

2023 - 2024 Ventilation Assessment



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Saint Paul Public Schools Como Park Senior High School

Assessment Date: Friday, April 21, 2023

Project Description

IEA conducted a ventilation inspection in Como Park Senior High School 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 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	End
		Time:	Time:
Monday- Friday	Yes	5:30 AM	10:30 PM
Saturday	No		
Sunday	No		
Holiday	No		

Typical occupancy:

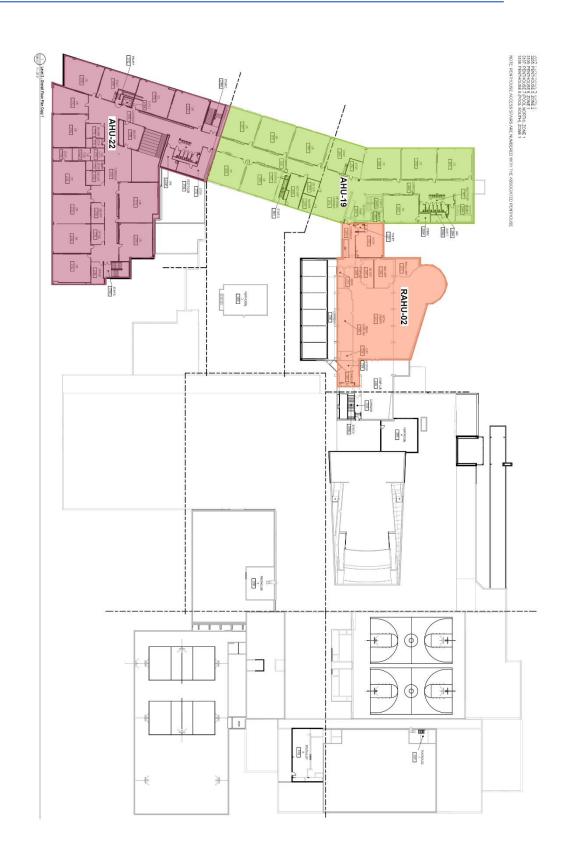
Day:	Occupied?	Start Time:	End Time:	
Monday- Friday	Yes	8:30 AM	3:00 PM	
Saturday	Yes	7:00 AM	3:00 PM	
Sunday	No			
Holiday	No			
Notes: Sometimes Sundays				

- 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 steam boiler.
- A cooling system is present and is a chilled water (air cooled) type system.
- Filters used are:

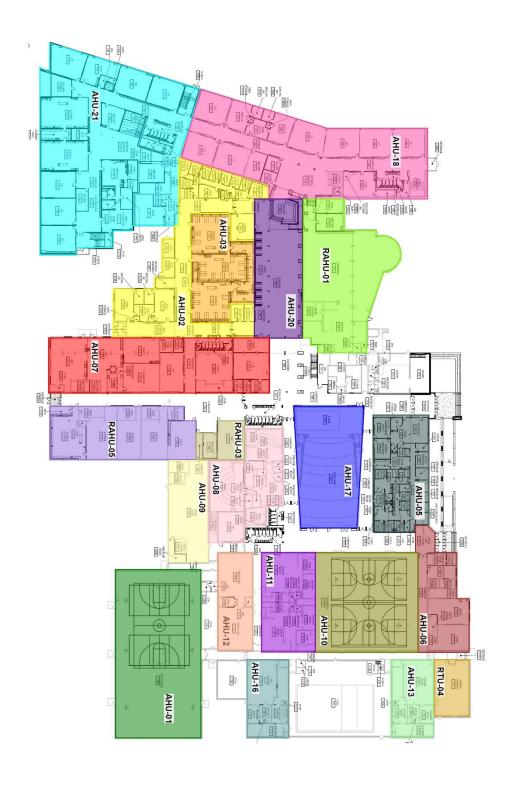
Filter Type	MERV Rating
Pleated	HEPA
Pleated	MERV 11
Pleated	MERV 13
Pleated	MERV 8
Pleated	N/A

- Filters are changed quarterly.
- Energy Recovery Units are present.
- Units do not contain system Enhancements.
- Personal air purifiers are supplied for individual rooms. They are of unknown make or model.
- It is not known whether or not the building was commissioned during the original construction.

