

IEA, INC.

2023 - 2024 Ventilation Assessment



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Saint Paul Public Schools Highwood Hills Elementary School

Assessment Date:
Wednesday, April 12, 2023

Project Description

IEA conducted a ventilation inspection in Highwood Hills Elementary School by IEA representative, Sashya Wandmaker, with the intent of gathering visual observations and overall ventilation information which will assist the District in making informed and proactive decisions to improve and maintain acceptable air quality in the building. This inspection is based upon the Environmental Protection Agency's (EPA's) Tools for Schools IAQ guidelines and the recommended Minnesota Department of Education (MDE) portion of a school district's IAQ management plan. Ventilation verification is also recommended by American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).

Some observations gathered during the inspection may identify issues which may require additional testing, evaluation, further investigation, or maintenance on the ventilation systems.

The findings, conclusions and recommendations presented herein are believed to be accurate and representative of the building on the date and time of the inspection.

GENERAL COMMENTS

The analysis and opinions expressed in this report are based upon data obtained from Saint Paul Public Schools at the indicated locations. This report does not reflect variations in conditions that may occur across the site, property, or facility. Actual conditions may vary and may not become evident without further assessment.

The report is prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted indoor air quality practices. Other than as provided in the preceding sentence, no warranties are extended or made.

Building Information

General information regarding the building was collected by IEA during an interview with building maintenance staff. The information gathered during this process is a vital component, as it is helpful in determining how these items may play a role in possible IAQ related issues.

Below is a summary of the information gathered during the interview:

- Automation controls are managed internally.
- A Building Automation System is present. The automation control software program is Tridium and controls can not be accessed remotely.
- Schedules:

Ventilation operation:

| Day: | Occupied? | Start Time: | End Time: |
|---------------|-----------|-------------|-----------|
| Monday-Friday | Yes | 5:30 AM | 9:00 PM |
| Monday-Friday | Yes | 6:30 AM | 6:00 AM |

Typical occupancy:

| Day: | Occupied? | Start Time: | End Time: |
|---------------|-----------|-------------|-----------|
| Monday-Friday | Yes | 5:30 AM | 9:30 AM |
| Saturday | No | | |
| Sunday | No | | |
| Holiday | No | | |

Notes: During summer rec center is open.
 Rec Center hours are Mon-Thurs 12:30-8:00
 Fri 12:30-6:00

- It is not known whether or not CO2 sensors are associated with the ventilation system.
- VAVs are present. They are fan powered with a None filter.
- Building has variable frequency drives (VFD).
- The heating system is a hot water boiler and gas-fired.
- A cooling system is not present.
- Filters used are:

| Filter Type | MERV Rating |
|-------------|-------------|
| Pleated | MERV 11 |

- Filters are changed Three times a year.
- Energy Recovery Units are not present.
- Units do not contain system Enhancements.
- Personal air purifiers are supplied for individual rooms. They are 3m/Filtrete .
 - Location: All rooms
- It is not known whether or not the building was commissioned during the original construction.

Assessment

Ventilation System

The following information was gathered by IEA on Wednesday, April 12, 2023 with support from the district building representative during the on-site interview. The type of heating, ventilating and air-conditioning (HVAC) system and its assessment is included for each unit below:

| | | |
|---|---|---|
| Unit Designation: | AHU-01 | |
| Location of Unit: | 2401 Boiler room | |
| Areas Served: | See attached map East wing | |
| System Enhancements: | None | |
| Supply System | Outdoor Air | Cleanliness and Observations |
| Type <ul style="list-style-type: none"> Supply System - Constant Volume Heating - Gas Fired Cooling - None Energy Recovery Unit (ERU) - None | Outdoor air intake is accessible Outdoor air intake is located on an exterior wall. No nearby pollution sources were found. Outdoor air intake is in good condition. | Outdoor air filters are not present. Return air filters are not present. Mixed air pre-filters are not present. Mixed air main filters are clean and not in need of replacement (scoring 1 out of 5) and fit well. Mixed air main filters are installed correctly. Drain pans are not applicable or not present. Drain pan condition is not known. Heating coil cleanliness is not known. Heat wheels are not present. Exterior ducting is visible. Exterior ducting insulation is in good condition. Interior ducting is not visible. Interior ducting insulation is in an unknown condition. Interior ducting is of unknown cleanliness. Air handling room is free of trash/chemicals. Outside damper is inaccessible, and its condition is good. Return damper is open, and its condition is good. The general condition of the unit is good. |
| Filter Type - Mixed <ul style="list-style-type: none"> Pre-filter: None Main filter: Pleated, MERV 11 | | |

