The Vital Role of Integrated Facility Management in a Healthy Building

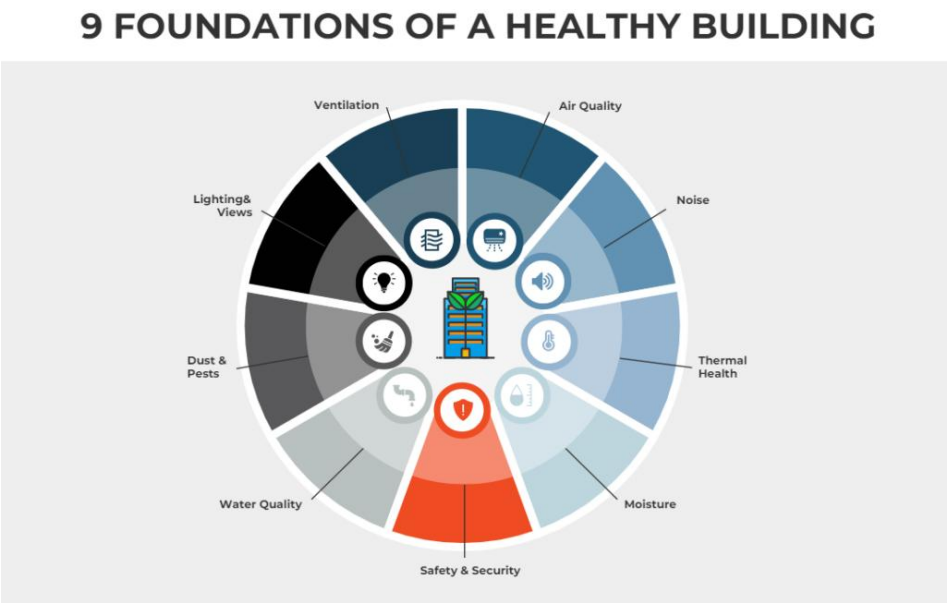
Why are Healthy Buildings Important?

Did you know that in a typical year the average full-time worker will take two million breaths in their workplace environment?

Unhealthy indoor air, inadequate ventilation, and chemical exposure from cleaning and maintenance routines can negatively impact building users and their overall health. Creating safer, healthier environments that help to redefine how occupants experience and perceive a building is critical. So, what makes a building healthy? And what role does integrated facility management play in achieving and maintaining a healthy building?

What Makes Up a Healthy Building?

There are a few simple foundational elements that make up a healthy building. The Harvard healthy buildings program curated "The 9 Foundations of a Healthy Building" which is designed to be a clear and actionable distillation of the core elements of healthy indoor environments.



The Crucial Role of Facility Management in Healthy Buildings

Why are these foundational elements of a healthy building the most important? And how does integrated facilities management play a vital role in achieving and maintaining the foundations of a healthy building? Not only does a facility manager need to consider building occupant health, wellness and comfort but it also needs to consider how the building can operate as efficiently as possible. According to a

survey by the International Facility Management Association (IFMA), *"utility cost is the largest component of a facility's operating cost."* Running a close second is maintenance costs, followed by janitorial costs.

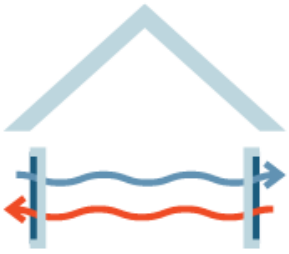
Finding the right balance between energy consumption, cost, and comfort are crucial for a well-run healthy building.

Taking a holistic management approach to achieving and managing a healthy building is the smartest method because each foundational element of a healthy building system is interconnected. How one area is managed and maintained has a direct impact on the others.

Having an experienced facility management service provider and a robust Building Management System (BMS) are essential in helping you determine the right approach toward continued reductions in energy expenditure and carbon emissions while identifying opportunities to reduce costs and improve overall comfort and well-being.

On a day-to-day basis, a BMS helps with optimizing systems in relation to occupancy patterns and employee preferences and provides 24/7 monitoring and reporting. Its ability to aggregate data from separate core systems allows for a bird's eye view of the assets of the whole building, which can help identify actual costs and opportunities for improvement. And in the longer term, it can be instrumental in enabling you to achieve environmental and sustainability goals, like achieving net-zero.

Ventilation



Why is Ventilation Important?

