

03/02/2021

Branciforte Small Schools
Attn: Trevor Miller
840 N Branciforte Ave
Santa Cruz, CA 95062

ACCO Project Number: 60510055
Project Name: Santa Cruz City Schools Ventilation Survey – Branciforte Small
FINAL REPORT

Dear Mr. Miller,

ACCO has performed a field survey of the existing HVAC units across the Branciforte Small campus. With this information and provided as-built drawings, an engineering analysis has been conducted to determine methods for improving indoor air flowrate and filtration given each building's HVAC system type. The following table identifies each building that was surveyed and its HVAC system configuration. Subsequent sections of this report include recommendations for improving indoor air quality for each HVAC system type. Please note that the listed filter recommendations are based on the product specifications included in the report's appendices.

For each room summarized in this report, a color-coded designation has been applied to describe the current status of its HVAC system:

- Green – Continuous 100% outside air during occupied hours and MERV-13 filtration are achievable with existing HVAC infrastructure
- Blue – Increased outside airflow and/or MERV-10 or higher filtration are achievable with existing HVAC infrastructure
- Orange – Existing HVAC equipment does not have means for providing outside air or filtered air; therefore, improvements to outside airflow or MERV rating are not possible. Consider providing portable filtration devices.
- White – Existing HVAC equipment is an exhaust fan that is only intended to draw air out of the space; thus, adjustments to outside airflow and filtration are not applicable.

Room Information			HVAC Information		
Number	Purpose	Type	Configuration	Filter Installed	Outside Air / Total Air %
1	Classroom	Permanent	A	MERV-10	49%
2	Classroom	Permanent	A	MERV-10	51%
3	Classroom	Permanent	A	MERV-10	54%
4	Classroom	Permanent	A	MERV-10	51%
5	Classroom	Permanent	A	MERV-10	48%
6	Classroom	Permanent	A	MERV-10	49%
6A	Classroom	Permanent	A	MERV-10	50%
7	Classroom	Permanent	A	MERV-10	56%
Library	Assembly	Permanent	A	MERV-10	49%
9	Classroom	Permanent	A	MERV-10	53%
Principal	Admin	Permanent	C	MERV-13	N/A
Admin	Admin	Permanent	A	MERV-10	53%
Staff	Admin	Permanent	D	MERV-13	N/A
Tea Room	Admin	Permanent	C	MERV-13	N/A
11	Classroom	Permanent	A	MERV-10	53%
12	Classroom	Permanent	A	MERV-10	54%
13	Classroom	Permanent	A	MERV-10	59%
14	Classroom	Permanent	A	MERV-10	49%
15	Classroom	Permanent	A	MERV-10	49%
16	Classroom	Permanent	A	MERV-10	54%
17	Classroom	Permanent	A	MERV-10	48%
Auditorium	Assembly	Permanent	B	MERV-13	68%
21	Classroom	Portable	A	MERV-13 ¹	48%
22	Classroom	Portable	A	MERV-13 ¹	37%
26	Classroom	Portable	A	MERV-13 ¹	47%
26 - Storage	Classroom	Portable	E	N/A	N/A
26 - Fire Control Panel	Classroom	Portable	E	N/A	N/A
26 - Toilet	Classroom	Portable	E	N/A	N/A
27	Classroom	Portable	A	MERV-10	46%
Counselor	Admin	Unknown	D	MERV-13	N/A
Community Coordinator	Admin	Unknown	A	MERV-13	45%
30	Classroom	Portable	A	MERV-10	60%
31	Classroom	Portable	A	MERV-10	54%
32	Classroom	Portable	A	MERV-10	31%
34	Classroom	Portable	A	MERV-10	53%
Custodian	Admin	Permanent	E	N/A	N/A
Boys' (Main)	Toilet	Permanent	E	N/A	N/A
Girls' (Main)	Toilet	Permanent	E	N/A	N/A
Staff (Main)	Toilet	Permanent	E	N/A	N/A
Unisex (2nd floor)	Toilet	Permanent	E	N/A	N/A
Adult (2nd floor)	Toilet	Permanent	E	N/A	N/A
Boys' (3rd Floor)	Toilet	Permanent	E	N/A	N/A
Girls' (3rd floor)	Toilet	Permanent	E	N/A	N/A
Kindergarten 1	Unknown	Unknown	E	N/A	N/A
Kindergarten 2	Unknown	Unknown	E	N/A	N/A
Restrooms	Toilet	Portable	E	N/A	N/A
Laundry	Admin	Unknown	E	N/A	N/A
Room 112A	Unknown	Unknown	E	N/A	N/A

