



NYSERDA

November 2020 Indoor Air Quality Monthly Report

DATE: 11/24/2020

Summary

This project consists of two school districts in Western NY. The first, an extremely large district with over 50 buildings. There are four buildings included in the audit from this school. The buildings and system information are shown below:

Building	Size (Sqft)	Main HVAC System Type
Elementary School	80,000	Mostly Unit Ventilators
Elementary School	96,000	VAV System with 2 AHUs
Admin	117,000	Central AHU
High School	280,000	Chilled Beam

The second school district also has four buildings included in the study consisting of the buildings and system information shown below:

Building	Size (Sqft)	Main HVAC System Type
Elementary School	80,500	Mix of Unit Vent, RTU and AHUs
Middle School	147,000	Multiple AHUs
High School	216,000	RTUs with MHUs
Admin	12,000	RTUs

IAQ Study Audit Process

Wendel will be following the following process in order to deliver a quality audit along with matching up with the relatively quick schedule.

Initial Review: Includes discussions and information gathering

- Review of Existing drawing and information Wendel
- Request for additional information from both schools, including drawings
- Calls with the lead facility people for each school and building
- Analysis of energy usage at each school by building

Walkthroughs: Includes site work at each building, multiple visits will likely be necessary

- Perform initial walkthroughs of all 4 buildings in each school's project
- Additional site work to be determined after review of information gathered and technologies being recommended

Engineering Analysis: Includes utility, system, and planned recommended technology analysis

- Baseline development and increased energy need due to the ASHRAE Guidance
- Wendel will provide an engineering analysis of the building systems include in the study, the utilities, and the recommended technologies for each building.
- Additional information will be requested and gathered based on the analysis

Tasks Completed

RFI's

- Final building selections were finalized for both School Districts, along with finalizing the paperwork for contracts.
- Initial RFI Information Received

Meetings / Communication:

- Phone meetings have been held for most buildings, at both School Districts, to go through the building systems involved in the Study in detail.
- Additional RFI's have been sent to each School District based on information that will be needed, and what needs to be verified during site walkthroughs.

Site Work:

- Covid -19 protocols are being followed, which track anyone that performs site visits, and sign in at any building location that is entered by each person per day, and wear masks if you will be within 6 feet of anyone. Otherwise the schools have no additional requirements currently.
- As of 8/21 all 8 of the buildings in both schools have the initial site walkthrough complete.
- Additional site work is expected to be necessary prior to finalization of engineering

Audit Work:

- Started to develop the baseline energy usage, using previous years utility and benchmarked information received through the P-12 Benchmark Program.
- Building takeaway's completed for each building to separate the systems delivering HVAC to each space in each building (completed in October)
- Baseline from B3 pull complete (completed in October)

Energy Analysis:

- Initial Baselines have been developed including the ASHRAE baseline development
- Developed engineering analysis of the current system makeup and delivery by system analysis for mechanical systems
- Developed initial engineering of system changes to reduce contaminants and virus levels
- Ventilation was analyzed to understand the delivery, rates, pressure requirements and setup
- UVGI will be analyzed to understand possible delivery system types, and include needed dosing levels to be effective.
- Many of the energy savings measures have been developed. Our goal has been to at least come close to offsetting the additional loads from the guidance, with dosing and energy reduction strategies. including the following list of ECMs:
 - UV-C, where applicable for each building and room type
 - Controls Resets

- Sequence modifications
- Occupancy based controls
- Schedule modifications
- Supplemental HVAC
- HVAC unit replacements
- Change ERV heat wheel to core or heat plate
- Additional more standard ECMs have been developed to offset some of the increase in energy usage: steam traps, RCx, reset schedules, and DHW.

Upcoming Tasks for the Following Month

Anticipated Activity for the following Month

- Pathogen rates being added into the space will be reviewed and analyzed to understand effect on system types.
- Energy savings measures are being reviewed to determine overall effectiveness and inclusion into the report.
- Costing is being developed for each of the ECMs
- Reports are being developed, for a draft delivery of the first school on December 15th, and the second on December 18th.

Discussion Items

Issue tracking for the project

- Additional school opening guidance has been presented by each of the School Districts. Wendel will take this into consideration during the engineering analysis for each building.
- Additional guidance from ASHRAE and other sources will be continually monitored.
- The increased ventilation included with the ASHRAE guidance increases energy usage approximately 25% over current system usage for both heating and cooling.

Resources

References utilized during the study

- ASHRAE Epidemic Task Force Reopening Schools
- ASHRAE Handbook 2019 UV Air and Surface Treatment
- Harvard-Healthy-Buildings-Schools-For-Health-Reopening
- Trane ENL ASHRAE COVID-19 Summary
- University Statistical Modeling