

FOR THE LOVE OF NATURE

The Beauty & Benefits
of Biophilic Design
in the Built Environment

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FOR THE LOVE OF NATURE THE BEAUTY & BENEFITS OF BIOPHILIC DESIGN IN THE BUILT ENVIRONMENT

Photo by Miguel Sousa on Unsplash

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Nature: Here to Stay

Design trends may come and go, but there are certain design strategies and elements that will stand the test of time. Biophilic design is among them. Why? Because people are inherently wired to connect with the beauty and complexity of the natural world. Furthermore, scientific research proves that access to nature in the built environment is good for occupants’ physical and mental well-being.

What is biophilic design exactly? Although it’s surged in popularity—especially in the wake of the pandemic—it’s not a new concept. Biophilic design goes beyond adding a few plants around the office. It is a thoughtful design approach that integrates the natural world into interior spaces through things like natural light, fresh air, natural materials, access to outdoor spaces and gardens or the use of organic shapes that mimic nature’s own design, according to the Global Wellness Summit (GWS).

And as city planners address climate change, the use of green spaces and parks is also on the rise, helping to offset the heat island effect and provide much-needed cooling. The concrete jungle is giving way to the concept of a “city in a garden,” GWS notes, and making cities more biodiverse and resilient.

For these reasons and more, we’ve assembled this eHandbook on the beauty and benefits of biophilic design. Inside, you’ll find in-depth information on the impact that biophilia has on employee health and wellness; how we can create more sustainable products that mimic nature; lessons that design professionals have learned by applying biophilic design strategies and more. We’ve also included two recent case studies of beautiful spaces that were designed to invite nature in and reap the benefits. You’ll also find products that were either inspired by nature or respect the earth in their thoughtful use of materials.

We hope you find this eHandbook both an educational and inspirational resource as you explore the various ways you can bring the outside world indoors.

Jeanie Fitzgerald, Editor in Chief, *Architectural Products*

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Photos courtesy Ghent

What is Biophilia?

It is no secret that humans have an innate connection with the natural world. This knowledge led to a field of study called biophilia, or biophilic design—design inspired by nature. Nature is essential for the mental and physical well-being of every person.

Let's take a cue from etymology to break the word apart. "Bio" means "of living beings"—in this case, plants. "Philia" denotes fondness. Put it together and the word means using plants to make spaces more enjoyable.

Biophilia in the workplace is incredibly powerful as far as what effects it has on individuals. There is growing research popping up everywhere that the spaces that we inhabit have both psychological and physiological impacts on us. Spaces with biophilic designs are more attractive and comfortable to work within.

BRING IN THE GREEN

There's been an explosion in the desire to put plants in homes and offices. People all around the world are discovering how adding some green to their space can be both rejuvenating and refreshing. Additionally, spaces with greenery are proven to be more attractive and mood-boosting for employees, as well as clients.

Globally, biophilic influence is making waves in office design. With many companies taking an interest in providing more pragmatic efforts for the wellbeing of their staff (such as meditation, yoga, and healthier



food options), it's no surprise that adding greenery to the office is taking off.

In essence, biophilia is another method of mindfulness. In the office, it can be easy to be swept away in the stress of the day—biophilic design can encourage us to pause and appreciate the current moment.

It's not just the leaves that provide health benefits. The soil plays a part, as well. This phenomenon is explained in a *Piedmont Health* article: "Microorganisms in the soil of the plant help clean the air as well," says Garvey. "These microorganisms have also been found to have antidepressant effects." There are emerging studies that show these microorganisms act as probiotics in our gut and provide mood-lifting perks.

When implementing biophilic design, placement is key. Certain designs and placements offer different functions, like stress reduction and cognitive function. One of the most manageable and effective ways to incorporate plants in your workspace is through plant walls. With [Pallet Display](#), there are not only shelving options to place small potted plants but also an option for planter mounts so that you can add even more variety to your personalized wall.

BRING THE OFFICE OUTSIDE

What stops most people from spending more time outdoors?

[Survey respondents say it's their work.](#) If you can't bring the outside into your office, bring your office outside. Access to fresh air and outdoor spaces greatly improves people's experience at work because it taps into our inherent need to be outside.

When thinking about what employees want, it turns out that adding outdoor amenities like balconies, patios, and other meeting and workspaces can have a significant impact on many things. It can increase employee:

- **Attraction and retention**—people who work away from their desks are more effective and have a better workplace experience.
- **Freedom to work how they want**—people who have a choice in workspaces have a better workplace experience.
- **Health and wellness**—simply being outside throughout the workday is enough to boost the happiness and overall health of employees.
- **Focus, productivity, and performance**—Attention Restoration Theory (ART) suggests the ability to concentrate may be restored by exposure to natural environments, a theory that is widely cited in academia.

With Ghent's new Preserve Outdoor Collaboration line, businesses and



Images courtesy Ghent

building owners can create a place that allows employees to collaborate and work outside of the confines of the office. It's the pinnacle of biophilia in office design; rather than trying to bring nature indoors, you bring the office to nature. These customizable structures provide a "fourth space" outdoors, transforming a notoriously underutilized space into an experiential workplace. Employees can meet, work, and engage with each other in an environment that has been shown to improve health, happiness, focus, and productivity.

MAKE IT MINDFUL

How can you foster mindfulness through biophilia? Let's take it back to the senses.

- **Smell:** Consider the aromas of the plants you incorporate and the environment around your outdoor meeting spaces. Are they pleasant, offering a sense of calm and centeredness?
- **Sight:** Plants like bonsai trees, ferns, and bamboo are not only low maintenance but especially pleasing to the eye and can also purify the air.
- **Sound:** Think of incorporating water features, to add peaceful and non-disturbing sounds like rippling or bubbling. Also, try to keep outdoor workspaces in a more serene area, away from loud traffic or machinery.

However you choose to embrace biophilia, it is guaranteed to make your workspace more mindful, centered, and pleasing to the senses.

Read more on the science behind moving your office environment outdoors in our latest whitepaper here: ghentwebsite.s3.us-east-2.amazonaws.com/Literature/Ghent_Whitepaper_OutdoorSpaces.pdf

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Biophilia Study Keys to Employee Health and Wellness

Key study breaks down ways that owners and design professionals can create wellness-centered office spaces with biophilia.

by Kadie Yale

Biophilia—the theory, science and practice of creating buildings and products inspired by and incorporating nature—has been studied since it was first popularized by Edward O. Wilson in 1984. Since then, research has increased in better understanding the impact that nature has on the psychological and physical health and wellness of humans, particularly in office interiors.

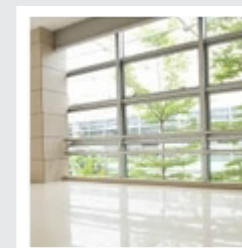
Biophilic design includes but isn't limited to

- Access to natural light
- Products which are made of or look like natural materials
- The inclusion of living plants into the space
- Lighting which mimics natural daylight

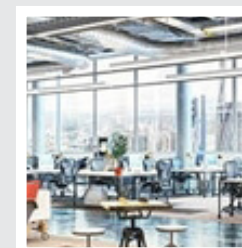
Human Spaces: The Global Impact of Biophilic Design in the Workplace, surveyed 7,600 respondents from 16 countries around the world to quantify how biophilia affects employees.

KEY FINDINGS

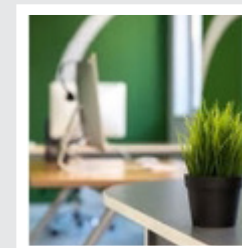
In studying the impact of biophilia in the workplace:



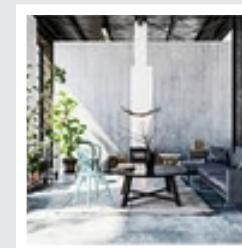
Window views of greenery and water were linked to lower stress levels compared to greater levels of stress for employees without a window.



