



IEA, INC.

2023 - 2024 Ventilation Assessment



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Saint Paul Public Schools Battle Creek Middle School

Assessment Date:
Friday, April 21, 2023

Project Description

IEA conducted a ventilation inspection in Battle Creek Middle 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 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	5:00 PM

Typical occupancy:

Day:	Occupied?	Start Time:	End Time:
Monday-Friday	Yes	7:30 AM	4:30 PM
Saturday	No		
Sunday	No		
Holiday	No		

- CO2 sensors are not associated with the ventilation system.
- VAVs are present. They are not fan powered.
- Building does not have variable frequency drives (VFD).
- The heating system is a hot water boiler.
- A cooling system is not present.
- Filters used are:

Filter Type	MERV Rating
Pleated	MERV 11
- Filters are changed quarterly.
- Energy Recovery Units are not present.
- Units do not contain system Enhancements.
- Personal air purifiers are supplied for individual rooms. They are Winix /Areomax2.0.
 - Location: In classrooms with low circulation
- It is not known whether or not the building was commissioned during the original construction.

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The floor plan shows a complex layout of rooms and corridors. Key areas include:

- Top Left (Purple):** AHU-12, 2104 Cafeteria, 2108 Kitchen, 2109 Storage/Closet, 2107 Kitchen, 2106 Kitchen, 2105 Kitchen, 2100A Corridor/Hallway, 2103 Restroom, 2102 Storage/Closet, 2101 Restroom, 2110 Entrance, 2110A Mechanical, 2111 Restroom, 2100B Corridor/Hallway, 2108 Kitchen, 2109 Storage/Closet, 2107 Kitchen, 2106 Kitchen, 2105 Kitchen, 2100A Corridor/Hallway, 2103 Restroom, 2102 Storage/Closet, 2101 Restroom, 2110 Entrance, 2110A Mechanical, 2111 Restroom, 2100B Corridor/Hallway.
- Top Center (Green):** AHU-8, 2204 Library/MC, 2203 ELL, 2202 Office, 2205 Office, 2206 Office, 2207 Storage/Closet, 2201 TV/Video Lab, 2208 Computer Lab, 2000 Corridor/Hallway, 2009 Corridor/Hallway, 2100 Corridor/Hallway, 2101 Restroom, 2102 Storage/Closet, 2103 Restroom, 2104 Cafeteria, 2105 Kitchen, 2106 Kitchen, 2107 Kitchen, 2108 Kitchen, 2109 Storage/Closet, 2110 Entrance, 2110A Mechanical, 2111 Restroom, 2100B Corridor/Hallway.
- Top Right (Purple):** AHU-13, 2304 Gymnasium, 2303 Gymnasium, 2300 Corridor/Hallway, 2301 Restroom, 2302 Mechanical, 2300A Corridor/Hallway, 2300B Corridor/Hallway, 2300C Corridor/Hallway, 2304 Gymnasium, 2303 Gymnasium, 2300 Corridor/Hallway, 2301 Restroom, 2302 Mechanical, 2300A Corridor/Hallway, 2300B Corridor/Hallway, 2300C Corridor/Hallway.
- Bottom Left (Pink):** AHU-9, 2611 ELL, 2612 Office, 2613 Office, 2615 Office, 2616 Office, 2618 Office, 2619 Office, 2614 General Classroom, 2617 Social Studies, 2600 Corridor/Hallway, 2601 Social Studies, 2602 Math, 2603 Language Arts, 2604 Special Education, 2605 Foreign Language, 2606 Social Studies, 2607 Special Education, 2608 Language Arts, 2609 Math, 2610 Language Arts, 2611 ELL, 2612 Office, 2613 Office, 2615 Office, 2616 Office, 2618 Office, 2619 Office, 2614 General Classroom, 2617 Social Studies, 2600 Corridor/Hallway.
- Bottom Center (Yellow):** AHU-10, 2610 Language Arts, 2609 Math, 2608 Language Arts, 2607 Special Education, 2606 Social Studies, 2600 Corridor/Hallway, 2601 Social Studies, 2602 Math, 2603 Language Arts, 2604 Special Education, 2605 Foreign Language, 2606 Social Studies, 2607 Special Education, 2608 Language Arts, 2609 Math, 2610 Language Arts, 2611 ELL, 2612 Office, 2613 Office, 2615 Office, 2616 Office, 2618 Office, 2619 Office, 2614 General Classroom, 2617 Social Studies, 2600 Corridor/Hallway.
- Bottom Right (Red):** AHU-1, 2504 Special Education, 2503 Special Education, 2502 Math, 2507 Storage, 2506 Restroom, 2505 Corridor, 2501 Storage/Closet, 2500 Corridor/Hallway, 2504 Special Education, 2503 Special Education, 2502 Math, 2507 Storage, 2506 Restroom, 2505 Corridor, 2501 Storage/Closet, 2500 Corridor/Hallway.

