# POST-PANDEMIC SUSTAINABLE DESIGN

For Restrooms, Locker Rooms, and Public Spaces



Provider: AIA – Florida Chapter Course: S21PPSD AIA Credit: 1 AIA HSW CE Hour



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We're providing the credit numbers for both IDCEC or GBCI In case you want to self-report.



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- This course has been registered with GBCI for CE hours for the following specialties LEED AP BD+C, LEED AP ID+C, LEED AP O+M, WELL AP.
- Course **#0920023394**
- Provided by GreenCE, Inc.
- Number of CE Hours: 1.0



This course has been registered with GBCI for 1 CE hour for the following specialties LEED AP BD+C, LEED AP ID+C, LEED AP O+M, WELL AP.

### COURSE DESCRIPTION

In the wake of COVID-19, people expect more from the facilities they use daily. Public spaces, especially restrooms and locker rooms, must be clean, hygienic, and accessible for everyone to use. Emphasizing public health should not require sacrificing sustainability or aesthetics. This onehour presentation outlines practical short- and long-term solutions that design professionals can incorporate into restrooms, locker rooms, and other public spaces to ensure safety for both end users and the environment. Attendees will also learn how restroom and locker room design can help contribute to projects seeking certification with WELL v.1 and LEED v.4, including USGBC's new Safety-First Pilot Credits. By utilizing sustainable and aesthetic designs, professionals can ensure that visitors and occupants can safely enjoy public spaces for years to come.

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## **LEARNING OBJECTIVES**

- **Identify** the short-term and long-term impacts that the global pandemic will have on public restroom design, especially as they relate to health and safety
- **Discuss** ways in which professionals can emphasize hygiene without sacrificing sustainability, accessibility, or aesthetics when designing and specifying for public restrooms and locker rooms
- **Illustrate** how sustainable product choices in public restrooms and locker rooms can positively impact occupant health and facility maintenance
- **Design** sustainable commercial restrooms and locker rooms that can help contribute to projects seeking certification with WELL v.1 and USGBC's LEED v.4 & v4.1 BD+C, ID+C, O+M new Safety-First Pilot Credits
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Part One: Pandemics and Design

## "Healthy people in healthy places equals a healthy economy."

U.S. Green Building Council, May 2020

In May 2020, the United States Green Building Council (USGBC) revealed a new vision statement to guide the sustainable building community through the COVID-19 pandemic and beyond: "Healthy people in healthy places equals a healthy economy." USGBC president Mahesh Ramanujam emphasized the importance for design professionals to "clearly communicate the economic, health and environmental benefits of a project to its occupants and the community to which it belongs." But how do we clearly and practically do that during—and after—a global pandemic?



According to the World Health Organization, there have been over 62 million confirmed cases of COVID-19, including 1.4 million deaths. In the United States, unemployment soared to 10.4% (Jones, Palumbo, and Brown). The Dow Jones average had its biggest quarterly drop in over thirty years (Jones, Palumbo, and Brown). Businesses have closed. Many cities around the globe have gone on lockdown. The effects of this crisis can be seen on the economy, on people, and our way of life.



The pandemic has already impacted the ways we interact with the spaces we live in, work in, and relax in. How will it impact the future of design and architecture?

# Pandemics have always changed design.

### During the 14<sup>th</sup> century,

Bubonic plague led to urban improvements.

### During the 18<sup>th</sup> and 19<sup>th</sup> centuries,

Yellow fever, cholera, & smallpox led to better deigned water & sewage systems.

### During the 20<sup>th</sup> century,

Tuberculosis, typhoid, polio, and Spanish flu led to tenement reform, waste management, and Modernism.



The reality is global pandemics have always changed design. In fourteenth century Europe, the bubonic plague led to urban improvements that expanded overcrowded cities. In the eighteenth and nineteenth centuries, diseases like yellow fever, cholera, and smallpox inspired cities to create water and sewage systems, which required wider, straighter streets. In the early twentieth century, outbreaks of tuberculosis, typhoid, polio, and the Spanish flu necessitated tenement reform, which included waste management and incorporated natural light and air in cities (Lubell).

Many even attribute the rise of Modernism to these epidemics. Modernism, in its clean lines, geometric shapes, and minimalism, "responded to the ravages of war and disease" of the early twentieth century and "offered an anesthetic to disease and trauma" (Chang). Le Corbusier, considered the pioneer of modern architecture, envisioned a clean, stark environment where "there are no more dirty, dark corners. Everything is shown as it is. Then comes inner cleanness." (Chang).



Now, "We have to return to this kind of medieval spatial response to disease control, which means that architecture and urban design suddenly become medical" (Geoff Manaugh, qtd. in Budds).



As design professionals engaged in the world of sustainability, we can contribute towards public health through design. Some of our contributions are for the short term: precautions we're already taking to help flatten the curve and stop the spread of disease.