Nature-resembling colors such as green, blue and brown positively impacted employee well-being vs. gray colors having a significant negative impact on employees' stress levels.



The global trend shows offices that provide natural light, live plants, greenery and water features have a significantly higher level of employee well-being.



Work environments with a sense of light and space create greater levels of well-being.

INITIAL FINDINGS

Greater levels of stress were reported by those employees who didn't have a window view. In contrast, window views of greenery and water were linked with lower levels of stress.

Nature-resembling colors such as green, blue and brown positively impacted employee well-being. Gray colors within the workspace had a significant negative impact on employees' levels of stress.

The global trend shows that those offices that provide natural light, live plants, greenery and water features have a significantly higher level of employee well-being than those devoid of nature.

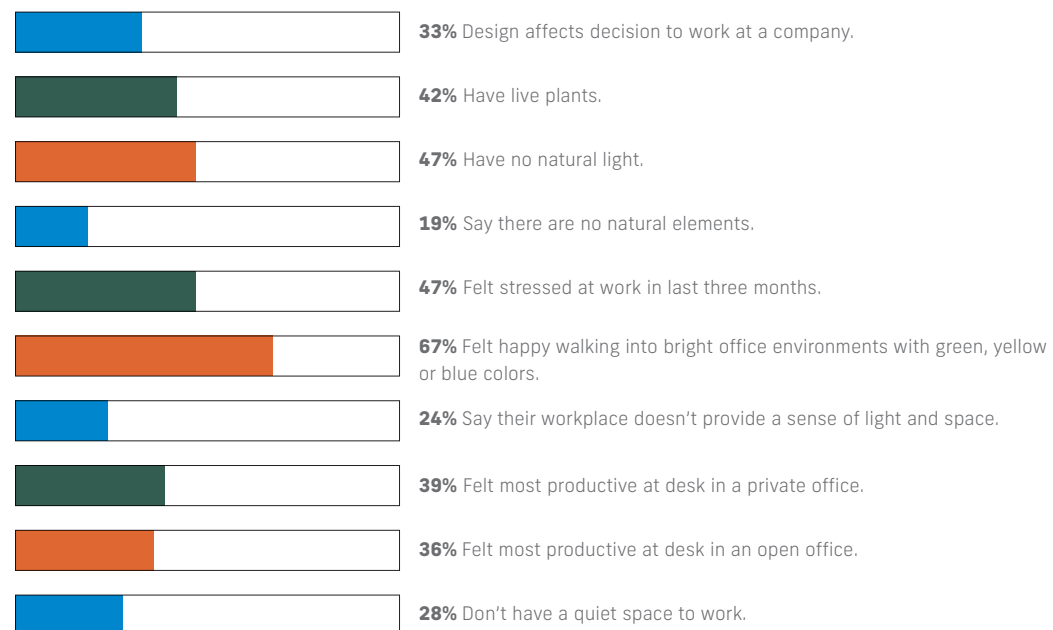
Those who report that their work environment provides a sense of light and space report greater levels of well-being in comparison to those who don't feel that their work environment is light and spacious.

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INITIAL FINDINGS

The report listed these responses from people about the office:



WHAT THIS MEANS FOR BUILDING OWNERS AND FACILITY MANAGEMENT

Due to technology, most employees don't need to be present daily in an office, with many able to work full-time outside of a shared office.

For building owners and facility managers who need to rent out their building's space, any additional means of enticing employees to use office space can increase leasee retention and entice new occupants.

Keeping biophilia in mind when approaching the design and layout of a building can not only increase the employees' sense of well-being but also work toward increasing the attractiveness of the property to potential and current companies.

Studies, including *Human Spaces: The Global Impact of Biophilic Design in the Workplace*, have shown that increasing the psychological and physical well-being of employees leads to increased productivity and performance, attendance (fewer sick days are reported), retention, attractiveness to recruits and user satisfaction.

Particularly as companies become increasingly owned and operated by those in the millennial population (those born between 1980 and 1995) and Generation Z (those born between 1996 and 2010), health and well-being will become more common and necessary elements of the workplace.

Both millennials and Generation Z are more understanding of their physical and mental needs, and mental health is less stigmatized by those

populations. These generations will be drawn toward spaces that make them feel better, more productive and provide amenities that align with current research.

HOW TO INCREASE BIOPHILIC AND WELLNESS-CENTERED ELEMENTS

Although it would be great if each office space could be a natural oasis of light and greenery, it's not always possible.

The first thing that building owners and facility managers can take away from the report is that, while the trend seems to show open offices will continue to prevail, there's a need for spaces where employees can get away and do quiet, heads-down work.

Including plants and water features in office interiors also has a profound effect on employees. Living walls are becoming easier to manage and install. However, if a permanent addition to the building isn't in the cards, bringing in potted plants or including a water sculpture in the entryway or in the offices will stimulate the positive portion of the brain.

LIVING 'GREEN' WALLS

Nothing says dedication to green building like putting actual greens in a building. Color and biophilic products and elements are also an easy way to bring health and wellness to the interior. As the study stated, natural colors such as green, blue and brown decreased employee stress, while gray increased it. Using calming blue or green paint on the walls in quiet or social areas, utilizing natural-themed wallcoverings in the same spaces, or including blue and green accents in the office, such as the upholstery for furniture, can do the trick.

Advancements in technology have also meant that durable materials such as luxury vinyl tile, ceramic and porcelain tiles, counter surfacing products and carpets/rugs can be designed to look identical to their natural counterparts. High-definition scanning and printing means wood and stone can be uploaded and printed directly to high-traffic products without the need for upkeep.

Incorporating artificial light that gives off a natural glow is another easy element to update. Natural-appearing lighting is everywhere these days, so there isn't a need to special order bulbs or change lighting fixtures. And with increased Internet of Things capabilities leading to lower prices for high-performing technology, natural lighting output has never been easier.

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Biomimicry: Taking Cues from Nature to Create More Sustainable Products and Interiors

Biomimicry looks to the ultimate teacher—nature—to create products that help build more sustainable, less impactful interiors. Here's how some companies are choosing to utilize it.

by AnnMarie Martin

Whether we are conscious of it or not, research shows that when our interior environments mimic the colors, patterns, textures and layouts that we see in nature, our minds make those connections resulting in positive effects on both mental and physical performance (known as biomorphic design). But when they take a step further to actually imitate how nature works, it can support the environment as well as user health (biomimetic design). Here, we speak to professionals making strides in both.

THE PRACTITIONERS

The Biomimicry Institute—a non-profit cofounded by the legendary Janine Benyus and Bryony Schwan—defines biomimicry as: “a practice that learns from and mimics the strategies found in nature to solve human design challenges—and find hope.” The Institute offers a variety of resources and initiatives to support professionals and startups that are trying to utilize



© Oleksii Hlushenkov | Dreamstime.com

the same methods that live systems in nature do. This can help them innovate in sectors that range from construction to agriculture, fashion, energy, chemistry, transportation materials and more.

“Nature designs things without causing harm,” said Jean Hansen, interior design sustainability principal with HDR, citing the example of a hypothetical adhesive mimicking the microscopic hairs on the bottoms of a gecko’s feet that allow it to climb a vertical wall without falling. “The gecko doesn’t leave behind anything toxic that can harm it or something that comes after it.”