Assessment

Ventilation System

The following information was gathered by IEA on Friday, April 21, 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:	Boiler room 1502	
Areas Served:	Home Economics-See Attached Map	
System Enhancements:	None	
Supply System	Outdoor Air	Cleanliness and Observations
Type <ul style="list-style-type: none"> Supply System - Constant Volume Heating - None Cooling - None Energy Recovery Unit (ERU) - None 	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 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.	Heat wheels are not present. Exterior ducting is not visible. Exterior ducting insulation is not present. 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 not known. Return damper is inaccessible, and its condition is not known. The general condition of the unit is good.

Unit Designation:	AHU-02	
Location of Unit:	Boiler room 1502	
Areas Served:	Music-See Attached Map	
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 incorrectly.</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 inaccessible.</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 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>

Unit Designation:	AHU-03	
Location of Unit:	1006 mechanical room	
Areas Served:	Administration-See Attached Map	
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 - Dx 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 incorrectly. Drain pans are not applicable or not present. Drain pan condition is not known. Heating coils are inaccessible and cooling coils are inaccessible. Heat wheels are not present. Exterior ducting is visible. Exterior ducting insulation is not present. 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 not known. Return damper is closed, 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-04	
Location of Unit:	1103B, access filters through a panel in room 1103. Panel is above viewing window into 1103B.	
Areas Served:	Shops-See Attached Map	
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 	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 2 out of 5) and fit well. Mixed air main filters are installed incorrectly. Drain pan plugged status is not known. Drain pan condition is not known. Heating coils are inaccessible. Heat wheels are not present. Exterior ducting is visible. Exterior ducting insulation is not present. 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 not known. 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: None Main filter: Pleated, MERV 11 		

Unit Designation:	AHU-05	
Location of Unit:	Boiler room 1502 mezzanine	
Areas Served:	Auditorium-See Attached Maps	
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 	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 coils are inaccessible. Heat wheels are not present. Exterior ducting is visible. Exterior ducting insulation is not present. Interior ducting is visible. Interior ducting insulation is in good condition. Interior ducting is clean. Air handling room is free of trash/chemicals. Outside damper is inaccessible, and its condition is not known. 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-06	
Location of Unit:	Boiler room 1502 mezzanine	
Areas Served:	Boiler Room-See Attached Maps	
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 	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 incorrectly. Drain pans are not applicable or not present. Drain pan condition is not known. Heating coils are inaccessible. Heat wheels are not present. Exterior ducting is visible. Exterior ducting insulation is not present. Interior ducting is visible. Interior ducting insulation is not present. Interior ducting is clean. Air handling room is free of trash/chemicals. Outside damper is open, 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 		

Unit Designation:	AHU-07	
Location of Unit:	2302A	
Areas Served:	2nd Floor East Classrooms-See Attached Maps	
System Enhancements:	None	
Supply System	Outdoor Air	Cleanliness and Observations
Type <ul style="list-style-type: none"> Supply System - Constant Volume Heating - None Cooling - None Energy Recovery Unit (ERU) - None 	Outdoor air intake is accessible Outdoor air intake is located on the roof. 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 2 out of 5) and fit well. Mixed air main filters are installed incorrectly. 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.	Heat wheels are not present. Exterior ducting is visible. Exterior ducting insulation is not present. Interior ducting is visible. Interior ducting insulation is not present. Interior ducting is clean. Air handling room is free of trash/chemicals. Outside damper is inaccessible, 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-08	
Location of Unit:	2302A	
Areas Served:	North Library-See Attached Maps	
System Enhancements:	None	
Supply System	Outdoor Air	Cleanliness and Observations
Type <ul style="list-style-type: none"> Supply System - Constant Volume Heating - None Cooling - None Energy Recovery Unit (ERU) - None 	Outdoor air intake is accessible Outdoor air intake is located on the roof. 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 2 out of 5) and fit well. Mixed air main filters are installed incorrectly. 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.	Heat wheels are not present. Exterior ducting is visible. Exterior ducting insulation is not present. Interior ducting is not visible. Interior ducting insulation is not present. Interior ducting is clean. Air handling room is free of trash/chemicals. Outside damper is inaccessible, 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-09	
Location of Unit:	2102 mechanical room	
Areas Served:	2nd Floor Southeast Classrooms-See Attached Maps	
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 	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 incorrectly. Drain pan plugged status is not known. Drain pan condition is not known. Heating coils are inaccessible. Heat wheels are not present. Exterior ducting is visible. Exterior ducting insulation is not present. 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 not known. Return damper is closed, 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-10	
Location of Unit:	2102, ceiling	
Areas Served:	South Library-See Attached Maps	
System Enhancements:	None	
Supply System	Outdoor Air	Cleanliness and Observations
Type <ul style="list-style-type: none"> Supply System - Constant Volume Heating - None 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 incorrectly. Drain pans are not applicable or not present. Drain pan condition is not known. Heat wheels are not present. Exterior ducting is visible. Exterior ducting insulation is not present. 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 not known. Return damper is closed, 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 	Outdoor air intake is in good condition.	

