

This ventilation assessment checklist is a tool for assessing the readiness state of any Army facility heating, ventilation, air conditioning (HVAC) system for optimal infectious disease mitigation. It is specifically created for use during the Coronavirus Infectious Disease 2019 pandemic. This checklist is intended to help the user identify a building's current state of COVID-19 ventilation risk mitigation controls, document their findings, and collect data to complete a risk assessment. The controls are also beneficial for controlling other respiratory or influenza-like illnesses.

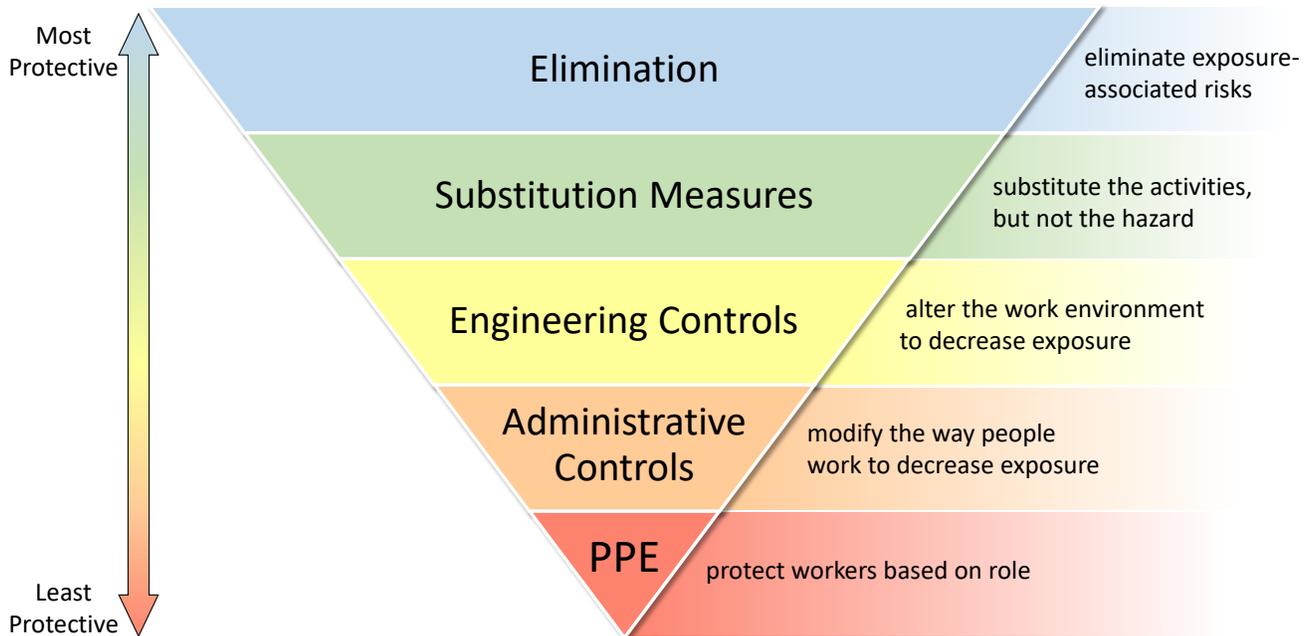
NOTE: This checklist includes references to supplemental air cleaning systems. These referenced systems are additional and independent of the primary ventilation controls of a facility as provided by an HVAC system. Before considering these additional controls, efforts should be exerted to ensure primary controls (HVAC system) are at optimal working conditions.

This checklist should not be considered all-encompassing, and should be modified to fit the diverse Army facilities. It is important that a variety of qualified individuals conduct the assessment and discuss findings, as differing specialties will be able to assess the facility more completely. Suggested qualified individuals include, but are not limited to, the organization's Department of Public Works, Facilities Engineers, and Industrial Hygiene.

The checklist utilizes the Army Public Health Center's "COVID-19 Hierarchy of Controls for Workplace Operations" as found in the "Sustaining Workplace Operations" guidance. The checklist focuses only on ventilation Engineering Controls. To ensure a safe working environment, additional controls, non-ventilation Engineering Controls, and Administrative Controls must also be considered.

Section 1

COVID-19 Hierarchy of Controls for Workplace Operations



Adapted from NIOSH Hierarchy of Controls



For current COVID-19 information:

<https://phc.amedd.army.mil/covid19>

<https://www.coronavirus.gov/>

The Military Health System Nurse Advice Line is available 24/7:

Call 1-800-874-2273 option #1

or visit <https://www.health.mil/I-Am-A/Media/Media-Center/NAL-Day-at-a-glance>

For more information, contact your installation's Department of Public Health



Public Health
Prevent. Promote. Protect.