| | | |
|---|---|--|
| Unit Designation: | AHU-02 | |
| Location of Unit: | 2401 Boiler room | |
| Areas Served: | See attached map East wing | |
| System Enhancements: | None | |
| Supply System | Outdoor Air | Cleanliness and Observations |
| Type <ul style="list-style-type: none"> Supply System - Unknown Heating - Gas Fired Cooling - None Energy Recovery Unit (ERU) - None | Outdoor air intake is accessible Outdoor air intake is located on an exterior wall. No nearby pollution sources were found. | Outdoor air filters are not present. Return air filters are not present. Mixed air pre-filters are not present. Mixed air main filters are clean and not in need of replacement (scoring 1 out of 5) and fit well. Mixed air main filters are installed correctly. Drain pans are not applicable or not present. Drain pan condition is not known. |
| Filter Type - Mixed <ul style="list-style-type: none"> Pre-filter: None Main filter: Pleated, MERV 11 | Outdoor air intake is in good condition. | Heating coil cleanliness is not known. Heat wheels are not present. Exterior ducting is visible. Exterior ducting insulation is in good condition. Interior ducting is not visible. Interior ducting insulation is in an unknown condition. Interior ducting is of unknown cleanliness. Air handling room is free of trash/chemicals. Outside damper is unknown, and its condition is not known. Return damper is open, and its condition is good. The general condition of the unit is good. |

| | | |
|---|---|---|
| Unit Designation: | AHU-03 | |
| Location of Unit: | Mechanical Room 1611 | |
| Areas Served: | See attached map Library | |
| System Enhancements: | None | |
| Supply System | Outdoor Air | Cleanliness and Observations |
| Type <ul style="list-style-type: none"> • Supply System - Constant Volume • Heating - Hot Water • Cooling - None • Energy Recovery Unit (ERU) - None | <p>Outdoor air intake is accessible</p> <p>Outdoor air intake is located on an exterior wall.</p> <p>It is not known if there are nearby pollution sources.</p> | <p>Outdoor air pre-filters are not present. Outdoor air main filters are clean and not in need of replacement (scoring 1 out of 5) and fit well. Outdoor air main filters are installed correctly.</p> <p>Return air filters are not present.</p> <p>Drain pans are not applicable or not present. Drain pan condition is not known.</p> <p>Heating coils are clean.</p> |
| Filter Type - Outdoor <ul style="list-style-type: none"> • Pre-filter: None • Main filter: Pleated, MERV 11 | <p>Outdoor air intake is in good condition.</p> | <p>Heat wheels are not present.</p> <p>Exterior ducting is visible. Exterior ducting insulation is not present.</p> <p>Interior ducting is not visible. Interior ducting insulation is in an unknown condition. Interior ducting is of unknown cleanliness.</p> <p>Air handling room is free of trash/chemicals.</p> <p>Outside damper is unknown, and its condition is not known.</p> <p>Return damper is not present.</p> <p>The general condition of the unit is good.</p> |

| | | |
|---|---|---|
| Unit Designation: | AHU-04 | |
| Location of Unit: | Mechanical room 1611 | |
| Areas Served: | See attached map Exterior rooms | |
| System Enhancements: | None | |
| Supply System | Outdoor Air | Cleanliness and Observations |
| Type <ul style="list-style-type: none"> • Supply System - Constant Volume • Heating - Gas Fired • Cooling - None • Energy Recovery Unit (ERU) - None | <p>Outdoor air intake is accessible</p> <p>Outdoor air intake is located on an exterior wall.</p> <p>It is not known if there are nearby pollution sources.</p> | <p>Outdoor air pre-filters are not present. Outdoor air main filters are clean and not in need of replacement (scoring 1 out of 5) and fit well. Outdoor air main filters are installed correctly.</p> <p>Return air filters are not present.</p> <p>Drain pans are not plugged. Drain pan condition is good.</p> <p>Heating coil cleanliness is not known.</p> |
| Filter Type - Outdoor <ul style="list-style-type: none"> • Pre-filter: None • Main filter: Pleated, MERV 11 | <p>Outdoor air intake is in good condition.</p> | <p>Heat wheels are not present.</p> <p>Exterior ducting is visible. Exterior ducting insulation is in good condition.</p> <p>Interior ducting is not visible. Interior ducting insulation is in an unknown condition. Interior ducting is of unknown cleanliness.</p> <p>Air handling room is free of trash/chemicals.</p> <p>Outside damper is unknown, and its condition is not known.</p> <p>Return damper is not present.</p> <p>The general condition of the unit is good.</p> |