The American Institute of Architects (AIA) created its Re-Occupancy Assessment tools for building owners to use when evaluating whether returning to occupancy is done safely. Following the Centers for Disease Control and Prevention's control measures ranked by priority, the Re-Occupancy Assessment tools vary depending on the type of facility, but generally follow the same structure. The first priority is elimination or instituting social isolation. The next is substitution, which is not applicable in the case of a pandemic.

http://content.aia.org/sites/default/files/2020-08/ReOccupancy\_Assessment\_Tool\_v3.pdf



The third, and most relevant to this presentation, priority is architectural and engineering controls. These are measures that reduce exposure to hazards without relying on occupant behavior. In general, architectural and engineering controls include measures that reduce density, increase spacing, emphasize touchless fixtures and features, and install partitions. We'll discuss these controls further in Part Two. The fourth priority is administrative controls, which include changing work policies and procedures to reduce exposure. The fifth and final priority is wearing personal protective equipment. That is not to suggest that PPE is not necessary. However, it should be used in conjunction with the previously discussed measures.

http://content.aia.org/sites/default/files/2020-08/ReOccupancy\_Assessment\_Tool\_v3.pdf



Short term measures are crucial to slowing the spread of disease during a pandemic. But what will the long-term effects be? Professors Naglaa A, Megahed and Ehab M. Ghoneim, in their article "Antivirus-Built Environment: Lessons Learned from COVID-19 Pandemic," predict several long-term trends that this pandemic will have on the architectural and construction industries. They anticipate architectural approaches will soon incorporate self-sufficient strategies that ensure buildings are energy-efficient. We'll refocus on green spaces by incorporating gardens, terraces, and green roofs that help the environment, mental health, and food production. Low-rise buildings will become more popular as they increase social distancing by reducing building occupancy. Architects will also seek ways to incorporate natural light and ventilation to improve air quality and thus physical and mental health (5).



Future trends in construction strategies might include modular construction that facilitates less expensive, quickly constructed buildings, which is particularly important for health facilities. Design professionals should consider adaptive reuse when designing sports facilities, parking lots, and other buildings in the event that they need to be easily converted to temporary medical facilities. As part of that, lightweight and adaptable structures will rise in popularity. Finally, hygienic building materials will become more and more important as designers seek to use anti-bacterial materials that are easily sanitized (5-6). "The time to reset and reshape our built environment is now, and not after the next pandemic."

As Professors Megahed and Ghoneim argue, "the time to reset and reshape our built environment is now, and not after the next pandemic" (4). We must start incorporating hygienic design in every project.



We've discussed how the pandemic will inspire some general trends both short- and long-term. But what specifically can design professionals do to implement hygienic trends in new and existing buildings? And how do those specific steps help stop the spread of germs? Handwashing is key to avoiding the spread of infectious diseases.



The Centers for Disease Control and Prevention (CDC) emphasize that keeping hands clean is one of the most important steps we can take to avoid getting sick and spreading germs to others. However, a recent study showed that only 31% of men and 65% of women washed their hands after using a public restroom (Judah et al, S405). According to the CDC, handwashing education in the community "reduces the number of people who get sick with diarrhea by 23-40%, reduces diarrheal illness in people with weakened immune systems by 58%, reduces respiratory illnesses, like colds, in the general population by 16-21%; and reduces absenteeism due to gastrointestinal illness in schoolchildren by 29-57%" ("Show Me the Science"). Providing materials to help inform people in your building of the benefits of handwashing is a great first step towards slowing the spread of germs in public restrooms. But design professionals also have the unique opportunity to steer behavioral changes towards adhering to changing habits to keep hands clean. Small but effective design improvements can encourage people to make better habits when it comes to sanitation.



As we discussed earlier, AIA created a Re-Occupancy Assessment tool detailing best practices for buildings to incorporate before reopening (Bannon-Godfrey, Millman, and Phinney). Let's take a closer look at how design professionals can renovate or retrofit public spaces in any building to help prevent the spread of germs.



Imagine you're entering any space you might go to throughout the day. Some of you might already be back in the office. Others might imagine picking up groceries or other essential tasks. As you're walking through the building, what surfaces are you touching?

## Entrance & Circulation Spaces

### Mounted or Standing Hand Sanitizer

Encourage hand hygiene by installing mounted or standing hand sanitizer stations.

Liquid, gel, and foam sanitizers are equally effective.<sup>1</sup>



The entrance and other circulation spaces such as lobbies and elevators are key points to stop the spread of germs. People are coming in and out, touching door handles, elevator buttons, and all kinds of other surfaces, potentially spreading germs throughout the building. To encourage hand hygiene in these areas, install hand sanitizer stations. Mounted or freestanding hand sanitizer dispensers are perfect for high traffic areas. Mounted dispensers are compact and save space in areas with a small footprint. Freestanding dispensers can be used in places where a wall or counter is not present. Hand sanitizer stations help eliminate the use of water, paper towels, and helps to eliminate waste.