Air Handling Unit Designations & Service Zones: 2nd Floor



Air Handling Unit Designations & Service Zones: 1st Floor



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:

		ded for each drift below.
	AHU01	
Location of Unit:	Mechanical Room	1144 near Fieldhouse
Areas Served:	Gym	
	See attached map	
System	None	
Enhancements:		
Supply System	Outdoor Air	Cleanliness and Observations
Туре	Outdoor air intake	Outdoor air filters are not present.
 Supply 	is inaccessible	
System -		Return air filters are not present.
Constant	Outdoor air intake	
Volume	is located on the	Mixed air pre-filters are clean and not in need of replacement
 Heating - Hot 	roof.	(scoring 2 out of 5) and fit well. Mixed air pre-filters are installed
Water		correctly. Mixed air main filters are somewhat dirty and on the
 Cooling - 	It is not known if	border of needing replacement (scoring 3 out of 5) and fit well.
None	there are nearby	Mixed air main filters are installed correctly.
Energy	pollution sources.	
Recovery		Drain pans are not plugged. Drain pan condition is good.
Unit (ERU) -	Outdoor air intake	
None	is in good	Heat wheels are not present.
	condition.	
Filter Type - Mixed		Exterior ducting is visible. Exterior ducting insulation is not
Pre-filter:		present.
Pleated,		
MERV 8		Interior ducting is not visible. Interior ducting insulation is in an
 Main filter: 		unknown condition. Interior ducting is of unknown cleanliness.
Pleated,		
MERV 13		Air handling room is free of trash/chemicals.
		Outside damper is inaccessible, and its condition is not known.
		Poturn damper is open, and its condition is good
		Return damper is open, and its condition is good.

Unit Designation:	AHU02	
Location of Unit:	Penthouse above s	tair G 3403 inside Room 1409
	Science Wing See attached map	
System	n None	
Enhancements:		
Supply System	Outdoor Air	Cleanliness and Observations
Type Supply System - VAV Heating - Hot Water Cooling - Chilled Water Energy Recovery Unit (ERU) - None	Outdoor air intake is inaccessible Outdoor air intake is located on the roof. 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 clean and not in need of replacement (scoring 2 out of 5) and fit well. Mixed air pre-filters are installed correctly. Mixed air main filters are somewhat dirty and on the border of needing replacement (scoring 3 out of 5) and fit well. Mixed air main filters are installed correctly. Drain pans are not plugged. Drain pan condition is good. Heating coils are clean and cooling coils are dirty. 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 open, and its condition is good.
		Return damper is open, and its condition is good. The general condition of the unit is good.

Unit	Designation:	AHU03	
	ion of Unit:		r G 3403 inside Room 1409
	s Served:	Science	1 0 3 103 113100 1103111 1 103
, ii cu	, sc. vcu.	See attached map	
Syste	m Enhancements:	•	
	Supply System	Outdoor Air	Cleanliness and Observations
Туре	Commello Comberna	Outdoor air intake is	Outdoor air filters are not present.
•	Supply System - VAV	inaccessible	Return air pre-filters are not present. Return air main
•	Heating - Hot Water	located on the roof.	filters are clean and not in need of replacement (scoring 2 out of 5) and fit well. Return air main filters are installed
•	Cooling - Chilled Water	It is not known if	correctly.
•	Energy Recovery Unit (ERU) - Fixed	there are nearby pollution sources.	Mixed air pre-filters are not present. Mixed air main filters are somewhat dirty and on the border of needing replacement (scoring 3 out of 5) and fit well. Mixed air
	Plate	Outdoor air intake is in good condition.	main filters are installed correctly.
Filter •	Type - Return Pre-filter: None		Drain pans are not plugged. Drain pan condition is good.
•	Main filter: Pleated, MERV		Heating coils are clean and cooling coils are clean.
	8		Heat wheels are clean.
Filter •			Exterior ducting is visible. Exterior ducting insulation is not present.
	Pleated, MERV 13		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 open, and its condition is good.
			The general condition of the unit is good.

Unit Designation:	AHU05	
Location of Unit:	Roof Penthouse near Computer Lab Roof Access	
Areas Served:	Area A,B Floor-1, N See attached map	lain Office Area
System	None	
Enhancements:		
Supply System	Outdoor Air	Cleanliness and Observations
Type Supply System - VAV Heating - Hot Water Cooling - Chilled Water Energy Recovery Unit (ERU) - None Filter Type - Mixed	is inaccessible Outdoor air intake is located on an exterior wall. It is not known if	Outdoor air filters are not present. Return air filters are not present. Mixed air pre-filters are clean and not in need of replacement (scoring 2 out of 5) and fit well. Mixed air pre-filters are installed correctly. Mixed air main filters are somewhat dirty and on the border of needing replacement (scoring 4 out of 5) and fit well. Mixed air main filters are installed correctly. Drain pans are not plugged. Drain pan condition is good. Heating coils are clean and cooling coils are clean. 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 inaccessible, and its condition is not known.
		The general condition of the unit is good.

