is provided by four central air handling units (AHUs), designated AC-1 through AC-4. These units are original to the building and are similar in overall design and capacity. AHUs AC-1 through AC-4 are designed and operated as mixed air systems meaning they deliver a portion of outdoor air and air returned from the occupied space. Each unit is equipped with a dedicated supply air fan and a dedicated return air fan that operate at a constant airflow volume. Cooling of the discharge air supplied from the AHUs is provided through a chilled water cooling coil or using an airside economizer that modulates the flow of outdoor air for “free” cooling when outdoor air temperatures permit. Each AHU was originally equipped with an electric resistance preheat coil to temper the outdoor and return air mixture prior to delivery. EH&E was informed that the preheat coils in all four AHUs are disconnected. Air filtration at each AHU was originally provided by an electronic air cleaner equipped with an automatic roll type pre-filter. These filter systems are no longer in use and new conventional air filter banks were installed. All AHUs currently operate with standard pleated air filters.

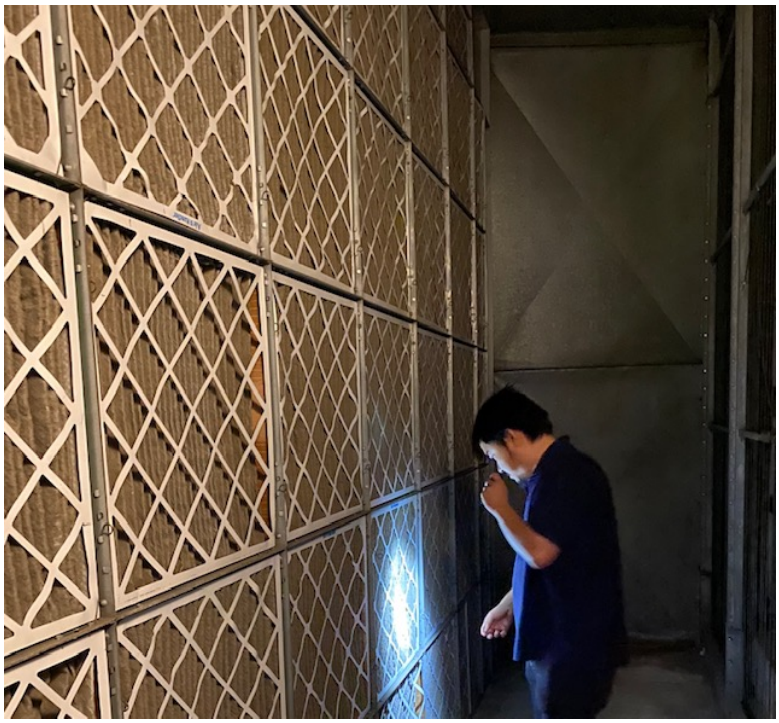
Air filters installed in the four AHUs were in good condition at the time of EH&E’s June 17, 2022, site visit. The air filters were well fitted and showed no evidence of air bypass. The air

filters installed are considered medium-high efficiency pleated panel filters with a MERV-13 efficiency rating.[1] The filtration efficiency rating has been upgraded from the MERV-8 filters that were observed at the time of EH&E's 2019 inspection. This filter efficiency upgrade will increase the protection to the AHU cooling coils and remove higher amounts of airborne particles as the higher the MERV rating on a filter, the fewer dust particles and other contaminants can pass through it. EH&E confirmed that the two types of filters installed (Airflow AFP3000 and Air Handler 2EKH6) are both rated by their manufactures to have a MERV-13 efficiency.

Inspection of the air filters in all AHUs showed that a few of the panels were installed with the pleats running horizontally as opposed to vertically. Although installing the panels with horizontal pleats does not reduce the level of filtration, installing the filters with the pleats running vertically reduces the potential for the pleat to partially collapse once the filter begins to load with particulate. EH&E recommends installing the pleated filters with pleats running vertical. Photograph 1 shows the MERV-13 filters installed in AC-1 and Photograph 2 shows the MERV-13 filters installed in AC-4.

Photograph 1 MERV-13 Filters AC-1, 50 State Street, Springfield, Massachusetts.