¹Filter installed may be a higher MERV rating than filter recommended due to inventory limitations

Configuration A

Room is served by a standalone air conditioning unit. The unit has a fan to draw air into the room, but no means of controlling airflow out.

- Maintain outside air damper position at 100% open to improve indoor air quality
 - If the room temperature is colder (in winter) or hotter (in summer) than desired, outside air damper may be closed incrementally until acceptable room temperature is achieved. This incremental approach is recommended to ensure that maximum airflow is being provided.
- If room has operable windows and/or doors to the building exterior, consider opening them to encourage airflow out of the room
- Replace existing air filter with MERV-10 filter
 - Airflow into room may be reduced, but is not expected to affect AC unit operation
 - If AC unit cannot operate with increased filter rating, revert to MERV-8 filter

Configuration B

Room is served by a standalone air conditioning unit, and fixed gravity relief openings to allow airflow out of the room.

- Maintain outside air damper position at 100% open to improve indoor air quality
 - If the room temperature is colder (in winter) or hotter (in summer) than desired, outside air damper may be closed incrementally until acceptable room temperature is achieved. This incremental approach is recommended to ensure that maximum airflow is being provided.
- Confirm airflow path through gravity relief vents is free of obstructions
- If room has operable windows and/or doors to the building exterior, consider opening them to further encourage airflow out of the room
- Replace existing filter with MERV-13 filter
 - Airflow into room may be reduced, but should not affect AC unit operation
 - If AC unit cannot operate with increased filter rating, install MERV-10 filter

Configuration C

Room has an air conditioning unit that recirculates air within the space, but no means of drawing fresh air in.

- If outside air is ducted to the room, ensure that outside air intake louver is free of obstructions
- If room has operable windows and/or doors to the building exterior, consider opening them to encourage airflow into the room
- If the above options are unavailable, consider installing operable windows or a room air purifier to treat recirculated air with ultraviolet light and bipolar ionization
- Replace existing recirculating air filter with MERV-13 filter
 - If a MERV-13 filter is incompatible with the unit or the unit cannot operate with increased filter rating, install MERV-10 filter
 - Recirculating airflow rate may be reduced, but should not affect room temperature

Configuration D

Room has an air conditioning unit that recirculates air within the space, but no means of drawing fresh air in. Room is also served by an exhaust fan drawing air out of the space.

- If outside air is ducted to the room, ensure that outside air intake louver is free of obstructions
- If room has operable windows and/or doors to the building exterior, consider opening them to encourage airflow into the room
- If the above options are unavailable, consider installing operable windows or a room air purifier to treat recirculated air with ultraviolet light and bipolar ionization
- Operate the exhaust fan at full speed
 - If there are dampers within the exhaust fan system, set them at 100% open
- Replace existing filter with MERV-13 filter
 - If a MERV-13 filter is incompatible with the unit or the unit cannot operate with increased filter rating, install MERV-10 filter
 - Recirculating airflow rate may be reduced, but should not affect room temperature

Configuration E

Room has a fan to draw air out of the room, but no means of supplying air into it.

- Operate exhaust fans at full speed
 - If there are dampers within the exhaust duct system, set them at 100% open
- If room has operable windows and/or doors to the building exterior, consider opening them to encourage airflow out of the room

The recommendations in this report are based on observed site conditions and proposed filter product data. If further modifications are desired, ACCO would be happy to continue working with Branciforte Small on its HVAC systems.

Sincerely,

Wendy Wang, PE
ACCO Engineered Systems
Design Engineer