Unit Designation: AHU06 Location of Unit: Mechanical/Laundry Room left of 1113 Areas Served: ROTC See attached map System None Enhancements: Cleanliness and Observations Type Outdoor air Outdoor air filters are not present. Supply System - VAV System - VAV Heating - Hot Heating - Hot
Areas Served: ROTC See attached map System Enhancements: Supply System Outdoor Air Cleanliness and Observations Type Outdoor air intake is System - VAV System - VAV Outdoor air filters are not present. Return air filters are not present.
Enhancements: Supply System Outdoor Air Cleanliness and Observations Outdoor air filters are not present. Supply intake is System - VAV accessible Return air filters are not present.
Supply System Outdoor Air Cleanliness and Observations Type Outdoor air Outdoor air filters are not present. • Supply intake is Return air filters are not present.
Type Outdoor air Supply System - VAV accessible Outdoor air filters are not present. Return air filters are not present.
Water Cooling - Chilled on an exterior Water Filter Type - Mixed Mixed air pre-filters are somewhat dirty and on the border of needing replacement (scoring 4 out of 5) and fit well. Mixed air pre-filters are installed correctly. Mixed air main filters are somewhat dirty and on the border of needing replacement (scoring 3 out of 5) and fit well. Mixed air main filters are installed correctly.

Unit Designation:	AHU07	
•	Mechanical Room 1310	
Areas Served:	Arts	
	See attached map	
System Enhancements:	None	
Supply System	Outdoor Air	Cleanliness and Observations
Type Supply System - VAV Heating - Hot Water Cooling - Chilled Water Energy Recovery Unit (ERU) - Fixed Plate Filter Type - Outdoor Pre-filter: None Main filter: Pleated, MERV 8 Filter Type - Return Pre-filter: None	Outdoor air intake is inaccessible Outdoor air intake is located on an exterior wall. It is not known if there are nearby pollution sources.	Outdoor air pre-filters are not present. 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 somewhat dirty and on the border of needing replacement (scoring 3 out of 5) and fit well. Return air main filters are installed correctly. 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 plugged. Drain pan condition is poor. Heating coils are clean and cooling coils are clean. Heat wheels are clean.
 Main filter: Pleated, MERV 8 		Exterior ducting is visible. Exterior ducting insulation is in good condition. Interior ducting is not visible. Interior ducting insulation is
Filter Type - Mixed • Pre-filter: None • Main filter: Pleated, MERV 13		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 open, and its condition is good. The general condition of the unit is good.

Unit Designation:	AHU08		
Location of Unit:	Penthouse near RAHU 3 (Roof acess only)		
Areas Served: Area A,B Floor-1			
	See attached map		
System Enhancements:	None		
Supply System	Outdoor Air	Cleanliness and Observations	
Type Supply System - VAV Heating - Hot Water Cooling - Chilled Water	Outdoor air intake is inaccessible Outdoor air intake is located on the roof. It is not known if there are nearby pollution esources. Outdoor air intake is in good condition.	Outdoor air filters are not present. Return air filters are not present. 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. Drain pans are not plugged. Drain pan condition is good. Heating coils are clean. 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 not known. Return damper is open, and its condition is good.	
		The general condition of the unit is good.	

Unit D	Designation:	AHU09		
Locati	on of Unit:	Penthouse near RAHU 3 (Roof acess only)		
Areas	Served:	See attached map.		
Syster	n Enhancements:	None		
S	Supply System	Outdoor Air	Cleanliness and Observations	
Type		Outdoor air intake is	Outdoor air filters are not present.	
•	Supply System -	inaccessible		
	VAV		Return air filters are not present.	
•	Heating - Hot	Outdoor air intake is		
	Water	located on an exterior	Mixed air filters are somewhat dirty and on the border	
•	Cooling - Chilled	wall.	of needing replacement (scoring 3 out of 5) and fit well.	
	Water		Mixed air filters are installed correctly.	
•		It is not known if there		
		are nearby pollution	Drain pans are not plugged. Drain pan condition is poor.	
	None	sources.		
			Heating coils are clean and cooling coils are clean.	
<u>Filter</u>	<u> Type - Mixed</u>	Outdoor air intake is in		
•	Pre-filter:	good condition.	Heat wheels are not present.	
	Pleated, MERV 8			
•	Main filter:		Exterior ducting is visible. Exterior ducting insulation is	
	Pleated, MERV		in good condition.	
	13			
			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 track/shomicals	
			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 D	esignation:	AHU10	
Locatio	on of Unit:	Penthouse above Gy	/m Closet 1101A
Areas S	Served:	Gym	
		See attached map	
System	n Enhancements:	None	
S	upply System	Outdoor Air	Cleanliness and Observations
Type		Outdoor air intake	Outdoor air filters are not present.
•	Supply System -	is accessible	
	Constant Volume		Return air filters are not present.
•	Heating - Hot	Outdoor air intake	
	Water	is located on the	Mixed air filters are somewhat dirty and on the border of
•	O	roof.	needing replacement (scoring 3 out of 5) and fit well.
•	Energy Recovery		Mixed air filters are installed correctly.
	• •	No nearby pollution	
	None	sources were	Drain pans are not plugged. Drain pan condition is good.
		found.	
	<u> </u>		Heating coils are clean.
•	Pre-filter:	Outdoor air intake	
		is in good	Heat wheels are not present.
•	Main filter:	condition.	
	Pleated, MERV 13		Exterior ducting is visible. Exterior ducting insulation is not
	15		present.
			Interior ducting is not visible. Interior ducting insulation is
			in an unknown condition. Interior ducting is of unknown
			cleanliness.
			oreuminess.
			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.