The current building ventilation standard, by definition, is a minimum standard designed to provide merely "acceptable" indoor air quality despite decades of research showing benefits of higher outdoor air ventilation rates.

Research has shown a direct link between the working environment and performance. A study conducted by Harvard "has shown that substandard ventilation rates negatively impact cognitive function". Ventilation in buildings is required to bring fresh air in from outside and dilute occupant-generated pollutants and product-generated pollutants. In buildings with lower ventilation rates, air quality is often reported as stuffy and unpleasant. Not only does this make the indoor environment uncomfortable to work in but the increased pollutants can cause an array of harm. A limited amount of ventilation in an indoor space can also

increase the transmission rate of respiratory infections or harmful pathogens. This was something that came to the forefront with the recent COVID-19 pandemic.

Facility Management and Ventilation

Having the right balance of ventilation that supports optimal Indoor Air Quality (IAQ) while still managing energy consumption is critical to a healthy building. An HVAC system takes outdoor air, heats or cools the air for the building, and then mixes it with existing indoor air to improve the overall ventilation of the building. This mix of intake air versus outgoing air determines the amount of heating and cooling required, which increases energy consumption.

An experienced facility management service provider can help you take a smart approach to ventilation by optimizing your air intake to keep energy costs low while still achieving good IAQ. They can also ensure that your ventilation systems operate properly and provide acceptable IAQ for the current occupancy level for each space.

Indoor Air Quality (IAQ)

Why is Indoor Air Quality Important?

Not only does poor IAQ harm occupant health and well-being, it also negatively impacts productivity. The World Green Building Council reported that offices equipped with an outdoor air supply ventilation source experienced reduced absenteeism rates as much as 35%.

IAQ depends on the presence and abundance of pollutants in the indoor environment that may cause harm. When IAQ is poor, occupants can experience building-related illnesses such as asthma, fatigue, irritation, headache or even Sick Building Syndrome (SBS). Poorly understood and most often unrecognized, SBS costs companies millions every year through employee absenteeism, decreased productivity and even increased healthcare premiums.

Facility Management and Indoor Air Quality

Creating strategies to measure and improve IAQ is a key factor to a healthy built environment. In an integrated facility service model the provider utilizes a Computerized Maintenance Management System (CMMS) to schedule and record operations and preventive or planned maintenance activities on facility equipment. A dedicated FM partner will regularly monitor your HVAC systems and schedule proactive ongoing maintenance.

To help manage IAQ, they can implement solutions to increase ventilation (fresh air intake) and air filtration and disinfection. They can also provide seasonal adjustments

accounting for outdoor air supply in cold and hot weather. The use of an Electronic Air Cleaner (EAC) can help with overall air quality and can be connected to the BMS to provide alerts for filter cleaning and maintenance. Additionally, air quality sensors can be installed throughout a building and monitored through the BMS dashboard to give real-time insights into where air quality is optimal and where more fresh air is required. The proper operation of IAQ measuring equipment and calibration is critical to achieving optimal IAQ.

Paying close attention to the way a building is cleaned is also important because this affects the quality of air in the building. Vacuum cleaners with HEPA filters can prevent contaminants from releasing into the air. Proper floor matting can prevent contaminants from making their way into the building and eventually into the air. Using the right equipment and safe cleaning supplies and chemicals are key initiatives that help improve overall indoor air quality. Taking an integrated approach to managing your facility can account for how all these foundational elements impact each other and how to best manage them individually and together.

Thermal Health and Comfort

Why is Thermal Health and Comfort Important?

Thermal comfort shouldn't be overlooked – it has actually been suggested to be more important to office workers' performance than job stress or job satisfaction.

The definition of Thermal comfort is "the condition of mind that expresses satisfaction with the thermal environment and is assessed by subjective evaluation". The term 'Thermal health' encompasses all of the impacts of thermal conditions on health, including mortality, that goes beyond just "comfort". Temperature is a factor that often directly affects the comfort of building occupants. Indoor temperatures are influenced by several factors including the building design, building geography and orientation, occupant density, ventilation strategies, building structure, and mode of ventilation.

Facility Management and Thermal Comfort

Air quality and thermal comfort go hand in hand, which is why having an integrated facility approach is beneficial. To ensure both air quality and comfort, occupancy monitoring data for each space can be shared with the BMS to proactively optimize HVAC settings. A BMS has both humidity and temperature control capabilities which are valuable for monitoring and optimizing levels in real-time. It can also support other building operations, including focused or specialized cleaning, and where and when it's needed to reduce unnecessary traffic for a safer environment.

