



# Information Regarding Ventilation & HVAC Airflow Study Reports

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*Prepared by Facilities & Operations*

*JULY 2021*

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# REQUIREMENTS AND GUIDELINES

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# CAL-OSHA REQUIREMENTS

Following the June 17 Cal-OSHA vote, the revised regulations reflect the state's latest COVID-19 public health guidance. The updates include changes to face coverings and physical distancing requirements.

- Fully vaccinated employees without symptoms do not need to be tested or quarantined after close contacts with COVID-19 cases unless they have symptoms.
- No face covering requirements outdoors (except during outbreaks), regardless of vaccination status, though workers must be trained on CDPH recommendations for outdoor use of face coverings.
- Employers may allow fully vaccinated employees not to wear face coverings indoors, but must document their vaccination status. There are some settings where CDPH requires face coverings regardless of vaccination status. In outbreaks, all employees must wear face coverings indoors and outdoors when six-foot physical distancing cannot be maintained, regardless of vaccination status.
- Employers must provide unvaccinated employees with approved respirators for voluntary use when working indoors or in a vehicle with others, upon request.
- Employers may not retaliate against employees for wearing face coverings

# CAL-OSHA REQUIREMENTS (part 2)

- No physical distancing or barrier requirements regardless of employee vaccination status with the following exceptions:
  - Employers must evaluate whether it is necessary to implement physical distancing and barriers during an outbreak (3 or more cases in an exposed group of employees)
  - Employers must implement physical distancing and barriers during a major outbreak (20 or more cases in an exposed group of employees)
- No physical distancing requirements whatsoever in the employer-provided housing and transportation regulations.
- Where all employees are vaccinated in employer-provided housing and transportation, employers are exempt from those regulations
- **Employers must evaluate ventilation systems to maximize outdoor air and increase filtrations efficiency, and evaluate the use of additional air cleaning systems.**

# CALIFORNIA DEPARTMENT OF PUBLIC HEALTH HIGHER EDUCATION GUIDELINES

All of the District facilities are in compliance with the previously issued California Department of Public Health, Higher Education Guidelines, specific to ventilation, as follows:

1. Increasing our HVAC outside air ventilation to 100%.
2. Having all HVAC systems run continuously.
3. Continued use of MERV-13 filters within HVAC systems.
4. Opening windows, where possible.
5. Placing portable HEPA air purifiers, where possible.

**Based on these guidelines and recent modifications to our HVAC systems, all of our offices and classrooms meet or exceed all federal and state guidelines and we are, therefore, confident that our offices and classrooms are prepared to be occupied.**

All central HVAC systems are now operating 100% of the time, with as much outside air being brought inside as possible. All central HVAC systems utilize MERV-13 filters. As per the guidelines SBCC advises employees to open all doors and windows (if possible) to increase ventilation and introduce as much fresh outdoor air as possible.

# Centers for Disease Control and Prevention (CDC) Recommendations on Ventilation

- CDC recommends a layered approach to reduce exposures to COVID-19. This approach includes using multiple mitigation strategies, including improvements to building ventilation, to reduce the spread of disease and lower the risk of exposure. In addition to ventilation improvements, the layered approach includes physical distancing, wearing face masks, hand hygiene, and vaccination.
- CDC also provides “Tools to improve ventilation”, which are similar to the Higher Education Guidance and are in line with the improvements the college has taken to improve ventilation.

# ASSESSMENTS USING ASHRAE

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# WHAT IS ASHRAE?

## **American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)**

- Founded in 1894, ASHRAE is a Global society advancing human well-being through sustainable technology for the built environment. Focus on building systems, energy efficiency, indoor air quality, refrigeration and sustainability within the industry.
- ASHRAE standards are developed so that HVAC and refrigeration professionals have access to up-to-date procedures when testing, installing and designing hardware. They also provide consistent terminology and information for HVAC professionals.
- ASHRAE is the foundation of HVAC recommendations utilized by architects and construction firms.