Unit Designation:	AHU11			
Location of Unit:	Penthouse above Gym Closet 1101B			
	Locker Rooms See attached map			
	None			
Supply System	Outdoor Air	Cleanliness and Observations		
Type Supply System - Constant Volume Heating - Hot Water Cooling - None Energy Recovery Unit (ERU) - None Filter Type - Mixed	Outdoor air intake is inaccessible Outdoor air intake is located on an exterior wall. It is not known if there are nearby pollution sources. Outdoor air intake is in good condition.	Outdoor air filters are not present. Return air filters are not present. Mixed air filters are somewhat dirty and on the border of needing replacement (scoring 3 out of 5) and fit well. Mixed air filters are installed correctly. Drain pans are not plugged. Drain pan condition is good. Heating coils are clean. 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 open, and its condition is good. Return damper is inaccessible, and its condition is not known.		

Unit Des	ignation:	AHU12		
Location of Unit:		Mechanical Room 1136A via Wrestling Room/Aux Gym 1136		
Areas Served:		Media Center		
		See attached map		
System E	nhancements:	None		
Sup	ply System	Outdoor Air	Cleanliness and Observations	
Type	Supply System - VAV Heating - Hot Water Cooling - None Energy Recovery Unit (ERU) - None	Outdoor air intake is inaccessible Outdoor air intake is located on an exterior wall. It is not known if there are nearby pollution sources. Outdoor air intake is in good condition.	Outdoor air filters are not present. Return air filters are not present. Mixed air filters are somewhat dirty and on the border of needing replacement (scoring 3 out of 5) and fit well. Mixed air filters are installed correctly. Drain pans are not plugged. Drain pan condition is good. Heating coils are clean. 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 open, and its condition is good.	
			Return damper is open, and its condition is good. The general condition of the unit is good.	

Unit Designation:	AHU13			
Location of Unit:	Stair 3107 Penthouse			
Areas Served:	Pool Men Lockers			
	See attached map			
System Enhancements:		Classification and Observations		
Supply System	Outdoor Air	Cleanliness and Observations		
Heating - Hot	Outdoor air intake is inaccessible Outdoor air intake is located on an exterior wall.	Outdoor air pre-filters are not present. 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		
Recovery Unit	It is not known if there are nearby pollution sources.	filters are dirty and in need of replacement (scoring 5 out of 5) and fit well. Return air main filters are installed incorrectly.		
Filter Type - Outdoor • Pre-filter: None • Main filter:	Outdoor air intake is in good condition.	Mixed air pre-filters are not present. Mixed air main filters are somewhat dirty and on the border of needing replacement (scoring 3 out of 5) and fit well. Mixed air main filters are installed correctly.		
Pleated, MERV 8		Drain pans are not applicable or not present. Drain pan condition is not known.		
Filter Type - Return • Pre-filter: None		Heating coils are clean.		
Main filter: Pleated, MERV		Heat wheels are clean.		
11		Exterior ducting is visible. Exterior ducting insulation is not present.		
Filter Type - Mixed Pre-filter: None Main filter: Pleated, MERV 13		Interior ducting is not visible. Interior ducting insulation is in an unknown condition. Interior ducting is of unknown cleanliness.		
15		Air handling room is free of trash/chemicals.		
		Outside damper is closed, and its condition is good.		
		Return damper is open, and its condition is good.		
		The general condition of the unit is good.		

Unit Designation:	Init Designation: AHU16	
Location of Unit: 1101B Roof Pent		e near baseball field and exterior door 23
	Pool Women Lockers See attached map	
System Enhancements:	None	
Supply System	Outdoor Air	Cleanliness and Observations
Type Supply System - Constant Volume Heating - Hot Water Cooling - None Energy Recovery Unit (ERU) - Fixed Plate	Outdoor air intake is inaccessible Outdoor air intake is located on an exterior wall. It is not known if there are nearby pollution sources.	Outdoor air pre-filters are not present. 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 2 out of 5) and fit well. Return air main filters are installed correctly. Mixed air pre-filters are not present. Mixed air main filters are somewhat dirty and on the border of needing replacement (scoring 3 out of 5) and fit well. Mixed air main filters are installed correctly. Drain pans are not plugged. Drain pan condition is good. Heating coils are clean. Heat wheels are dirty. 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 open, and its condition is good. Return damper is inaccessible, and its condition is good. The general condition of the unit is good.