Look for hand sanitizer dispensers that use universal soap for a hasslefree refill and include a convenient sight gauge to determine refill needs. Freestanding dispensers should be strong, with rounded corners for added safety and rubber feet on the base to prevent sliding and scratching. An integral drip tray keeps floors clean. Studies have shown that there is no efficacy difference between liquid, gel, or foam hand sanitizer, but users might have a personal preference (Wilkinson et al, 359). The important thing is to make sure hand sanitizer is available in high-touch areas.

Another benefit of hand sanitizer stations is that they are portable which offers more flexibility throughout the day as the visitor type may change from day shift or night shift. office vs. manufacturing, visitors vs. students, etc. There may be changes to traffic flow of a building postpandemic. These may add an extra layer of flexibility as they can easily be moved from one location to another in comparison to a built-in installation that cannot be easily moved or changed to adapt to new traffic patterns.



One potentially overlooked area that is vital to stopping the spread of germs is the HVAC. Studies have found that "bacteria...can be dispersed throughout buildings" through ventilation systems (Huesca-Espitia, 1). Install an effective ventilation system or evaluate your current one. Commission the HVAC system, increase the rate of exhaust to provide more air changes, filter exhaust to ensure air is cleaned before cycling back through the HVAC system, or provide 100% exhaust and outside air makeup.



Now, let's specifically address public restrooms. Restrooms are a vital but vulnerable space in any building. Although users have always expected public restrooms to be clean and hygienic, people have understandably been more demanding than ever during the pandemic. Many are even avoiding public restrooms entirely. We must consider all of the surfaces and fixtures in a restroom in order to create a clean and hygienic space that people feel safe using.
### Doors

Clean hands can be contaminated again by dirty doors.<sup>1</sup>

Eliminate doors entirely or install hands-free door openers.



People who have washed their hands run the risk of recontamination when they push open a restroom door to exit, since people who haven't washed their hands have pushed open the same door. In 2011, researchers at the University of Colorado-Boulder examined the spread of bacteria on different surfaces in 12 public restrooms on campus (Flores et al). Commonly touched surfaces such as doors had skinassociated bacteria that can cause skin conditions, staph infections, and respiratory infections.

Ideally, design professionals would eliminate doors in public restrooms

where possible, reducing the spread of germs by minimizing hand contact and improving ventilation to discourage germ growth. A welldesigned restroom with no doors has a vestibule entry preventing a direct line of sight to toilets, urinals or mirrors, thus protecting users' privacy.

Since this won't be possible for existing restrooms, provide automatic door openers, hands-free door hardware or proximity sensors so that users can enter and exit without touching any handles. Another option is to hang doors so that they swing out. This allows users to open doors with a push of a foot to the kickplate or the push of an elbow, eliminating hand-door contact and, therefore, effectively preventing the spread of germs.



The AIA encourages professionals to replace or modify stalls and partitions so that they extend to the floor, which promotes privacy and safety. But the dimensions of the partitions aren't the only important factor. Ensure the partition material is sustainable and hygienic. There are several sustainable partition options. High-Density Polyethylene (HDPE) is moisture resistant, which helps stop mold and bacteria from growing. Partitions with a phenolic core are also moisture resistance and also includes a top and bottom seal. Stainless steel partitions often include recycled content. They can also have a permanently sealed edge, which eliminates gaps, making them easier to clean. Glass partitions, with frosted privacy glass, are sustainable and easy to wipe down and clean. Regardless of which option you pick, look for partitions that are GREENGUARD certified, which we'll discuss later to ensure the material promotes healthy air quality.

### Toilets

#### Sensor-flush valves

Reduce spread of germs and water consumption

#### **Toilet lids**

Indicate lids should be closed prior to flushing

#### Seat covers & disposable liners Provide biodegradable disposable liners for users



Sensor-operated flush valves, which are motion-activated, prevent users from touching flush handles, which could harbor bacteria and other germs. Not only do automatic flush valves work to prevent the spread of germs, they also are programmed to supply a predetermined quantity of water, thus reducing water consumption. If toilet lids are present, place signs indicating that toilet lids should be closed before flushing, which can help reduce the spread of germs vis aerosolization. Seat covers are becoming more popular because of the pandemic, so provide biodegradable disposable liners for users. Biodegradable liners for baby changing stations are also important to remember.

### Faucet & Soap

**Touch-free faucets & soap dispensers** Complementary, sophisticated design



Infection-causing germs are readily spread on high-touch surfaces, like faucet handles. According to the Mayo Clinic, "Cold and flu virus-laden droplets may remain infectious for several hours, depending on where they fall. Viruses generally remain active longer on stainless steel, plastic and similar hard surfaces than on fabric and other soft surfaces." It is possible to catch an active virus after handling an object—like a faucet handle—upon which an infected person recently coughed or sneezed. The best and safest faucet option is a touchless faucet. Sensor-operated faucets prevent users from coming into contact faucet handles and can save water by being set to run for a specific amount of time and eliminating the possibility of a faucet not being completely turned off.

