

IEA, INC.

2023 - 2024 Ventilation Assessment



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Saint Paul Public Schools Adams Spanish Immersion

Assessment Date:
Wednesday, April 19, 2023

Project Description

IEA conducted a ventilation inspection in Adams Spanish Immersion by IEA representative, Eddie Anderson, 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 contracted by Tridium.
- A Building Automation System is present. The automation control software program is Tridium and controls can be accessed remotely.
- Schedules:

Ventilation operation:

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

Typical occupancy:

Day:	Occupied?	Start Time:	End Time:
Monday-Friday	Yes	6:30 AM	6:00 PM
Saturday	No		
Sunday	No		
Holiday	No		

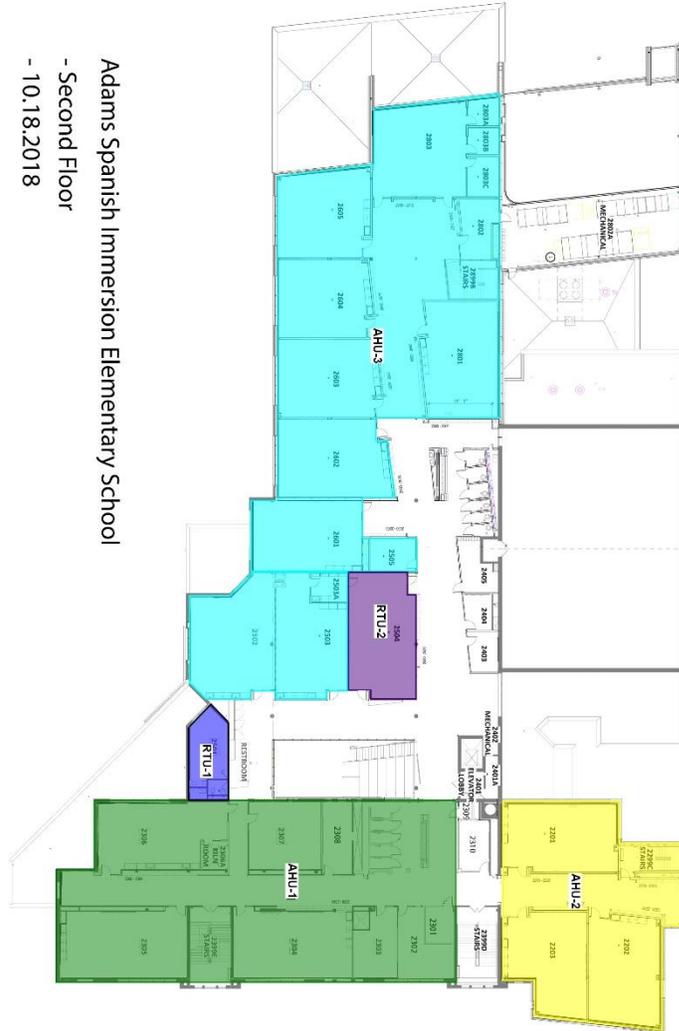
Notes: Discovery club runs until 6

- It is not known whether or not CO2 sensors are associated with the ventilation system.
- VAVs are present. It is not known whether or not they are fan powered.
- Building has variable frequency drives (VFD).
- The heating system is a hot water boiler.
- A cooling system is present and is a chilled water (air cooled) type system.
- Filters used are:

Filter Type	MERV Rating
Metal Mesh	MERV 13
Pleated	MERV 13
Pleated	MERV 8

- Filters are changed quarterly.
- Energy Recovery Units are not present.
- Units contain system Enhancements:
- Personal air purifiers are supplied for individual rooms. They are Winix /3M .
 - Location: Various- classrooms
- It is not known whether or not the building was commissioned during the original construction.