Unit Designation:	AHU17		
Location of Unit:	ocation of Unit: Roof Penthouse near Computer Lab Roof Access		
Areas Served:	Auditorium		
	See attached map		
System	None		
Enhancements:			
Supply System	Outdoor Air	Cleanliness and Observations	
Туре	Outdoor air	Outdoor air filters are not present.	
Supply	intake is	·	
System - Constant	inaccessible	Return air filters are not present.	
Water Cooling - Chilled Water Energy Recovery Unit (ERU) - None	No nearby pollution sources were found. Outdoor air	Mixed air pre-filters are clean and not in need of replacement (scoring 2 out of 5) and fit well. Mixed air pre-filters are installed correctly. Mixed air main filters are somewhat dirty and on the border of needing replacement (scoring 3 out of 5) and fit well. Mixed air main filters are installed correctly. Drain pans are not plugged. Drain pan condition is good. Heating coils are clean and cooling coils are clean.	
• Pre-filter: Pleated, MERV 8 • Main filter:	intake is in good condition.	Heat wheels are not present. Exterior ducting is visible. Exterior ducting insulation is not present.	
Pleated, MERV 13		Interior ducting is visible. Interior ducting insulation is not present. 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:	•	AHU18		
		Stair G Penthouse via 2618		
Areas Served:		Area A,B Floor-1 See attached map		
System Enhancen	nents:	None		
Supply Syste	em	Outdoor Air	Cleanliness and Observations	
VAV Heating - Water Cooling - Water Energy Re Unit (ERU Fixed Plat Filter Type - Outd Pre-filter:	Hot Chilled ecovery J) - ce loor	is accessible Outdoor air intake is located on an exterior wall. No nearby pollution sources were found. Outdoor air intake is in good	Outdoor air pre-filters are not present. 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 2 out of 5) and fit well. Return air main filters are installed incorrectly. Mixed air pre-filters are not present. Mixed air main filters are somewhat dirty and on the border of needing replacement (scoring 3 out of 5) and fit well. Mixed air main filters are installed correctly.	
Main filte Pleated, N		condition.	Drain pans are not plugged. Drain pan condition is poor.	
• Pre-filter: • Main filte Pleated, N	None er: MERV 8		Heating coils are clean and cooling coils are clean. Heat wheels are clean. Exterior ducting is visible. Exterior ducting insulation is not present.	
Pre-filter:Main filtePleated, N13	er:		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 open, and its condition is good.	
			The general condition of the unit is good.	

Unit Designation:	AHU19	
	Area A,B Floor-2 See attached map	
System Enhancements:	None	
Supply System	Outdoor Air	Cleanliness and Observations
Water Cooling - Chilled Water Energy Recovery Unit (ERU) - Fixed Plate	inaccessible Outdoor air intake is located on an exterior wall. It is not known if there are nearby pollution sources.	Outdoor air pre-filters are not present. 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 2 out of 5) and fit well. Return air main filters are installed correctly. Mixed air pre-filters are not present. Mixed air main filters are somewhat dirty and on the border of needing replacement (scoring 3 out of 5) and fit well. Mixed air main filters are installed correctly. Drain pans are not plugged. Drain pan condition is good.
Filter Type - Return Pre-filter: None Main filter: Pleated, MERV 8		Cooling coils are clean. Heat wheels are clean. Exterior ducting is visible. Exterior ducting insulation is not present.
Filter Type - Mixed • Pre-filter: None • Main filter: Pleated, MERV 13		Interior ducting is visible. Interior ducting insulation is not present. 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 open, and its condition is good. The general condition of the unit is good.

Unit Designation:	AHU20	
Location of Unit: Stair G Penthouse via 2618		ria 2618
Areas Served:	Area A,B Floor-1, Commons Area See attached map	
System Enhancements:	None	
Supply System	Outdoor Air	Cleanliness and Observations
Water Cooling - Chilled Water Energy Recovery	is accessible Outdoor air intake is located on an exterior wall. No nearby pollution sources	Outdoor air pre-filters are not present. 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 2 out of 5) and fit well. Return air main filters are installed incorrectly.
Fixed Plate Filter Type - Outdoor	were found. Outdoor air intake is in good condition.	Mixed air pre-filters are not present. Mixed air main filters are somewhat dirty and on the border of needing replacement (scoring 3 out of 5) and fit well. Mixed air main filters are installed correctly.
Main filter: Pleated, MERV 8		Drain pans are not plugged. Drain pan condition is poor. Heating coils are clean and cooling coils are clean.
Filter Type - ReturnPre-filter: NoneMain filter:		Heat wheels are clean.
Pleated, MERV 8 Filter Type - Mixed		Exterior ducting is visible. Exterior ducting insulation is not present.
Pre-filter: None Main filter: Pleated, MERV 13		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 open, and its condition is good.
		The general condition of the unit is good.