# ASHRAE STANDARD DEFINED

- The HVAC assessment reports provide tested supply airflow data and subsequent air change rates. Only HVAC systems providing outside airflow to rooms were tested.
- ASHRAE standards are a requirement for any new building design.
- Each building on campus was designed to meet existing ASHRAE standards at the time they were designed. Our older buildings are not required to meet current ASHRAE standards.

# SCOPE OF WORK FOR HVAC ASSESSMENT

- Palt and Associates, an HVAC specialist consulting firm, completed 2021 HVAC assessments across all three campuses.
- Assessments were performed prior to HEPA air purifier installations, and with all windows and doors closed, in order to test the air exchange rate produced by the HVAC system alone.
- **The scope of work was to test supply airflows for all indicated classrooms, lecture halls and offices to determine Air Change Rates for each room/area.**
- All tested airflows listed in these report can only be used to evaluate the condition of the HVAC system. The standards referenced are meant to evaluate the HVAC systems **only** and cannot in any way be used in regards to health and safety recommendations.
- Recommendations listed in the reports are based on current Centers for Disease Control (CDC), National Environmental Balancing Bureau (NEBB) and similar organization's knowledge, recommendations, and suggestions.

# WHY SOME ROOMS WERE NOT INCLUDED

- Many classrooms and offices on campus do not have HVAC systems (for example, there is no outside air being forced into the room and interior air being removed from the room to create air exchange).
- The purpose of the assessments were to test the air exchange rates of rooms based on the performance of the HVAC system.
- Therefore, rooms that do not have HVAC systems were unable to be tested (there was no air exchange to test) and were not included in the report.

# WHY WAS THE ASSESSMENT COMPLETED

- The District's focus is to exceed regulatory guidance as it pertains to health and safety.
- Having the campus HVAC systems evaluated for air flow by an external consultant exceeds guidance.
- To provide ventilation data to our employees.
- To provide valuable information to Facilities & Operations to know which HVAC systems need repairs and modifications.

# HOW TO READ THE REPORTS

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# AIRFLOW STUDY REPORTS

- Airflow Study Reports are HVAC assessments that provide air change rate data of classrooms and offices that have HVAC systems. Within the reports, the classroom/office is noted as either within or not within ASHRAE air change rate standards. The 'standards' are the guidelines to evaluate the HVAC systems.
- **Air Changes per Hour (ACH, also called Air Change Rate)** approximates how many times the air within a space is replaced each hour. ACH is a calculated value that allows standards, guidelines, and comparisons for ventilation to be made for rooms of different dimensions and which have different ventilation systems.  $ACH = (\text{ventilation rate in CFM} \times 60 \text{ minutes/hour}) / \text{room volume in cubic feet}$ .

# WHERE ARE THESE REPORTS LOCATED?

The reports are posted on our SBCC website “Return to Campus - Business Services” page under the “HVAC Reports (2021)” section.

+ SBCC > Business Services > Return to Campus

## Return to Campus – Business Services Projects

Across the campus, all college departments continue to work on the many preparations necessary for the Phase-in return to campus from July 12 to August 15, with full return on August 16, 2021.

The Business Services projects described below are in progress to ensure the college environment is ready for its students and employees return to campus. The Business Services Division aims to collaborate with departments to ensure physical campus space is a safe and healthy environment.

Return to Campus frequently asked questions by employees can be found here: [Employee Return to Campus Frequently Asked Questions](#)

The latest pandemic updates for our SBCC Campus Community can be found on the [SBCC Coronavirus \(COVID-19\) Campus Updates](#) main page.

Please visit the [Human Resources page](#) for [Return to campus](#) information for coming to campus and the training available to staff specific to COVID-19.

Expand All Collapse All

Campus Cleaning	+
Campus Safety Precautions	+
Classroom Capacities	+
Cleaning Supplies	+
Community Collaboration	+
Hand Sanitizing Stations and Wall Mounted Sanitizer	+
Health Guards	+
<b>HVAC Reports (2021)</b>	-

**Heating Ventilation and Air Conditioning (HVAC) Assessment**  
Pait and Associates, an HVAC specialist consulting firm, completed 2021 HVAC assessments across all three campuses.

These HVAC assessments were performed prior to HEPA air purifier installations, and with all windows and doors closed, in order to test the air exchange rate produced by the HVAC system alone.

