

# **OLMSTED ENVIRONMENTAL SERVICES, INC.**

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Subject: **Ventilation Screening**  
**Benjamin Franklin Lower and Upper Schools**  
**950 Norton Street, Rochester, NY 14621**

On Thursday, February 25, 2021, Ed Olmsted and Margaret Sergent, representing the Rochester, NY Teachers Association (RTA) inspected representative classrooms at Benjamin Franklin Lower and Upper Schools at 950 Norton Street, Rochester. The survey team also included a representative of the Rochester City School District (RCSD), Matthew Seeger, Schools Facilities Management.

The survey was done as part of the exposure control program for pandemic SARS-CoV-2. RCSD instituted many exposure control measures for the coming year including mandatory wearing of masks, distancing of occupants (reduced occupancy), enhanced cleaning, in-school COVID-19 testing, operating the ventilation systems with a maximum fraction of outside air, installation of ASHRAE MERV 13 filters, where the HVAC units can accommodate them, and the provision of air purifiers to all occupied spaces. Each school will have temperature screening upon entry and have a nurse's office. Students with symptoms or suspected of having COVID-19 will be isolated in an isolation room. More information on the RCSD reopening plans can be found on the [RCSD website](#).

The building is intended to be utilized in the Phase 3 February reopening for blended and in-school classes in middle and high schools. This inspection was requested prior to the staff and students' return and conducted after their return. The survey included the following:

1. A visual inspection of a number of representative classrooms;
2. A visual inspection of the building ventilation system(s); and
3. Taking airflow measurement at supply outlets, return/exhaust grilles, and open windows using a TSI 9515 VelociCalc Air Velocity Meter (anemometer).

The findings include:

1. The Franklin Campus has a central heating ventilation system that serves all classrooms. The classrooms are also heated by perimeter steam radiators. There are also exhaust fans on the roof that pull air from the classrooms and bathrooms. Exhaust ventilation in classrooms appears to be located in small alcoves at the base of the wall and work to exhaust air to the roof. Each classroom has operable windows that can be opened for outside air. The building is also heated by perimeter radiators.
2. The central air handler units are located in mechanical rooms throughout the building. The units are in good condition and modern. The air handler units are designed to provide a mixture of outside air and return air modulated by dampers. Each supply fan has an associated return fan. Mixed air is filtered through MERV 14 filters and heated in fan coils in the unit. Filters with MERV-13 or higher ratings are recommended for HVAC systems due to their ability to filter smaller particles, including viruses. Filters with MERV-13 or higher ratings can trap smaller particles, including viruses. As such, upgrades to a MERV-13 rated filter, or the highest-rated filter in HVAC systems have been recommended by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) as a method to reduce the transmission of the SARS-CoV-2 virus in recirculated air.<sup>1</sup>
3. From these air handler units, that tempered and filtered air is distributed via a system of ductwork. The ductwork then terminates in an occupiable space at air diffusers. In addition, passive return grilles were also observed in classrooms usually located on the ceiling.
4. All the above-mentioned components of the school's central mechanical ventilation systems were examined and found to be working.
5. Not all rooms could be inspected but a representative number was included in the inspection. These rooms included Rooms 16, 21, 217, 237 (Isolation Room), and 241 (Nurses' office) and the weight room. The supply outlets were screened with a thermal anemometer to determine whether supply air was discharging from the outlet. All rooms visited were found to have a good flow of ventilation air from the supply outlets.
6. The windows were checked in four classrooms to verify that they are operable and can be opened. Air velocities were measured at an opened window, and the room size was measured to estimate the air exchange rate through the window through natural ventilation. There are no set ventilation guidelines or standards regarding air changes per hour in classrooms, however, most experts suggest at least 3 air changes per hour, and ideally 6 air changes per hour in classrooms. The following room air exchange rates were estimated for each room:
  - a. Classroom 16 – One window was opened 4 inches provided 8 supplemental air changes per hour.
  - b. Classroom 217 – One window was opened 2 inches provided 2 supplemental air changes per hour.
  - c. Classroom 237 (Isolation Room) – One window was opened 8 inches provided 3 supplemental air changes per hour.
  - d. Classroom 243 – One window was opened 2 inches provided 6 supplemental air changes per hour.

## **CONCLUSIONS**

Overall, the school's ventilation can help reduce the risk of exposure to SARs-CoV-2 and meets the published guidelines. The mechanical ventilation system is capable of providing a MERV 14

filtered mixture of outside air and return air. Most classrooms also have operable windows that can be used to provide natural ventilation.

Where possible and if necessary, teachers can open two windows in each room to an opening of two inches. This will provide natural ventilation without causing the room to become cold and will provide 4 to 5 supplemental air changes per hour. However, as previously noted, the building's mechanical ventilation system is capable of delivering filtered and tempered outside air to occupiable spaces in the building. Lastly, ensure other safety and health precautions, such as mask-wearing, social distancing, cleaning/sanitization, and routine handwashing, are also practiced to prevent the transmission of SARS-CoV-2. Pairing effective ventilation with mask-wearing, social distancing, and other precautions are crucial in reducing the risk of COVID-19 in schools.

## **REFERENCE**

1. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Reopening of Schools and Universities. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). 2020. Available at: <https://www.ashrae.org/technical-resources/reopening-of-schools-and-universities>.



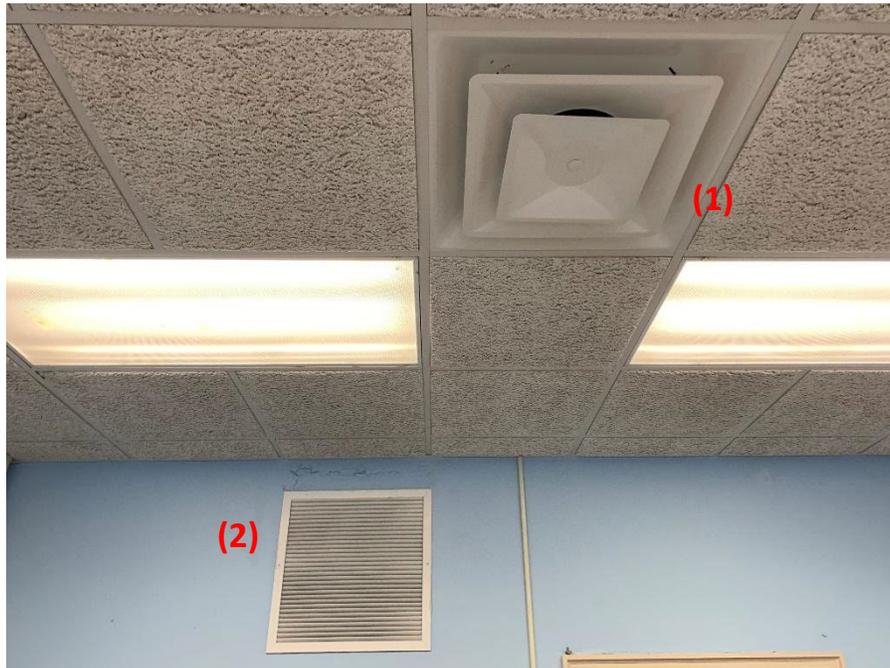
Air handler unit in Franklin Campus



New MERV-14 filter



MERV-14 filters in filter bank. The outside air dampers are opened.



Typical mechanical ventilation setup in different classrooms with (1) supply air diffuser at top of the wall or on the ceiling, and (2) exhaust ventilation located in a small alcove at the base of the wall or on the wall.