



## The Harley School

### Building Owner:

The Harley School

### Region:

Finger Lakes

### Number of Buildings:

1

### FlexTech Consultant:

Bergmann Associates

### Sector:

PreK-12 School

### Square Footage:

175,000 sq.ft.

### Pre-COVID Condition:

- Filters: MERV 8

- Ventilation: There are various ventilation configurations across the building spaces, consisting of rooftop units and air handling units with variable air volume and reheat or constant volume airflow, make-up air units, energy recovery ventilation units, and unit ventilators

- Outside Air: 15% / 26,593 CFM

• All energy use and energy cost values are presented on an annual basis

• Negative values represent increased use/cost

• The Energy Efficiency Package Measure savings are presented with the ASHRAE ETF Guidelines Measures Totals as the baseline

## Study Overview

NYSERDA funded this energy efficiency indoor air quality study that identified the energy use associated with the ASHRAE Epidemic Task Force (ETF) Building Readiness guidance<sup>1</sup> HVAC-related measures aimed at preventing the risk of COVID-19 infection that are feasible at the building. Additionally, the study investigated alternate opportunities that were more energy efficient, yet equally risk adverse from an indoor air quality perspective, as the ASHRAE guidance measures.

## Measures Evaluated

Measure Name	Measure Status	Electric Savings (kWh)	Fossil Fuel Savings (MMBtu)	Energy Cost Savings (\$)	Measure Cost (\$)
<b>ASHRAE Epidemic Task Force (ETF) Guidelines Measures Evaluated</b>					
Baseline Adjustment: 24/7 Runtime of Arts RTU 1 and Arts RTU 2	Not Recommended	-26,327.0	-124.1	-\$3,190.00	\$1,000.00
Baseline Adjustment: 2 Hour Pre- and Post-Occupancy Building Flush	Not Recommended	-79,047.0	-484.1	-\$10,151.00	\$1,000.00
Baseline Adjustment: 15% Minimum Outside Air to Cooling Coil Maximum Capacity (Minimum 28% Outside Air)	Not Recommended	-32,063.0	-5,236.1	-\$29,972.00	\$1,000.00
Baseline Adjustment: MERV 8 to MERV 13 Filters	Recommended	-12,926.0	0.0	-\$1,254.00	\$5,305.00
Totals:		-150,363.0	-5,844.3	-\$44,567.00	\$8,305.00
<b>Energy Efficiency Package Measures Evaluated</b>					
ECM-2 MERV 13 to MERV 8 Plus UVGI	Not Recommended	-13,627.0	0.0	-\$1,322.00	\$100,000.00
ECM-3B Implement 95% Virus Removal with MERV 8 and UVGI (Pre- and Post-Occupancy)	Not Recommended	59,285.0	363.1	\$7,613.00	\$1,000.00
ECM-5A Equivalent Air Changes with MERV 13 Filters	Not Recommended	22,553.0	3,792.4	\$21,642.00	\$1,000.00
ECM-5B Equivalent Air Changes with UVGI	Not Recommended	26,235.0	4,198.0	\$24,080.00	\$1,000.00
ECM-1 Proper Scheduling of Arts RTU 1 and Arts RTU 2	Recommended	26,327.0	124.1	\$3,190.00	\$1,000.00
ECM-3A Implement 95% Virus Removal with MERV 13 Filters (Pre- and Post-Occupancy)	Recommended	50,985.0	312.3	\$6,547.00	\$1,000.00
ECM-4A Code Minimum Ventilation	Recommended	26,235.0	4,198.0	\$24,080.00	\$1,000.00
ECM-4B Reengage DCV on AC AHU 1, 2, and 3 (Additive Savings)	Recommended	5,011.0	508.1	\$3,093.00	\$50,000.00
Retro-commissioning Savings	Recommended	6,467.0	142.1	\$1,357.00	\$0.00
Recommended Measures Totals:		115,025	5,284.6	\$38,267	\$53,000

<sup>1</sup> The ASHRAE ETF guidance used for this study was based on one or more of the following document versions: Building Readiness v.5-21-2020, Commercial v.4-20-2020, Schools & Universities v. 5-5-2020, Healthcare v. 6-17-2020, Filtration & Disinfection v. 5-27-2020, ERV Practical Guide v. 6-9-2020

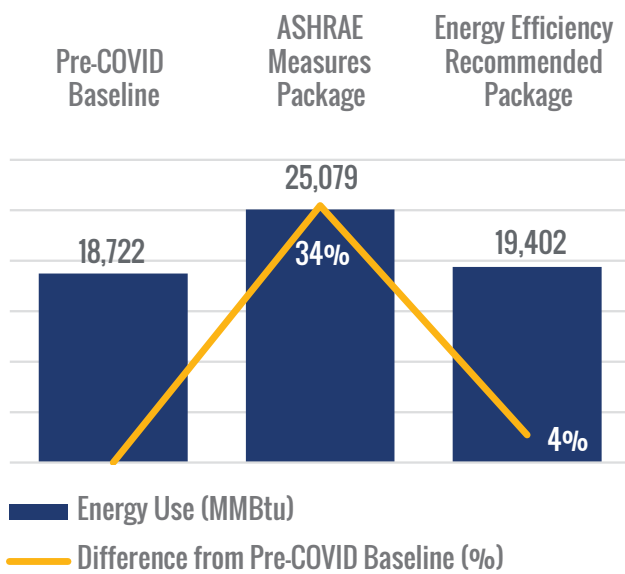


## Key Notes

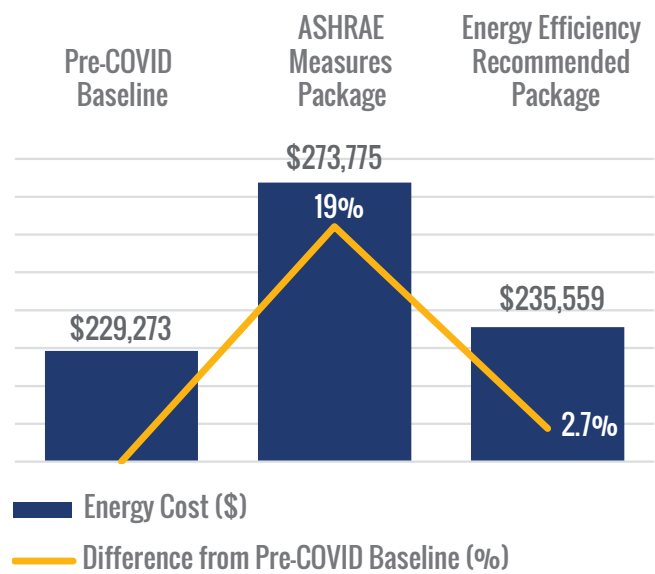
- The additional energy usage associated with ultraviolet germicidal irradiation (UVGI) is not offset by the energy savings from the static pressure differential between MERV 13 and MERV 8 filters. The UVGI evaluated provided a 99% deactivation rate on coronaviruses.
- The additional energy associated with UVGI is not offset by the energy savings from reducing the air handler run time to achieve 95% virus removal with MERV 8 filters when compared to utilizing MERV 13 filters.
- Reengaging demand-controlled ventilation (DCV) on AC air handling units 1, 2, and 3 is recommended for further study. DCV will provide energy savings but reduce the volume of outside air brought into the building.
- Reducing outside air levels from maximum air handling unit capacity operation to a level that achieves equivalent virus-free air via increased MERV filtration levels or UVGI is not recommended. These options are both mutually exclusive with instating code minimum ventilation.

## Impact Results

### Energy Use Impacts



### Energy Cost Impacts



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