Look for faucet and soap dispensers that are coordinated to create washroom harmony. Some manufacturers even design dispenser and

faucet sets to complement handwashing basins. Advanced sensor technology eliminates false activations and optimizes power consumption, longer spouts create increased handwashing space and brass cast spout construction delivers durability with stylish and environmentally friendly PVD finishes.

### Faucet & Soap

Dual soap & water faucets Combine soap dispenser and water faucet in one Integrated all-in-one sink systems Combine soap dispenser, water faucet ,and hand dryer



Another option is dual soap and water faucets that offer touch-free soap and water in one convenient fixture, eliminating clutter on the deck. Integrated all-in-one sink systems provide a completely touchless handwashing experience that houses soap, water and dryer in one intuitive and attractive unit. This not only ends soap and paper towel waste but also eliminates water splashing on users or dripping across the floor.

Our effort to be specification neutral, we've used the term Centralized Handwashing Systems. Centralized Handwashing System have become 'smart-technology' handwashing systems. They provide water & soap or Water, Soap and hand drying; that are centrally located at the handwashing basin.

Each function (soap, water, dryer) is delivered by infrared accessible, touchless fixtures

### Hand Washing Systems Access Panels

Security Barrier: Vandalism, Flooding & Theft

Ease of maintenance

ADA and Accessibility Requirements

Eliminates Cost, and maintenance



Accessible clearances for knee and toes; are defined to ensure a wheelchair can access the faucet.

Sink and basin handwashing systems are often designed with access panels beneath the sink to enclose and cover the plumbing connections & mechanicals.

### Security Barrier: Vandalism, Flooding & Theft:

Access panels serve as a front-line barrier to prevent visitors' unobstructed access to

- 1. Under-sink electronics and plumbing connections..
- 2. Cutting water lines; thereby flooding the restroom and other areas of the building.
- 3. Steal soap containers and sink electronics

### Sanitization:

Restrooms require both daily cleaning and sanitization to maintain a healthy and safe environment for the facility owners' visitors.

Mold, mildew and nasty bacteria will grow in a restroom and will quickly become a health hazard without a daily/weekly cleaning schedule.

### Which is easier for maintenance staff?

Cleaning and sanitizing the surface of a stainless-steel access panel? OR

Cleaning and sanitizing the web of pipes, valves, wires, fixture supports, electronics and wall surface with a sanitization spray bottle

### ADA Accessibility & Pipe Wrap Requirement:

Access panels ensure ADA\ANSI 117.1 knee-toe clearance access to the sink and handwashing with a wheelchair; while protecting the visitors' knees from hot pipes and sharp objects beneath the sink.

### Eliminates Cost, Maintenance and Replacement of Pipe Wrap Ben

An ASTM International standard on safety for disabled individuals is defined below.

Designed to help improve safety of public restrooms for people with disabilities, **C1822, Specification** for Insulating Covers on Accessible handwashing basin Piping, provides guidance on protecting people from exposed pipes in accessible restrooms.

### Sinks

#### Seamless handwashing basin decks

Eliminate mold and delamination with hygienic surfaces
Easy installation and maintenance
Fewer plumbing connections and unique mounting features
Sophisticated design
Variety of finishes and faucets to complement any design



Sinks and handwashing basin decks should provide the complete package and deliver incredible value where it matters most—high durability, fast installation, easy maintenance and stylish design. The perfect alternative to china sinks and laminate countertops, these basins provide a hygienic handwashing solution that meets the high demand of today's commercial restroom. Some handwashing basin decks can include the soap dispenser, water faucets, and countertop in one package, while still complying with ADA. Look for sinks and handwashing basin decks that are made of durable and repairable solid surface material. Their seamless construction eliminates mold and delamination, while gentle curves inside the basin make them a breeze to clean and maintain.

### **Hand Dryers**

<sup>1</sup>Patrick, Findon, and Miller, 319 2 CDC, "Frequent Questions about Hand Hygiene

Damp hands spread bacteria more easily than dry ones do.<sup>1</sup>

Currently, there is not enough evidence to prove one hand-drying method is more effective or hygienic than others.<sup>2</sup>

Warm air and jet hand dryers are cost-effective, sustainable options for restrooms.



Research shows that damp hands spread bacteria more easily than dry ones, but it's less clear which method of hand-drying reduces bacteria the most (Patrick, Findon, and Miller, 319). Although you may have hear rumors suggesting otherwise, the CDC states that "There is currently not enough scientific evidence to determine if using a clean towel or an air hand dryer to dry your hands is more effective at reducing germs on your hands. Both are effective ways to dry your hands." Hand dryers reduce paper towel and energy costs, thus protecting the environment. Look for hand dryers that keep noise levels down and incorporate reliable touchfree activation. Those equipped with HEPA filters reduce contaminants in the air. Although hand dryers are just as, if not more, safe to use, paper towels are still popular with users. Consider providing users with the choice between using a hand dryer or paper towels but emphasize touch-free options.



