# Facilities and Operations COVID Update

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# **Overview of Ventilation and Air Filtration Systems**

Overview of Cambrian's Ventilation and Air Filtration Systems are based on Santa Clara County of Public Health Department Guidance and Recommendations of Consultants

- Components of Indoor Air Quality
  - Wear a Face Covering = Preventative Measure
  - Physical Distancing
- Increase Outdoor Air Exchange
- Maintain HVAC Systems
- Portable Air Cleaners
- Other Actions and Communication
  - Consult with HVAC Expert
  - Classroom Checklist Posted
  - Update District Website

# **Components of Indoor Air Quality**

VENTILATE WITH OUTDOOR AIR **HVAC SYSTEM?** YES ..... NO Open system Open windows dampers Remember your Mask or Face Covering **INCREASE FILTER EFFICIENCY HVAC SYSTEM?** YES ..... NO Upgrade system filters to >MERV13 Prioritization of SUPPLEMENT WITH Engineering Controls to PORTABLE AIR **CLEANERS** Reduce Long-Range Airborne Transmission

### **Face Coverings**

Face coverings help reduce the risk of transmission in an indoor environment by as much as 50%.

• Face coverings must be worn by everyone when in shared indoor spaces

- Face shields may be used in addition to face coverings, but not in lieu of them
- All staff and students are encouraged to come to school with a mask; however, masks will be available onsite should a replacement mask be necessary during the day
- Adult face shields are also available at each site



# **Physical Distancing**

A typical 1,000 square foot classroom with 30 students would require a minimum of 450 CFM (cubic feet per minute) to allow for an exchange of 15 CFM per person.

• With the new social distancing guidelines in reducing occupancy, will increase the ventilation per person.

- Cambrian class sizes will be smaller in the hybrid model with approximately half the students being on campus at one time (460 - Price w/o VSP)
- Classrooms are being reconfigured to meet Santa Clara Public Health Department classroom setting requirements
- Use of outdoor learning spaces (weather permitting)

# **Outdoor Air Exchange**

Increase outdoor air circulation by opening doors and windows when safe to do so.

- With a mechanical ventilation system, evaluate the impact of open windows or doors.
- Create an airflow plan to maximize the movement of indoor air to the outside.

- All vents are being inspected and opened to full capacity
- Windows have been inspected for operability and access
- Blowers have been set to run continuously; Monday Friday, 6am 6pm





# Upgrades to the HVAC Unit

Upgrade the efficiency of your system's mechanical filter to the highest efficiency compatible with the air handling system and currently installed filter rack; ideally, filter efficiency should be MERV 13 or greater.

- Increase the percentage of outdoor air through the HVAC system, readjusting or overriding recirculation ("economizer") dampers.
- Keep the humidity between 40% and 60%.

- MERV 13 filters are being installed in all locations to be completed by 11.30.20
- In process: Outside consultant to perform environmental air quality testing to ensure we are meeting the per person cfm requirements and appropriate humidity levels
- CO2 sensors will also be purchased to monitor air quality in classrooms and workspaces installed by December 30, 2020

#### Table 1. MERV Ratings\*

MERV Rating	Average Particle Size Efficiency (PSE), microns - % Removal			Typical Controlled Contaminant or Material Source (ASHRAE 52.2)	Typical Building Applications
	0.3 - 1.0	1.0 - 3.0	3.0 - 10.0		
1 - 4			<20%	> <b>10 Microns</b> Textile Fibers, Dust Mites, Dust, Pollen	Window AC units, Common Residential Minimal Filtration
5			20 - 35	3.0 to 10.0 Microns	Instrurial Workplace, Better Residential Commercial
8			>70	Cement Dust, Mold Spores, Dusting Aids	
9		<50	>85	1.0 to 3.0 Microns	Hospital Laboratories, Better Commercial Superior REsidential
12		>80	>90	Dust	
13	<75	>90	>90	.3 to 1.0 Microns	Superior Commercial, Smoking Lounge Hospital Care, General Surgery
16	>95	>95	>90	Tobacco Smoke, Insecticide Dust	
17**	<u>&gt;</u> 99.97			<0.3 Microns (HEPA/ULPA Filters) Viruses, Carbon Dust Fine Combustion Smoke	Clean Rooms, Carcinogenic & Radioactive Matls., Orthopedic Surgery
18**	<u>&gt;</u> 99.99				
19, 20**	<u>&gt;</u> 99.999				

\*Adapted from EPA 2009; Originally form ANSI/ASHRAE Standard 52.2 - 2007. Not all levels shown \*\* Not part of the official ASHRAE Standard 52.2 Test, but added by ASHRAE for comparison purposes.

### MERV 8 vs. MERV 13



MERV 8

CONTAMINANTS CAUGHT	MERV 8	MERV 13
HUMAN HAIR	<b>I</b>	<ul> <li>✓</li> </ul>
CARPET FIBERS		<ul> <li>Image: Image: Ima</li></ul>
POLLEN		<ul> <li>Image: Image: Ima</li></ul>
DUST MITES		
MOLD SPORES		✓
PET DANDER		✓
CANDLE/TOBACCO SMOKE		✓
LUNG DAMAGING DUST		
SMOG		✓





MERV 13

### **Updates to the HVAC Systems**

- Run air handling systems for longer hours, including before and after the space is occupied.
- Seal edges of the filter to limit bypass.
- Disable demand-control ventilation (DCV) controls that reduce air supply based on temperature or occupancy, and maintain systems that increase fresh air supply
- Increase total airflow supply to occupied spaces, if possible.
- Ensure ongoing, routine maintenance of the HVAC system in all areas, but especially smaller rooms with exhaust fans, such as restrooms, laundry rooms, and kitchens.
- Monitor the effectiveness of the system by measuring ventilation directly, when possible. If possible, review specific components such as air flow rates (outdoor air vs. recirculated air) and the pressure differences between higher risk areas (e.g., bathrooms and dining areas) and other areas.

### **Portable Air Cleaners**

Portable air cleaners or purifiers should be installed in areas where minimum air exchange or MERV 13 filter recommendations may not be achieved

- Cambrian will provide portable air purifiers for rooms that do not meet the air exchange recommendations as determined in the environmental air study to be performed
- These would potentially be rooms that are not on stand alone HVAC systems (ie. shared office spaces or classrooms with shared HVAC systems; Care Rooms (alternate health office spaces where students may be exhibiting symptoms); or common spaces that may not have HVAC systems installed

# **Other Actions and Communication**

### • Facilities Website & Other Communications

- Classroom Checklist completed and posted in every room by December 18, 2020
- Safety Data Sheets (SDS) for chemicals used in cleaning and disinfecting
- Ventilation update on buildings and grounds website

### • Timeline for Completion

- MERV 13 filter installation at all sites by November 30, 2020
- Cold Craft HVAC system assessment at all sites by December 30, 2020
- Environmental air quality assessment by December 30, 2020
- Installation of CO2 sensors by December 30, 2020

### • Future Items in Process

• Purchase and installation of portable air purifiers where appropriate

# **Next Steps & References**

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- Site walkthroughs have been completed
  - Windows: 1,320 evaluated; 47 need attention
  - Blowers: 230 evaluated; 57 need attention
  - Filters: 232 filters; 67 MERV 13 installed
- Staff will begin addressing areas that need attention and arrange for contractors to repair or replace any items that are unable to resolved by District Staff

References:

- Santa Clara County Public Health Department Guidance (10.20.20)
- Reopening of Santa Clara County K-12 Schools: Classroom Settings Page 11
- Cleaning and Disinfecting Products Safety Data Sheets