

Sustainable Response to Covid-19 Task Group Decision Guide

US General Services Administration

Green Building Advisory Committee

Cleaning: Air			
Facility Re-opening Guidance	Sustainability Implications	Health and Wellness Implications	Considerations
<p>HVAC System Assessment</p> <ul style="list-style-type: none"> • Verify system performance and implement cost effective improvements to address significant deficiencies. • Include evaluation of system condition, e.g., cleanliness, damaged components, etc. <p>References: ASHRAE Epidemic Building Readiness Returning to OPM Facilities Preparedness Guide</p>	<ul style="list-style-type: none"> • Assessment may identify system issues that require changes to meet acceptable indoor environmental conditions that result in additional energy or water consumption. 	<ul style="list-style-type: none"> • Assessment may identify system issues which inhibit delivery of acceptable indoor environmental quality. 	<ul style="list-style-type: none"> • Verify that design intent conforms to current applicable standards, as well as standards in effect during design. • Retro-commission existing building systems, especially if the system condition is poor. • Review system maintenance procedures (e.g., filter replacement). • Assure that any system modifications (e.g., conversion of constant volume to VAV) and space use changes meet current standards. • Update system documentation to reflect current conditions. <p>Resources: Standard 180-2018 -- Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems ENERGY.GOV Commissioning in Federal Buildings Determining Compliance with the Guiding Principles for Sustainable Federal Buildings Sustainable Facilities Tool COVID-19 Resources GSA Sustainable Facilities Tool Building O&M Services ASHRAE Guideline 11-2018, Field Testing of HVAC Control Components</p>
<p>Ventilation, Filtration, Air Cleaning</p> <ul style="list-style-type: none"> • Ventilation - Required minimum outdoor air (e.g., ASHRAE 62.1) • Filtration – Increase filtration for recirculated air (targeting MERV 13 filters with effective gaskets and racking) when physically practical without negatively impacting air flow, ventilation and system capacity. • Air cleaners – standalone HEPA filters, UV-C or other technologies demonstrated to be safe and effective <p>References: CDC Ventilation in Buildings ASHRAE Increased Ventilation ASHRAE Increased Ventilation Control ASHRAE Upgrading & Improving Filtration ASHRAE UVGI Systems ASHRAE Bipolar Ionization and other Emerging Technologies</p>	<ul style="list-style-type: none"> •Increasing ventilation rates beyond the ASHRAE Standard 62.1 can increase energy use under certain weather and operating conditions. •Increasing filter MERV rating can increase fan energy and reduce capacity in some systems. •Air cleaners can reduce energy use associated with increased ventilation and filtration but only remove specific contaminants. •Natural ventilation (e.g., open windows) can increase energy use. 	<ul style="list-style-type: none"> •Increasing ventilation rates beyond ASHRAE 62.1 can have a positive impact on occupant health and wellness if the delivered air is clean and dry. •Increased filtration can reduce the impact of outdoor and indoor air pollution on occupants. •Natural ventilation (e.g., open windows) can introduce poor quality outdoor air. 	<ul style="list-style-type: none"> •Consider system type and facility location when upgrading mechanical systems and engineering controls – avoid generic “one-size-fits-all” solutions. •Standalone air treatment devices may deliver higher levels of clean air delivery performance than modifications to central air handling systems and be more cost effective and energy efficient than increasing rates of outdoor air ventilation. The outdoor air change rate through ventilation can be combined with the rate of contaminant removal through increased filtration or air cleaning to achieve a desired overall contaminant removal rate. <p>Resources: ASHRAE Practical Approach to Increase MERV in an AHU ASHRAE Calculation Approach to Increase MERV in an AHU CDC Considerations to Improve Ventilation CDC Ventilation FAQs HHS Basic Upper-Room Ultraviolet Germicidal Irradiation Guidelines for Healthcare Settings GSA Sustainable Facilities Tool System Overview EPRI Light-Based Technologies for Air and Surface Disinfection IUVA Fact Sheet on COVID-19 IES Germicidal Ultraviolet (GUV) FAQs</p>
<p>Air Distribution</p> <ul style="list-style-type: none"> •Promote mixing while avoiding strong air currents in occupied zone –not applicable for displacement ventilation systems. <p>References: ASHRAE Building and Space Pressure</p>		<ul style="list-style-type: none"> •Excessive horizontal airflow is dangerous because it can increase transmission of aerosolized viruses in addition to negatively impacting occupant comfort 	<ul style="list-style-type: none"> •Test and balance services can be used to verify proper air distribution. •Room airflow dynamics and air distribution pathways need to be evaluated to determine if more turbulent flow at higher velocities is present and would be more likely to carry droplets across the space.

