



WHITEPAPER

Preparing for the "New Normal" of Building Occupancy Post COVID-19



**SAIN ENGINEERING
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What will be the "new normal" of building occupancy post-COVID-19?

Strategies and Modifications for an Ever Changing Building Occupant Environment

Building Condition Assessments and Retro-Commissioning

Indoor Air Quality Analysis

Adjusting to the NEW NORMAL

What will be the new normal of building occupancy post COVID-19?

This seems to be the daunting question that is top of mind for building owners and facility operations managers alike as people come out of quarantine and start going back to the office. As more and more people receive their vaccinations, companies are looking at their return-to-work plan. While many buildings have continued to operate under COVID-19 restrictions, others have been closed.

This leaves many building owners and facility operations managers questioning what their building occupancy will look like in the future:

- Will full, and pre-existing building occupancy return to normal?
- Did companies see increased production from remote employees during the pandemic - thus, prompting consideration for allowing for a stronger remote work force in the future?
- Will companies stagger and schedule their workforce upon reentry as they return to work?
- Will companies downsize their facilities and maintain the old relatively high-occupant density model in smaller spaces?
- Will companies stay in their same buildings and simply have lower people-per-square-foot counts?

The questions are endless. And the reality is that each company will adopt varying strategies.

At SEA, we believe many workplaces will have lower average occupant load as employees and employers take advantage of technologies and processes that support working from home that were recognized during the pandemic.

However, we recognize that each company is unique and will select the strategy that best compliments their own production initiatives. Regardless of the decisions made and the strategic path moving forward, the changes will not happen overnight, and they are apt to be incremental.

Additionally, occupants of buildings will have a heightened awareness and concern when it comes to sharing spaces and interacting with others. This is why companies must start reimagining their workplaces and take into consideration the necessary changes and costs for creating a healthier working environment. To best serve your occupants, we recommend having these conversations to help you prepare how to best serve them.

In this whitepaper, we will discuss the strategies and modifications in today's ever changing building occupancy environment. We will also take a detailed look at the Building Condition Assessments, Retro-Commissioning and Indoor Air Quality Analysis necessary to host a post COVID-19 facility.

Our goal is that this guide will give employers, property owners and facility managers the tools they need to prepare for the new mindset and new normal of operating in a post COVID-19 lockdown.

As a result of uncertainty, the post-pandemic period will require building operators to be in a nearly continuous retro-commissioning mindset as building needs change and energy conservation becomes a driving force again.



Strategies and Modifications for an Ever-Changing Building Occupant Environment

Buildings that have continued operations throughout COVID-19 have been making modifications to their HVAC Systems in hopes of reducing the risk of virus transmission within their buildings. These strategies include:

- Increased outside air ventilation
- Continuous (24/7) air system operation
- Increased filter efficiencies
- Ultraviolet disinfection
- Improved relative humidity control
- Relative space pressurization
- Directional/Laminar airflow

All building owners should carefully evaluate every strategy against its appropriateness for each unique building and HVAC system, and refer to ASHRAE for their latest guidelines associated with each of the strategies under consideration.

For those buildings who have eliminated or greatly reduced occupancy during the pandemic, we believe facility owners should engage with energy engineers to study the potential impact reduced occupancy had, or could have on your buildings in the future.

Building operators will be challenged to run their HVAC systems in the most energy-efficient manner while supporting evolving space usage decisions. That might mean annual (or more frequent) evaluation and resetting of operating hours and minimum outside ventilation rates. Such ventilation analysis and adjustments should involve a professional engineer and a testing, adjusting and balancing (TAB) contractor.

The regular investment in such outside consultants is not typically in anyone's operating budget, but they should more than pay for themselves in energy savings by right-sizing the ventilation system, especially in severe climate zones.

We believe there are two key initiatives that must be implemented to prepare for building occupancy return, and ever-changing building occupancy strategies:

- Optimized System Performance
- Compliant Indoor Air Quality

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Optimized System Performance

Retro-commissioning is the process of improving the efficiency and effectiveness of existing equipment and systems within your building. This is particularly important for preparing buildings and spaces that have remained closed due to the pandemic.

Additionally, it will be necessary to schedule a maintenance check to identify any deficiencies, uncover any infrastructure problems, and plan the necessary corrections or updates as occupants return.

By implementing a retro-commissioning process, you are able to assess the following:

- Are new strategies performing as intended?
- Is the balance of the HVAC system performing as intended?
- Are building operators trained on the maintenance, operation, set points and intent of a system's modifications?
- Will there be ongoing monitoring and verification to ensure COVID-19 strategies remain effective over time?

Compliant Indoor Air-Quality

The post COVID-19 work environment will demand improved ventilation and filtration systems to help mitigate the spread of pathogens and allergens. Many companies already have installed well-designed systems; however, it is recommended they monitor them frequently and conduct regular air-quality assessments.

Additionally, as new products are introduced to your overall operations to improve filtration and meet COVID-19 air-quality compliance, it is important to make sure each of the components operate holistically with your entire system to ensure energy efficiencies.

Let's take a deeper look at each of these initiatives.

BOTTOM LINE:

As occupants start returning to facilities, equipment should be serviced and tested.



Building Condition Assessments and Retro-Commissioning

Retro-Commissioning is a systematic process developed to improve an existing building's performance. When applied to existing "older" buildings, commissioning identifies deficiencies, uncovers problems, and offers recommendations for sound, cost-effective solutions for correction.