A person with clean hands should not have to touch a waste receptacle when disposing of used paper towels, so be sure to choose touch-free. There are a number of options, including flaps, and sensor and foot pedal activated. Place waste receptacles next to the exit door so that, when pushing the door open, a user can use paper towels as a barrier between his/her clean hands and the door, depositing the paper towels in the waste receptacle once the door is open. Bear in mind that, even if you use hand dryers, waste receptacles are still necessary to capture disposable items, such as diapers and feminine hygiene products. Also consider adding additional touchless trash cans to accommodate increased waste and enforce physical distancing between sinks.

### **Materials**

#### Natural quartz surface

Durable, non-porous surface that's high-end *and* maintenance free

#### Solid surface

Seamless, non-porous surface that's easily repaired and made of recycled content

### Antimicrobial accessories

Inhibit the growth of microorganisms to protect against bacteria



What materials these finishes are made of is just as important. Hygienic, sustainable materials do not have to be ugly and utilitarian. Natural quartz surface is the first and only natural quartz material that can be molded into round and curved shapes. Imagine graceful curves, soft radius edges, elegant shapes and effortless beauty that will last a lifetime. A durable, long lasting material, natural quartz surface is non-porous, with inconspicuous seams that are easy to clean and maintain. The absence of cracks or crevices prevent bacteria and mold from accumulating. Natural quartz surface is also chemical, stain, impact and scratch resistant, and it's repairable. Made from a blend of bio-based

resin, natural quartz, granite, recycled glass and other exotic minerals, natural quartz surface can have up to 70% recycled content.

Another option is solid surface, which is made to last a lifetime and can easily be repaired and renewed, thus minimizing the need for replacement or disposal. Most solid surface products are completely molded including bowls, overflows, backsplashes and aprons, eliminating fabrication waste and the use of sealants and adhesives. Solid surface is composed of eco-friendly bio-based resin and up to 25% pre-consumer recycled granules.

Finally, look for accessories and partition door pulls and latches with antimicrobial protection that help to inhibit the growth of microorganisms such as bacteria, mold, mildew and fungus.

### **Locker Rooms**

#### Lockers and benches

Made from moisture resistant, vandal resistant HDPE and is up to 100% post-consumer recycled content

#### **Shower curtains**

Antimicrobial finish protects against microorganisms and doesn't wear away



Like restrooms, locker rooms also require privacy and safety. Look for lockers that are constructed from corrosion-proof, high-density polyethylene (HDPE) material that won't rust or dent like metal will. HDPE is more resistant to scratches & easier to repair than metal. Look for locker manufacturers who can provide lockers made from 100% postconsumer HDPE recycled material that is GREENGUARD GOLD certified as a low emitting material. **100% post-consumer recycled content means that the products are made from materials disposed of in recycling bins. This can include empty plastic bottles or even aluminum cans. Specifying 100% post-consumer content in your project could help your building achieve LEED credit points.** According to the USGBC **construction and demolition waste constitutes about 40 percent of the total solid waste stream in the US.** LEED projects are responsible for **diverting more than 80 million tons of waste from landfills, and this volume is expected to grow to 540 million tons by 2030.**  Ensure the locking and latch system is the most secure one available: a continuous slide latch made of ½" (127mm) thick HDPE, which secures the entire length of the door. Other areas to consider when designing or retrofitting locker rooms post-pandemic include the showers. Use shower curtains with an antimicrobial finish that protects against microorganisms and doesn't wear away.



Public health must include accessibility. Ensure public restrooms and locker rooms are easily accessible to ALL future occupants. Look for manufacturers who prioritize accessibility and can work with you to create a sustainable, hygienic, and accessible restroom or locker room.



Now that we've discussed the pandemic's effects on design and ways design professionals can help stop the spread of germs, let's discuss how pandemics effect the environment and how design professionals can create safe and sustainable spaces.

# Pandemics impact the environment.

Lockdown has improved air and water quality across the globe.<sup>1</sup>

However, increased PPE use has led to massive amounts of medical waste.<sup>2</sup>

How do we make sure the ways we're protecting people also protect the environment?



<sup>1</sup>Saadat, Rawtani, and Hussai <sup>2</sup>Saadat, Rawtani, and Hussai

A pandemic doesn't just impact people—it impacts the environment, too. On one hand, lockdown has led to improved air and water quality across the globe—how do we continue these improvements once we return to our daily activities? (Saadat, Rawtani, and Hussain). On the other hand, the exponential increase in PPE has led to a massive amount of medical waste in the environment (Saadat, Rawtani, and Hussain). How do we make sure the ways we're protecting people also protect the environment? One of the best ways design professionals can do this is by using products and creating projects that clearly document how they impact the environment. Let's look at a few labels and certifications that design professionals can use, especially when designing public restrooms and other spaces.