Army Public Health

The Army COVID-19 Information Hotline:

1-800-984-8523

Overseas DSN 312-421-370

Stateside DSN 421-3700

Primary Ventilation Engineering Controls Assessment

The following five questions are to be used to assess the current state of the ventilation systems within a facility. Every effort to ensure these primary ventilation controls are operating at optimal conditions should be taken. Only after fully optimizing existing systems should supplemental ventilation controls (Section 2) be considered.

Question 1

Is the Heating Ventilation and Air Conditioning (HVAC) system providing proper ventilation rates and maintaining thermal comfort? (A well-functioning HVAC system will provide proper airflow, temperature, and humidity to building occupants.)		
	Unacceptable	The HVAC system is not functioning properly (e.g., not providing sufficient airflow, not maintaining temperature and relative humidity parameters, exhaust air fans not functioning). Routine maintenance of the HVAC system is not conducted.
	Nominal	The HVAC system is functioning properly for the building and occupants. Routine maintenance of the HVAC system is conducted.
	Good/Ideal	The HVAC system functions properly, and has been evaluated and adjusted for pandemic conditions (e.g., total airflow has been increased, if necessary, to occupied areas, exhaust air fans functioning properly, temperature and relative humidity parameters maintained). Routine maintenance of the HVAC system has been reviewed and adjusted for pandemic conditions.
	N/A	No HVAC system exists for the building.
Assessment Rationale		
Notes		

References:

- ASHRAE Standard 180-2018, Standard Practice for the Inspection and Maintenance of Commercial HVAC Systems.
- ASHRAE. 2020. Epidemic Task Force Building Readiness Guidance.
- APHC TIP 98-113-0420 – “Measures to Modify Building HVAC for Health and Comfort during the COVID-19 Pandemic.”
- American Industrial Hygiene Association, Back to Work Safely: <https://www.backtoworksafely.org/>
- TA-559-0620. SWO_Building Readiness Annex 27APR2021

Question 2

Have changes been made to the HVAC system outdoor air ventilation rate? (Increasing outdoor air is a mitigation technique to lower indoor air contaminants through dilution.)		
	Unacceptable	No changes have been made. The HVAC system does not provide outdoor air sufficient to meet design and ASHRAE 62.1 guidance.
	Nominal	No changes have been made. The HVAC system provides outdoor air sufficient to meet design and ASHRAE 62.1 guidance. If determined necessary by facilities engineering personnel, windows and doors can be opened to increase circulation of outdoor air meeting minimum outdoor air quality requirements when thermal and humidity conditions allow.
	Good	The outdoor air ventilation rate is maximized to the HVAC system limits while maintaining indoor temperature and humidity for comfort.
	Ideal	The HVAC system outdoor air ventilation rate is designed for 100%, allowing no recirculation of air back into the building/space while maintaining indoor temperature and humidity for comfort. Any heat recovery equipment is evaluated for pandemic conditions.
	N/A	No HVAC system exists for the building.
Assessment Rationale		
Notes	As greater numbers of persons are anticipated to occupy the building, the outdoor air ventilation rate should be based on those anticipated numbers.	

References:

- ASHRAE Standard 180-2018, Standard Practice for the Inspection and Maintenance of Commercial HVAC Systems.
- ASHRAE. 2020. Epidemic Task Force Building Readiness Guidance.
- APHC TIP 98-113-0420 – “Measures to Modify Building HVAC for Health and Comfort during the COVID-19 Pandemic.”
- TA-559-0620. SWO_Building Readiness Annex 27APR2021

Question 3

Have there been changes made to the HVAC system filters? (Increasing filter efficiency is a mitigation technique to decrease indoor air contaminants through filtration.)		
	Unacceptable	No filters in place, ill-fitting filters in rack (gaps, damage, bowing, etc.), or standard filters in place without change-out schedule established and followed. No replacement filters in inventory or attainable.
	Nominal	Designed Minimum Efficiency Reporting Value (MERV) filters properly in place with proper change-out schedule established and followed. Replacement filters in inventory or attainable.
	Good	Highest MERV filters able to be handled by existing system properly in place and change-out schedule established and followed. Replacement filters in inventory or attainable.
	Ideal	HVAC system accommodates, or is redesigned to accommodate, \geq MERV 13 filters properly in place with change-out schedule established and followed. Replacement filters in inventory.
	N/A	No HVAC system exists for the building.
Assessment Rationale		
Notes		

References:

- ASHRAE Standard 180-2018, Standard Practice for the Inspection and Maintenance of Commercial HVAC Systems.
- ASHRAE. 2020. Epidemic Task Force Building Readiness Guidance.
- APHC TIP 98-113-0420 – “Measures to Modify Building HVAC for Health and Comfort during the COVID-19 Pandemic.”
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- TA-559-0620. SWO_Building Readiness Annex 27APR2021