Unit Designation:	AHU-11	
Location of Unit:	Mechanical room 2102	
Areas Served:	1st Floor East Classrooms-See Attached Maps	
System Enhancements:	None	
Supply System	Outdoor Air	Cleanliness and Observations
Type <ul style="list-style-type: none"> Supply System - Constant Volume Heating - None 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 poorly. Mixed air main filters are installed incorrectly. 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.	Heat wheels are not present. Exterior ducting is visible. Exterior ducting insulation is not present. Interior ducting is visible. Interior ducting insulation is not present. Interior ducting is clean. Air handling room is free of trash/chemicals. Outside damper is inaccessible, and its condition is not known. Return damper is closed, and its condition is good. The general condition of the unit is good.

Unit Designation:	AHU-12	
Location of Unit:	Mechanical room 2102	
Areas Served:	Cafeteria-See Attached Maps	
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 	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 incorrectly. Drain pan plugged status is not known. Drain pan condition is not known. Heating coils are inaccessible. Heat wheels are not present. Exterior ducting is visible. Exterior ducting insulation is not present. 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 not known. 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: None Main filter: Pleated, MERV 11 		

Unit Designation:	AHU-13	
Location of Unit:	2302 mechanical Room	
Areas Served:	Gym-See Attached Maps	
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 	Outdoor air intake is accessible Outdoor air intake is located on the roof. 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 2 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 coils are inaccessible. Heat wheels are not present. Exterior ducting is visible. Exterior ducting insulation is not present. 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.

Unit Designation:	AHU-14 (100% OA)	
Location of Unit:	2110 loading dock, ceiling	
Areas Served:	Kitchen-See Attached Maps	
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 the roof.</p> <p>No nearby pollution sources were found.</p>	<p>Outdoor air pre-filters are not present. Outdoor air main filters are somewhat dirty and on the border of needing replacement (scoring 3 out of 5) and fit well. Outdoor air main filters are installed correctly.</p> <p>Return air filters are not present.</p> <p>Drain pan plugged status is not known. Drain pan condition is not known.</p> <p>Heating coils are inaccessible.</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 visible. Interior ducting insulation is in good condition. Interior ducting is clean.</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 not present.</p> <p>The general condition of the unit is good.</p>

Unit Designation:	AHU-15	
Location of Unit:	2302 mechanical room	
Areas Served:	Locker Rooms-See Attached Maps	
System Enhancements:	None	
Supply System	Outdoor Air	Cleanliness and Observations
Type <ul style="list-style-type: none"> Supply System - Constant Volume Heating - None Cooling - None Energy Recovery Unit (ERU) - None 	Outdoor air intake is accessible Outdoor air intake is located on the roof. 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 incorrectly. 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.	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 inaccessible, and its condition is good. Return damper is open, and its condition is good. The general condition of the unit is good.

Unit Designation:	ERV-16	
Location of Unit:	Roof access from 2110	
Areas Served:	Science Rooms-See Attached Maps	
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 accessible</p> <p>Outdoor air intake is located on the unit.</p> <p>No nearby pollution sources were found.</p>	<p>Outdoor air pre-filters are not present. Outdoor air main filters are somewhat dirty and on the border of needing replacement (scoring 3 out of 5) and fit well. Outdoor air main filters are installed incorrectly.</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>Mixed air filters are clean and not in need of replacement (scoring 2 out of 5) and fit well. Mixed air filters are installed incorrectly.</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>Drain pans are not plugged. Drain pan condition is good.</p> <p>Heating coils are dirty and cooling coils are clean.</p> <p>Heat wheels are clean.</p> <p>Exterior ducting is not visible. Exterior ducting insulation is in an unknown condition.</p>
Filter Type - Return <ul style="list-style-type: none"> Pre-filter: None Main filter: Pleated, MERV 11 		<p>Interior ducting is not visible. Interior ducting insulation is in an unknown condition. Interior ducting is of unknown cleanliness.</p>
Filter Type - Mixed <ul style="list-style-type: none"> Pre-filter: Pleated, MERV 11 Main filter: Pleated, MERV 11 		<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>

Recommendations

Dirty Coils were observed on unit ERV-16 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.

