

A COVID19 RESPONSIVE HVAC SYSTEM



Considerations for Adapting Your Building

HVAC systems are an important component of any building, but as buildings re-open, their operation takes on an even more critical role. These systems are key in upholding a healthy and comfortable indoor environment. This guide may be useful as a building maintenance checklist, a conversation starter for you and your building owner, or as a lens for re-examining projects.

PHASE 1 SHORT TERM

Recommendations that can be implemented quickly, without significant initial costs or system modifications.

HVAC System Assessment

- **Assess design and operation** to identify improvement opportunities.
- **Perform retro-commissioning**, which tests an existing HVAC for optimal efficiency. During this process, recommendations can be implemented from the initial system assessment.
- **Create a systems manual** to include optimum set points, recommended maintenance schedule, and protocols for regular testing.

Ventilation Design Evaluation

Ventilating buildings with fresh air reduces the need for recirculated air and dilutes the air within a space, helping to improve occupant wellness.

- **Consider increasing minimum ventilation rates during the pandemic.** With requirements for reduced occupancies there is typically more capacity for HVAC systems to handle increased ventilation rates even during the hottest and coldest portions of the year, while providing more fresh air per person.
- **Expand the use of outside air economizers**, which increase the use of fresh air when outdoor conditions are optimal, by adjusting the limits of when systems go into economizer mode.
- **Encourage users to open operable windows** as much as practical.

Plumbing System Evaluation

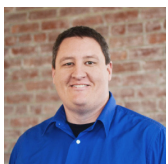
- **Replace toilet seats** without lids with ones that include a lid. This will minimize risk of virus transmission.
- **Install touch-free fixtures in restrooms** to minimize risk of virus transmission from surfaces.

Wellness, Energy, and Sustainability

- **Balance the energy and wellness trade-offs.** The considerations above can in some cases lead to more energy use from the HVAC systems, especially if not implemented strategically.
- **Find the right balance between indoor air quality and energy considerations**, especially in the near term.

Questions on adapting your building?

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PHASE 2 MID TERM

Recommendations for modifying HVAC systems to optimize operation.

HVAC Optimization

- **Improve system filtration.** There are multiple types of filtration systems; mechanical filtration, electronic filtration, UV treatment, all with varying efficiencies and effectiveness. It is important to find the right filtration solution for the specific building usage.
- **Re-program HVAC system sequences of operation.** Specific strategies include:
 - **Ensure HVAC systems run around the clock** to continuously filter the building air.
 - **Flush out buildings** two hours before and after occupancy with fresh air.
 - **Operate restroom exhaust continuously** during occupied hours.

Ventilation Design

- **Mitigate energy penalty associated with increased ventilation.** Specific strategies include:
 - **Add energy recovery** to pre-treat outdoor air with exhaust air.
 - **Implement demand controlled ventilation strategies** using occupancy and CO2 sensors to provide increased ventilation in occupied areas and reduce ventilation in unoccupied areas.
 - **Improve ventilation efficiency** by ensuring fresh air is delivered into the breathing zone between 4' & 7' above the floor.

PHASE 3 LONG TERM

Recommendations for re-examining or pivoting HVAC system design.

Ventilation Design

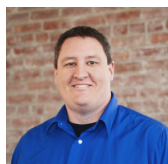
- **De-couple ventilation & heating / cooling systems.** This allows dedicated ventilation systems to be more efficient in providing fresh air where it is needed during occupied hours. Also allows more flexibility in designing space conditioning systems while reducing air recirculation between zones.
- **Incorporate natural ventilation and daylight into building design.**

Integrated Design

- **Take a whole building approach to design** through the use of an integrated design process.
- **Consider implications for all systems** early in the design process (HVAC, lighting, envelope, etc.) This can lead to reduced first costs, improved building efficiency and comfort, and fewer coordination issues during construction.

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