Health Product Declaration or HPD labels are a growing and trending specification standard specification for reporting product contents and associated health information. These include a summary, the product's contents, any certifications and compliance, accessories, and then general notes and references. Although these work with rating and certification standards in the building industry, HPD labels don't provide any guidelines or thresholds for product content.

# mindful MATERIALS Library

Building industry database that allows design professionals to search for products that meet different sustainability criteria

Manufacturers in this database have provided documentation for transparency disclosure, VOC emissions testing, and/or certifications

The mindful MATERIALS Library is a building industry database that allows design professionals to search for products that meet different sustainability criteria. Manufacturers with products in this database have provided documentation for transparency disclosure, VOC emissions testing, and/or certifications regarding VOC testing, material ingredients, environmental profile, or material sourcing.

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# GREENGUARD Label

<sup>1</sup>EPA, "Volatile Organic Compounds

Volatile Organic Compounds (VOCs) emitted from indoor products can cause serious health issues<sup>1</sup>

Products with this label can help reduce indoor air pollution and exposure to toxic chemicals



The Environmental Protection Agency warns that volatile organic compounds (VOCs) that are present in many building materials, interior furnishings, and cleaning products can negatively affect indoor air quality and our respiratory health. To reduce indoor air pollution and exposure to toxic chemicals, look for products that are UL GREENGUARD certified, which means they have been thoroughly tested and meet VOC emission limits. GREENGUARD Gold Certification has even stricter requirements, ensuring products with this label are safe for even at-risk environments such as healthcare facilities.

# LEED Certification

Leadership in Energy and Environmental Design

Projects with LEED certification have prioritized green building strategies that serve both the environment and building occupants

Beyond labels, there are also building rating systems that encourage sustainable building design. LEED (Leadership in Energy and Environmental Design) is the most widely used green building rating system in the world. Available for virtually all building types, LEED provides a framework for healthy, highly efficient, and cost-saving green buildings. Projects pursuing LEED certification earn points for various green building strategies across several categories. Let's look at some LEED credit categories that specifically relate to the restroom features we discussed previously.

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In the Water Efficiency category, LEED includes a credit for Indoor Water Use Reduction. To apply for this credit, projects should utilize fixtures such as water faucets that reduce aggregate water consumption by 20% from the baseline. The baseline for public restroom faucets is 0.5 gpm at 60 psi, so low flow faucets below 0.375 gpm can help contribute to this credit.

## **Materials & Resources**

#### Building Product Disclosure & Optimization—Sourcing of Raw Materials

Use products that are responsibly sourced and extracted, such as using recycled content

#### Building Product Disclosure & Optimization—Material Ingredients

Use products from manufacturers that demonstrate the chemical inventory or material ingredient optimization



In the Materials & Resources category, several credits focus on Building Product Disclosure & Optimization. Using products that meet responsible sourcing and extraction criteria, such as recycled content, or have transparent material ingredient optimization can help contribute to these credits. Products sourced within 100 miles of the project site are valued at twice their base contributing cost.



Low-Emitting Materials Use materials and products that meet low-emitting criteria

#### Indoor Air Quality Assessment

Perform a screening test for Total Volatile Organic Compounds



In the Indoor Environmental Quality category, several credits promote using materials that reduce VOC exposure. Products that are GREENGUARD certified can help contribute to these credits.

## LEED Safety-First Pilot Credits

Provide safer livings spaces, workspaces, and public spaces LEED 2009 | LEED v.4 | LEED v.4.1 | Cities + Communities

- Cleaning & Disinfecting Your
   Space
- Re-Enter Your Workplace
- Building Water System Recommissioning
- Managing Indoor Air Quality during COVID-19
- Pandemic Planning
- Social Equity in Pandemic Planning
- Arc Re-Entry

Given the COVID-19 pandemic crisis we face, the USGBC has launched the "Safety First" pilot credits, which hope to provide a safer living space, workspace, and public space. The LEED pilot credits are distributed in the building and construction, operations and management and the cities and communities rating systems. We will provide an overview of the Safety First Pilot Credits. However, it is important to note that these credits may be updated periodically, so project teams should review the most up to date information on the USGBC website. Seven pilot credits have been released so far, but we'll focus on the first four, as the last three refer to cities + communities projects.



The first pilot credit focuses on effective cleaning and disinfecting during re-occupancy and operations while minimizing adverse health impacts on cleaning personnel, building occupants and visitors, and the environment. It encourages the use of disinfectants that the EPA have labeled Disinfectants for Use Against SARS-CoV-2, including those with the GreenSeal or ECOLOGO labels.

#### LEED SAFETY FIRST PILOT CREDITS

### **Re-Enter Your** Workspace

#### Intent: "To promote best practice requirements in operations and human behavior to take precautions against the spread of COVID 19"

- Requirement:
  - Use AIA Re-Occupancy Assessment Tool

The next pilot credit details best practices for operations that take precautions against the spread of COVID 19. The requirement for this credit includes using AIA's Re-Occupancy Assessment Tool mentioned previously to prepare spaces for re-entry through infection prevention and hygiene practices.