During the COVID-19 pandemic, retro-commissioning has never been more important.

While some buildings have remained in operation for essential employees, other buildings are sitting vacant or were shut down. As a result, HVAC problems may not have been addressed, and systems may need to be calibrated.

Having a clear retro-commissioning or repurposing strategy to hit the ground running and turn unused buildings into a clean, functioning facility takes the right team of people and the right tools.

SEA QUICK TIPS

What you can do to start your retro-commissioning process by partnering with a licensed Commissioning Provider.

- Assess building systems and controls functionality, including air and water quality issues in buildings that have been vacant
- Conduct building assessment, audits, and retro-commissioning of HVAC, plumbing, lighting, IT and fire protection systems to verify operational ability after a prolonged shutdown or reduction in occupancy-related loads
- Controls testing
- Building flush-out, if necessary (e.g., in event of damage or contamination)
- Full electrical system inspection - from outside transformers to each panel, breaker, circuit, switch, receptacle, low voltage, etc.
- Quality assurance procedures that focus on building enclosure components, including:
 - Implementation of materials that are durable and can easily be cleaned
 - Installation of negative air pressure systems to prevent the spread of infection
 - Inspection and removal of mold, asbestos and lead

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Indoor Air Quality Analysis

Well-designed, installed and monitored mechanical and plumbing systems produce healthy indoor environments where pathogens are filtered, diluted and removed from the occupant breathing zone which is vital to the post COVID-19 workplace. You should engage with professional engineers to understand the fundamental principles of:

- Thermodynamics
- Building Physics (humidity, air flow, differential pressurization)
- Smart Controls
- Sequencing of Operations
- Innovative Ventilation
- Filtration Technologies

Mitigate the presence and spread of potential pathogens and allergens.

As the infection pathways of COVID-19 continue to be discovered and better understood, guidance is shifting regarding criteria such as the optimal relative humidity levels to maintain in building and criteria around filtration.

SEA QUICK TIPS

Below are areas you should address and always keep top of mind throughout the pandemic and into the future:

- Rapidly address indoor air quality issues - perceived and actual - in existing buildings
- Conduct air quality assessments, testing, design and seek professional guidance to improve ventilation effectiveness of existing HVAC systems, support long-term air quality monitoring, and create air-quality awareness
- Adapt controls and sequencing to accommodate and monitor additional filtration needs, and additional criteria concerning recirculated air systems
- Develop messaging and education for building occupants - dashboards, apps, situational cues -- to reduce concerns regarding potential pathogen transmission

Confirming that an HVAC system is functioning as originally intended is the least a building owner / operator can do for any occupied building during the COVID-19 pandemic. This means confirming that supply and exhaust belts are secure, fan motors are operational, outside air dampers stroke fully from open to closed upon a signal from the control system, the control system is programmed to maintain an appropriate airflow and that temperature and ventilation sensors are calibrated and communicating with controllers.



Employers, Property Owners and Facility Managers Must Prepare for the New Mindset

As people come out of quarantine and start going back to the office, they will be expecting increased health and safety measures at their workplace. In addition to this, they will have a heightened awareness and concern when it comes to sharing spaces and interacting with others. This is why companies must start reimagining their workplaces and take into consideration the necessary changes and costs for creating a healthier work environment. Whether your building's occupants will be making structural and infrastructure changes, or providing flexible schedules and remote work options - your building occupancy will change.

With building occupancy change, comes the need to constantly address indoor air quality through retro-commissioning from a professional licensed Commissioning Provider.

As you begin to receive the answers to many of your questions about your building occupancy, you will need to make sure that your building operations are prepared and suitable to serve your occupants with confidence, reassuring them that you have their health and best interests at the heart of their investment - and yours.

SEA's team of energy engineers are available to provide the retro-commissioning services needed within ASHRAE COVID-19 Guidelines to prepare your facility for occupant return and ever-changing occupancy rates.

Learn more about our services at www.saineng.com





ABOUT

Sain Engineering Associates, Inc. (SEA)

SEA is a widely recognized global leader in energy engineering for federal programs with unprecedented success of the Resource Efficiency Management (REM) program which has resulted in enhanced sustainability and increased resiliency for military installations and federal agencies throughout the globe.

Today, SEA continues its mission with the Federal Government while expanding services into healthcare, education, commercial and manufacturing industries by providing a portfolio of comprehensive energy solutions.

Located in Birmingham, AL, SEA is a small, employee-owned business that has achieved world-class energy excellence for its clients for more than 30 years.

Through SEA's energy consulting practices, our cross-functional team of professional engineers and licensed architects evaluate infrastructure reliability for critical facility requirements. Acting on behalf of the owner, our approach ensures facilities are operating at peak performance, whether it's a newly constructed building or aging infrastructure.

For us, it's about earning the trust of the facility owner and their team. It's about sharing our expertise so that each building we leave is operating at maximum efficiency despite various conditions. It's why we rapidly respond to each client's needs, provide seamless collaboration and ensure your team is well prepared for ongoing operations. Nothing gives us greater satisfaction than knowing we have solved the building's challenges while implementing cost effective energy solutions.

Wrapped in relentless integrity, Sain Engineering Associates, Inc. (SEA) provides comprehensive energy solutions through consulting services to federal and private organizations worldwide.



Let's work together



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