One of the Biomimicry Institute’s teaching sites, [AskNature.org](https://www.asknature.org), offers even more in-depth examples, including an office complex in Zimbabwe designed by architect Mick Pearce and engineers at Arup Associates that boasts an internal climate control system built off the structure of termite mounds, which results in 90% less energy used for ventilation than similar projects its size.

This is accomplished thanks to the work of Werewool, a fashion-meets-biotech startup designing a way to create biodegradable fibers by identifying protein structures found in nature, such as the red fluorescent protein found in some species of a coral relative called *Discosoma*. They grow fibers that are reliant on these proteins and create textiles that don’t need toxic dyes and/or petroleum-based synthetics (which the global textile market is dependent on and unfortunately accounts for 35% of global microplastic pollution).

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Bill Browning and the other co-founders of sustainability consulting firm Terrapin Bright Green are utilizing biomimicry on an ecosystem scale, having developed a suite of ecological design services they've dubbed "Phoebe" (after a group of North American songbirds that have adapted to human development by nesting in bridges, buildings and other structures). They use certain metrics pulled from both the history and current needs of a project's local ecosystems to achieve regenerative design.

One of their initial efforts started in 2010 with a project in New York, under the New York State Energy Research and Development Authority's (NYSERDA) bioinspired innovation program. Check out more information and findings from this collaboration in Terrapin's report, *Tapping into Nature*, terrabinbrightgreen.com.

Utilizing The Mannahatta Project—a study led by the Wildlife Conservation Society that recreates the landscape and ecology of the island of Manhattan as it was back in the 1600s—Terrapin was able to determine why a building that was buying 51 million gallons of water a year was putting 90 million into the sewer. One of the original streams of Manhattan was under the building, and for more than 80 years had been pumped into the storm drains. After a tenant purchased the building, they worked together to create the performance goals that would eventually become Phoebe.

The data centers housed there also gave it an 85,000-ton carbon footprint. When the site had been an intact forest with the stream running through it, it would have been sequestering 3.7 tons of carbon a year. The long-term aspirational goal is to get the building back to the site's original carbon balance.

"It's a forever project," laughed Browning when discussing the cisterns, new glazing, new mechanical systems, green roofs installed and the other elements helping them reach that goal. "But the idea is asking can I, with the built environment, replicate the ecosystem services that would have been provided by the natural habitat on this site."

THE PRODUCTS

Coalesce's Design Director, John Hamilton, said the company is focusing on an often-overlooked design element from nature: irregularity. "We can make things that don't line up in such a geometric way because that's not what happens in nature. Things don't occur equally."

This can apply to space planning with layouts that push the user to



navigate through settings as they would if walking a path in the forest, rather than following a straight line from one part of a building to another. "And we think about how that can be built into products—products that don't align perfectly and bring in that typography and sense of

landscape," he explained, such as with soft seating that provides a variety of heights and shapes.

The Mohawk Group's lens is a little more hyper-focused, this time on communities of lichens—organisms that can grow on branches and rocks, in a variety of different climates. They convert carbon dioxide into oxygen and can also absorb pollutants from the air. The recently released Lichen Community modular carpet collection builds off the original Lichen line, designed in collaboration with McLennan Design to mimic the growth patterns of unique lichen species. Lichen Community is dematerialized and utilizes EcoFlex One backing, making it net positive for both carbon and water, part of its achievements for Petal Certification from the International Living Future Institute.



Images courtesy Mohawk Group

But it's their collection known as Data Tide that begs the next question for biomimicry.

THE NEXT STEPS?

"We need to start talking about our mixed presence," said Hamilton of the workplace. With most employers (if not all) embracing some physical and some digital presence at the office, how will we ultimately accommodate that? "And how can we apply biomimicry to that?" he asked.

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Images courtesy of Roppe

Building in Biophilic from the Ground Up

All aspects of a space must be considered when incorporating biophilic design into built environments, and the approach should ensure that all components reinforce and complement one another as part of an integrated whole. This applies to flooring, which is a foundational component of a biophilic strategy.

Rubber flooring supports biophilic design in its quest to incorporate elements that promote a connection with nature. Research suggests that biophilic design has significant positive effects on people's physical and mental health, performance, and well-being. Flooring plays an important role in contributing to the indirect experience of nature and its accompanying benefits to those inhabiting interior spaces.

THE BENEFITS OF RUBBER FLOORING IN BIOPHILIC DESIGN

- **Natural colors and textures.** Available in various profiles, including

textured, hammered and slate, which resemble rock, stone and other materials that mimic nature.

- **Organic shapes and patterns + pathways.** Can be cut into unique shapes and patterns that represent natural elements. Think leaves, waves, petals, stepping stones, or any nature-inspired design. Plus, it can help create seamless pathways and transitional spaces that aid in wayfinding and organize spatial features to foster a sense of security.



Roppe ReNew Cork-infused Rubber Flooring

Contains 13% bio-based content from rapidly renewable resources. The combination of cork with tonal-chip rubber flooring creates a striking aesthetic, including many nature-inspired shades.

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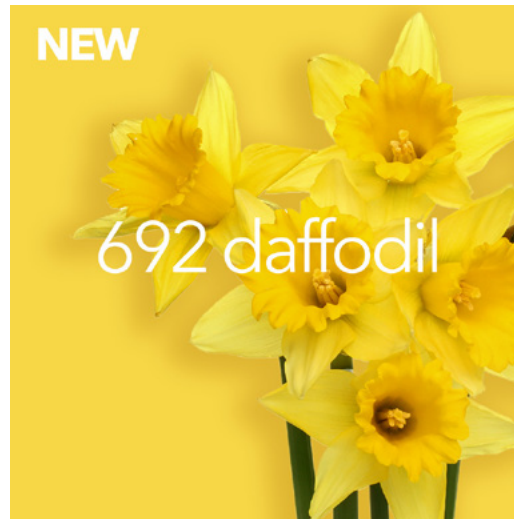
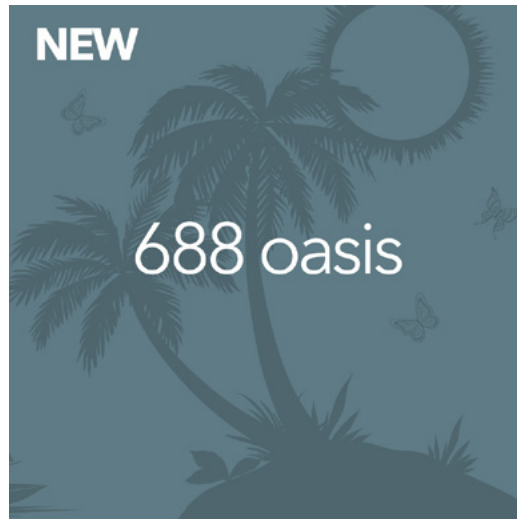
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• **Underfoot comfort.** Rubber’s resiliency provides cushion, impact reduction and a sensory connection to nature, with each footfall evoking the experience of walking on grass or another soft, natural surface.

• **Acoustics.** The sound absorption properties of rubber reduce noise from foot traffic and equipment, making it an excellent choice for healthcare and other areas where fostering a quiet, soothing environment is paramount.