An experienced FM service provider can ensure you are implementing the right building control strategy to properly manage and maintain thermal comfort. They will consider the configuration of a building, its materials, and building fabrics and how that plays a role in space planning and management. It's important for the individual temperature to be monitored and logged in each zone and room, which can require additional sensors.

Space management solutions can include a network of IoT-enabled sensors and other devices that can include imaging and thermal monitoring sensors for area-specific people counting, active infrared to count people flow, and desk sensors to identify availability. Your facility management partner can provide optimizations and recommendations for things such as force flow heaters that are typically in the entryways and end of hallways to ensure airflow and efficient, individualized room temperature control in all areas of the building.

Moisture and Water

Why is Moisture and Water Important?

Water is easily the most pervasive offender when it comes to risks to your infrastructure – *51% of property insurance claims in Canada stem from water.*

Moisture control is fundamental to the proper functioning of any building. According to Harvard, entrance of water into damaged, poorly designed, and improperly maintained buildings has been identified as the main source of building-related illness from mold exposure.

Researchers identified that dampness and moisture-related indoor exposures are of primary concern for preventing asthma and other respiratory conditions among both sensitized and unsensitized individuals alike. Dry buildings lead to discomfort – maintaining a targeted level of humidity and finding the right balance are critical to achieving a healthy building.

Facility Management and Moisture

Establishing a mold and moisture management plan is crucial to maintaining good IAQ. Maintaining the proper moisture level and monitoring humidity levels while knowing how to adapt these for changes in seasonality is a key part of the plan. Building managers need to proactively plan for proper inspections, which include everything from the roof to the building fabric, so they are informed of any outside water coming into the building and plumbing and drains.

A facility management partner can ensure you have a predictive and proactive asset management plan in place that accounts for asset lifecycle and regular maintenance and repair to extend the life of these assets. Having a dedicated FM partner is also crucial in the event that a water issue within a building is identified so that they are able to mobilize resources quickly to limit the extent of damage to your building.

Another great way to regulate and add moisture to a building is to install a living wall. Not only can this be a focal point for building users that can contribute to wellness but it also improves IAQ in the space. A single potted plant removes a portion of common airborne toxins in a space. A living wall can contain over a thousand plants, all of which filter air and in addition create energy-rich oxygen.

Dust and Pest Management

Why is Dust and Pest Management Important?

Dust acts as a reservoir for a variety of harmful agents – outdoor particles that penetrate indoors, viruses, bacteria, chemicals, allergens, building materials, dander, fabric fibers, and flakes of paint with lead.

Many contaminants residing in dust and lead can be harmfully exposed to humans and have a direct impact on their health. The primary concern from pests and domestic animals is that they introduce allergens to the indoor environment which can cause an immune response in adults and children.

Facility Management and Dust and Pest Management

Dust management is an important element of a healthy building. For example, if the appropriate cleaning is not being done in your building to keep dust levels at a minimum this can create a buildup that will then cause your HVAC system to need to work harder to produce a healthy indoor environment. Technicians can ensure the right filters are being used that account for efficiency, resistance to airflow, and dust-holding capacity. Studies have shown that re-circulated air tends to have a larger proportion of lint than does outdoor air, but proper filtration might reduce dust and lint in the space, resulting in lower housekeeping costs.

When it comes to pests, nearly all infestations can be traced back to one simple issue: access. Your FM partner can inspect the building to determine where access points are and then create a pest control plan that will take preventative measures to avoid any infestation. They can deploy green, non-toxic techniques that will minimize the use of pesticides.

Safety and Security

Why is Safety and Security Important?

Maslow's Hierarchy of Needs tells us that safety and security are fundamental to our ability to thrive, coming only after the basic needs of food and water.

Indoor security threats are continuously evolving. Building managers need to consider and address a complex variety of existing and emerging risks that can arise from unauthorized entry to a building. When a person feels secure, it can positively impact their mental health. Feelings of safety may be influenced by the presence of security guards and additional building safety measures.

Facility Management and Safety and Security

Having security guards and controlled access within a building are just a few ways that safety and security can be prioritized. Along with having the appropriate security measures in place within a building, another element that can be overlooked is the fire and life safety systems. These systems are continually operating and require ongoing testing and maintenance from specialist technicians.

