

COMMUNITIES OF FAITH BUILDINGS

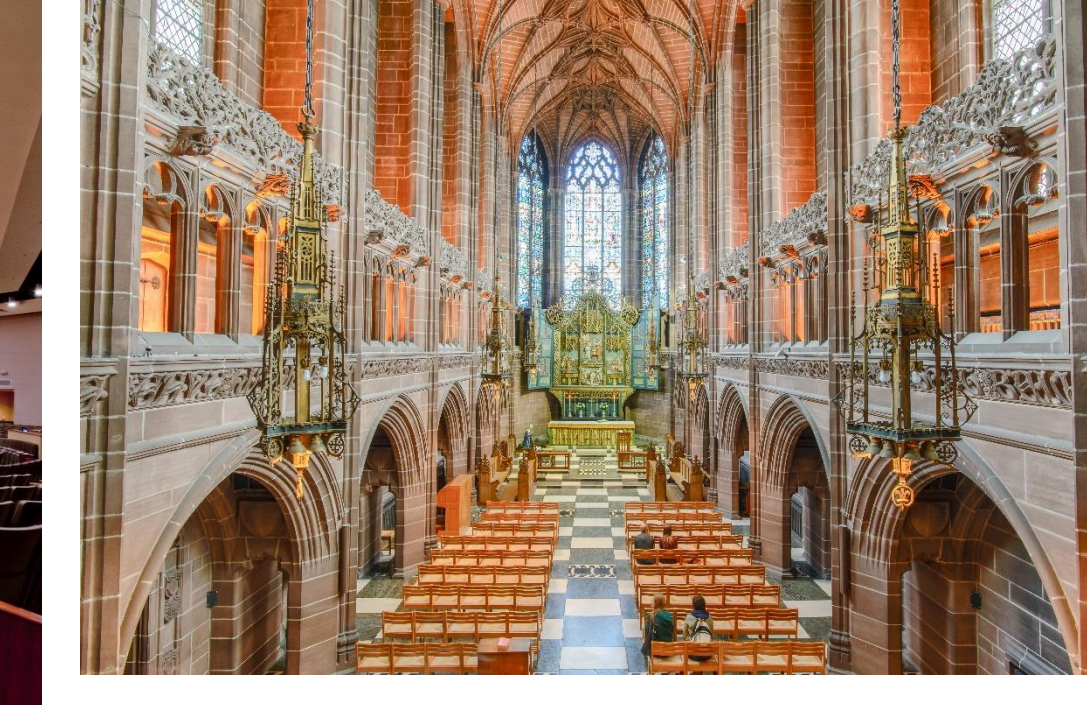
