



Public Services and Procurement Canada (PSPC) Heating, Ventilation and Air-Conditioning (HVAC) Minimum Requirements – (COVID-19)

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Public Services and Procurement Canada (PSPC) is committed to providing our building occupants with productive and healthy work environments; the health and safety of building occupants are paramount.

During the current COVID-19 pandemic, PSPC continues to ensure that building systems including Heating Ventilation and Air Conditioning (HVAC) systems are properly operated and maintained to ensure healthy work environments. The HVAC measures contained in this document are one aspect of a complete COVID-19 occupancy plan that includes both custodial and employer responsibilities. It is important to apply the [hierarchy of controls](#) when developing return to workplace plans. As a custodian, PSPC has implemented a variety of measures to enhance occupant safety and wellness. Details of these other measures can be found in the following documents:

- [PSPC Building Management Direction for Coronavirus Disease 2019 \(COVID-19\)](#)
- [PSPC Building Water Systems Minimum Requirements – \(COVID-19\)](#)
- [PSPC Guidance and Practices for the Safe Return to Workplaces in Light of the Easing of Restrictions](#)
- [COVID-19 PSPC Standard Protocols for Real Property Construction Projects](#)

The minimum HVAC requirements contained in this document are consistent with guidance from public health agencies and American Society of Heating, Refrigerating and Air-Conditioning Engineers ([ASHRAE](#)) recommendations. These requirements have been established by the Technical Services Service Line (TSSL) and the Property Facility Management Service Line (PFMSL) of PSPC's Real Property Services in consultation with Health Canada to enhance HVAC operation during COVID-19 to promote the wellness of building occupants. These requirements, which apply to PSPC Crown-owned buildings will be reviewed and updated as required. For leases, it is required to have a discussion with the landlord to ensure that similar measures are being implemented prior to re-occupancy of leased spaces.

There is a multistep quality monitoring process to track the implementation of the HVAC requirements contained within this document.

- High level implementation status on a variety of COVID-19 aspects (including HVAC) in both Crown owned and leased buildings is monitored by PSPC through the [Building Re-Occupancy Readiness Tracker](#) .
- The Real Property Service Provider has developed an HVAC requirements checklist that has been completed at the building level.
- A national status report (see documentation section below) is being completed to track the implementation of each HVAC aspect to provide a detailed view of HVAC compliance at each facility.

Communications Requirements

Note that in order for PSPC to successfully complete the required actions to meet the minimum requirements prior to re-occupancy and to assist clients in their employer role, it is important that client departments provide sufficient advance notice of their intention to re-occupy a space that they have vacated. The amount of advance notice required will depend on a variety of factors (e.g. regional capacity, localized demand, remoteness of buildings). Communication is key to the success of re-occupancy; it is therefore important that clients be informed ahead of time of the planned actions and testing. It is equally important that the client departments be informed of actions completed and of the testing results (e.g. *Legionella*).

Modes of Transmission

As indicated by the [Public Health Agency of Canada \(PHAC\)](#), which is qualified to assess the risk of transmission through different modes, SARS-CoV-2, the virus that causes COVID-19, spreads from an infected person to others through respiratory droplets and aerosols created when an infected person coughs, sneezes, sings, shouts, or talks. The droplets vary in size from large droplets that fall to the ground rapidly (within seconds or minutes) near the infected person, to smaller droplets, sometimes called aerosols, which linger in the air under some circumstances.

The relative infectiousness of droplets of different sizes is not clear. Infectious droplets or aerosols may come into direct contact with the mucous membranes of another person's nose, mouth or eyes, or they may be inhaled into their nose, mouth, airways and lungs. The virus may also spread when a person touches another person (i.e., a handshake) or a surface or an object (also referred to as a fomite) that has the virus on it, and then touches their mouth, nose or eyes with unwashed hands.