Additionally, an FM service provider can ensure emergency and disaster recovery plans are in place that accounts for the unique needs of your building. This would not only include emergency plans for how building users can evacuate a space if there is a security or safety issue but also emergency plans for HVAC or other systems that provide protocols on how to identify, rectify and minimize equipment failures that can disrupt operations within an area of a building or building-wide.

Water Quality

Why is Water Quality Important?

Contaminated drinking water is one of the leading causes of disease globally. Normal building operation can also often result in stagnation (e.g., offices over the weekend, unused hotel rooms).

Drinking water may be contaminated by improper treatment – poor maintenance of distribution systems, malfunctioning wastewater treatment systems, accidental sewage releases, pesticides, fertilizers and more. Despite regulations on water quality in Canada, it's difficult to predict the exact composition of water coming out of your faucet. Things less regulated like atrazine (a pesticide), microplastics and lead, which

are very commonly used in buildings, may be present in the tap water and can impact health.

Facility Management and Water Quality

Building water management plans help guide prevention and response to water quality issues, especially opportunistic pathogen growth. An experienced FM service partner can help you focus on the most important aspects related to water quality in your building and on quickly achievable goals. A building should have a legionella management plan as well as a detailed water management plan. A water management plan should account for the full lifecycle management of all water systems. To create this, facility managers would have a full understanding of the water flow in the building and be able to identify critical inspection points that require scheduled water testing for proactive maintenance.

Noise

Why is Noise Control Important?

A recent survey of more than 1,200 senior executives and non-executive employees found that 53% of employees report that ambient noise reduces their work satisfaction and productivity.

Noise enters building interiors from outside sources such as aircraft, road traffic, trains, lawn mowers etc. Indoors, noise can be generated from a building's mechanical and HVAC systems, office equipment, vacuum cleaners, industrial machinery, or conversations among occupants. Studies of the non-auditory effects of noise exposure have observed that increased noise levels are associated with higher systolic and diastolic blood pressure, changes in heart rate, and hypertension.

Facility Management and Noise

An experienced FM service provider will take the time to understand the layout and components of your building and identify where noise reduction is required from both internal and external sources. Identifying these weak points and then mitigating them through adequate space planning and acoustic design are key for noise control within a healthy building.

For example, within a critical building if there's a room located beside an x-ray machine that creates a lot of noise the room would require to be soundproofed. Having your FM partner conduct regular audits and then deploy plans that can help with the flow of conversation moving throughout a building can also help regulate

and reduce noise throughout the building. Technologies like sound absorbing panels and white noise machines can also be used to further reduce noise.

Lighting and Views

Why is Lighting and Views Important?

With increasing urban societies, views to natural landscapes are often obstructed and indoor spaces are typically illuminated with electric light sources that differ in intensity, spectrum, and exposure timing from outdoor daylight.

The average North American person spends about 90% of their time indoors which has important implications for the wellbeing of building occupants. Light levels typically experienced indoors can induce non-visual responses. It also has acute effects on our cognitive function and sleep. In a building, it's important to consider the type of lighting that users are exposed to and ensure that the space is planned to optimize exposure to the right light at the right time and avoid the wrong light at the wrong time where possible.

Facility Management and Lighting and Views

Your FM provider can look for areas where they can utilize soft lighting throughout a building versus using harsh white lighting. A lighting plan for a space will include considerations like the type of lights used, amount of light needed, and the ability users might have to adjust or change lighting in certain spaces for user comfort. A living wall is another great way to add indoor "views" to a space that may not have unobstructed outdoor views or lots of natural light. Additionally, maximizing window space and natural light can be a consideration if you are in a building development or renovation stage.

Healthy Buildings Now and In the Future

When the foundational elements of a healthy building are considered and regularly maintained there are many benefits to buildings users – increased overall health, cognitive function, and enhanced well-being, to name a few. Creating and maintaining a healthy building doesn't have to be hard.

If you remember the nine foundational elements and the important role successful ongoing management and maintenance play in achieving this, you're one step closer to creating the ideal indoor space for all your occupants. Partnering with a knowledgeable integrated facility management company that has expertise in the

psychological – as well as the practical – aspects of buildings, will allow you to create an environment that is healthy not just now but into the future.