Unit D	esignation:	AHU21			
Locati	on of Unit:	Stair F 3702 Penthouse			
Areas Served:		Area C Floor-1			
		See attached map			
Systen	n Enhancements:	None			
S	Supply System	Outdoor Air	Cleanliness and Observations		
<u>Type</u>		Outdoor air intake	Outdoor air pre-filters are not present. Outdoor air main		
•	Supply System -	is accessible	filters are clean and not in need of replacement (scoring 2		
	VAV		out of 5) and fit well. Outdoor air main filters are installed		
•	Heating - Hot		correctly.		
	Water	is located on an			
•	Cooling - Chilled	exterior wall.	Return air pre-filters are not present. Return air main filters		
	Water		are clean and not in need of replacement (scoring 1 out of		
•			5) and fit well. Return air main filters are installed correctly.		
	Unit (ERU) -	sources were			
	Fixed Plate	found.	Mixed air pre-filters are not present. Mixed air main filters		
			are clean and not in need of replacement (scoring 2 out of		
Filter '	<u> Type - Outdoor</u>		5) and fit well. Mixed air main filters are installed correctly.		
•	Pre-filter: None	is in good			
•	Main filter:	condition.	Drain pans are not plugged. Drain pan condition is good.		
	Pleated, MERV 8				
	-		Heating coils are clean and cooling coils are clean.		
	Type - Return				
•	Pre-filter: None		Heat wheels are clean.		
•	Main filter:				
	Pleated, MERV 8		Exterior ducting is visible. Exterior ducting insulation is not		
Files:	Trues Mirrod		present.		
	Type - Mixed Pre-filter: None		Interior ducting is not visible. Interior ducting insulation is		
•	Main filter: None		Interior ducting is not visible. Interior ducting insulation is		
•			in an unknown condition. Interior ducting is of unknown cleanliness.		
	Pleated, MERV		creammess.		
	13		Air handling room is free of trash/chemicals.		
			All Hallulling room is free or trashythernicals.		
			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.		

Unit D	esignation:	AHU22		
Locati	on of Unit:	Stair F 3702 Penthouse		
Areas	Served:	Area C Floor-2		
		See attached map		
Systen	n Enhancements:	None		
S	Supply System	Outdoor Air	Cleanliness and Observations	
Type		Outdoor air intake	Outdoor air pre-filters are not present. Outdoor air main	
•	Supply System -	is accessible	filters are clean and not in need of replacement (scoring 2	
	VAV		out of 5) and fit well. Outdoor air main filters are installed	
•	Heating - Hot		correctly.	
	Water	is located on an		
•	Cooling - Chilled	exterior wall.	Return air pre-filters are not present. Return air main filters	
	Water		are clean and not in need of replacement (scoring 1 out of	
•			5) and fit well. Return air main filters are installed correctly.	
	Unit (ERU) -	sources were		
	Fixed Plate	found.	Mixed air pre-filters are not present. Mixed air main filters	
			are clean and not in need of replacement (scoring 2 out of	
	Type - Outdoor		5) and fit well. Mixed air main filters are installed correctly.	
•	Pre-filter: None	is in good		
•	Main filter:	condition.	Drain pans are not plugged. Drain pan condition is good.	
	Pleated, MERV 8			
Cilton.	Tuna Datuur		Heating coils are clean and cooling coils are clean.	
	Type - Return Pre-filter: None		Heat wheels are clean.	
•	Main filter:		neat wheels are clean.	
•	Pleated, MERV 8		Exterior ducting is visible. Exterior ducting insulation is not	
	rieateu, MENV o		Exterior ducting is visible. Exterior ducting insulation is not present.	
Eiltor '	Type - Mixed		present.	
•	Pre-filter: None		Interior ducting is not visible. Interior ducting insulation is	
	Main filter:		in an unknown condition. Interior ducting is of unknown	
	Pleated, MERV		cleanliness.	
	13		ciediliness.	
	13		Air handling room is free of trash/chemicals.	
			All Hallaling room is free or trashyellermeals.	
			Outside damper is closed, and its condition is good.	
			Return damper is open, and its condition is good.	
			The general condition of the unit is good.	

Unit D	esignation:	DHU01	
Locatio	ation of Unit: 1101B Roof Penthouse near baseball field and exterior door 23		e near baseball field and exterior door 23
Areas Served:		Pool	
		See attached map	
System	Enhancements:	None	
Su	upply System	Outdoor Air	Cleanliness and Observations
Type Filter T	Supply System - Constant Volume Heating - Hot Water Cooling - Dx Energy Recovery Unit (ERU) - Fixed Plate Sype - Outdoor Pre-filter: None Main filter: Pleated, HEPA Sype - Return Pre-filter: None Main filter: Pleated, MERV 8	Outdoor air intake is inaccessible Outdoor air intake is located on the roof. It is not known if	Cleanliness and Observations Outdoor air pre-filters are not present. Outdoor air main filters are dirty and in need of replacement (scoring 5 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 2 out of 5) and fit well. Return air main filters are installed correctly. Drain pans are not plugged. Drain pan condition is good. Heating coil cleanliness is not known and cooling coils are clean. Heat wheels are clean. 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 open, and its condition is good.
			Return damper is open, and its condition is good. The general condition of the unit is good.