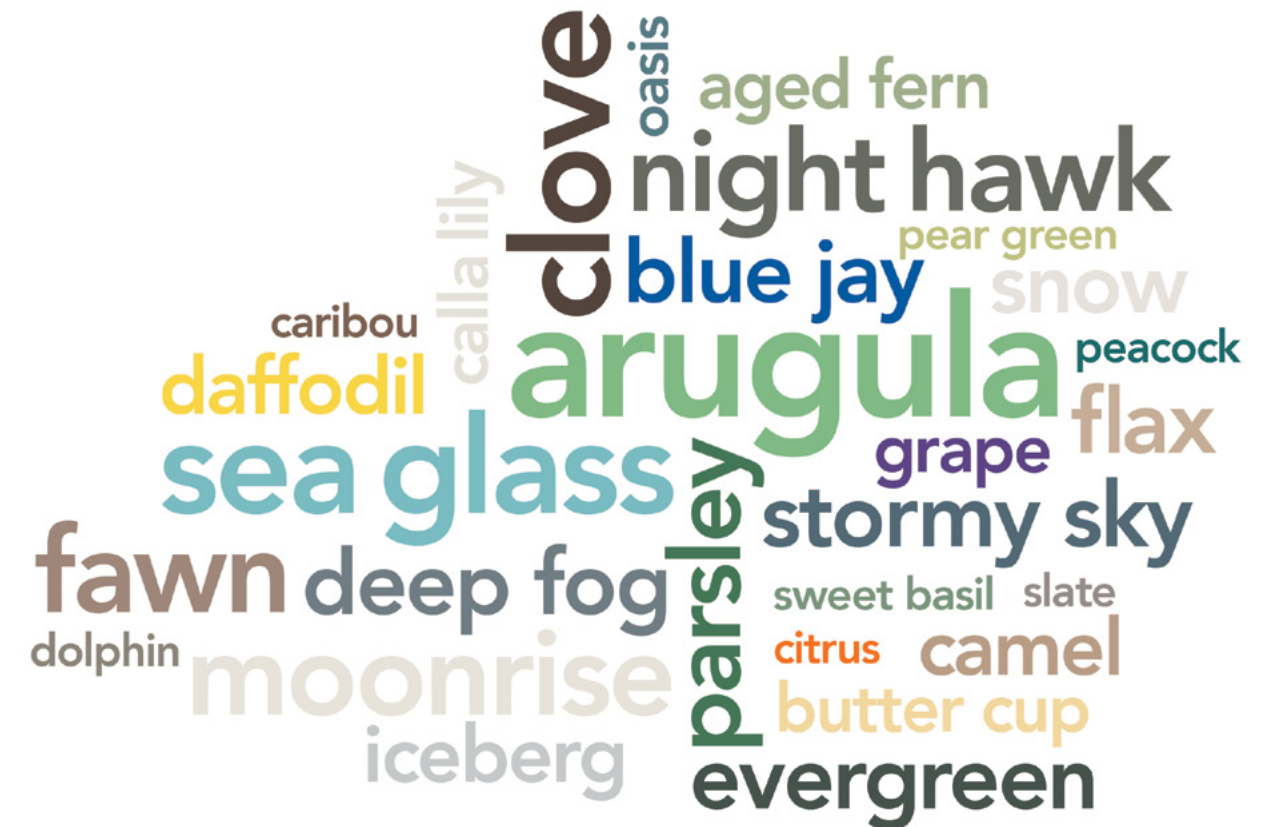
• **Sustainability.** An environmentally friendly choice that supports biophilic design goals; also promotes a relationship between people and nature, fostering a sense of responsibility to the natural world.

ROPPE RENEW CORK-INFUSED RUBBER FLOORING

Contains 13% bio-based content from rapidly renewable resources. The combination of cork with tonal-chip rubber flooring creates a striking aesthetic, including many nature-inspired shades.

COLORS WITH MORE THAN A NOD TO NATURE

Roppe understands the important role color plays in biophilic design. And Roppe colors are inspired, in large part, by natural elements, favoring muted earth tones characteristic of soil, stone and vegetation. Roppe offers a plethora of color choices, including neutrals, greens, browns and blues, that evoke pleasing nature associations, promoting calm, harmony, relaxation, tranquility, and other beneficial states of well-being. Brighter accent colors emphasize the beauty of natural forms such as flowers. An



on-trend selection of hues, shades and textures help create immersive experiences and connections with nature.

The majority of colors featured in the Roppe rubber flooring palette were inspired by nature, offering effortless design flexibility.

For more information on how Roppe is Ready to support your biophilic design needs, visit <https://colors.roppeflooring.com/>

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Photo courtesy of Eric Laignel

This place of refuge in COOKFOX's offices offers daylighting, views, greenery and a place for focus work in a safe, comfortable setting.

A Lesson in Biophilic Design

COOKFOX Expert Bethany Borel shares effective biophilic design strategies

By Barbara Horwitz-Bennett

While sunlight, natural materials and greenery are great for buildings, biophilic design is more expansive than that. Just ask Bethany Borel, WELL AP a senior associate at COOKFOX Architects in New York.

“Humans have an innate connection to nature. A large volume of research has proven nature’s impact on our physical and psychological state, and we use specific design strategies to invoke or enhance these reactions to enhance the user experience within the built environment,” she explains.

Embracing biophilic strategies long before they became an industry buzzword, COOKFOX taps into research from its sister company Terrapin Bright Green and applies biophilia as an underlying framework for all its projects large and small.

Adding to popular daylighting and natural material selections, Boral shares some other key strategies:

- **Prospect/Refuge**

“Having a wide view over an open space from a location of private ‘refuge’ can increase a human’s feeling of safety and comfort, while also reducing cortisol levels so the user can focus,” she explains. Some design strategies include banquettes, phone booths and secluded areas off terraces.

- **Connection with natural systems**

“As humans, we are part of nature, thus we are closely impacted by the natural cycles of healthy ecosystems,” says Boral. Consequently, witnessing the landscape transition with the seasons, native plantings, vegetable gardens and views are sound strategies.

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A Lesson in Biophilic Design

• **Non-rhythmic sensory stimuli**

“Our current dependence on technology coupled with our work considering data ... requires us to design space that allows our brains to reset in order to function efficiently. Non-rhythmic sensory stimuli allow our eye muscles to relax, heart rate to slow and our sympathetic nervous system to activate.” An example is watching grasses sway in the breeze outside the window.

HUMANS HAVE AN INNATE CONNECTION TO NATURE. A LARGE VOLUME OF RESEARCH HAS PROVEN NATURE’S IMPACT ON OUR PHYSICAL AND PSYCHOLOGICAL STATE.

While multiple strategies comprise a good biophilic design project, Boral cautions against going overboard. “It’s best to focus on achieving a few strategies really well; more is not better. In fact, if too many are used, it can cause confusion and end up working against the final design intent.”

WELL PLATINUM HEADQUARTERS

To design the healthiest, most efficient space possible, test their design against benchmarks and gain expertise in WELL certification, COOKFOX invested much thought, time and energy in designing its WELL Platinum headquarters at 250 West 57th Street in Manhattan.

As one of the designers heading up the project, Boral shares a few of the project’s biophilic design strategies:

- Optimized daylighting and minimized blue spectrum electrical lighting to support healthy circadian rhythms
- Framed views of outdoor gardens at each end of the studio



COOKFOX’s Manhattan WELL Platinum-certified headquarters incorporates natural materials and patterns, plantings, daylighting and lighting to support circadian rhythms, high-quality air filtration, zoned temperature control and more.

Photo courtesy of Eric Laignel

• Natural materials and textures including white oak doors, carpet with biomimetic patterns, bamboo work surfaces and textured glass mimicking flowing water

• A garden bed, hydroponic towers and two beehives on one of the office’s three terraces

Since joining the team in 2012, Boral’s passion for wellness and sustainability in design has been a great fit with COOKFOX. “There is always more to learn, more to test, more to explore and most importantly, an opportunity to make a difference,” she concludes.