[1] The air filter Minimum Efficiency Reporting Value (MERV) rating was developed by the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) as a means of rating the effectiveness of an air filter. The MERV rating scale ranges from MERV-1 (lowest effectiveness) to MERV-20 (highest effectiveness filter). Filtration systems commonly installed in commercial buildings typically range between MERV-5 through MERV-13 with many upgrading to MERV-13 as part of COVID-19 response programs.



Photograph 2 MERV-13 Filters AC-4, 50 State Street, Springfield, Massachusetts.

Perimeter Fan Coil Units

For zones located along the perimeter of the building, supplemental heating and cooling is provided by perimeter fan coil units (FCUs) where the heating and cooling function is controlled by separate individual zone thermostats. Per the original design, cooling was provided by chilled water and heating was provided by electric resistance heating coils. Cooling and heating are now provided through the use of a single FCU coil that operates with chilled water during the summer months, and hot water during the winter months. All perimeter FCUs currently operate with standard pleated air filters.

With the assistance of building maintenance staff, EH&E inspected the air filters in 61 perimeter FCUs on June 17, 2022. Most of the air filters installed in the FCUs were in good condition at the time of EH&E's site visit. Seven (7) of the 61 filters were noted by EH&E as being wet at the time of the site visit. Inspection indicated that a majority of the air filters (45/61) were not well fitted and showed evidence of air bypass between the filter frame and filter rack. In addition, EH&E was not able to confirm the filtration efficiency on 2 of the 61 FCU filters inspected as there was no identification marked on the filter frames. The Airflow AFP3000 filters observed in the majority of the FCUs were confirmed to be rated by their manufacture to have a MERV-13 efficiency. Photographs 3 and 4 show examples of gaps between FCU filter frames and the filter racks.

Photograph 3 Gap between Filter Frame and FCU Filter Rack in Room 422, 50 State Street, Springfield, Massachusetts.

Photograph 4 Gap between Filter Frame and FCU Filter Rack in Jury Pool 446, 50 State Street, Springfield, Massachusetts.

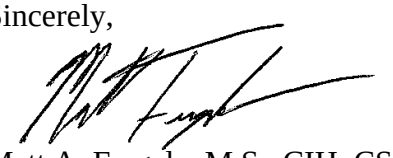
RECOMMENDATIONS

Based on the findings from the HVAC system filter inspection at the Building, EH&E offers the following recommendations to help optimize indoor air filtration:

- Install the pleated filters with pleats running vertical in AC-1, AC-2, AC-3, and AC-4.
- Inspect FCU filters for signs of moisture and water damage during filter changes. Address sources of moisture, which may include condensation or small leaks.
- Install spacers or gap fillers between the FCU filter frames and filter racks to minimize air bypass.
- Ensure all FCU filters are rated by the manufacturer to have a MERV-13 efficiency.

If you have any comments or questions regarding this report, please contact me at 1-800-TALK EHE (1-800-825-5343).

Sincerely,



Matt A. Fragala, M.S., CIH, CSP
Managing Principal Consultant

Appendix A Limitations

APPENDIX A
LIMITATIONS

1. Environmental Health & Engineering, Inc.'s (EH&E) indoor environmental quality assessment described in the attached report number 25633, *HVAC System Filter Inspection, Roderick L. Ireland Courthouse, 50 State Street, Springfield, Massachusetts* (hereafter "the Report"), was performed in accordance with generally accepted practices employed by other consultants undertaking similar studies at the same time and in the same geographical area; and EH&E observed that degree of care and skill generally exercised by such other consultants under similar circumstances and conditions. The observations described in the Report were made under the conditions stated therein. The conclusions presented in the Report were based solely upon the services described therein, and not on scientific tasks or procedures beyond the scope of described services.

2. Observations were made of the site as indicated within the Report. Where access to portions of the site was unavailable or limited, EH&E renders no opinion as to the condition of that portion of the site.

3. The observations and recommendations contained in the Report are based on limited environmental sampling and visual observation and were arrived at in accordance with generally accepted standards of industrial hygiene practice. The sampling and observations conducted at the site were limited in scope and, therefore, cannot be considered representative of areas not sampled or observed.

4. When an outside laboratory conducted sample analyses, EH&E relied upon the data provided and did not conduct an independent evaluation of the reliability of these data.

5. The purpose of the Report was to assess the characteristics of the subject site as stated within the Report. No specific attempt was made to verify compliance by any party with all federal, state, or local laws and regulations.