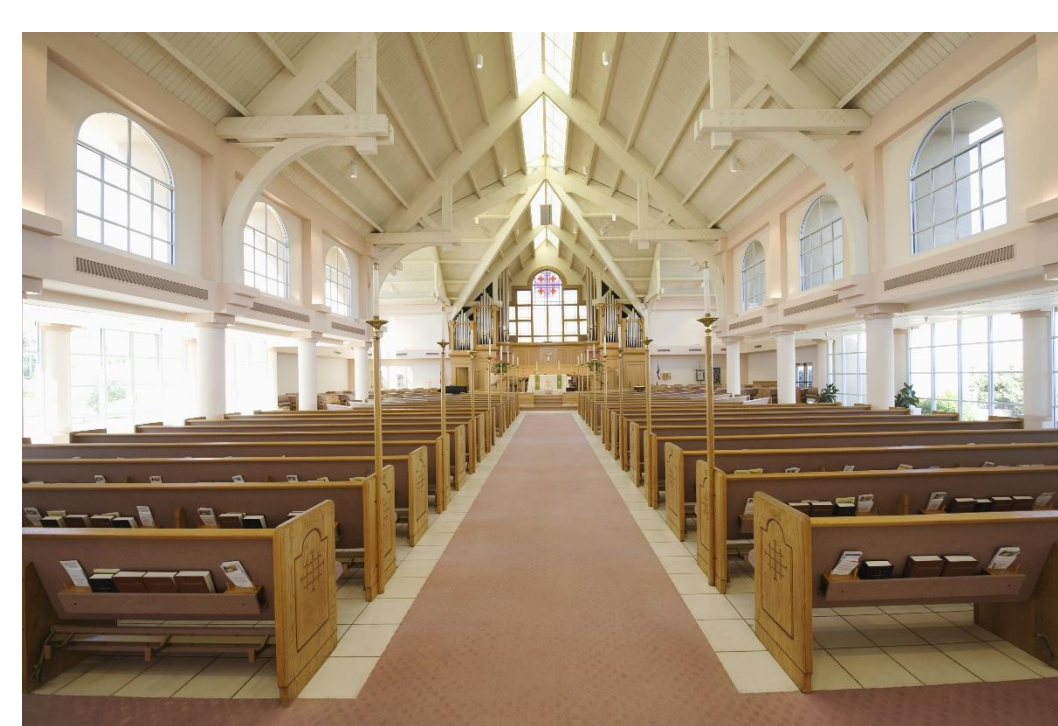
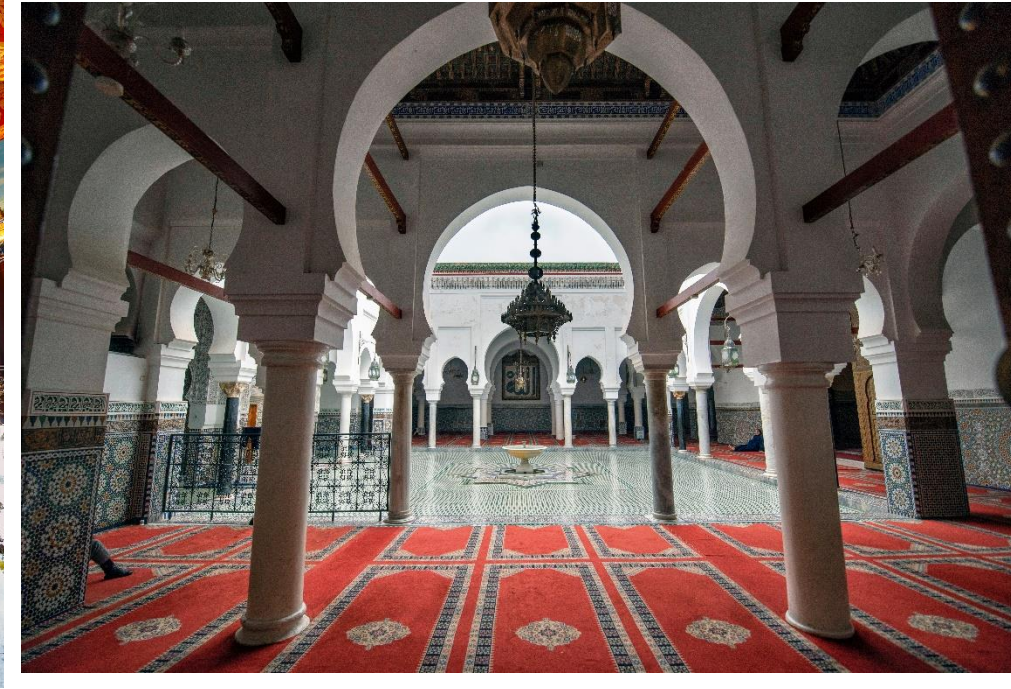
ASHRAE EPIDEMIC TASK FORCE