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Credit: Hilton Hotels

How Biophilic Design Can Boost Productivity in Hospitality Meeting Spaces

Bringing the outside in is becoming more common and can impact the meeting experience.

by Danielle LeBreck

Warm sun on the skin, big breaths of fresh air, and multicolored flora and fauna eye candy—who doesn't feel instantly rejuvenated after a few moments outside on a nice day? Turns out, there are some scientific reasons for that.

Research shows that interacting with nature can support physical, social and psychological well-being. This was recognized by The Global Wellness Institute, which named immersion in nature as a top global trend in 2019.

How you design a space can profoundly impact the meeting experience. And in hospitality, where the trend is to create a more unique space for each venue, bringing the outside in is becoming more common.

WHAT IS BIOPHILIA?

Biophilia suggests that humans have an innate connection with the natural world. Biophilic design brings elements of nature indoors, using this connection to improve the well-being of those experiencing the space.

But it's more complex than many may think, said Larry Traxler, senior vice president for Hilton Global Design.

"Simply putting a potted plant or a simple patch of moss on the wall is not enough to provide the lifting experience that many are seeking from this design philosophy," he explained. "It's important to note that biophilia should be multisensory. Well-orchestrated meeting environments with a biophilic focus should be immersive experiences that are relaxing, calming and sustainable."

Air, lighting, greenery, and floor and furniture design that mimic natural

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landscapes all combine to improve the indoor experience.

Peter Scialla, president and chief operating officer of Delos, has done extensive research in collaboration with Mayo Clinic to study the effects of indoor environments on human health, which helped launch the Stay Well hospitality and meetings programs at select hotel properties.

“Delos Stay Well program was built off the growing body of evidence of the ways that key indoor environmental parameters impact occupants’ health,” Scialla explained. “Poor indoor air quality can contribute to health concerns such as headaches, asthma attacks, respiratory diseases and heart disease, as well as lower productivity by an estimated 6-9%.

“Recent scientific discoveries have pointed to the effects lighting has not just on our vision, but on our health, mood and performance,” he added. To combat these negative effects of the indoors, Scialla turned to biophilia.

BIOPHILIC DESIGN IN MEETING SPACES

When it comes to meeting rooms, the harmful effects of poor air and lighting, and uninspiring surroundings can take their toll on the overall well-being of people inside. “People naturally gravitate toward representations of nature all around them. Artificial light and ‘beige box’ meeting spaces are often considered draining to folks who count down the minutes until they can get outside,” Traxler said.

Scialla noted some biophilic design features and their positive effects from Delos’ research. These include:

Active green walls: Living walls, constructed from plants or moss, bring the outdoors in to improve productivity and can also help remove contaminants from the air.

Lighting systems or natural lighting: Bright light during daytime hours can help promote productivity and alertness, in addition to increasing energy and better performance on cognitive tasks. Lighting systems that simulate natural sunlight or actual natural sunlight can help maintain circadian rhythm and improve energy, mood and productivity during meetings.

Purified air: Air purifiers, along with active green walls, that filter the air can increase the ability to focus and improve respiratory health.

Floor and furniture materials: Meeting rooms with patterned carpets or with floors and furniture that mimic natural elements like water and trees, such as wood or wood laminate meeting tables, can help enhance attention and task performance.

HOTEL MEETING ROOMS THAT USE BIOPHILIC DESIGN

For the following hotels, biophilic design is now a key focus when creating and improving existing meeting spaces.

MGM Resorts partnered with Delos to create Stay Well meeting rooms in its MGM Grand Hotel & Casino, Park MGM and The Mirage Hotel & Casino properties, and chief sales officer Stephanie Glanzer said her team has received tremendous feedback.

“Several clients have shared their post-conference survey results and attendees felt more focused and engaged during their meetings,” she said. “We find it can enhance the creative process, and when you’re attending a meeting or event, that is a very positive experience.”

Delos also works with Wyndham Hotels and Resorts and Marriott Resorts International on the Stay Well program.

Additionally, Traxler says that most of Hilton Hotels’ properties now incorporate biophilic design elements throughout common areas and meeting spaces. Some notable properties include:

Hilton Hotel Munich City: This hotel is a plant haven, with live plants and plant-inspired imagery throughout the property, from its restaurant to meeting and event spaces.

Hilton McLean Tysons Corner: Home to the “Innovation Gallery” space that can be used for meetings and presentations. Biophilic elements, including living walls, can be found in this space.

Hilton London Bankside: The AGORA meeting room in this hotel features plants flanking the room, a wall meant to resemble rocks and the earth and a “push for creativity” button that releases a citrus scent into the air.

El Conquistador Tucson: This 90-acre resort in Arizona features an interior that reflects the desert with colors, textiles and native flora inside the property.

Scialla also noted that biophilia’s restorative effects on health can be gained not only through real exposure to natural elements but also but through virtual experiences, too. “Exposure to digital nature scenes for as little as five minutes have been observed to produce meaningful effects, such as improved recovery from stress when viewed during work breaks,” he explained, adding that some Stay Well meeting rooms feature decorative glass with nature patterns such as leaves or grass.

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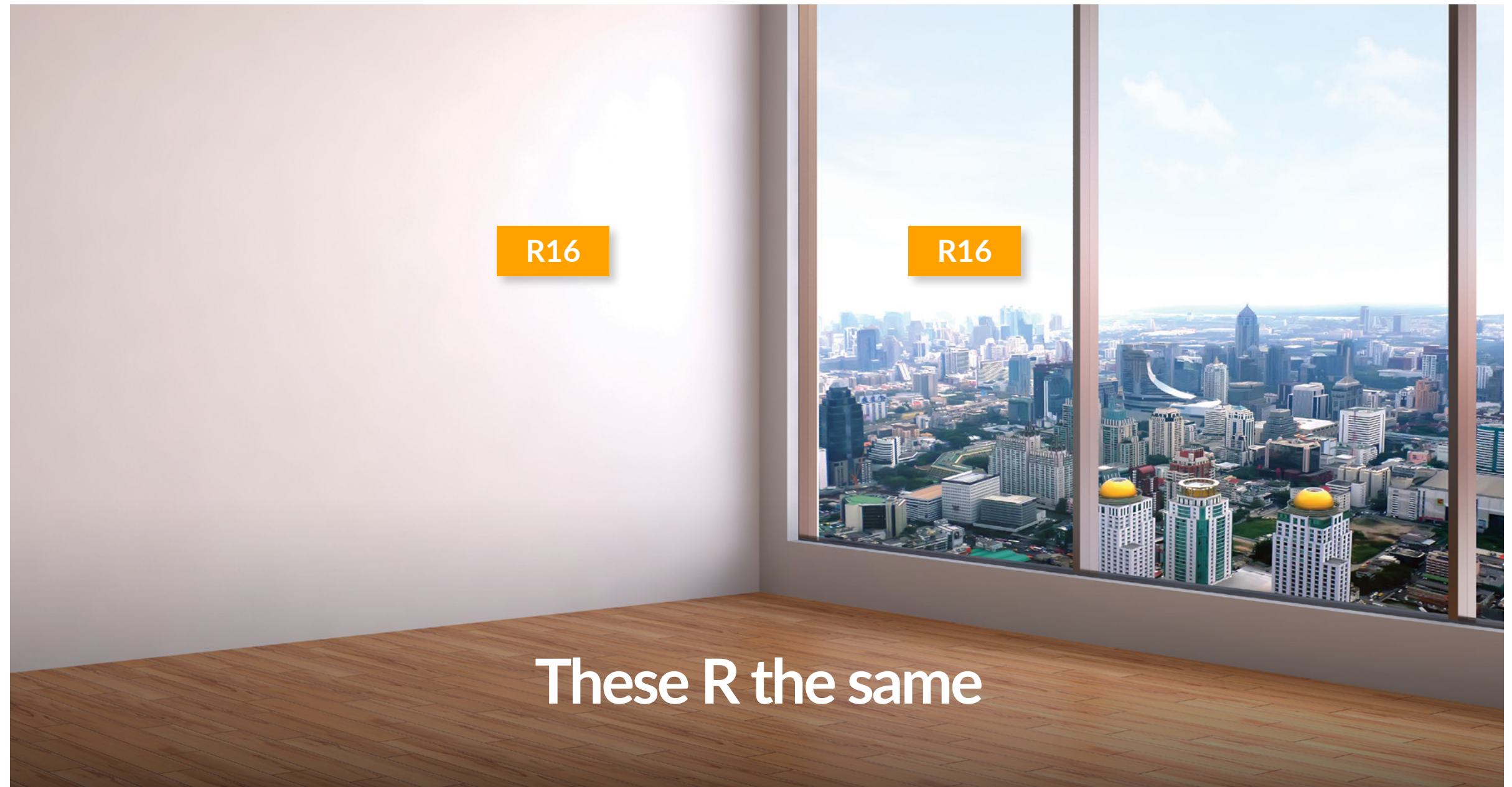
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Biophilia and Glass: Supporting a Connection to Nature