Below are the reports for the airflow test study conducted at Santa Barbara City College during 2021. The scope of work was to test supply airflows for all indicated

+ SBCC > Business Services > Return to Campus

Facilities department has completed all inspections to our HVAC systems, all of our offices and classrooms meet or exceed all federal and state guidelines and we are, therefore, confident that our offices and classrooms are prepared to be occupied.

The HVAC assessment reports provide air exchange rate data of classrooms and offices that have HVAC systems. Within the reports the classroom/office is noted as either within or not within ASHRAE air exchange rate standards. If an office is not within the ASHRAE standards, we recommend a HEPA air purifier be utilized in that office. All classrooms will have portable HEPA air filters. Additionally, our facilities department will continue to work on improving airflow in the spaces that did not fall within the ASHRAE standards.

- Offices HVAC Assessment Summary/Results
- Classroom HVAC Assessment Summary/Results

Building Specific Reports: (some PDFs are pending compilation by consultant to be completed by approximately June 30, 2021)

- Supply Airflow Testing Report (select Summer classrooms Adm, DM, EBS, Hum, PE, PS, WCC) pending PDF completion
- Supply Airflow Testing Report (Administration)
- Supply Airflow Testing Report (Business Communications)
- Supply Airflow Testing Report (Campus Center)
- Supply Airflow Testing Report (Campus Store)
- Supply Airflow Testing Report (Drama Music DM)
- Supply Airflow Testing Report (Earth Biological Sciences EBS)
- Supply Airflow Testing Report (East Campus Classrooms ECC)
- Supply Airflow Testing Report (East Campus Office Center ECOC 1&2)
- Supply Airflow Testing Report (English Second Language ESL)
- Supply Airflow Testing Report (Facilities & Operations)
- Supply Airflow Testing Report (Humanities)
- Supply Airflow Testing Report (Hotel Restaurant Culinary Arts HRC)
- Supply Airflow Testing Report (Interdisciplinary Center IDC)
- Supply Airflow Testing Report (International Education Center) pending PDF completion
- Supply Airflow Testing Report (Library & Learning Resource Center LRC)
- Supply Airflow Testing Report (Marine Technology)
- Supply Airflow Testing Report (Occupational Education)
- Supply Airflow Testing Report (Orfalea Early Learning Center/Childrens Center)
- Supply Airflow Testing Report (Physical Science PS)
- Supply Airflow Testing Report (Purchasing, Security, Faculty Resource Center FRC)
- Supply Airflow Testing Report (Schott Campus)
- Supply Airflow Testing Report (Sports Pavilion, Physical Education, Life Fitness Center)
- Supply Airflow Testing Report (Student Services)
- Supply Airflow Testing Report (West Campus Classroom)
- Supply Airflow Testing Report (Wake Campus)

A second set of supplemental assessments will be performed on a sampling of spaces that did not meet the recommended air exchange rate. The supplemental reports will include having HEPA air purifiers as a part of the air exchange rate testing. These assessments are planned to be completed by Fall 2021.



# HOW TO READ THE REPORTS

## 5. Test Data Summary

The following table shows a summary of the main tested data compiled during the airflow study. More detailed information for each area tested are arranged at the end of this report.

### SS Building First Floor:

Room #	Category	Tested	
		Total SA Airflow	Calculated OSA Airflow
		CFM	CFM
100	Counseling	991	743
110	Registration	180	135
110 D	File Room	264	198
110 E	Office	107	80
110 F	Office	0	0
110 G	Office	27	20
110 H	Office	29	22
111-1	Study / Read	283	212
111-2	Office	531	398
119	Reception	163	122
120	Office	129	97
121	Office	38	29
122	Office	59	44
123	Office	66	50
124	Office	72	54
125	Office	209	157
126	Office	330	248
127	Office	338	254
128	Office	323	242
129	Office	151	113
130	Office	57	43
131	Office	45	34
132	Office	117	88
133	Office	65	49
134	Office	38	29
134 B	Office	130	98
135	Office	49	37
136	Office	49	37
137	Office	99	74
138	Office	111	83
139	Office	90	68
140	Read / Study	536	402
141	Office	30	23
142	Office	132	99
143	Office	145	109