Updated 12-15-2020



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Introduction

The recommendations contained here are based the expertise and experiences of collected individuals in the HVAC&R related fields. Building owners, community leaders, and engineers should also consult CDC, EPA, community-of-faith guidance at state and national levels, and other cognizant guidelines not specifically discussed in order to complete a preparedness plan.

→ Such items include, but not limited to cleaning and disinfecting, PPE to protect workers and worshippers, social distancing, service schedules, and engineered controls to limit the transmission of airborne infectious diseases.

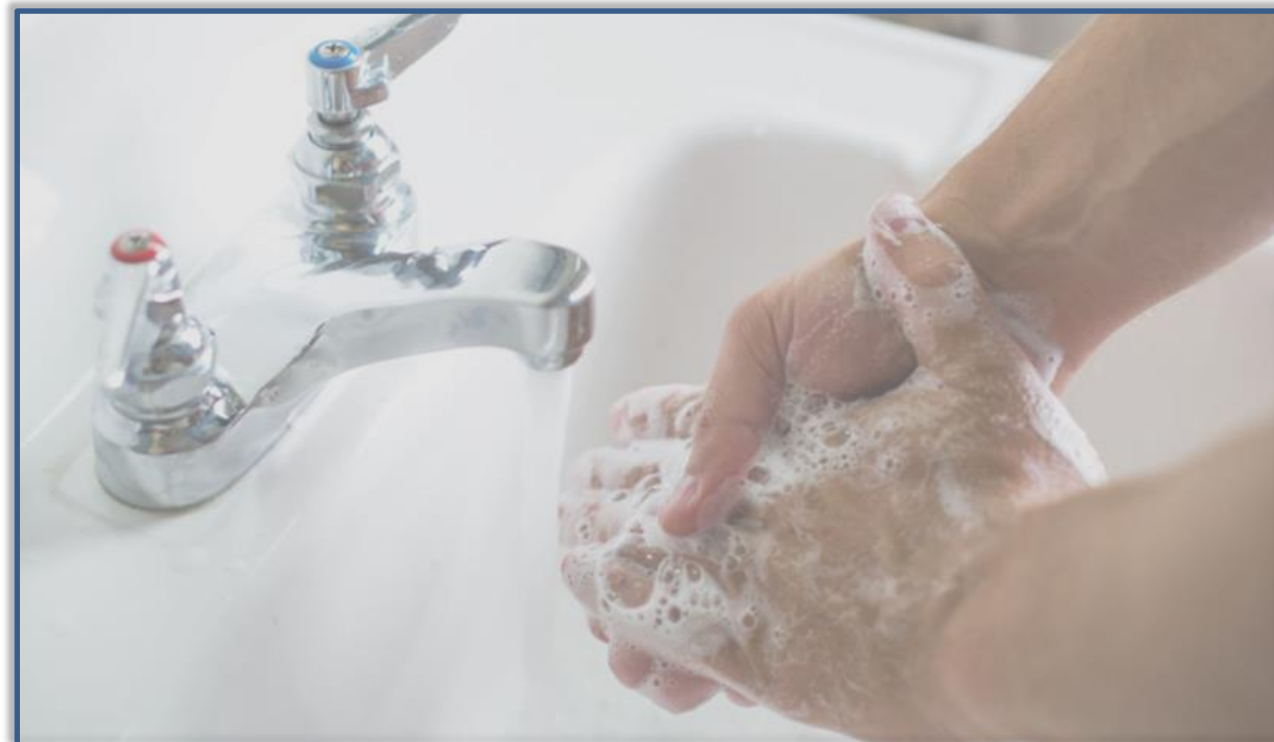
Generally, this guidance applies to all infectious diseases.

[CDC Information](#)

[OSHA](#)

[EPA](#)

[ASHRAE Glossary](#)



General Recommendations:

Conducting worship services under epidemic conditions requires an awareness of possible viral transmission and movement toward a new “normal” operation after the public health emergency has ended.

This document contains guidance that can be followed to reduce exposure to SARS-COV-2, the virus that causes COVID-19.

Building Readiness:

Refer to [ASHRAE Building Readiness for COVID-19 Reopening](#), make sure the community of faith buildings and surroundings are ready.

Each function and service should be evaluated separately, including but not limited to religious services and education, funerals, weddings, coffee/greeting events, choir services, and events.



COVID-19 Preparedness and Response Plan



Develop an epidemic plan that can help guide protective actions against COVID-19. This plan should be reviewed and updated regularly. Follow relevant CDC, EPA, OSHA, city, state, and federal guidelines in developing the plan.

- Establish a communication protocol and continuity of operations plan.
- Communicate risks and precautions being taken with occupants.
- Consider keeping log of those attending worship services for possible contact tracing.
- Ensure physical distancing for all spaces. Provide staff with:
 - PPE per CDC and OSHA requirements.
 - Training on the proper use and disposal of PPE and waste.
 - Training on infection prevention and control measures.
 - Instruction to staff to stay at home if they are feeling sick.

