

How to limit the spread of infectious diseases inside buildings

In this issue, we will address concerns with respect to heating, ventilating and air-conditioning systems of buildings amidst the COVID-19 threat. While there is still ongoing research and analysis on how exactly the disease is transmitted, ensuring a healthy indoor environment remains an important step in limiting spread of infectious diseases.

ASHRAE has released 'COVID-19 Preparedness Resources' to provide guidance to building owners and operators as well as design engineers on how to protect occupants best in case there are airborne particles that may be circulating in HVAC systems.

New and existing healthcare buildings, and similar public facilities should use reliable indoor air quality guides to be even better prepared to control infectious diseases like Coronavirus and future pandemics. Systems should provide air virtually free of dust, dirt, and chemical and radioactive pollutants. In some cases, untreated outdoor air is hazardous to patients suffering from cardiopulmonary, respiratory, or pulmonary conditions.

When designing isolation/quarantine rooms and special treatment rooms for hospitals, the following factors must be considered to ensure occupants have a healthy indoor environment:

- Negative pressure airflow to prevent contaminants, bacteria and viruses from escaping the isolation room
- Effective control of air change rate, temperature and humidity
- Monitoring of indoor air quality and particulate count and alert system for building operator
- How ventilation rates, airflow regimes, filtration and irradiation can be used to filter/clean indoor air to protect occupants
- Integrate the utilisation of ultraviolet (UV) radiation to destroy or deactivate chemical and biological air and surface contaminants in HVAC systems and indoor spaces

ASHRAE recommends the following strategies of interest to address disease transmission: dilution ventilation, laminar and other in-room flow regimes, differential room pressurization, personalized ventilation, source capture ventilation, filtration (central or unitary), and UVGI (upper room, in-room, and in the airstream).

The common vision of building services consultants when designing specialised treatment rooms and isolation areas is to create a healthy and sustainable healthcare-built environment for all.

BIM IN REVIEW

Moving to work-from-home

The AEC industry has always required collaborative processes with external parties via meetings, site visits and more. With the health crisis at hand, the work-from-home strategy has become the preferred way to ensure business continuity.

To preserve our BIM workflows, we have resorted to a cloud solution, BIM 360, that integrates across our project lifecycle from planning, design, construction and operation of buildings. Because data is stored in the cloud, barriers to communication are removed so that project collaboration can occur anytime and from any location.

We are currently using BIM 360 Docs and Design to share models with multiple firms and control the exchange of work-in-progress data thereby keeping design teams informed and aligned to day to day changes. It also allows us to streamline project deliverables, easily visualise changes, track progress and manage issues while working from home. In addition to the above, we are actively looking into the other modules of BIM 360 to further streamline our operations on the cloud platform.