Unit Designation: RAHU01		RAHU01		
Locatio	on of Unit:	Roof near stair G Penthouse (Up ladder)		
Areas S	Served:	Cafeteria		
		See attached m	ар	
System	1	None		
Enhand	cements:			
Sup	ply System	Outdoor Air	Cleanliness and Observations	
Туре		Outdoor air	Outdoor air filters are not present.	
•	Supply	intake is	'	
		accessible	Return air filters are not present.	
•	Heating - Hot		·	
	Water	Outdoor air	Mixed air pre-filters are somewhat dirty and on the border of	
•	Cooling -	intake is	needing replacement (scoring 3 out of 5) and fit well. Mixed air	
	Chilled Water	located on the	pre-filters are installed correctly. Mixed air main filters are clean	
•	Energy	roof.	and not in need of replacement (scoring 2 out of 5) and fit well.	
	Recovery		Mixed air main filters are installed correctly.	
	Unit (ERU) -	No nearby		
	None	pollution	Drain pans are not plugged. Drain pan condition is poor.	
		sources were		
ilter T	<u>ype - Mixed</u>	found.	Heating coils are clean and cooling coils are clean.	
•	Pre-filter:			
	Pleated,	Outdoor air	Heat wheels are not present.	
	MERV 8	intake is in		
•		good condition.	Exterior ducting is not visible. Exterior ducting insulation is in an	
	Pleated,		unknown condition.	
	MERV 13			
			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.	
			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:	RAHU02		
Location of Unit:	Roof near stair G Penthouse (Up ladder)		
Areas Served:	Media Center		
	See attached map		
	None		
Supply System	Outdoor Air Cleanliness and Observations		
Type Supply System - VAV Heating - Hot Water Cooling - Chilled Water 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 intake is in good condition.	Outdoor air filters are not present. Return air filters are not present. 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. Drain pans are not 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.	

Roof near Stair G Pen Band Area	thouse		
Band Area			
Danu Area			
See attached map			
None			
Outdoor Air	Cleanliness and Observations		
accessible Outdoor air intake is located on the roof. 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 filters are clean and not in need of replacement (scoring 2 out of 5) and fit well. Mixed air filters are installed incorrectly. Drain pans are not 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 closed, and its condition is good. Return damper is open, and its condition is good.		
	Outdoor Air Outdoor air intake is accessible Outdoor air intake is located on the roof. No nearby pollution sources were found. Outdoor air intake is in good condition.		

Unit E	Designation:	RAHU04		
Locati	ion of Unit:	Roof near tennis court		
Areas Served:		Workout Room		
See attack		See attached map		
Syster	m Enhancements:	None		
S	upply System	Outdoor Air	Cleanliness and Observations	
Type •	Supply System - Constant Volume Heating - Hot Water Cooling - None Energy Recovery Unit (ERU) - None Type - Mixed Pre-filter: None Main filter:	Outdoor air intake is accessible Outdoor air intake is located on the roof. No nearby pollution sources were found. Outdoor air intake is in good	Outdoor air filters are not present. Return air filters are not present. Mixed air pre-filters are not present. Mixed air main filters are somewhat dirty and on the border of needing replacement (scoring 3 out of 5) and fit well. Mixed air main filters are installed correctly. Drain pan plugged status is not known. Drain pan condition is good. Heating coils are inaccessible. 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 D	esignation:	RAHU05		
Locatio	on of Unit:	Roof near Stair G Penthouse		
Areas :	Served:	Science		
		See attached map		
System Enhancements:		None		
S	upply System	Outdoor Air	Cleanliness and Observations	
Type		Outdoor air intake	Outdoor air pre-filters are not present. Outdoor air main	
•	Supply System -	is accessible	filters are clean and not in need of replacement (scoring 2	
	VAV		out of 5) and fit well. Outdoor air main filters are installed	
•	Heating - Hot	Outdoor air intake	correctly.	
	Water	is located on the		
•	Cooling - Chilled	roof.	Return air pre-filters are not present. Return air main filters	
	Water		are clean and not in need of replacement (scoring 2 out of 5)	
•		No nearby	and fit well. Return air main filters are installed correctly.	
	Unit (ERU) -	pollution sources		
	Fixed Plate	were found.	Mixed air pre-filters are not present. Mixed air main filters	
			are clean and not in need of replacement (scoring 2 out of 5)	
Filter Type - Outdoor			and fit well. Mixed air main filters are installed correctly.	
•	Pre-filter: None	is in good		
•	Main filter:	condition.	Drain pans are not plugged. Drain pan condition is poor.	
	Pleated, MERV 8		Hasking soils are also and soliton soils are also.	
Filton T	Tuna Datum		Heating coils are clean and cooling coils are clean.	
	Type - Return Pre-filter: None		Heat wheels are clean.	
•	Main filter:		neat wheels are clean.	
•	Pleated, MERV 8		Exterior ducting is not visible. Exterior ducting insulation is in	
	Fledieu, MENV o		Exterior ducting is not visible. Exterior ducting insulation is in an unknown condition.	
Filter Type - Mixed			an unknown condition.	
•	Pre-filter: None		Interior ducting is not visible. Interior ducting insulation is in	
	Main filter:		an unknown condition. Interior ducting is of unknown	
	Pleated, MERV		cleanliness.	
	13		orearmiress.	
	10		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.	