COVID-19 Preparedness and Response Plan (cont.)



The following activities can increase the transmission rate of SARS-CoV-2.
Avoid these activities:

- Solo and group singing/chanting during worship services.
- Sharing a microphone.
- Sharing of worship materials, such as books, bulletins, and specific appointments of special rituals and services.
- Using a confessional; make plans to use larger space with better air flow.
- Sharing prayer rugs or mats.
- Face-to-face money collection.
Instead consider collection by mail or the internet.



HVAC (Heating, Ventilation, and Air Conditioning) Systems



General

- Identify HVAC system characteristics. Compile and review operation and maintenance manuals and schedules.
- Verify HVAC systems are well maintained and operating as intended. For maintenance, follow the requirements of [ASHRAE Standard 180 - 2018, Standard Practice for the Inspection and Maintenance of Commercial HVAC Systems](#).
 - Consider PPE when maintaining HVAC systems including filters, coils, and drain pans.
- Operate your HVAC systems, if present, with system fan set to run continuously when building is occupied for services or cleaning.
- Operate the system for a time required to achieve three equivalent air changes of outdoor air (effect of outdoor air, filtration, and air cleaners) before the first daily occupancy and between occupied periods, if appropriate. Three equivalent air changes can be calculated using the [Building Readiness Guide](#).

HVAC Systems (cont.)



General (cont.)

- Operate toilet exhaust fans during occupied hours and during cleaning.
 - Refer to [ASHRAE Guidance on “Transmission through Air in Toilet Rooms”](#)
- Operate toilet exhaust fans for a period prior to occupancy.
- Evaluate building occupied hours, adjust as necessary (consider multiple services to allow for appropriate physical distancing).
- Maintain indoor temperatures within the comfort ranges indicated in [ANSI/ASHRAE Standard 55-2017](#).
- Create, plan for, and document “Epidemic Mode” operation that can be turned on, shut down, or overridden, if needed, by manual or automatic selection.



HVAC Systems (cont.)



Overview of System Types and Strategies

Overview of System Types and Strategies						
Building System Type						
Strategy	Strategy Requirements	<u>No space conditioning and no mechanical ventilation</u>	No Central Air System (local)		Central Air System	
			<u>Unit Ventilators</u>	<u>Other</u>	<u>Recirculation and no mechanical ventilation</u>	<u>Recirculation and mechanical ventilation</u>
Operable windows Optional: with Ceiling level extraction or window fans	<i>Dilution</i> When outside air conditions are appropriate	✓		✓	✓	
In-room air cleaner*	<i>Source Removal</i> HEPA and/or UV-C*	✓	✓	✓	✓	✓
Central filtration*	<i>Source Removal</i> MERV 13 minimum or equivalent to MERV 13*				✓	✓
Mechanical ventilation	<i>Dilution</i> Minimum Outdoor Air per ASHRAE 62.1		✓			✓

*See ASHRAE [Filtration & Disinfection](#)



HVAC Systems (cont.)



No space conditioning and no mechanical ventilation

- In buildings with operable windows, when outside air temperature and humidity conditions and outdoor air quality are acceptable, open windows preferably on multiple sides of rooms, where appropriate, during occupied hours. Use box or pedestal fans for better air flow.
 - Exposure to seasonal and other outdoor allergens (pollen and mold spores) may occur with windows opened. Consider adding screens on windows to control insects.
- Install and operate ceiling level extraction fans (roof mounted or ducted) along with open windows on all sides to facilitate ventilation air flow through the occupied zones to the exhaust duct or opening.
- Promote mixing of room air without causing strong air currents that increase direct transmission from person-to-person.



HVAC Systems (cont.)



No space conditioning and no mechanical ventilation (cont.)