Cleaning: Air (continued)

Facility Re-opening Guidance	Sustainability Implications	Health and Wellness Implications	Considerations
<p>System Operations</p> <ul style="list-style-type: none"> Maintain and dynamically adjust temperature and relative humidity set points per the sequence of operations Maintain design maximum outdoor air when occupied (disable demand controlled ventilation) Use occupied mode whenever people (e.g. housekeeping staff) are present Continually evaluate filter pressure drop and change out filters at final filter ΔP Inspect filters every week to confirm filters are not experiencing bypass Flush buildings with 3 equivalent air changes pre-occupancy Assure that energy recovery devices don't cross contaminate return and supply air flows. <p>References: ASHRAE Building Readiness General Recommendations ASHRAE Pre- or Post-Occupancy Flushing Strategy ASHRAE Energy Recovery Ventilation Systems Operations Considerations</p>	<ul style="list-style-type: none"> Controlling humidity to between 40-60% RH, as some recommend, can significantly increase energy use in some locations. Disabling demand controlled ventilation will increase energy use in spaces with variable occupancy. 	<ul style="list-style-type: none"> ASHRAE 62.1 contains moisture management requirements to limit mold growth in some locations, and proper system design and maintenance is required to avoid other IAQ problems. Air flushing prior to occupancy could support health and wellness, and potentially comfort. Some energy recovery ventilators can lead to cross contamination of airstreams. 	<ul style="list-style-type: none"> Use of automated building controls should be considered to schedule and monitor system operations with occupancy overrides. Designating spaces as temporarily not occupied could allow reduced energy use for maintaining space conditions and powering plug-load devices. <p>Resources: ASHRAE Indoor Air Quality Design Guide</p>
<p>Building Automation Systems</p> <ul style="list-style-type: none"> Make necessary control sequence changes to meet operational guidelines and verify the effect of the changes and verify performance through trend reports, physical measurements or standalone data loggers. Consider including an automated response to return to the original sequences (or pre and post pandemic sequences) at the push of "virtual" button. <p>References: ASHRAE Building Automation and Control System Considerations</p>	<ul style="list-style-type: none"> Care should be taken to limit access to the initiation of any automated sequences as they may have a large energy, IAQ and comfort impact on your facility. 	<ul style="list-style-type: none"> Control sequences can be programmed to operate in modes specifically intended to support improved indoor environmental conditions (e.g., 30% increased ventilation). Environmental control based on individual comfort preferences can increase occupant satisfaction and effectiveness 	<ul style="list-style-type: none"> After determining what sequence of operation changes are appropriate, make small changes to the system incrementally and monitor for a few days or through some varying weather conditions to make sure the system and building is operating as expected. Existing alarm parameters may need to be adjusted during these new sequences as the original "normal" conditions may not be able to be met. <p>Resources: ASHRAE Building Readiness Building Automation Systems (BAS) Considerations</p>
<p>System Environmental Monitoring</p> <ul style="list-style-type: none"> Measure/trend environmental conditions including temperature (dry bulb), relative humidity, carbon dioxide concentration, zone population, etc. Follow-up and investigate out of acceptable range conditions. <p>References: ASHRAE Building Automation and Control System Considerations</p>	<ul style="list-style-type: none"> Use of indoor environmental monitoring to confirm proper HVAC system operation can help reduce energy use. 	<ul style="list-style-type: none"> Use of indoor environmental monitoring to confirm proper HVAC system operation can help assure acceptable indoor environment conditions. Carbon dioxide concentration can be an indicator for outdoor air ventilation rates per occupant, but there is no single value that applies to all occupancies and intended ventilation rates, nor is there an indoor standard for non-industrial environments. 	<ul style="list-style-type: none"> Evaluate capabilities of existing systems and controls to provide recommended monitoring. (H) Set targets and acceptable ranges for environmental conditions, for example using WELL, Fitwel, RESET and other guidelines. Mobile/handheld devices may be used if central monitoring not available or cost prohibitive. <p>Resources: Guideline 1.4-2019 -- Preparing Systems Manuals for Facilities GSA Sustainable Facilities Tool Enhancing Health with Indoor Air Fitwell Resources</p>
<p>Isolation Rooms</p> <ul style="list-style-type: none"> Follow ANSI/ASHRAE/ASHE Standard 170 Negative Pressure to 0.01 inches of water Twelve air changes (HEPA recirculation allowed) All air exhausted to outdoors <p>References: ASHRAE Pressure Control Considerations</p>	<ul style="list-style-type: none"> Isolation rooms have significant energy requirements due to high outdoor ventilation and room pressurization requirements. Air treatment devices can consume significant amounts of energy 	<ul style="list-style-type: none"> Isolation rooms provide high levels of indoor quality Beyond Covid-19, the space could be a general purpose sick room. 	<ul style="list-style-type: none"> Consider creation of isolation rooms to temporarily isolate COVID-19 positive or symptomatic occupants (potentially using a multi-purpose room) in federal facilities. Consider room-based air cleaning devices that have been tested to AHAM AC-1-2020, and define clear policies for use Use BAS to schedule for unoccupied times. Consider energy draw from air treatment devices. <p>Resources: ANSI/ASHRAE/ASHE Standard 170-2017, Ventilation of Health Care Facilities</p>
<p>Special needs/high risk populations</p> <ul style="list-style-type: none"> Evaluate need for additional risk mitigation measures Design spaces for different populations and their specific vulnerabilities. <p>References: ASHRAE HVAC System Considerations ASHRAE Pressure Control Considerations ASHRAE Post-Epidemic Conditions in Place Prior to Occupying Considerations</p>	<ul style="list-style-type: none"> The application of some supplemental engineering controls to address high risk populations may increase energy use. Tracking and tracing applications can provide occupant density information useful in optimizing energy use and space design. 	<ul style="list-style-type: none"> Policies to encourage walking, bike riding and exposure to the outdoors can provide health and wellness benefits. 	<ul style="list-style-type: none"> Implement and enforce masking, social distancing and handwashing to complement space design and engineering controls to protect at-risk populations. <p>Resources: CDC Using Personal Protective Equipment (PPE) A Five-Layered Defense for Workplace Reopening, Harvard Gazette Understanding the Touchless Workplace, Gensler</p>