WHAT IS BIOPHILIA?

Biophilia is a concept that suggests human beings have a natural desire to be connected to and immersed in nature. The growing practice of biophilic design in architecture is all about maintaining a connection to nature and light through a building, whether with views outside through the exterior of a building or by physically bringing nature inside the building.

Because glass is the most popular transparent building material used in contemporary architecture and building construction, it is a very popular choice for biophilic design and readily supports the inclusion of views of nature and the placement and survival of plant life inside buildings.

Advancements in energy efficiency and thermal insulation performance have also made glass a sustainable choice that complements the philosophy behind biophilic design.

GLASS AND BIOPHILIC DESIGN

Research has shown that increased daylight in the workplace increases employee satisfaction and overall performance. As we reconsider what design principles are most valuable for today's in-person offices, we can expect biophilia to play a major role in designing the workplaces of the future to help attract workers and support increased productivity and happiness at work.

Glass is arguably the most effective façade material when it comes to increasing interior daylight. When a facade employs biophilic design techniques and combines them with materials like glass that can increase daylight, occupants will enjoy more interior daylighting and views of nature.

Glass is also an effective material for making interior spaces private without closing off views to exteriors and each other, allowing for separate spaces that are engaging yet hygienic in a post-pandemic-era world. Innovations in electrochromic glass can even turn glass opaque with a

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Photographer: Jim Schafer

simple flip of a switch, creating temporary privacy when needed and otherwise allowing for maximum views and connection.

LOW-E COATINGS

Low-emissivity (low-e) coatings can play an important role in supporting indoor plant life in biophilic buildings by allowing for the right kind of light or wavelength—the kind that supports plant growth—inside without compromising the amount of visible light that is transmitted or allowing for too much solar heat.

The color rendering index (CRI) is a qualitative measure that evaluates how true colors are being viewed, and the goal of biophilic design is to ensure the views through a window are as true to nature as possible. Many glasses with low-e coatings will maintain a neutral appearance, allowing for better thermal performance and increased energy efficiency while retaining a higher CRI value for the preservation of true color views.

INSULATION PERFORMANCE AND ENERGY EFFICIENCY

Glass is often misunderstood as insufficient when it comes to insulation performance, but innovations in glass technology have led to new products that can easily support principles of biophilic design while also functioning as a high-quality façade material. Vacuum insulating glass (VIG) combines vacuum technology and low-e coatings into an insulating glass unit (IGU) with exceptional insulation performance, rivaling that of traditional walls while simultaneously allowing for exterior views.

The use of glass facades to increase daylight will also reduce the



Photographer: Bruce Damonte

demand for artificial lighting, which is an important consideration for energy efficiency. Biophilia and sustainability go hand in hand, and thanks to advancements in glass technology, glass can accomplish both goals.

BIOPHILIA IN URBAN AREAS

Even in large cities where green views are more challenging to access, biophilic design has adapted for urban settings. In this case, building occupants can benefit from views of other people living social lives outdoors, and the psychological benefits of this are quite significant.

As designers work to develop biophilic buildings in urban areas, architects have found innovative ways to bring green spaces into and even onto buildings, sometimes by installing greenery and plant life on facades. Using glass as a façade material in tandem with greenery installations allows for these innovative biophilic designs to be seen from the inside as well.

As cities continue to grow and more workers return to in-person workspaces, the demand for biophilic design will only increase. Glass facades are an excellent way to design with biophilia in mind. As a building façade material, glass can help support interior plant life, increase natural views and daylighting for occupant satisfaction, and even improve energy efficiency to support a project’s sustainability, which goes hand-in-hand with the desire to appreciate and protect our natural environment.

For more information about optimizing biophilic design with architectural glass, talk to a National Architectural Representative from Vitro Architectural Glass.

Find your representative at vitroglazings.com/rep.

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Courtesy of Legrand

How to Create Productive Outdoor Spaces

Offering well-designed outdoor spaces can boost health and well-being and allow people to remain connected and productive.

by Rachel Kats

It's a beautiful day but you find yourself stuck inside, tethered to your desk—your work and productivity depend on it.

And the reality is, that even when the workday ends, it's no longer easy to fully disconnect, unplug and go outside. Now we need to be productive 24/7, but outdoor spaces are rarely supportive of that need according to Sabrina Snyder, product marketing manager for Legrand, a digital and electrical solutions provider.

BEYOND OUTDOOR SPACES:

FOUR OFFICE MUST-HAVES FOR EMPLOYEE WELLNESS

"As Americans, roughly 90% of our time is spent indoors," Snyder explains. "In addition to that, of the remaining 10% only 7% is really spent outside. The other three percent is spent in cars getting to and from home and job."

To counterbalance this inside time, biophilic design has made strides in connecting humans and nature by incorporating more plants and greenery

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into places where people live and work. Through studies and research, this connection has proven essential for health and well-being and has been shown to have innumerable other benefits.

Inspired by these benefits, designers and their clients are taking the movement a step further, creating spaces that allow people to be outside, with nature, yet remain connected and productive. Snyder explores the whys and ways companies are creating these spaces in a webinar, *How to Increase Productivity and Engagement in Outdoor Spaces*.

WHAT DO WE WANT IN OUTDOOR SPACES AND WHY?

There are other influences, aside from biophilic benefits, that are challenging the traditional workspace model, such as a generational shift and advancements in technology. Considering these factors, there are typically three main features people are looking for in a productive outdoor space.

Mobility: One essential element is mobility, or being able to bring devices (phones, laptops, wearables, tablets and even audio-visual equipment) outdoors, and move from space to space freely without interrupted connectivity.

IT'S NOT AS EASY AS BUYING A PROPERTY THAT HAS SOME GREEN SPACE AND CALLING IT A DAY. WE REALLY NEED TO THINK ABOUT HOW YOU CAN MAKE THOSE GREEN SPACES OR OUTDOOR SPACES PERFORM BETTER.

"That's a huge, disruptive change to workplaces, given millennials' desire for flexible workspaces and flexible work schedules as well as their need for constant connection," she says. It's not only millennials driving this change, however, all generations rely on connectivity, so mobility becomes a critical component of any space.