Recommendations

Dirty Coils were observed on unit AHU02 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.

The drain pan for units AHU06, AHU07, AHU09, AHU18, AHU20, RAHU01 and RAHU05 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 units AHU13, AHU18, AHU20, DHU01 and RAHU03 during the ventilation inspection.

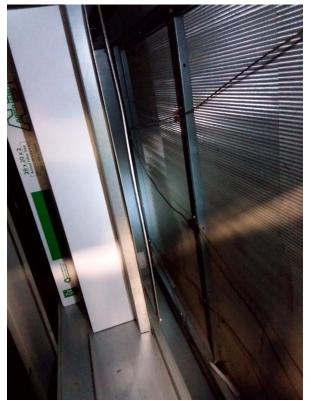
Recommendation: The operations and maintenance program for filter changes should be reviewed and revised to ensure proper filter changes to optimize filtration capacity.

Appendix A

Photo Documentation



AHU01
Mixed Main Filter Cleanliness



AHU02 Cooling Coils



AHU02
Mixed Main Filter Cleanliness



AHU03
Mixed Main Filter Cleanliness



AHU05
Mixed Main Filter Cleanliness



AHU06
Mixed Main Filter Cleanliness



AHU06
Mixed Pre-Filter Cleanliness



AHU06 Drain Pans



AHU07
Return Main Filter Cleanliness



AHU09
Mixed Pre-Filter Cleanliness



AHU07 Drain Pans



AHU09
Mixed Main Filter Cleanliness



AHU09 Drain Pans



AHU10
Mixed Main Filter Cleanliness



AHU10
Mixed Pre-Filter Cleanliness



AHU11
Mixed Pre-Filter Cleanliness



AHU11
Mixed Main Filter Cleanliness



AHU12
Mixed Main Filter Cleanliness



AHU12
Mixed Pre-Filter Cleanliness



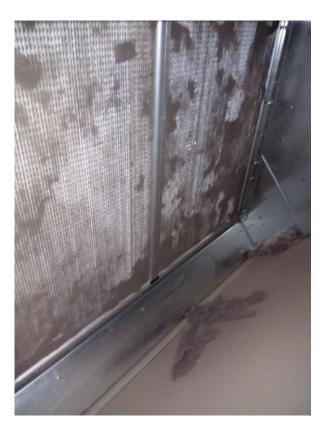
AHU13
Return Main Filter Installation



AHU13
Mixed Main Filter Cleanliness



AHU16
Mixed Main Filter Cleanliness



AHU16 Heat Wheel



AHU17
Mixed Main Filter Cleanliness



AHU18
Return Main Filter Installation



AHU18
Drain Pans



AHU18
Mixed Main Filter Cleanliness



AHU19
Mixed Main Filter Cleanliness



AHU20
Return Main Filter Installation



AHU20 Drain Pans



AHU20
Mixed Main Filter Cleanliness



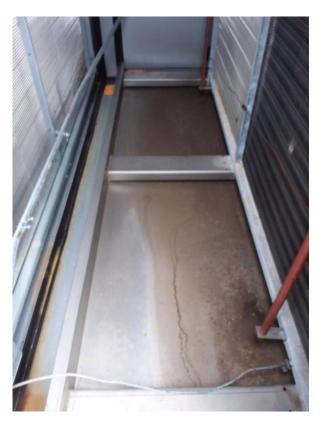
DHU01
Outdoor Main Filter Cleanliness



RAHU01
Mixed Pre-Filter Cleanliness



RAHU03
Mixed Pre-Filter Installation



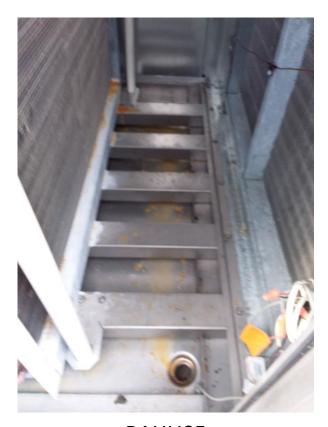
RAHU01 Drain Pans



RAHU03
Mixed Main Filter Installation



RAHU04
Mixed Main Filter Cleanliness



RAHU05 Drain Pans