Cleaning: Surfaces [Cleaning procedures are not to be taken as a substitution for physical distancing or ventilation improvements.]

Impacts	Fomite Description	Sustainability Implications	Health and Wellness Implications	Considerations
<p>Property - organized from least to most likely to touch or encounter exposure. A fomite is a high touch surface. The indirect transmission of a pathogen occurs by touching a contaminated surface and then touching face, nose, mouth or eyes (in the case of SARS-CoV-2 virus responsibility for COVID-19). Cleaning and disinfection plays a role in reducing the spread of infection. Because SARS-CoV-2 is both a community acquired infection (CAI) as well as a healthcare acquired infection (HAI), the potential of transmission is greater. In addition to surfaces and cleaning and disinfection playing a role in reducing the spread of infection, cleaning and disinfecting chemistry can degrade surfaces. When a damaged surface is present it has the potential for becoming a reservoir for pathogens, contributing to the indirect vector of transmission by touching an infected surface and in turn touch the face, nose, mouth or eyes.</p>	<p>Door Knobs, Pull Handles/Push Plates, Cabinetry Handles, Grab Bars, Handrails, Light Switches, Room Controls (i.e. thermostats, sensors, etc.)</p> <p>Seating and workspaces (chairs, couches, desks, tables)</p>	<p>Action: Establish frequency of cleaning and disinfection based on use pattern, type of occupant, and occupancy density.</p> <p>Risk to material: (Low) abrasion of any polymer-coated devices in this category. Discoloration and degradation of control may occur due to cleaning protocol.</p> <p>Action: Determine whether this is single use or shared seating solution to determine frequency of cleaning and disinfection. Establish frequency based on type of space and location, shared space or individual space, prioritizing high traffic use areas shared by multiple people.</p> <p>Risk: Seating components and materials can degrade when harsh chemicals are applied. Plastic laminated surfaces may degrade faster than solid surface material, depending on the chemistries used for cleaning and disinfecting. Prioritizing less-caustic chemicals that are effective against pathogens should be evaluated.</p> <p>Note: Focus on cleaning any visible dirt or debris. The porous nature of fabric chairs and armrests make these surfaces difficult to disinfect.</p>	<p>Action: establish frequency based on use pattern, type of occupant, and occupancy density.</p> <p>Risk: Surface to person transmission of pathogen and exposure to airborne cleaning/disinfecting chemicals.</p> <p>Note: Growing scientific evidence points to surface to person transmission as a low probability event for SARS-CoV-2 infection. Furthermore, exposure to cleaning/disinfecting chemicals is a low risk given that both GSA and CDC guidance requires custodial staff to wear disposable gloves (e.g., latex or nitrile) and use chemicals in accordance with manufacturer instructions, including any additional personal protective equipment.</p> <p>Action: Establish frequency of cleaning and disinfection based on use pattern and occupancy density. Discourage food consumption except in areas designated for this activity and in alignment with pest management policies.</p> <p>Risk: Surface to person transmission of pathogen and exposure to airborne cleaning/disinfecting chemicals.</p> <p>Note: Growing scientific evidence points to surface to person transmission as a low probability event for SARS-CoV-2 infection. Furthermore, exposure to cleaning/disinfecting chemicals is a low risk given that both GSA and CDC guidance requires custodial staff to wear disposable gloves (e.g., latex or nitrile) and use chemicals in accordance with manufacturer instructions, including any additional personal protective equipment.</p>	<ul style="list-style-type: none"> ● Priority should be given to SaferChoice Disinfectants if available and follow label instructions. A list of SaferChoice disinfectants on List N is available at www.epa.gov and check the box "Disinfectants for use against the coronavirus SARS-CoV-2 (COVID-19)" in the search box. ● Utilize appropriate PPE for individuals cleaning and disinfecting, including maintenance & environmental services staff or contractors, end users, and occupants. ● CDC recommended handwashing practices after cleaning and disinfecting protocol has been executed. <ul style="list-style-type: none"> ● Priority should be given to SaferChoice Disinfectants if and follow label instructions. A list of SaferChoice disinfectants on List N is available at www.epa.gov and check the box "Disinfectants for use against the coronavirus SARS-CoV-2 (COVID-19)" in the search box. ● Utilize appropriate PPE for individuals cleaning and disinfecting, including maintenance & environmental services staff or contractors, end users, and occupants. ● CDC recommended handwashing practices after cleaning and disinfecting protocol has been executed. ● Verify with seating manufacturer cleaning and disinfecting chemicals from EPA List N that will reduce the possibility of surface degradation. Request manufacturers' minimum performance ASTM Testing results and for durable coated fabrics used for upholstery, request compliance with CFFA Healthcare 201A Standard for healthcare settings and CFFA-100, CFFA 141, CFFA- 110, and CFFA-11 for settings other than healthcare. ● Verify cleaning and disinfecting chemicals from EPA List N that will reduce the possibility of surface degradation with the plastic laminate and solid surface manufacturer. Request from manufacturers' minimum performance ASTM Testing results for installed products demonstrating chemicals tested on material and resulting impacts.

Cleaning: Surfaces (continued)