Flexibility: It's important that these spaces lend themselves to a variety of activities, such as enhancing collaboration, optimizing downtime and creating a more productive and more engaged population. This often means having spaces that can serve as both individual and group workspaces.

"This desire for flexible spaces, especially flexible workspaces, encompasses multiple generations. This is about spaces that don't just

have picnic tables to 'encourage work outdoors'—instead they have actual collaboration or meeting areas. They've thought through things like shading, lighting and power access," Snyder says.

Functionality: These spaces need to support our habits and have all the conveniences of the indoors, while still providing much-needed access to nature or a comfortable, enjoyable environment.

"Gone are the days when employees logged off their PCs at five o'clock and went home," Snyder says. "For better or worse we are now connected and we're productive all of the time. But we're not just working from home and office, we're also working from what's been called third spaces. These are areas that are between work and home and allow you to be productive yet still enjoy other aspects of your environment."

WHAT TO CONSIDER WHEN CREATING OUTDOOR SPACES

A common thread that runs through the concept of creating productive outdoor spaces is the need for intentional design.

"It's not as easy as buying a property that has some green space and calling it a day. We really need to think about how you can make those green spaces or outdoor spaces perform better," Snyder says.

Without being strategic you run the risk of having to retrofit a space with additional electrical outlets and equipment, after the fact, which can be both unsightly and unsafe.

Also, consider the location and who will be using the space. Whether it's education or hospitality and retail, healthcare or in a commercial office building, goals will be unique to each setting and achieving them will take a strategic and intentional design strategy.

For instance, in commercial applications, one goal will be to improve employee productivity, whereas in a hospitality or retail setting it's important to encourage people to stay longer.

"The more people that can use their devices and power up, the more likely they are to spend more and stay longer in that location," Snyder says. "Malls have Wi-Fi and convenience power outlets today for exactly that reason and there's no reason why that shouldn't be implemented in outdoor spaces as well."

Finally, consider the climatological conditions. This will play a major part in choosing equipment and furnishings that are both sustainable and durable enough to hold up to the elements.

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Courtesy of 1 Hotel Nashville

The Green Jewel

The 1 Hotel Nashville offers up a one-of-a-kind oasis in a hospitality business driven by the flash-bang of Music City.

by AnnMarie Martin

You can't miss it.

With a facade draped in ivy, the 1 Hotel Nashville is a head turner—especially sitting right across from the coppery waves of the Music City Center. “The minute you see that, you should know the experience that you’re going to have,” said Christopher Alvarado, senior vice president, design, at operator SH Hotels & Resorts. “It’s going to be different.”

The 1 Hotel brand seeks to deepen guests’ connection with nature by immersing them in it no matter the location—whether that’s a bustling

metropolis like Nashville or an exotic island across the world in China (Haitang Bay, Sanya).

But the mission goes much deeper with sustainability and wellness initiatives that are making clear and visible differences in the health of our planet. From the macro, like the 19,171 tons of CO₂ they’ve offset making them 100% certified carbon neutral since 2018, to the more micro in the local farms and nonprofits they support, the brand’s reach stretches far and wide—and the design is no exception.

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The Green Jewel

SH Hotels & Resorts partnered with New York-based studio Workshop/APD for the 215-room LEED Silver-certified 1 Hotel Nashville, both of whom agreed the property needed to serve as an escape from what Alvarado dubbed the “Nash-Vegas experience.” Besides its auspicious neighbor, it’s also within walking distance of the Country Music Hall of Fame and is a conductor of the energy in this hub of music culture and history. “We all know it, and it’s there if you want to experience it—you’re within arm’s length of it. But we wanted 1 to be more of a sanctuary from that if you need it,” he explained.

A JOURNEY INSPIRED BY NATURE

In order to create such a space, the Workshop/APD team started their process by escaping that bubble of downtown Nashville for a journey through surrounding Tennessee landmarks that could help them define the city in a different way. This started with using the Cumberland River and Fort Nashborough to inform the lobby design.

“So we made it like a journey for the traveler,” explained Andrew Kline, Workshop/APD associate principal. “They come in through the Cumberland River, which is how goods would naturally flow into Nashville.” He points to the photograph featured on page (?) that they took along the way at Fort Nashborough that features the water line from a previous flood:

“A lot of the conversation we were having with 1 Hotel was centered around if you could take just five minutes of a person’s busy trip, how could you make them think about nature in a different way? Sometimes, that’s recognizing that nature is super powerful, and we need to respect it,” Kline said. “So that idea became very influential, especially in our millwork design, which features a color tone change at a certain height in the lobby, coming back to the idea that nature can take over the built environment.”

They also paid a visit to the city’s Belle Meade Plantation, reflected in the guest rooms. To evoke the feeling of “returning home,” the guestroom furniture, crafted from textured woods, was inspired by the idea of an open farm table. Instead of building in the vanity, mini bar and closet, they can be accessed from both sides. The bed was also designed to look like a fence that you might see at a plantation or at the races, and lighting mimics that found in a barn or warehouse.

“We also looked at the agriculture of the region,” Alvarado said, particularly tobacco farms. Behind the check-in desk is an installation wall of tobacco



Image courtesy of 1 Hotel Nashville

leaves. “We studied barn structures, which are very prevalent throughout Tennessee,” and the Neighbors grab ‘n’ go café actually places guests within the frame of one. Large timber columns and beams at the rooftop bar Harriet’s do the same. “It makes you feel like you are in this rural place in the middle of a major city.” The lakes of Tennessee led the team to make nautical statements in 1 Kitchen, such as with the woven rope canopy that sits behind the bar and captures twinkling lights above patrons in the main dining area.

The outdoors was brought in wherever possible, with lots of connective spaces between two, and of course, a huge plant program keeps guests surrounded by plant life native to the area wherever they go. The elevator lobby on each floor features a large screen print by artist Richard A. Lou of a different local endangered plant species. It was also important to Kline to utilize local materials in their most true and natural form, such as the Tennessee granite slab that serves as the front desk and the flagstone on the spa floor, neither of which was overly processed or cut.

Lots of opportunities are also taken throughout the property to remind guests that preserving nature should not be differentiated from their own personal health. A filtered tap is located right next to the bed in guestrooms to fill a carafe or bottle, and Farmstand sits right outside the elevators. This vintage farm table offers naked fruits picked fresh from local farms to grab as a snack. When taken advantage of regularly, both moves help to significantly cut back on plastic waste.

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Beyond Plants: The Diversity of Biophilia

Novelis, a metals recycling company, embraces nature connections in its new office.

by Jennie Morton



How does a metal recycling firm signal its ongoing commitment to sustainability? By asking architectural firm Hendrick to create a new office that's rooted in biophilic principles. The headquarters exemplifies how to integrate biophilia into every facet of interior design.

"At its core, biophilia is about connecting people with nature," explained Jennifer Treter, managing principal for Hendrick. "The Novelis project is based on three biophilic pillars: nature within the space, elements that suggest nature and qualities that encourage wellbeing."

CLIENT VISION

Novelis is already invested in the circular economy, so it was a logical move to extend this model into its new Atlanta headquarters. The space needed to be sustainable as well as egalitarian. The company wanted to remove hierarchical divisions and siloed offices. The new design embraces free address, even for the executive team.

"Our mantra became 'How do we earn the commute?' Because if people can choose to work from anywhere, including the comforts of home, the office must offer value," Treter stressed. "Biophilia softens the Novelis space, so it has a comforting, familiar feel that encourages social interaction."



Courtesy of Brian Robbins

While it might have been expected for a recycling company to exude an industrial vibe, Hendrick took a different approach for Novelis. Warm and cohesive, biophilia is what unites the open concept across three floors. It's used directly and subconsciously through greenery, wood, lighting and art.