The virus is most frequently transmitted when people are in close contact with others who are infected with the virus (either with or without symptoms). Most transmission occurs indoors. Some outbreaks (eg. choir practice, fitness classes, restaurants) have occurred in poorly ventilated spaces suggesting that infectious aerosols were suspended in the air and that people inhaled the virus. However, PHAC indicates that **“there is no evidence at this time that the virus is able to transmit over long distances through the air, for example, from room to room through air ducts. It is still unclear how easily the virus spreads through contact with surfaces or objects”**. In addition, the American Society of Heating, Refrigerating, and Air-conditioning Engineers ([ASHRAE](#)) indicates that “There is no evidence to date that SARS-CoV-2 penetrates to a significant extent through central air-handling units to cause risk in spaces where infectors are not present.”

While public health agencies do not yet fully understand all modes of transmission and their relative importance, and it is likely that multiple modes of transmission occur, we do know that several actions can be taken to help prevent transmission:

- maintain a [physical distance](#) of 2 metres from people outside of your household
- wear a [non-medical mask](#) when:
 - you are in public and you might come in close contact with others
 - you are in any indoor space with people from outside your immediate household
 - advised by your local [public health authority](#)
- wash your hands often and do not touch your face with unwashed hands
- keep the number of people you have prolonged contact with as small as possible

To stay healthy and to protect ourselves and others, we must be mindful of the ever-present risk of exposure to the virus. Using all of these layers of protection will help to reduce the risk of transmission. The measures indicated by the PHAC above relate to employer and personal responsibilities and are most important when reducing risk in settings that cannot be avoided and are particularly risky for transmission of the virus such as:

- closed spaces that are poorly ventilated
- crowded places
- close-contact settings and close-range conversations
- settings where there is singing, shouting or heavy breathing, for example, during exercise

It is particularly important to avoid settings where these risks overlap, e.g., closed, crowded spaces where close-range conversations occur.

PHAC has further highlighted the importance of maximizing the performance of building ventilation to decrease the concentration of potentially infectious aerosols that may be suspended in the air and ensuring that HVAC systems are in good working order.

Since the beginning of the COVID-19 pandemic PSPC has taken steps to address PHAC's latest ventilation recommendations. During the COVID-19 pandemic, PSPC has continued to implement its regular custodial activities that include ensuring that HVAC systems are designed, installed, operated and maintained to meet or exceed the requirements of the National Building Code of Canada and the Canadian Occupational Health and Safety Regulations to provide healthy work environments. Furthermore, the COVID-19 pandemic specific measures contained within this document include maximizing the quantity of outdoor air and the quality of recirculated air that is provided within buildings. The level of adjustments that can be provided will depend on the time of the year and the limits of the building systems.

For more information, you can also visit the Government of Canada's [Coronavirus Disease \(COVID-19\)](#) website.

Minimum Requirements for HVAC systems

A. Documentation:

- Employees responsible for property facility management and technical support are to review existing building documentation, such as those listed below and determine if there is a need to develop new or updated documents in support of COVID-19 occupancy plans:
 - As-built Drawings
 - Operation and Maintenance Manuals
 - Operation and Maintenance Records
 - Standard Operating Procedures
 - Balancing Reports
 - Commissioning Reports
 - Control Sequences
- Ensure that the facilities' Pre-COVID-19 and COVID-19 HVAC equipment operational details (e.g. ventilation, temperature, humidity, filtration and hours of operation) and sequences of operation are documented and available at the facility level. The Pre-COVID-19 information may be contained in one or more of the documents listed above.
- Complete the [HVAC COVID-19 Requirements Implementation Status Report](#) which includes sections on: Communications; Buildings with no regular occupancy; Buildings with occupancy. The report is to be updated by the last business day of each month.

B. For buildings with reduced occupancy or full occupancy

In addition to completion of mandated and lifecycle maintenance of HVAC equipment, it is required to provide enhanced indoor environmental quality in occupied spaces to promote occupant wellness while public health agencies have declared an epidemic of COVID-19. The following minimum operational changes to HVAC system(s) for ventilation, filtration and humidity are required to support enhanced indoor environmental quality and to reduce potential risks associated with the accumulation of aerosol particles which could possibly lead to transmission of the virus that causes COVID-19 within a workspace. For operational requirements and considerations unique to specific system types, refer to the [ASHRAE guidance](#) on system treatments.