Air Handling Unit Designations & Service Zones: 2nd Floor



Adams Spanish Immersion Elementary School
- Second Floor
- 10.18.2018

Air Handling Unit Designations & Service Zones: 3rd Floor

Adams Spanish Immersion Elementary School
- Third Floor
- 10.18.2018



Assessment

Ventilation System

The following information was gathered by IEA on Wednesday, April 19, 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:	Mechanical room 4201	
Areas Served:	See attached map. SE Building Area VAV's on all Levels NE Building VAV's on Levels 1, 2, & 3	
System Enhancements:	None	
Supply System	Outdoor Air	Cleanliness and Observations
Type <ul style="list-style-type: none"> Supply System - VAV Heating - Hot Water Cooling - Dx Energy Recovery Unit (ERU) - Wheel 	Outdoor air intake is inaccessible Outdoor air intake is located in an unknown location. It is not known if there are nearby pollution sources.	Outdoor air pre-filters are somewhat dirty and on the border of needing replacement (scoring 3 out of 5) and fit well. Outdoor air pre-filters are installed correctly. Outdoor air main filters are clean and not in need of replacement (scoring 2 out of 5) and fit well. Outdoor air main filters are installed correctly. Return air pre-filters are not present. Return air main filters are clean and not in need of replacement (scoring 1 out of 5) and fit well. Return air main filters are installed correctly. Drain pans are not plugged. Drain pan condition is good.
Filter Type - Outdoor <ul style="list-style-type: none"> Pre-filter: Pleated, MERV 8 Main filter: Pleated, MERV 13 	Outdoor air intake is in good condition.	Heating coils are clean and cooling coils are clean. Heat wheels are clean. Exterior ducting is visible. Exterior ducting insulation is in good condition.
Filter Type - Return <ul style="list-style-type: none"> Pre-filter: None Main filter: Pleated, MERV 8 		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 open, and its condition is good. Return damper is closed, and its condition is good. The general condition of the unit is good.

Unit Designation:	AHU-02	
Location of Unit:	Mechanical room 4201	
Areas Served:	See attached map & NE Building VAV's on Levels 1, 2, & 3	
System Enhancements:	None	
Supply System	Outdoor Air	Cleanliness and Observations
Type	Outdoor air intake is inaccessible	Outdoor air pre-filters are somewhat dirty and on the border of needing replacement (scoring 3 out of 5) and fit well. Outdoor air pre-filters are installed correctly. Outdoor air main filters are clean and not in need of replacement (scoring 2 out of 5) and fit well. Outdoor air main filters are installed correctly.
<ul style="list-style-type: none"> • Supply System - VAV • Heating - Hot Water • Cooling - Dx • Energy Recovery Unit (ERU) - Wheel 	Outdoor air intake is located on an exterior wall.	Return air filters are clean and not in need of replacement (scoring 2 out of 5) and fit well. Return air filters are installed correctly.
	It is not known if there are nearby pollution sources.	Drain pans are not plugged. Drain pan condition is poor.
Filter Type - Outdoor	Outdoor air intake is in good condition.	Heating coils are clean and cooling coils are clean.
<ul style="list-style-type: none"> • Pre-filter: Pleated, MERV 8 • Main filter: Pleated, MERV 13 		Heat wheels are clean.
		Exterior ducting is visible. Exterior ducting insulation is in good condition.
Filter Type - Return		Interior ducting is visible. Interior ducting insulation is not present. Interior ducting is of unknown cleanliness.
<ul style="list-style-type: none"> • Pre-filter: Pleated, MERV 8 • Main filter: Pleated, MERV 13 		Air handling room is free of trash/chemicals.
		Outside damper is open, and its condition is good.
		Return damper is closed, and its condition is good.
		The general condition of the unit is good.

