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October 16, 2020

Mr. Michael Falcone
Greenburgh Central School District
475 West Hartsdale Avenue
Hartsdale, NY 10530

Re: **Districtwide Ventilation Assessment**

Dear Mr. Falcone,

On October 13, 2020, Enviroscience Consultants, Inc. performed a limited ventilation assessment within the Richard J. Bailey Elementary School of the Greenburgh CSD. The purpose of this audit was to re-characterize the ventilation after installation of window fans in the functional spaces within the building, in preparation for reopening school in October during the current COVID-19 pandemic. Our assessment was performed within approximately 20 percent of the classrooms within the building, as well as the nurse's office, gymnasium and cafeteria.

The assessment indicates that after installation of the window fans, the ventilation in the building was significantly improved with the fans on the lowest setting. Further, the assessment indicates that overall the ventilation is adequate and has air flow required by NYS Education Department Building Code, and follows the U.S. Environmental Protection Agency Indoor Air Quality in Schools Guideline, and the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 62.1-2013. For assessments of air flow, sampling was performed using a hot wire anemometer. The hot wire anemometer measures air velocity and volume flow rate to determine the overall ventilation of the space. Results are obtained in real time. The building was assessed under normal, daytime operating conditions. Assessments of fresh air damper operation, when combined with appropriate levels of air volume, are deemed acceptable ventilation rates. Generally, classrooms should have 13 CFM (ages 5 to 8) and 15 CFM (ages 9+) per occupant, and offices should have 17 CFM per occupant (TABLE 6.2.2.1 Minimum Ventilation Rates in Breathing Zone, ASHRAE Standard 62.1-2013).

The assessment also confirmed that classrooms 002, 103, 012, 208, 201 and the Cafeteria do not have any exhaust grilles.

Reference the attached Ventilation Assessment Form for the findings identified in this building. The remaining rooms should be assessed by District staff for the presence of similar conditions. Classroom doors should remain open in rooms where exhaust grilles are not present, as per NYSED Reopening Guidance – August 26, 2020.

If you should have any questions, please feel free to contact me.

Sincerely,

Glenn Neuschwender

ENVIROSCIENCE CONSULTANTS INC.

# Air Ventilation Assessment

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| Client: Greenburgh CSD | Date: October 13, 2020 |
| Project: Richard J. Bailey Elementary School | Job #: 20209 |
| Auditors: Drew Cheskin & Marvin Luccioni | |

| | |
|---|---|
| Are roof top exhaust fans present and operational No | Are mechanical systems uncontrolled, BMS, or mixed? N/A |
| Date of last filter change? N/A | What are current day/night time settings? N/A |

*Air Flow is calculated in Cubic Feet per Minute (CFM), to determine the Flow Velocity in feet per minute, multiply this figure by the Duct Cross Sectional Area. (CFM = FPM x Duct Cross Sectional Area)

Multiple registers have a cumulative effect on the total CFM of a given space.

This form is used to record general information about specific areas of the building; during the air ventilation assessment.

| Room Number / Name | Anticipated # of Occupants | Ventilation Type | Area Opening (Square Feet) | Measured Flow Rate (CFM)* | Flow rate meets 15 CFM / occupancy rate | Vents unobstructed? | Flow velocities meet building codes? | Exhaust grilles unobstructed? | Fresh air dampers open? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| Cafeteria | 45 | Natural | 0.3 | 1653 | Yes | N/A | Yes | N/A | N/A | Measurement taken with 4 window fans on low setting. Windows also provide natural ventilation. No exhaust grilles observed. |
| Room 002 | 11 | Natural | 0.3 | 497 | Yes | N/A | Yes | N/A | N/A | Measurement taken with 2 window fans on low setting. Windows also provide natural ventilation. No exhaust grilles observed. |
| Art Room | 10 | Natural | 0.3 | 865 | Yes | N/A | Yes | Yes | N/A | Measurement taken with 2 window fans on low setting. Windows also provide natural ventilation. |
| Room 012 | 7 | Natural | 0.3 | 739 | Yes | N/A | Yes | Yes | N/A | Measurement taken with 2 window fans on low setting. Windows also provide natural ventilation. No exhaust grilles observed. |
| Gym | 25 | Natural | 0.3 | 916 | Yes | N/A | Yes | Yes | N/A | Measurement taken with 4 window fans on low setting. Windows also provide natural ventilation. |
| Room 108 | 10 | Natural | 0.3 | 621 | Yes | N/A | Yes | Yes | N/A | Measurement taken with 2 window fans on low setting. Windows also provide natural ventilation. |
| Room 103 | 10 | Natural | 0.3 | 551 | Yes | N/A | Yes | N/A | N/A | Measurement taken with 2 window fans on low setting. Windows also provide natural ventilation. No exhaust grilles observed. |
| Nurse's Office | 3 | Natural | 0.3 | 670 | Yes | N/A | Yes | Yes | N/A | Measurement taken with 2 window fans on low setting. Windows also provide natural ventilation. |
| Room 114 | 9 | Natural | 0.3 | 410 | Yes | N/A | Yes | Yes | N/A | Measurement taken with 2 window fans on low setting. Windows also provide natural ventilation. |
| Room 213 | 10 | Natural | 0.3 | 445 | Yes | N/A | Yes | Yes | N/A | Measurement taken with 2 window fans on low setting. Windows also provide natural ventilation. |
| Room 208 | 10 | Natural | 0.3 | 504 | Yes | N/A | Yes | N/A | N/A | Measurement taken with 4 window fans on low setting. Windows also provide natural ventilation. No exhaust grilles observed. |
| Room 201 | 10 | Natural | 0.3 | 817 | Yes | N/A | Yes | N/A | N/A | Measurement taken with 4 window fans on low setting. Windows also provide natural ventilation. No exhaust grilles observed. |