

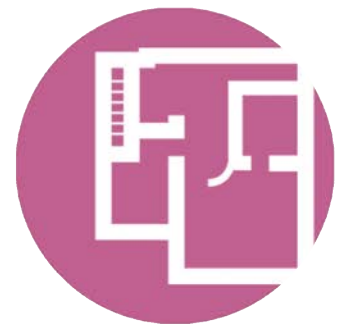
COVID-19: Design Considerations for Healthier Environments



WAYFINDING



BEHAVIOR



PHYSICAL LAYOUT



INTEGRATED SYSTEMS



FINISHES & MATERIALS



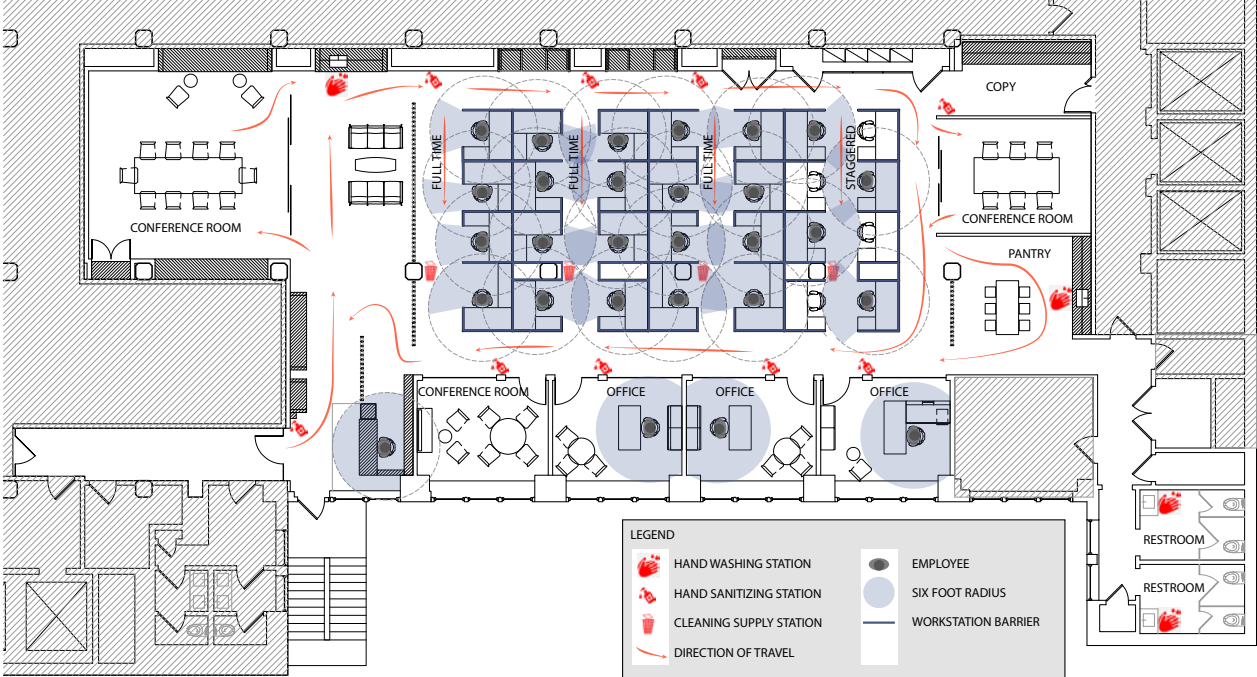
AIR QUALITY



Highland Associates recognizes the environment in which we currently live and work may change dramatically in the near future as a result of the COVID-19 pandemic. **In the coming weeks and months we will all need to work together as we navigate the inevitable shifts and transformation of commercial offices, healthcare facilities, educational institutions, retail stores, mission critical facilities and industrial buildings, and gather together following this crisis.**

Throughout our 32 years in business, **our multidisciplinary teams have developed best practices** and have always sought to share that knowledge across each market we serve. We understand that every project and building type is unique and comes with its own set of challenges. We are here to **serve as a resource** and work with you to design solutions that best meet your needs for today and well into the future. In spite of these uncertain times, **Highland Associates has retained the full technical and administrative resources of our 160+ employees.** We remain **fully operational and committed to business continuity.**

Drawing from our own experience and following guidelines established by the CDC as well as recommendations from the AIA, ASHRAE, ASID and other professional entities, we have outlined the following design considerations:





BEHAVIOR

The CDC has established a comprehensive set of guidelines for everyone to follow. It has been established that social distancing, wearing a mask and handwashing are critical components to combating the spread of COVID-19. What measures can be taken to encourage responsible behavior within our spaces?