# Building Water System Recommissioning

#### LEED SAFETY FIRST PILOT CREDITS

- Intent: "To reduce occupant exposure risks associated with degraded water quality in community and building water systems due to stagnant or low water use"
- Requirements:
  - Develop and implement a water quality management plan for the building water system and all devices that use water in accordance with ASHRAE Standard 188-2018: Legionellosis: Risk Management for Building Water Systems (BWS).

Next, we have a credit that seeks to reduce occupant exposure risks associated with degraded water quality in community and building water systems due to stagnant or low water use. Building owners should ensure their water system meets the ASHRAE standard 188-2018: Legionellosis: Risk Management for Building Water Systems.

# Managing Indoor Air Quality during COVID-19

#### LEED SAFETY FIRST PILOT CREDITS

- Intent: "To promote precautionary best practices for managing air quality in buildings during the COVID-19 pandemic to minimize spread of COVID-19 through the air"
- Requirements:
  - Take steps to improve ventilation in the building, such as increasing the percentage of outdoor air, increasing total airflow supply to occupied spaces, disabling demand-control ventilation controls, using natural ventilation to increase outdoor air dilution of indoor air, improve central air filtration, running the ventilation systems during unoccupied times, reevaluating the positioning of supply and exhaust air diffusers, and using portable high-efficiency particulate air fan and filtration systems.

The last LEED Safety First Pilot Credit we'll discuss focuses on managing indoor air quality during COVID-19. There are a lot of steps you can take to improve ventilation in the building, such as increasing the percentage of outdoor air, using natural ventilation to increase outdoor air dilution of indoor air, and improving central air filtration.

# WELL Building Standard

Projects that are WELL Certified have prioritized building strategies and design that promote human health and wellness



While LEED certification focuses on a project's impact on the environment, the WELL Building Standard is another building rating system that encourages architecture and design that promotes human health and wellness. Created by the International WELL Building Institute, the WELL Building Standard considers a building's effects on the whole human body and the ability of a facility to holistically support wellness. Let's look at WELL concepts that directly relate to public restrooms.

# Air

Air Quality Standards Ensure a basic level of high indoor air quality

#### **VOC Reduction**

Minimize the effect of VOCs in building materials on indoor air quality

#### **Cleaning Protocol**

Reduce occupant exposure to pathogens, allergens, and harmful cleaning chemicals



The first WELL Building Standard concept is Air, similar to LEED's Indoor Air Quality. Public restrooms can be designed to meet many requirements in this category, such as air quality standards and VOC reduction, which focus on limiting VOCs, and the Cleaning Protocol standard, which prioritizes non-toxic cleaning products.

# Air

Fundamental Material Safety Reduce occupant exposure to lead, asbestos, and PCBs

### Moisture Management

Limit the potential for bacteria and mold growth

**Toxic Material Reduction** Minimize the impact of hazardous building material chemicals on indoor air quality



Other Air standards include Fundamental Material Safety and Toxic Material Reduction, which encourages the use of non-toxic building materials, and Moisture Management, which includes using materials that resist moisture and bacteria growth.
# Air

**Enhanced Material Safety** Minimize impact of hazardous building material ingredients on IAQ

### Antimicrobial Activity for Surfaces

Reduce occupant exposure to harmful pathogens and hazardous cleaning agents

Cleanable Environment Reduce occupant exposure to pathogens on high-touch surfaces



Enhanced Material Safety continues to promote safe building materials, while Antimicrobial Activity for Surfaces and Cleanable Environment focus on clean, hygienic surfaces and cleaning processes, which are especially relevant during the pandemic.



Finally, the Cleaning Equipment standard encourages the use of high quality cleaning equipment.

# Nourishment

#### Hand washing

Reduce pathogen transmission by providing accessible and sanitary hand washing facilities



Within the Nourishment category, the Hand Washing standard encourages providing accessible and sanitary hand washing facilities to reduce pathogen transmission. The requirements for this standard include handwashing supplies, contamination reduction, and even sink dimensions.

## Comfort

#### Accessible Design

Provide building that are accessible and usable by people of all physical abilities

#### **Olfactory Comfort**

Reduce the transmission of strong smells and odors within the building



Finally, in the Comfort category, two standards can relate to public restrooms. First, the Accessible Design standard requires that buildings are accessible and usable by people of all physical abilities. Utilizing manufacturers who focus on ADA compliant design can help contribute to this standard. Second, the Olfactory Comfort standard seeks to reduce the transmission of strong smells and odors within the building. This includes separating areas, such as restrooms, from main spaces.

# WELL Building Standard

Support in the Fight Against COVID-19

- Promote Clean Contact
- Improve Air Quality
- Maintain Water Quality
- Manage Risk and Create Organizational Resilience
- Support Movement and Comfort, Including Work from Home
- Strengthen Immune Systems
- Foster Mental Resilience
- Champion Community Resilience
  and Recovery

Strategies from the WELL Building Standard to Support in the Fight Against COVID-19 specify WELL Building standards that can help buildings and operations promote health and wellness during the pandemic. We'll focus on the first three standards, which focus specifically on building design and maintenance.