Unit Designation:	AHU-03	
Location of Unit:	Mechanical room 2802 A	
Areas Served:	See attached map SW Building VAV's on Levels 1 & 2	
System Enhancements:	None	
Supply System	Outdoor Air	Cleanliness and Observations
Type <ul style="list-style-type: none"> Supply System - VAV Heating - Hot Water Cooling - Dx Energy Recovery Unit (ERU) - Wheel 	<p>Outdoor air intake is inaccessible</p> <p>Outdoor air intake is located on the roof.</p> <p>It is not known if there are nearby pollution sources.</p>	<p>Outdoor air filters are somewhat dirty and on the border of needing replacement (scoring 3 out of 5) and fit well. Outdoor air filters are installed correctly.</p> <p>Return air pre-filters are not present. Return air main filters are clean and not in need of replacement (scoring 2 out of 5) and fit well. Return air main filters are installed correctly.</p> <p>Drain pans are not plugged. Drain pan condition is good.</p> <p>Heating coils are clean and cooling coils are clean.</p> <p>Heat wheels are clean.</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 open, and its condition is good.</p> <p>Return damper is closed, and its condition is good.</p> <p>The general condition of the unit is good.</p>
Filter Type - Outdoor <ul style="list-style-type: none"> Pre-filter: Pleated, MERV 8 Main filter: Pleated, MERV 13 	<p>Outdoor air intake is in good condition.</p>	
Filter Type - Return <ul style="list-style-type: none"> Pre-filter: None Main filter: Pleated, MERV 8 		

Unit Designation:	AHU-04	
Location of Unit:	Mechanical room 2802 A	
Areas Served:	See attached map Commons on Levels 1 & 2	
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 on an exterior wall.</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 filters are clean and not in need of replacement (scoring 2 out of 5) and fit well. Mixed air filters are installed correctly.</p> <p>Drain pans are not plugged. Drain pan condition is good.</p>
Filter Type - Mixed <ul style="list-style-type: none"> Pre-filter: Pleated, MERV 8 Main filter: Pleated, MERV 13 	<p>Outdoor air intake is in good condition.</p>	<p>Heating coils are clean.</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 open, and its condition is good.</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-05	
Location of Unit:	Mechanical room 2802 A	
Areas Served:	Kitchen/Cafeteria Area VAV's	
System Enhancements:	None	
Supply System	Outdoor Air	Cleanliness and Observations
Type <ul style="list-style-type: none"> • Supply System - VAV • Heating - Hot Water • Cooling - Chilled Water • Energy Recovery Unit (ERU) - None 	<p>Outdoor air intake is inaccessible</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 filters are not present.</p> <p>Return air filters are not present.</p> <p>Mixed air filters are clean and not in need of replacement (scoring 2 out of 5) and fit well. Mixed air filters are installed correctly.</p> <p>Drain pans are not plugged. Drain pan condition is good.</p>
Filter Type - Mixed <ul style="list-style-type: none"> • Pre-filter: Pleated, MERV 8 • Main filter: Metal Mesh, MERV 13 	<p>Outdoor air intake is in good condition.</p>	<p>Heating coils are clean and cooling coils are clean.</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 open, and its condition is good.</p> <p>Return damper is open, and its condition is good.</p> <p>The general condition of the unit is good.</p>

Unit Designation:	RTU-01	
Location of Unit:	Roof	
Areas Served:	See attached map Administration Office Area VAV's	
System Enhancements:	None	
Supply System	Outdoor Air	Cleanliness and Observations
Type <ul style="list-style-type: none"> Supply System - VAV Heating - Hot Water Cooling - Dx Energy Recovery Unit (ERU) - None Filter Type - Mixed <ul style="list-style-type: none"> Pre-filter: Pleated, MERV 8 Main filter: Pleated, MERV 13 	<p>Outdoor air intake is accessible</p> <p>Outdoor air intake is located in an unknown location.</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 filters are clean and not in need of replacement (scoring 2 out of 5) and fit well. Mixed air filters are installed correctly.</p> <p>Drain pans are not plugged. Drain pan condition is poor.</p> <p>Heating coils are clean and cooling coils are clean.</p> <p>Heat wheels are not present.</p> <p>Exterior ducting is not visible. Exterior ducting insulation is in an unknown 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 open, and its condition is good.</p> <p>Return damper is inaccessible, and its condition is not known.</p> <p>The general condition of the unit is good.</p>