- Create **visible reminders** for employee and visitor handwashing such as signs and posters
- Install hand sanitizers at all building entrances, major circulation points, gathering spaces including kitchenettes, water coolers, conference rooms and teaming areas
- Install **dedicated hand sanitizing stations**. These can be mobile furniture items or built in handwashing sinks
- Provide **dedicated entry and exit points** to control staff movement
- Provide disposable mats for **daily protection of individual workstations**



PHYSICAL LAYOUT

With social distancing mandates, perception of space is changing. Simple things like the width of a grocery store aisle have become major talking points. The recommended 6' separation impacts every market and industry. So what can we consider where space is at a premium and cost per square foot is a major driver?



- Create dedicated flow and movement through the space to **reduce congestion at major intersections** and high traffic areas
- Use the architectural layout to **create clear zones for social distancing**. Colors, materials, and wall partitions subliminally cue occupants, making it a natural part of the experience
- **Decrease the density of occupants** within the space. This could be through larger workstations, increased circulation paths, controlled entry or creative scheduling of the workforce
- Install a **physical separation** between open workstations. Clear partitions can still foster a sense of community and teamwork
- **PPE stations** at all building entrances





AIR QUALITY

Improved indoor air quality has long been known to increase employee productivity, reduce employee absenteeism, and improve worker satisfaction. Today, ASHRAE and other industry leaders recommend increased fresh air exchanges and improved air quality as an important part of COVID-19 response plans. The solutions will vary depending on building type and operational needs, but there are several technologies that can be considered.

- **Broad-spectrum germicidal UV-C light** is highly effective at killing bacteria and viruses by destroying the molecular bonds that hold their DNA together. UV-C light is routinely used to decontaminate surgical equipment, OR's, patient rooms and surfaces. UV-C products can also be placed in the Heating Ventilation and Air Conditioning (HVAC) system to disinfect the air of both bacteria and viruses. This technology can also be applied to any type of facility based on proper design
- **Increasing ventilation rates as well as outside air intake** can be looked at based on quality of outside air
- Along with proper ventilation, **air filtration** is equally as important. Air filtration can be as simple as a standard media filter, or include advanced HEPA filtration. Other specialized filtration methods such as gas phase filtration, energetic filters, needle point bi-polar ionization, electrostatic precipitators or other industry specific means of filtration may be employed as well



FINISHES & MATERIALS

Per the CDC guidelines, disinfecting and consistent cleaning of surfaces can help control the spread of infectious disease. Selecting materials with anti-microbial properties, durability and ease of maintenance is an additional measure to help with mitigation. Use of color to draw attention along with products that create physical separation can also be considered.



- **Antimicrobial coating** with copper and silver ion technology for high touch points such as furniture, flooring, paint and bathroom fixtures
- Smooth, porous free wall protection for high traffic areas
- Use of **color and pattern to designate social distancing** in floor, ceiling and wall finishes
- Use of color and lighting to highlight and **draw focus to hand sanitization areas**
- Use of clear partitions to create a physical separation without eliminating a personal connection and sense of teamwork
- Use of **materials that can withstand harsh disinfection and multiple cleanings** that are required to reduce the opportunity for infection

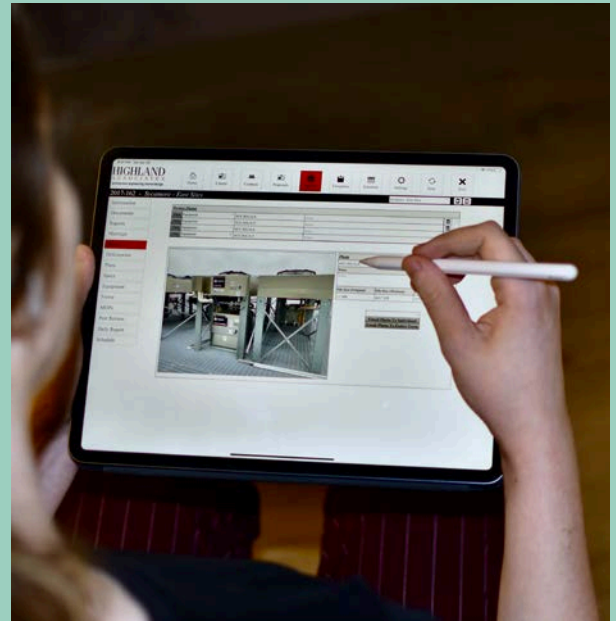




INTEGRATED SYSTEMS

Smart buildings and automated systems can help reinforce behaviors while improving the indoor environment. What type of technologies should be considered as we rethink how we interact with buildings?