ASHRAE STANDARD 62.1-2019 Table L-1 Ventilation Check Table		
Min. required OSA Airflow	Within ASHRAE Requirements	Recommendation
CFM	Yes / No	
264	YES	See section 5.1.1 thru 3
104	YES	See section 5.1.1 thru 3
50	YES	See section 5.1.1 thru 3
20	YES	See section 5.1.1 thru 3
10	NO	See section 5.1.1 thru 4
10	YES	See section 5.1.1 thru 3
11	YES	See section 5.1.1 thru 3
66	YES	See section 5.1.1 thru 3
18	YES	See section 5.1.1 thru 3
33	YES	See section 5.1.1 thru 3
29	YES	See section 5.1.1 thru 3
9	YES	See section 5.1.1 thru 3
8	YES	See section 5.1.1 thru 3
8	YES	See section 5.1.1 thru 3
9	YES	See section 5.1.1 thru 3
8	YES	See section 5.1.1 thru 3
8	YES	See section 5.1.1 thru 3
16	YES	See section 5.1.1 thru 3
11	YES	See section 5.1.1 thru 3
10	YES	See section 5.1.1 thru 3
14	YES	See section 5.1.1 thru 3
9	YES	See section 5.1.1 thru 3
13	YES	See section 5.1.1 thru 3
7	YES	See section 5.1.1 thru 3
10	YES	See section 5.1.1 thru 3
7	YES	See section 5.1.1 thru 3
8	YES	See section 5.1.1 thru 3
8	YES	See section 5.1.1 thru 3
10	YES	See section 5.1.1 thru 3
417	NO	See section 5.1.1 thru 4
8	YES	See section 5.1.1 thru 3
9	YES	See section 5.1.1 thru 3
8	YES	See section 5.1.1 thru 3

Room #	Category	Tested	
		Total SA Airflow	Calculated OSA Airflow
		CFM	CFM
144	Read / Study	179	134
145	Office	91	68
146	Office	72	54
147	Office	79	59
150	Office	146	110
160	Office	256	192
160 B	Office	74	56
160 C	Office	84	63
160 D	Office	73	55
160 E	Office	57	43
162	Computer Lab	353	265
171	Office	92	69
171-2	Hall	54	41
172	Office	54	41
173	Office	45	34
174	Office	0	0
175-1	Office	54	41
175-2	Office	66	50
176	Treatment	61	46
178	Office	0	0
179	Office	0	0

ASHRAE STANDARD 62.1-2019 Table L-1 Ventilation Check Table		
Min. required OSA Airflow	Within ASHRAE Requirements	Recommendation
CFM	Yes / No	
83	YES	See section 5.1.1 thru 3
9	YES	See section 5.1.1 thru 3
9	YES	See section 5.1.1 thru 3
8	YES	See section 5.1.1 thru 3
25	YES	See section 5.1.1 thru 3
45	YES	See section 5.1.1 thru 3
9	YES	See section 5.1.1 thru 3
8	YES	See section 5.1.1 thru 3
8	YES	See section 5.1.1 thru 3
8	YES	See section 5.1.1 thru 3
350	NO	See section 5.1.1 thru 4
14	YES	See section 5.1.1 thru 3
14	YES	See section 5.1.1 thru 3
10	YES	See section 5.1.1 thru 3
9	YES	See section 5.1.1 thru 3
11	NO	See section 5.1.1 thru 4
11	YES	See section 5.1.1 thru 3
9	YES	See section 5.1.1 thru 3
31	YES	See section 5.1.1 thru 3
7	NO	See section 5.1.1 thru 4
7	NO	See section 5.1.1 thru 4

*Sample pages from Student Services report pages 6-8*

# HOW TO READ THE REPORTS

*Total SA AIRFLOW = Total Supply Airflow*

*CFM = Cubic Feet per Minute*

*OSA AIRFLOW = Outside Supply Airflow*

YES or NO indicated for each room, regarding if they are within ASHRAE requirements