Question 4

Have there been changes made to increase the HVAC system run time? (Increased run time increases dilution of indoor air to reduce air contaminants before, during, and after occupation of the building.)		
	Unacceptable	No changes made. The HVAC system does not run the entire time that the building is occupied.
	Nominal	No changes have been made. The HVAC system is run in occupied mode for the duration of building occupancy.
	Good	The HVAC system is run in occupied mode for at least 2 hours before and after occupancy, or the equivalent of 3 air changes of outdoor air.
	Ideal	The HVAC system is run in occupied mode continually.
	N/A	No HVAC system exists for the building.
Assessment Rationale		
Notes		

References:

- ASHRAE Standard 180-2018, Standard Practice for the Inspection and Maintenance of Commercial HVAC Systems.
- ASHRAE. 2020. Epidemic Task Force Building Readiness Guidance.
- APHC TIP 98-113-0420 – “Measures to Modify Building HVAC for Health and Comfort during the COVID-19 Pandemic.”
- American Industrial Hygiene Association, Back to Work Safely: <https://www.backtoworksafely.org/>
- TA-559-0620. SWO_Building Readiness Annex 27APR2021

Question 5

Has the HVAC supply and return layout been evaluated? (Supply diffusers provide “clean” air while return/exhaust diffusers remove potentially “dirty” air. The placement of supply and exhaust or return grilles encourages mixing of air in the space or, if necessary for the space, creates directional airflow.)		
	Unacceptable	No evaluation of the HVAC supply and return/exhaust air diffusers, dampers, or directional airflow has been conducted.
	Nominal	Evaluation of the HVAC supply and return/exhaust air diffusers, dampers, or directional supply has been conducted. Suggested modifications have been reviewed and accepted, but have not yet been fully completed.
	Good	Evaluation of the HVAC supply and return/exhaust air diffusers, dampers, or directional supply has been conducted. While suggested modifications are pending/in-process, personnel have been relocated to locations with either directional airflow or well-mixed air.
	Ideal	Evaluation of HVAC supply and return/exhaust air diffusers, dampers, or directional supply has been conducted. Areas of deficiency have been modified to ensure well-mixed air. Locations with directional airflow ensure that personnel are not subject to potentially contaminated air.
	N/A	No HVAC system exists for the building.
Assessment Rationale		
Notes		

References:

- Centers for Disease Control and Prevention. COVID-19 Employer Information for Office Buildings. <https://www.cdc.gov/coronavirus/2019-ncov/community/office-buildings.html>
- ASHRAE. 2020. Epidemic Task Force Building Readiness Guidance.
- APHC TIP 98-113-0420 – “Measures to Modify Building HVAC for Health and Comfort during the COVID-19 Pandemic.”
- American Industrial Hygiene Association, Back to Work Safely: <https://www.backtoworksafely.org/>

Section 2

Supplemental Ventilation Controls

There are a wide variety of supplemental ventilation controls on the market. They all do not perform the same function or operate at the same efficiency. Care must be taken if employing a supplementary ventilation control system to ensure that it is appropriate for the location

NOTE: Supplemental ventilation control systems should only be considered after the primary ventilation engineering controls have been optimized to existing pandemic conditions.

Below are a list of supplementary systems reviewed by the US Army Public Health Center (APHC). Further information on these systems can be found on the APHC public website:

1. Portable High-Efficiency Particulate Air (HEPA) Filtration Units

APHC Technical Information Paper (TIP) 98-124-0820: Considerations for the Use of Portable High-Efficiency Particulate Air (HEPA) Filtration Units

<https://phc.amedd.army.mil/PHC%20Resource%20Library/portable-hepa-filtration.pdf#search=considerations%20for%20use%20of>

2. Ultraviolet Germicidal Irradiation (UVGI)

APHC TIP 98-128-1120: Considerations for the Use of Ultraviolet Germicidal Irradiation (UVGI)

<https://phc.amedd.army.mil/PHC%20Resource%20Library/cv19-considerations-for-uv-irradiation.pdf#search=considerations%20for%20use%20of>

APHC TIP 24-103-1020: Effectiveness and Safety of Ultraviolet Germicidal Irradiation Lamps Used for Air and Surface Disinfection

<https://phc.amedd.army.mil/PHC%20Resource%20Library/cv19-effectiveness-safety-uv-light.pdf>

3. Dry Hydrogen Peroxide

APHC TIP 98-120-0620: Cleaning and Disinfection Guidelines During COVID-19

[https://phc.amedd.army.mil/PHC Resource Library/cv19-cleaning_and_disinfection_guidelines.pdf](https://phc.amedd.army.mil/PHC%20Resource%20Library/cv19-cleaning_and_disinfection_guidelines.pdf)

4. Ionized Air Filtration

APHC TIP 98-126-0820: Considerations for the Use of Ionized Air Filtration Units to Mitigate COVID-19

<https://phc.amedd.army.mil/PHC%20Resource%20Library/cv19-use-ionized-air-filtration-units.pdf#search=ionized>