<p>Property - organized from least to most likely to touch or encounter exposure. A fomite is a high touch surface. The indirect transmission of a pathogen occurs by touching a contaminated surface and then touching face, nose, mouth or eyes (in the case of SARS-CoV-2 virus responsibility for COVID-19). Cleaning and disinfection plays a role in reducing the spread of infection. Because SARS-CoV-2 is both a community acquired infection (CAI) as well as a healthcare acquired infection (HAI), the potential of transmission is greater. In addition to surfaces and cleaning and disinfection playing a role in reducing the spread of infection, cleaning and disinfecting chemistry can degrade surfaces. When a damaged surface is present it has the potential for becoming a reservoir for pathogens, contributing to the indirect vector of transmission by touching an infected surface and in turn touch the face, nose, mouth or eyes.</p>	<p>Flooring (based upon the CDC Guidance, flooring is considered a high touch surface, not in the traditional sense of direct hand contact, but for two other reasons:</p> <ol style="list-style-type: none"> 1. If a floor is contaminated and any item is dropped onto the surface and picked up, the item can be an indirect vector of transmission. 2. When a floor is cleaned and disinfected, if water and chemistry used for mechanical cleaning and disinfection is not changed frequently and the applicator used (such as microfiber mop head) is not changed as recommended, contamination can be spread from room to room, tracked on shoes, and unintentionally be carried throughout a space, area, or building. Going beyond the workspace, contamination can subsequently be brought into the home. 	<p>Action: Establish frequency based on type of space and location, shared space or individual space, prioritizing high traffic use areas shared by multiple people.</p> <p>Risk: Flooring surfaces can degrade when harsh chemicals are applied.</p> <p>Note: <i>Focus on cleaning visible dirt or debris, including responding to specific instances of known contamination (such as vomit or feces).</i></p>	<p>Action: Establish frequency of cleaning and disinfection based on use pattern and occupancy density. Discourage food consumption except in areas designated for this activity and in alignment with pest management policies.</p> <p>Risk: Surface to person transmission of pathogen and exposure to airborne cleaning/disinfecting chemicals.</p> <p>Note: <i>Infection risk is considered very low from routine interior facility foot traffic. Growing scientific evidence points to surface to person transmission as a low probability event for SARS-CoV-2 infection. Furthermore, exposure to cleaning/disinfecting chemicals is a low risk given that both GSA and CDC guidance requires custodial staff to wear disposable gloves (e.g., latex or nitrile) and use chemicals in accordance with manufacturer instructions, including any additional personal protective equipment.