Room #	Category	Tested	
		Total SA Airflow	Calculated OSA Airflow
		CFM	CFM
100	Counseling	991	743
110	Registration	180	135
110 D	File Room	264	198

ASHRAE STANDARD 62.1-2019 Table L-1 Ventilation Check Table		
Min. required OSA Airflow	Within ASHRAE Requirements	Recommendation
CFM	Yes / No	
264	YES	See section 5.1, 1 thru 3
104	YES	See section 5.1, 1 thru 3
50	YES	See section 5.1, 1 thru 3

# ROOMS THAT HAVE NOT MET THE ASHRAE STANDARD

- ASHRAE standards are not a requirement for the District. They are guidelines that were used by the consultant for the Airflow Study Testing.
- The Airflow Study Reports do not indicate if a room is safe to occupy regarding the spread of COVID-19, rather it evaluates the air exchange rate in relation to the standards by ASHRAE.
- HEPA air purifiers were installed, and Facilities continues to make repairs to the HVAC systems, to improve the air quality in the rooms that did not meet the airflow quality ASHRAE standards.

# WHAT ABOUT ROOMS THAT DO NOT HAVE HVAC

- The recommendations for classrooms, offices, and spaces that do not have HVAC systems are:
  - Open windows and doors to increase outdoor airflow, if possible
  - Install portable HEPA air purifiers
  - Reduce occupants in classrooms

# VENTILATION IMPROVEMENTS

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# FUNDING AVAILABLE

- The Higher Education Emergency Relief Funds Act (HEERF) provided funds to SBCC that has been utilized by Facilities as follows:
  - Install new MERV13 filters in our air handler units.
  - Clean and sanitize the coils in our air handlers in both January 2020 and June 2021.
  - Purchase spare parts to limit down time during future system malfunctions.
  - Large quantities of HEPA air purifiers for classrooms and offices.
  - Repair of Jurkowitz Theatre heater (which previously was not operational).
  - Complete various repairs across the campus.

# HOW ARE WE USING THE AIRFLOW STUDY REPORTS?

**Facilities & Operations is making targeted repairs.**

- The assessments provided valuable information, previously unavailable, to the Facilities Dept on what classrooms/offices are in need of repairs relating to air flow.
- Over the years, dampers/vents have been closed and/or restricted to decrease airflow as requested by individuals/departments. Those dampers/vents are being reopened to increase ventilation.
- Window repairs (where possible) are also in progress to allow for increased ventilation.

# HVAC THERMOSTAT SETTINGS

Per CDC recommendations: Turn off any demand-controlled ventilation (DCV) controls that reduce air supply based on occupancy or temperature during occupied hours. Set the fan to operate the fan continuously, even when heating or air-conditioning is not required.

SBCC has set HVAC thermostats in office/shared spaces and no longer allow for local control. Temperature levels are centrally operated at a set temperature range of 70° to 74° F. If there are operational issues with any HVAC systems, submit a work order to Facilities & Operations.



# HEPA AIR PURIFIERS

- Palt and Associates, the Districts HVAC specialist consulting firm, recommended the District purchase HEPA Air Purifiers from Medify Air and Spycor Environmental.
- All classrooms will have HEPA air purifiers installed by August 16, 2021.
- The size of the HEPA air purifiers are matched to the square footage of the office, classroom or shared space.
- All employees can request a portable HEPA air purifier for their office by submitting a work order to facilities.

# CONCLUSION

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# CAN SBCC OFFICES AND CLASSROOMS BE OCCUPIED?

**YES, offices and classrooms can be occupied.**

The District will continue to follow the previously published California Department of Public Health, Higher Education Guidelines from SB County Department of Health, specific to ventilation, as follows:

1. Increasing our HVAC outside air ventilation as much as possible.
2. Having all HVAC systems run continuously.
3. Continued use of MERV-13 filters within HVAC systems.
4. Opening windows, where possible.
5. Utilize portable HEPA air purifiers (these portable HEPA air purifiers also come with ionization capability)

Based on these guidelines and recent modifications to our HVAC systems, all of our offices and classrooms meet or exceed all federal and state guidelines and we are, therefore, confident that our offices and classrooms are prepared to be occupied.