- **Automated doors and hands free sensors** at all entrances and exits to reduce touch points in high traffic areas. These can be badge activated or motion controlled, all for touch free operation
- **Monitoring systems** to control occupant census
- Hands free sensors at all restroom and kitchenette fixtures
- Include bottle filling stations at traditional drinking fountains to **reduce cross contamination**
- Hand sanitizers equipped with badge activated monitoring systems. Monitors can signal an employee to sanitize at given intervals or **track the frequency and locations of hand sanitizing**
- HVAC controls systems to **continuously monitor indoor environmental quality**
- IT systems to **enhance electronic collaboration** such as video conferencing and remote access
- **Voice operated controls** for doors, elevators, lighting and building controls
- Safe, **automatic continuous cleaning lights**. These ceiling light fixtures not only provide ambient light, they automatically and continually kill harmful bacteria and continuously disinfect hard and soft surfaces



WAYFINDING

Wayfinding facilitates movement through a space or building with the least amount of frustration or confusion. How can wayfinding be implemented to ease anxiety, control and encourage social distancing?



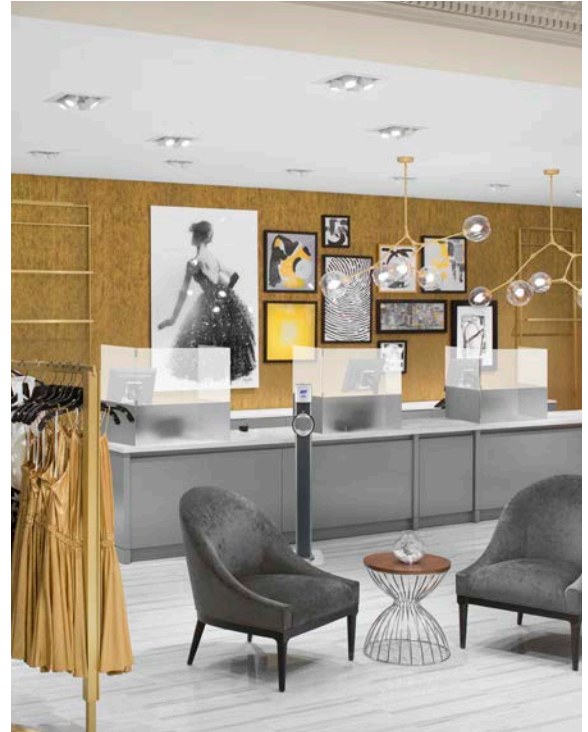
- Install **signage to designate social distancing** and 6' separation
- Use signage and floor patterns to **provide visual cues** for social distancing
- Use arrows and colors to **designate traffic patterns and one-way flow** through a space
- Use words and graphics to **make social distancing a normal part of the end user's experience**



Highland Associates has designed these types of solutions for clients in various building types. We can provide additional information from the leading manufacturers of these products and provide additional information on their use and application. **We are here to help you find the most effective and efficient ways to keep all those that inhabit your building safe.** We acknowledge that there may be potential changes in national and local codes and requirements. We will continue to monitor, as we have been, to ensure compliance.

As this situation continues to evolve and progress, we recognize that there are still a lot of unknowns and research that has yet to be completed regarding the impact of COVID-19. The links provided below are constantly being updated as new information and data is gathered.

We are all in this together and place the safety and well-being of our employees, clients and colleagues at the forefront of all we do. Please contact us with any questions or concerns.



Sources and References

Centers for Disease Control (CDC)

- Interim Guidance for Businesses and Employers to Plan and Respond to Coronavirus Disease 2019 (COVID-19)
- <https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-ihe-response.html>
- <https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/index.html>
- <https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-recommendations.html>

The American Institute of Architects (AIA)

- <https://www.aia.org/articles/6280398-covid-19-resources>

American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)

- <https://www.ashrae.org/technical-resources/resources>

The American Society for Interior Designers (ASID)

- <https://www.asid.org/resources/covid-19>





Highland Associates has formed an internal team of thought leaders consisting of Architects, MEP Engineers, and Commissioning personnel to focus specifically on the issues identified in this document. For additional information or to discuss specific concerns please reach out to one of the team members below.

Thank you.

Gil Ben-Ami, PE
gben-ami@ha-ny.com

John Palucci, PE
jpalucci@ha-ny.com

George Christiana
gchristiana@ha-ny.com

Rick Guditus, PE
rguditus@ha-pa.com

Brian Schafer
bschafer@ha-ny.com

Bilal Hasan, PE, LEED AP
bhasan@ha-ny.com

Elizabeth Corts, RA
ecorts@ha-ny.com

Glenn Leitch, AIA, LEED AP
gleitch@ha-ny.com

Bridget Goryeb
bgoryeb@ha-pa.com

Tracy Wescott, LEED BD+C
twescott@ha-pa.com

Ian Tornquist
itornquist@ha-ny.com

Cassie Homeyer
chomeyer@ha-ny.com



HIGHLAND
ASSOCIATES
www.highlandassociates.com