| | | |
|--|--|---|
| Unit Designation: | AHU-05 | |
| Location of Unit: | Mechanical room 1108A | |
| Areas Served: | See attached map Gym/ Rec Center | |
| System Enhancements: | None | |
| Supply System | Outdoor Air | Cleanliness and Observations |
| Type <ul style="list-style-type: none"> • Supply System - Constant Volume • Heating - Hot Water • Cooling - None • Energy Recovery Unit (ERU) - None Filter Type - Mixed <ul style="list-style-type: none"> • Pre-filter: None • Main filter: Pleated, MERV 11 | <p>Outdoor air intake is inaccessible</p> <p>Outdoor air intake is located on an exterior wall.</p> <p>No nearby pollution sources were found.</p> <p>Outdoor air intake is in good condition.</p> | <p>Outdoor air filters are not present.</p> <p>Return air filters are not present.</p> <p>Mixed air pre-filters are not present. Mixed air main filters are clean and not in need of replacement (scoring 1 out of 5) and fit well. Mixed air main filters are installed correctly.</p> <p>Drain pans are not plugged. Drain pan condition is good.</p> <p>Heating coils are clean.</p> <p>Heat wheels are not present.</p> <p>Exterior ducting is visible. Exterior ducting insulation is not present.</p> <p>Interior ducting is not visible. Interior ducting insulation is in an unknown condition. Interior ducting is of unknown cleanliness.</p> <p>Air handling room is free of trash/chemicals.</p> <p>Outside damper is unknown, and its condition is not known.</p> <p>Return damper is unknown, and its condition is not known.</p> <p>The general condition of the unit is good.</p> |

| | | |
|---|--|---|
| Unit Designation: | AHU-06 | |
| Location of Unit: | 2401 Boiler room | |
| Areas Served: | See attached map | |
| System Enhancements: | None | |
| | Supply System | Cleanliness and Observations |
| Type | Outdoor Air | |
| <ul style="list-style-type: none"> • Supply System - Constant Volume • Heating - Gas Fired • Cooling - None • Energy Recovery Unit (ERU) - None | <p>Outdoor air intake is accessible</p> <p>Outdoor air intake is located on an exterior wall.</p> <p>No nearby pollution sources were found.</p> <p>Outdoor air intake is in good condition.</p> | <p>Outdoor air filters are not present.</p> <p>Return air filters are not present.</p> <p>Drain pans are not applicable or not present. Drain pan condition is not known.</p> <p>Heating coil cleanliness is not known.</p> <p>Heat wheels are not present.</p> <p>Exterior ducting is visible. Exterior ducting insulation is not present.</p> <p>Interior ducting is not visible. Interior ducting insulation is in an unknown condition. Interior ducting is of unknown cleanliness.</p> <p>Air handling room is free of trash/chemicals.</p> <p>Outside damper is unknown, and its condition is not known.</p> <p>Return damper is open, and its condition is good.</p> <p>The general condition of the unit is good.</p> |

| | | |
|---|--|---|
| Unit Designation: | AHU-07 | |
| Location of Unit: | Mechanical room 2320 | |
| Areas Served: | See attached map North addition | |
| System Enhancements: | None | |
| Supply System | Outdoor Air | Cleanliness and Observations |
| Type <ul style="list-style-type: none"> • Supply System - Constant Volume • Heating - Hot Water • Cooling - None • Energy Recovery Unit (ERU) - None | <p>Outdoor air intake is inaccessible</p> <p>Outdoor air intake is located in an unknown location.</p> <p>It is not known if there are nearby pollution sources.</p> | <p>Outdoor air filters are not present.</p> <p>Return air filters are not present.</p> <p>Mixed air pre-filters are not present. Mixed air main filters are clean and not in need of replacement (scoring 1 out of 5) and fit well. Mixed air main filters are installed correctly.</p> <p>Drain pans are not applicable or not present. Drain pan condition is not known.</p> |
| Filter Type - Mixed <ul style="list-style-type: none"> • Pre-filter: None • Main filter: Pleated, MERV 11 | <p>Outdoor air intake is in good condition.</p> | <p>Heating coils are dirty.</p> <p>Heat wheels are not present.</p> <p>Exterior ducting is visible. Exterior ducting insulation is in good condition.</p> <p>Interior ducting is not visible. Interior ducting insulation is in an unknown condition. Interior ducting is of unknown cleanliness.</p> <p>Air handling room is free of trash/chemicals.</p> <p>Outside damper is inaccessible, and its condition is not known.</p> <p>Return damper is inaccessible, and its condition is not known.</p> <p>The general condition of the unit is good.</p> |

Recommendations

Dirty Coils were observed on unit AHU-07 during the ventilation inspection.

Recommendation: Impacted/dirty coils can result in poor ventilation air supply as well as be a source for mold and bacterial growth on the coils. Coils should be cleaned annually, or as needed, as identified in the operations and maintenance program.

Appendix A

Photo Documentation



AHU-07
Heating Coils