# CAN SBCC OFFICES AND CLASSROOMS WITHOUT HVAC BE OCCUPIED?

**YES, offices and classrooms without HVAC systems can be occupied.**

For offices and classrooms without HVAC, Palt and Associates provided the following recommendations, which we are implementing:

- Open windows to increase outside air amount and fresh air circulation throughout the room, to increase the outside airflow in the classroom.
- Minimize classroom density.
- Place portable HEPA filter air purifiers in classrooms of concern. These units recirculate room air at a specified rate (can be tested) through a system of pre-filter and HEPA filters and help provide clean filtered air to the area.

# UPDATES AND NEXT STEPS

- The eight (8) classrooms/offices in the Student Services Building that did not meet the ASHRAE standards during the original test were re-tested at the end of June.
  - After modifications were made to the HVAC systems in those rooms, five (5) of the eight (8) rooms did meet the ASHRAE standards.
  - Three (3) of the eight (8) rooms continue to require modifications and will be retested in the Student Services Building. (They are SS174, SS178, SS179)
- Palt & Associates will be on campus July 7 and 8 to perform sample testing of offices and classrooms that did not meet the ASHRAE standards to determine if the HEPA air purifiers improved the air exchange rate.

# ADDITIONAL INFORMATION

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# LAYERS OF PROTECTION AGAINST COVID

In June 2021, our Santa Barbara County Public Health liaison shared the following with the college in regards to COVID mitigation strategies:

“The best way to prevent the spread of COVID is thinking about barriers or layers of protection. Vaccination is the first layer of protection. It has been found to be highly effective. Face coverings, physical distance, hygiene etiquette (hand washing and cleaning), and ventilation are probably the next layers of protection. Thus, if the school is proposing multiple layers of protection, each layer is not independent and does not need to be at a highly stringent level to be effective.”

Susan Klein-Rothschild

# IMPACT OF ROOM CAPACITY ON AIRFLOW

- As a general rule, the greater the number of people in an indoor environment, the greater the need for ventilation with outdoor air. As mentioned in the HVAC assessments, one of the recommendations is to reduce the number of students in classrooms if possible.

## **Room Capacity Recommendations:**

- Palt & Associates recommended to not exceed classroom capacity limits (all testing was performed assuming normal occupancy rate).



# REQUESTING HEPA AIR PURIFIERS OR HEALTH GUARDS

- All employees can request a portable HEPA air purifier for their office by submitting a work order to facilities.
- If a health guard is needed or a modification to an already installed health guard is needed in your area, please submit a work order to facilities.

Work order link can be found here: <https://www.sbcc.edu/facilities/workorders.php>

# WHO TO CONTACT WITH QUESTIONS

General Questions: [Facilities@sbcc.edu](mailto:Facilities@sbcc.edu)

- ❖ Rob Morales, Director of Facilities & Operations  
[moralesr@sbcc.edu](mailto:moralesr@sbcc.edu)
- ❖ Carlos Campos, Environmental Health & Safety Specialist  
[c.campos@pipeline.sbccc.edu](mailto:c.campos@pipeline.sbccc.edu)

# IMPACT ON ENERGY USAGE

At this point in time, we are running our units at maximum to introduce 100% outside air into our buildings 24/7. This effort equates to increased energy consumption as the units are working harder to pull air through the MERV-13 filters and air handlers.

Newer energy efficient HVAC systems are not designed to run 24/7 or to pull in a majority of outside air.

# DEFINITIONS

**Heating Ventilation and Air Conditioning (HVAC):** The system that provides heating and cooling to buildings.

**Minimum Efficiency Reporting Value (MERV or MERV13):** This is a measurement scale designed by the American Society of Heating Refrigeration and Air-conditioning Engineers to report the effectiveness of air filters in more detail.

**High Efficiency Particulate Air (HEPA) Filter:** This filter is an efficiency standard of air filter, where filters meeting the HEPA standard must satisfy certain levels of efficiency.

**What does a HEPA air purifier do?** A HEPA air purifier removes Particulate Matter (PM) from the ambient air and recirculates the filtered air.