To promote clean contact, these standards focus on reducing pathogen transmission associated with washing and drying hands by providing sufficiently large sinks, disposable soap containers and hand-drying towels and implementing a rigorous cleaning protocol that addresses high-touch surfaces, provide annual trainings, maintain cleaning logs and restrict use of hazardous or harmful ingredients in cleaning, disinfection and sanitization products.



There are many features under this standard, including Ventilation Effectiveness, Enhanced Ventilation, Operable Windows, Air Filtration, Microbe and Mold Control, Moisture Management, and Humidity Control.



Finally, the Maintain Water Quality standard includes features such as Fundamental Water Quality, Water Contaminants, Enhanced Water Quality, and Water Quality Consistency, which provide performance thresholds for all water likely to come in contact with building occupants.



Let's review what we've discussed today.



COVID-19 is going to impact our way of life for a long time. Because of this, design professionals have a unique opportunity to renovate and create spaces that promote public health and protect the environment. Environmental health and human health are directly linked, so it's imperative that your designs are safe, sustainable, and accessible.

## Review

- **Identify** the short-term and long-term impacts that the global pandemic will have on public restroom design, especially as they relate to health and safety
- Discuss ways in which professionals can emphasize hygiene without sacrificing sustainability, accessibility, or aesthetics when designing and specifying for public restrooms and locker rooms
- **Illustrate** how sustainable product choices in public restrooms and locker rooms can positively impact occupant health and facility maintenance
- **Design** sustainable commercial restrooms and locker rooms that can help contribute to projects seeking certification with WELL v.1 and USGBC's LEED v.4 & v4.1 BD+C, ID+C, O+M new Safety-First Pilot Credits

Now, you will be able to:

- Identify the short-term and long-term impacts that the global pandemic will have on public restroom design, especially as they relate to health and safety
- Discuss ways in which professionals can emphasize hygiene without sacrificing sustainability, accessibility, or aesthetics when designing and specifying for public restrooms and locker rooms
- Illustrate how sustainable product choices in public restrooms and locker rooms can positively impact occupant health and facility

maintenance

 Design sustainable commercial restrooms and locker rooms that can help contribute to projects seeking certification with WELL v.1 and USGBC's LEED v.4 & v4.1 BD+C, ID+C, O+M new Safety-First Pilot Credits



If you're ONLY seeking an AIA credit today, AIA Florida will take care of the credit submittal .. NO ACTION Required.



If you're seeking IDCEC or GBCI credit, we need you to email us your IDCEC and/or GBCI numbers in the next 48 hours. .. ACTION REQUIRED.

We're providing the credit numbers for both IDCEC or GBCI In case you want to self-report.

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## Sources



Any questions?



**Online Resources:** 

- Virtual Design Tool https://www.bradleycorp.com/virtual-design-tool
- Bradley's AR App https://www.bradleycorp.com/bradley-arexperience
- Online ADA Design Guide https://www.bradleycorp.com/online-adadesign-guide



The Bradley Virtual Design Tool provides architects and designers selfservice, photo-realistic product selection tools, within several pre-built restroom environments: high traffic, institutional, corporate, and hospitality. The virtual design tool allows you to see how any lavatorysink model will appear within a space using your color selections. With the collaboration tool, you can then capture and share your design option decisions with the project team and owner.



Bradley's AR Experience is your way to visualize innovative faucet/soap combinations within your existing spaces. See how WashBar Technology or the New Verge Soap and Faucet Combinations will look in within your next project. The app allows you to Visualize Bradley products within your space, Choose between deck-mounted faucet/soap or a full handwashing system, Choose your favorite faucet/soap combination and finish, and Capture a photo of your space and share via email.



Bradley's VDC-Assist (Virtual Design & Construction Assistance) guide features Starter Kits architects can use to jump-start projects. The comprehensive kits include accessible restroom & locker room layouts in 3D or 2D format to easily copy/paste into your projects' design software. Each starter kit includes fully-dimensioned accessible floor plans, elevations, sections, 3D views with both fixture and washroom accessory schedules, plus Autodesk Revit (3D \*.rvt files), Autodesk AutoCAD (2D \*.dwg files) and PDFs. Use the PDF documents as reference guides to ADA and accessible design standards for installation heights and clearances. Installed height ranges are dimensioned in both floor plan, elevation and section views. 3D views enhance the designers' understanding of installed products within the layout. Pre-built 3D restroom layouts use product models from Bradley's extensive Revit Library to configure Single and Men\Women multi-occupant restrooms. The start kits also integrate Bradley's award-winning accessible & sustainable products into every layout.



Checkout Bradley's newly updated CE by Design Program at our website: https://www.bradleycorp.com/ce



Thank you! The education program has concluded.

Contact us directly at: BradleyCE@bradleycorp.com