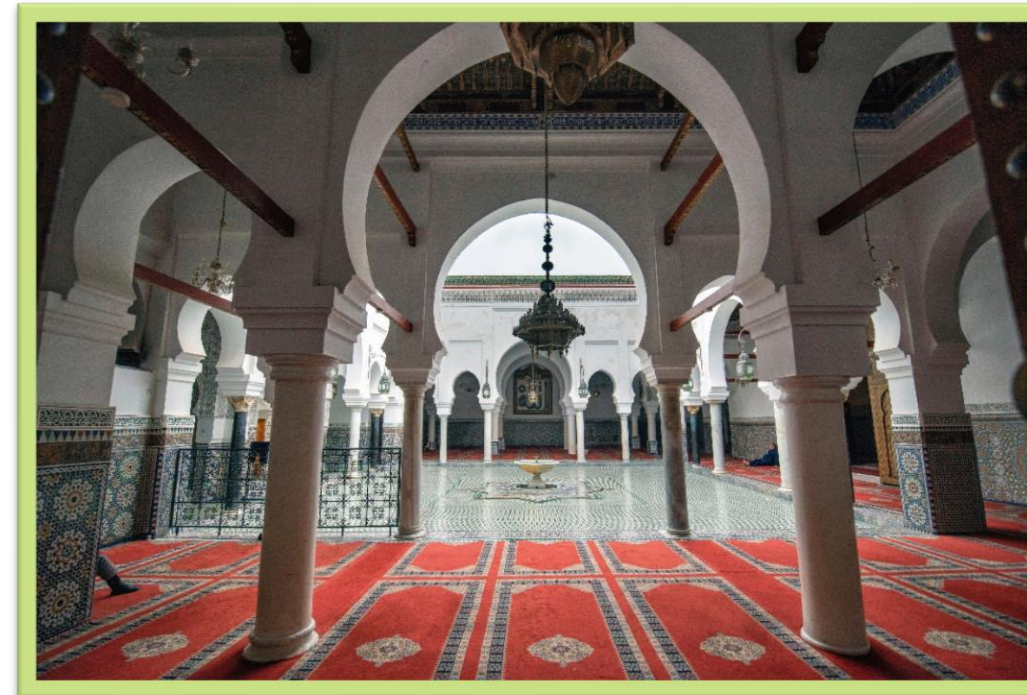
- Consider upper-room UV-C, such as wall-mounted units or UV-C equipped ceiling fans in rooms of worship. Operate during occupied hours.
- Consider portable or local air cleaners equipped with HEPA filtration and/or UV-C disinfection in common spaces such as meeting rooms, sanctuaries, and offices.
 - Avoid the use of ozone-generating air-cleaning devices by following the advice in the [“ASHRAE Position Document on Filtration and Air Cleaning”](#).



HVAC Systems (cont.)

No Central Air: Unit ventilators

- Consider upper-room UV-C, such as wall-mounted units or UV-C equipped ceiling fans in rooms of worship. Operate during occupied hours.
- Consider portable or local air cleaners equipped with HEPA filtration and/or UV-C disinfection in common spaces such as meeting rooms, sanctuaries, and offices.
 - Avoid the use of ozone-generating air-cleaning devices by following the advice in the [“ASHRAE Position Document on Filtration and Air Cleaning”](#) and [“Filtration and Disinfection”](#).
- Outside air for ventilation should be set to at least the required minimum outdoor air flow rates for ventilation as specified by applicable standards.
- If there are significant energy impacts, use minimum outside air as required by [ASHRAE Standard 62.1](#) with MERV-13 filter minimum.



HVAC Systems (cont.)

No central air: Other heating/cooling systems

(boilers, radiators, electric resistance, split-type units, and window air conditioning units)

- In buildings with operable windows, when outside air temperature and humidity conditions and outdoor air quality are acceptable, open windows preferably on multiple sides of rooms, where appropriate, during occupied hours. Use box or pedestal fans for better air flow. Consider this strategy even when heating/cooling systems are in operation.
 - Exposure to seasonal and other outdoor allergens (pollen and mold spores) may occur with windows opened. Consider adding screens on windows to control insects.
- Install and operate ceiling level extraction fans (roof mounted or ducted) along with open windows on all sides to facilitate ventilation air flow through the occupied zones to the exhaust duct or opening.