B1. Ventilation:

- As recommended by [ASHRAE](#), during periods of occupancy, operate HVAC systems at a higher fraction of outdoor air up to the maximum rate that can be sustained by the building systems, while maintaining:
 - Normal supply airflows, and
 - Temperature and humidity levels as indicated in this document and as per the [National Joint Council Occupational Health and Safety Directive](#). This may require modifications to building systems and components such as:
 - Dampers
 - Demand controlled ventilation systems (e.g. CO₂ sensors), where present
 - Supply, return, exhaust fans, to ensure proper building pressurization
 - Fire protection systems (e.g. duct smoke sensors)
 - Building automation systems
- As recommended by [ASHRAE](#), HVAC systems shall be operated before and after occupancy at the maximum outside airflow that can be sustained by the building systems for at least 2 hours and until 3 outdoor air changes has been achieved.

- As recommended by [ASHRAE](#), review the locations of supply, return and exhaust air diffuser/grille/register placement as part of return to occupancy planning. Consider modifications to diffuser/grille/register placement and/or furniture locations where the existing airflow patterns allows for prolonged exposure to airflow from the face of one person to another.
- Review the need for system re-balancing if modifications are made.

B2. Filtration:

As recommended by [ASHRAE](#), ensure the installation of the highest level of filtration compatible with the HVAC system filter rack(s) while ensuring that normal operational airflow volumes are maintained. Filters in HVAC systems must be replaced when they reach the end of their useful life and be checked at least on their regular schedule, to ensure that they properly fit in the filter racks and have their edges sealed to limit airflow bypass.

B3. Temperature and Humidity:

Maintain temperature and humidity levels within the limits prescribed in [PSPC MD-15000 Mechanical Environmental Standard for Federal Office Buildings](#). Maintain a minimum of 25% relative humidity in occupied spaces. As recommended by [ASHRAE](#), where buildings systems and envelope allow, operate building humidification systems serving occupied spaces at a higher relative humidity level to enhance occupant wellness but not to exceed 60% relative humidity. **CAUTION:** Do not operate at a relative humidity setpoint that will cause condensation on a building envelope component or other element in the building if it is not designed to manage the condensation.

B4. Heat/Energy Recovery:

As recommended by [ASHRAE](#), bypass or shut down heat/energy recovery ventilation systems that may leak potentially contaminated exhaust air (e.g. washrooms) back into the outdoor air supply.

Refer to [ASHRAE specific guidance on energy recovery device operation](#) during epidemics and pandemics for further equipment specific guidance.

B5. Cooling towers:

The resulting reduced building occupancy may impact cooling needs in buildings and cause cooling towers to remain idle more frequently. This reduced occupancy must be evaluated when making a decision to start cooling towers. It is imperative that water is not allowed to sit stagnant for prolonged periods. Recall that the [PSPC standard MD-15161 Control of Legionella in mechanical systems](#) (3.3.3) requires a system that does not operate for 3 days to be shut-down and drained. As such, operational cooling towers must continue to circulate water regularly through all components, water treatment system must remain operational and validation testing (chemical and bacterial) must be completed.

C. For buildings or tenant spaces with no occupancy

While a building or tenant space is unoccupied, in addition to completion of mandated and lifecycle maintenance of HVAC equipment, the building's HVAC system(s) should operate in unoccupied/weekend set-back modes for outdoor airflow, temperature and humidity setpoints.

However, it is recommended that the HVAC system(s) be operated at the occupied setpoints for outdoor airflow, temperature and humidity for at least a 12 hour period once a week to support the continued functionality of building systems.

The same cooling tower requirements from above apply to buildings with no occupancy.

Prior to re-occupancy, the building should be flushed with the maximum amount of outdoor air for at least 24 hours while maintaining temperature and humidity setpoints as indicated in this document and as per the [National Joint Council Occupational Health and Safety Directive](#).

Key Contacts

Please consult with your regional technical center of expertise for support implementing these requirements.

Technical enquiries related to this document should be directed to Senior Director Environment, Health and Safety, Technical Services Service Line, Real Property Services.

Facility Management enquiries related to this document should be directed to Senior Director Property and Facility Management Services Directorate, Property Facility Management Service Line, Real Property Services.