</i></p>	<ul style="list-style-type: none"> ● Priority should be given to SaferChoice Disinfectants if and follow label instructions. A list of SaferChoice disinfectants on List N is available at www.epa.gov and check the box "Disinfectants for use against the coronavirus SARS-CoV-2 (COVID-19)" in the search box. ● Utilize appropriate PPE for individuals cleaning and disinfecting, including maintenance & environmental services staff or contractors, end users, and occupants. ● CDC recommended handwashing practices after cleaning and disinfecting protocol has been executed. ● Verify cleaning and disinfecting chemicals from EPA List N that will reduce the possibility of surface degradation of flooring materials being used - resilient flooring and hard surface flooring can be disinfected. ● Carpet as a soft surface needs to be reviewed for capability of being sanitized and per CDC recommendations, disinfected if possible. Verify with carpet manufacturer. ● Request from manufacturers' minimum performance ASTM Testing results for installed products demonstrating chemicals tested on material and resulting impacts.
	<p>Personal Electronic Devices (smart phones, touchpads, computers, etc.), Workstation Peripherals (mouse/keyboard)</p>	<p>Action: Provide cleaning and sanitizing and/or disinfection products to safely and effectively clean and sanitize and/or disinfect device, establishing frequency depending on pattern of use, location of use, and movement of device that changes location from non-shared to shared spaces (i. e. toilet rooms, eating areas, break areas, and conference spaces)</p> <p>Risk: Minimal to device depending upon chemistry used to clean and sanitize and/or disinfect device.</p> <p>Note: <i>Cleaning and disinfection of personal property such as personal electronics has been determined to be the responsibility of each individual and their employing agency. Share recommended practices broadly to insure adoption.</i></p>	<p>Action: Establish frequency based on use pattern, occupant use, and occupant location of use.</p> <p>Risk: Surface to person transmission of pathogen and exposure to airborne cleaning/disinfecting chemicals.</p> <p>Note: <i>Growing scientific evidence points to surface to person transmission as a low probability event for SARS-CoV-2 infection. Furthermore, exposure to cleaning/disinfecting chemicals is a low risk given that both GSA and CDC guidance requires custodial staff to wear disposable gloves (e.g., latex or nitrile) and use chemicals in accordance with manufacturer instructions, including any additional personal protective equipment.</i></p>	<ul style="list-style-type: none"> ● For devices that are within public spaces, frequent cleaning and sanitizing and/or disinfecting is recommended. ● Review personal electronic device manufacturer recommendations for appropriate cleaning and sanitizing and/or disinfecting products that are acceptable and will not cause detrimental damage to the device surface and/or its effective operation.

Resources

[ASHRAE: COVID-19 \(Coronavirus\) Preparedness Resources](#)

[ASHRAE: Frequently Asked Questions \(FAQ\)](#)

[ASTM: ASTM standards related to the production and testing of personal protective equipment \(PPE\)](#)

[CDC: Guideline for Disinfection and Sterilization in Healthcare Facilities \(2008\)](#)

[CDC: Disinfecting Your Facility: Everyday Steps, Steps When Someone is Sick, and Considerations for Employer](#)

[CDC: Using Personal Protective Equipment \(PPE\)](#)

[CDC: Coronavirus \(COVID-19\) – Compilation of and links to CDC guidance and additional resources](#)

[EPA: List N](#)

[EPA: Disinfectant Use and Coronavirus \(COVID-19\)](#)

[EPA: Frequent Questions About Disinfectants and Coronavirus \(COVID-19\)](#)

[GSA: GSA Cleaning Standards](#)

[OSHA: COVID-19 Resources – Compilation of and links to OSHA resources](#)

[WELL: SC3- Improve Cleaning Practices](#)

[WELL: SC4- Select Preferred Cleaning Products](#)