Dirty or poorly fitting filters were observed in units AHU-02, AHU-03, AHU-04, AHU-06, AHU-07, AHU-08, AHU-09, AHU-10, AHU-11, AHU-12, AHU-15 and ERV-16 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-02

Mixed Main Filter Installation



AHU-03

Mixed Main Filter Installation



AHU-04

Mixed Main Filter Installation



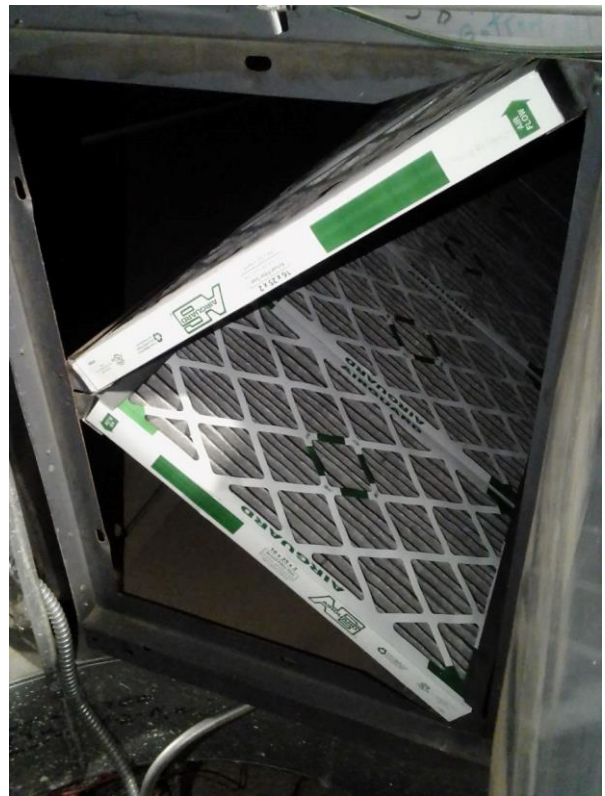
AHU-06

Mixed Main Filter Installation



AHU-07

Mixed Main Filter Installation



AHU-08

Mixed Main Filter Installation



AHU-09

Mixed Main Filter Installation



AHU-10

Mixed Main Filter Installation



AHU-11

Mixed Main Filter Fit



AHU-11

Mixed Main Filter Installation



AHU-12

Mixed Main Filter Installation



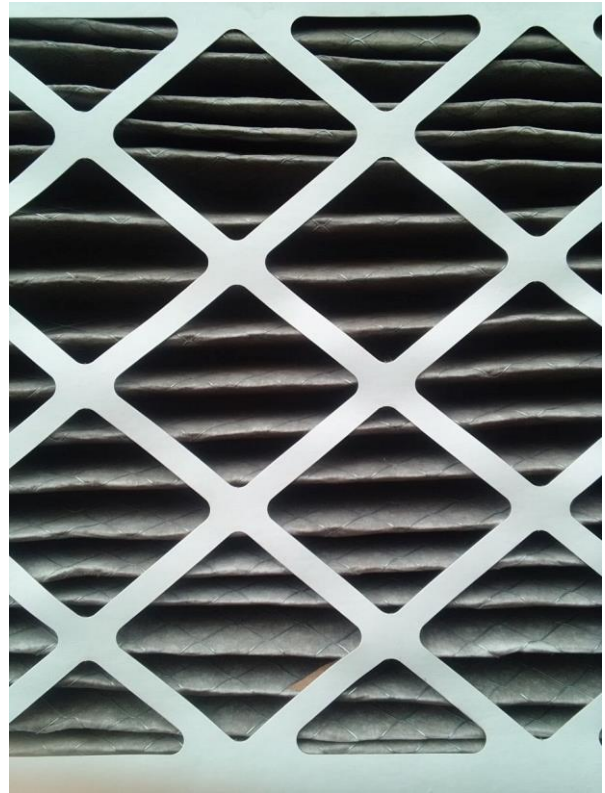
AHU-14 (100% OA)

Outdoor Main Filter Cleanliness



AHU-15

Mixed Main Filter Installation



ERV-16

Outdoor Main Filter Cleanliness



ERV-16

Outdoor Main Filter Installation



ERV-16

Mixed Pre-Filter Installation



ERV-16
Heating Coils