Unit Designation:	RTU-02	
Location of Unit:	Roof	
Areas Served:	See attached map Media Center Area VAV's	
System Enhancements:	None	
Supply System	Outdoor Air	Cleanliness and Observations
Type <ul style="list-style-type: none"> Supply System - VAV Heating - Hot Water Cooling - Dx Energy Recovery Unit (ERU) - None 	Outdoor air intake is accessible Outdoor air intake is located on the unit. No nearby pollution sources were found.	Outdoor air filters are not present. Return air filters are not present. Mixed air filters are dirty and in need of replacement (scoring 5 out of 5) and fit well. Mixed air filters are installed correctly. Drain pans are plugged. Drain pan condition is good. Heating coils are clean and cooling coils are clean. Heat wheels are not present. Exterior ducting is not visible. Exterior ducting insulation is in an unknown 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 open, and its condition is good. Return damper is inaccessible, and its condition is not known. The general condition of the unit is good.
Filter Type - Mixed <ul style="list-style-type: none"> Pre-filter: Pleated, MERV 8 Main filter: Pleated, MERV 13 	Outdoor air intake is in good condition.	

Unit Designation:	RTU-03	
Location of Unit:	Roof	
Areas Served:	See attached map West 1/2 of the Gymnasium	
System Enhancements:	None	
Supply System	Outdoor Air	Cleanliness and Observations
<u>Type</u> <ul style="list-style-type: none"> Supply System - Constant Volume Heating - Hot Water Cooling - None Energy Recovery Unit (ERU) - None 	Outdoor air intake is accessible	Outdoor air filters are not present. Return air filters are not present.
	Outdoor air intake is located on the roof.	Mixed air filters are clean and not in need of replacement (scoring 2 out of 5) and fit well. Mixed air filters are installed correctly.
	No nearby pollution sources were found.	Drain pans are not applicable or not present. Drain pan condition is not known.
<u>Filter Type - Mixed</u>	Outdoor air intake is in good condition.	Heating coils are inaccessible.
<ul style="list-style-type: none"> Pre-filter: Pleated, MERV 8 Main filter: Pleated, MERV 13 		Heat wheels are not present.
		Exterior ducting is not visible. Exterior ducting insulation is in an unknown 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 open, and its condition is good.
		Return damper is inaccessible, and its condition is not known.
		The general condition of the unit is good.

Unit Designation:	RTU-04	
Location of Unit:	Roof	
Areas Served:	See attached map East 1/2 of the Gymnasium	
System Enhancements:	None	
Supply System	Outdoor Air	Cleanliness and Observations
<u>Type</u> <ul style="list-style-type: none"> Supply System - Constant Volume Heating - Hot Water Cooling - None Energy Recovery Unit (ERU) - None 	Outdoor air intake is accessible	Outdoor air filters are not present. Return air filters are not present.
	Outdoor air intake is located on the roof.	Mixed air filters are clean and not in need of replacement (scoring 2 out of 5) and fit well. Mixed air filters are installed correctly.
	No nearby pollution sources were found.	Drain pans are not applicable or not present. Drain pan condition is not known.
<u>Filter Type - Mixed</u>	Outdoor air intake is in good condition.	Heating coils are inaccessible.
<ul style="list-style-type: none"> Pre-filter: Pleated, MERV 8 Main filter: Pleated, MERV 13 		Heat wheels are not present.
		Exterior ducting is not visible. Exterior ducting insulation is in an unknown 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 open, and its condition is good.
		Return damper is inaccessible, and its condition is not known.
		The general condition of the unit is good.

Recommendations

The drain pan for units AHU-02, RTU-01 and RTU-02 was plugged or damaged at the time of the site inspection.

Recommendation: Damage to the drain pan should be repaired, or the drain pan should be inspected more frequently to ensure that it does not become plugged.

Dirty or poorly fitting filters were observed in unit RTU-02 during the ventilation inspection.

Recommendation: The operations and maintenance program for filter changes should be reviewed and revised to ensure proper filter changes to optimize filtration capacity.

Appendix A

Photo Documentation



AHU-01

Outdoor Pre-Filter Cleanliness



AHU-01

Outdoor Pre-Filter Fit



AHU-02

Outdoor Pre-Filter Cleanliness



AHU-02

Drain Pans



AHU-03

Outdoor Pre-Filter Cleanliness



AHU-03

Outdoor Main Filter Cleanliness



RTU-01

Drain Pans



RTU-02

Drain Pans