HVAC Systems (cont.)

No central air: Other heating/cooling systems (cont.)

(boilers, radiators, electric resistance, split-type units, and window air conditioning units)

- Consider upper-room UV-C, such as wall-mounted units or UV-C equipped ceiling fans in rooms of worship. Operate during occupied hours.
- Consider portable or local air cleaners equipped with HEPA filtration and/or UV-C disinfection in common spaces such as meeting rooms, sanctuaries, and offices.
 - Avoid the use of ozone-generating air-cleaning devices by following the advice in the [“ASHRAE Position Document on Filtration and Air Cleaning”](#).



HVAC Systems (cont.)



Systems with central air and no mechanical ventilation

- In buildings with operable windows, when outside air temperature and humidity conditions and outdoor air quality are acceptable, open windows preferably on multiple sides of rooms, where appropriate, during occupied hours. Use box or pedestal fans for better air flow. Consider this strategy even when heating/cooling systems are in operation.
 - Exposure to seasonal and other outdoor allergens (pollen and mold spores) may occur with windows opened. Consider adding screens on windows to control insects.
- Install and operate ceiling level extraction fans (roof mounted or ducted) along with open windows on all sides to facilitate ventilation air flow through the occupied zones to the exhaust duct or opening.

HVAC Systems (cont.)



Systems with central air and no mechanical ventilation (cont.)

- Consider upper-room UV-C, such as wall-mounted units or UV-C equipped ceiling fans in rooms of worship. Operate during occupied hours.
- Consider portable or local air cleaners equipped with HEPA filtration and/or UV-C disinfection in common spaces such as meeting rooms, sanctuaries, and offices. See [“In-Room or Portable Air Cleaners”](#) for more information.
 - Avoid the use of ozone-generating air-cleaning devices by following the advice in the [“ASHRAE Position Document on Filtration and Air Cleaning”](#).
- Provide maximum filter efficiency that the unit can handle, aim for at least MERV 13.
 - If the unit cannot handle MERV 13 or better, then run the fans and put in portable or local air cleaner units equipped with HEPA filtration and/or UV-C disinfection in common spaces such as meeting rooms, sanctuaries, and offices.
 - Avoid the use of ozone-generating air-cleaning devices by following the advice in the [“ASHRAE Position Document on Filtration and Air Cleaning”](#).

HVAC Systems (cont.)



Systems with central air and mechanical ventilation (cont.)

- Outdoor air for ventilation should be set to provide the minimum outdoor air as required by [ASHRAE 62.1](#) or code. Consider the use of additional outdoor air to enhance dilution in the space.
- Provide maximum filter efficiency that the unit can handle, aim for MERV 13.
 - If the unit can not handle high filter efficiency, then run the fans and put in portable or local air cleaner units equipped with HEPA filtration and/or UV-C disinfection in common spaces such as meeting rooms, sanctuaries, and offices.
 - Avoid the use of ozone-generating air-cleaning devices by following the advice in the [“ASHRAE Position Document on Filtration and Air Cleaning”](#).
- Consider upper-room UV-C, such as wall-mounted units or UV-C equipped ceiling fans in rooms of worship. Operate during occupied hours.
- Consider portable or local air cleaners equipped with HEPA filtration and/or UV-C disinfection in common spaces such as meeting rooms, sanctuaries, and offices.
 - Avoid the use of ozone-generating air-cleaning devices by following the advice in the [“ASHRAE Position Document on Filtration and Air Cleaning”](#).

HVAC Systems (cont.)

Systems with central air and mechanical ventilation (cont.)



- Use minimum outdoor air as required by [ASHRAE standard 62.1](#) with MERV-13 filtration as minimum. Consider energy the impacts of this strategy.
- Consider opening windows to increase outdoor air, especially when the system cannot achieve minimum code air flow rate or use MERV-13 filters.
- If indoor conditions permit and energy use is not greatly impacted, close recirculation dampers and open outdoor air dampers to achieve 100% outdoor air.
- Evaluate any energy-recovery wheels according to ASHRAE's "[Practical Guidance for Epidemic Operation of Energy Recovery Ventilation Systems](#)".