1. PLANTS

Living greenery is a foundational expression of biophilia. Novelis has plants located intentionally throughout—vegetation is integral to the design, not an embellishment.

The lobby is flanked by a living moss wall placed inside a polygon frame, a shape that evokes the recycling symbol. Vertical planters along the glass facade and horizontal boxes between zones serve as lush dividers. Floor and tabletop containers are plentiful, all in neutral colors so the focus is on the foliage. Plant species are low maintenance, especially for water needs.

"Even the accents of forest green are a touch of biophilia. While part of the Novelis brand palette, they also add a rich contrast to the light wood," said Stephen Wells, principal at Hendrick. "The lobby's acoustic tile is even in the same emerald shade, pulling double duty for noise dampening while referencing trees."

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2. WOOD

Wood is a visually impactful and sustainable way to bring the outdoors in. Cork flooring is used prominently and has the advantage of being a rapidly renewable material. The walls and ceilings of conference rooms as well as partitions glow with light grains. Cabinetry has natural stain rather than paint. Even small elements like chair backs, side tables and molding are done in wood.

“The trellis system evokes the power of trees with overhead patterns and repetition. Low lighting creates shadows for an abstract interpretation of a tree canopy,” added Wells. “They’re strategically placed over gathering points, like the lobby and soft seating.”

AT ITS CORE, BIOPHILIA IS ABOUT CONNECTING PEOPLE WITH NATURE. THE NOVELIS PROJECT IS BASED ON THREE BIOPHILIC PILLARS: NATURE WITHIN THE SPACE, ELEMENTS THAT SUGGEST NATURE AND QUALITIES THAT ENCOURAGE WELLBEING.

The indoor pergola and recessed alcoves with booths are both examples of providing places of refuge as part of biophilia. “Refuge is illustrated by enclosure and sensory retreat using overhead canopies and vertical screening,” according to a GSA article titled Biophilic Design. These havens are another way to give employees choices as they shift through different task styles.



3. LIGHT

Daylight is essential to plants and people. Novelis has workstations, conference rooms and seating placed along the second floor’s perimeter windows, taking advantage of the views of Atlanta’s verdant scenery.

“We also used artificial light intentionally. Daylight harvesting



Courtesy of Brian Robbins

lowers energy consumption while circadian lights automatically brighten and dim to replicate the sun,” Wells explained. “Additionally, we selected ceiling lights that have an X shape to echo the lines in the wood trellis.”

4. ARTISTIC REPRESENTATION

The most direct embodiment of biophilia at Novelis is a life-sized aluminum tree that graces the lobby. It is paired with a kinetic sculpture that extends above into the staircase, which has metal cutouts of birds and leaves.

“The aluminum tree is an artistic statement that combines biophilia and branding,” Treter said. “Art is a meaningful way to tie nature into a space. Corporate identity doesn’t have to be an ad campaign—it can be balanced by organic cues.”

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Emser Tile helps safeguard the health and well-being of people indoors. From protecting the integrity of the air quality to supporting biophilic design, glazed porcelain and ceramic tiles also inhibit the growth of microorganisms. Porcelain tiles are fired at very high temperatures during manufacturing, which eliminates volatile organic compounds (VOCs). This material is also impervious to moisture and chemicals. With looks that mimic natural hardwood planks, marble and stone, tile offers architects ways to bring the calming effect of outdoor elements inside.

emser.com



SYLVAN

Sylvan is a unique hand-painted pattern that draws inspiration from the hypnotic effect that light and shadow have on the world around us, and the changes of light throughout the day and year. Calico Wallpaper’s latest collection portrays the shadows cast by trees on snow-covered mountains. To emphasize the beautiful undulating quality of the shadows, Behun abstracted the trees into simple vertical elements that act as markers, highlighting how the play of shadows enhances the topography hidden beneath the blanket of snow.

Sylvan is available in eight colorways that include Shadow, Tone, Daylight, Sundial, Penumbra, Afterlight, Lakeside and Boreal.

calicowallpaper.com



OUTDOOR BIOBASED XOREL

Xorel is the world’s first and only plant-based, commercial-grade performance textile that moonlights for indoor and outdoor use. This textile is made with 85% bio-based PE content that is derived from the sugarcane plant. It is also free from topical and chemical finishes and coatings, while still being fade-proof, tear/UV and weather-resistant.

carnegiefabrics.com

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TAIGA

A small amount of exposure to greenery indoors can reduce stress and increase happiness. To create healthier and more pleasant indoor environments, Biome developed a turnkey ecosystem. With no plumbing and no soil, Taiga is a living wall solution that can be installed in just 30 minutes—much like a whiteboard. Taiga is a hydroponic, self-sustaining device with 34 included plants.

biome.us



KIREI INK BIOPHILIA COLLECTION

The Biophilia Collection for Kirei Ink—a line of custom-printed acoustic recycled PET panels—transforms spaces into healthier, more inviting atmospheres by highlighting the beauty of nature without sacrificing sound quality. Choose from six print options, from beautiful botanicals to landscape-inspired prints, to add a subtle elegance and cut out distracting echoes. Like the other Kirei Ink panels, the Biophilia Collection is customizable and printed in-house on PET felt panels made from 60% post-consumer recycled PET, which diverts hundreds of plastic water bottles from the landfill per panel. Kirei Ink panels are low-VOC and come with Declare labels and Health Product Declarations; they are printed using water-soluble, GREENGUARD-certified PROGRAPHIC UV ink.

kireiusa.com



**HEALTHY ENVIRONMENTS
RESILIENT SHEET FLOORING**

Heterogeneous resilient sheet options for healthcare and senior living. Mohawk’s Healthy Environments collection of resilient sheet flooring now offers more heterogeneous resilient sheet options than before with a new range of styles and an expanded palette. The collection helps create spaces that comfort patients and families. The soothing natural forms and textures inspired by nature deliver high performance and the ease of cleaning that healthcare and senior living spaces require. The M-Force combination finish layer, wear layer and design layer provide exceptional scratch, stain and wear resistance that supports all activities in healthcare and senior living facilities. All styles are FloorScore Certified.

mohawkgroup.com



NATURE VIEW SERENITY POD

Whitney Brothers, an award-winning children’s furniture brand, has launched the Nature View Serenity Pod, a biophilia-inspired interpretation of a pod study carrel for early learners. It enables unlimited configurations in physical space design and supports flexible learning environments. Its open, elegant design accommodates social distancing and activity workspace in early learning environments. The woodland scene printed on the curved acrylic panel brings nature indoors and creates a personalized activity space for children that also provides important visibility for adult supervision. Use multiple pods to form an S shape, semi-circle, horseshoe or other configurations.

whitneybros.com

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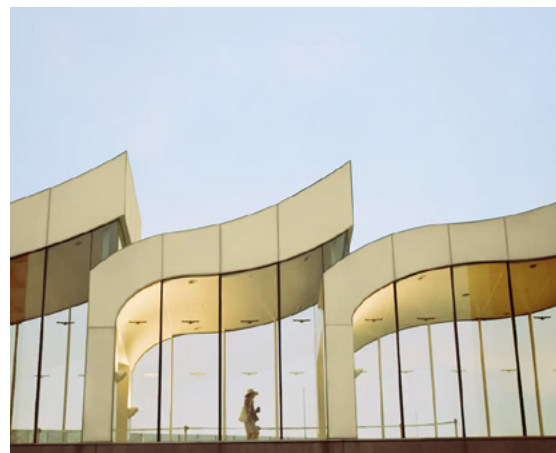
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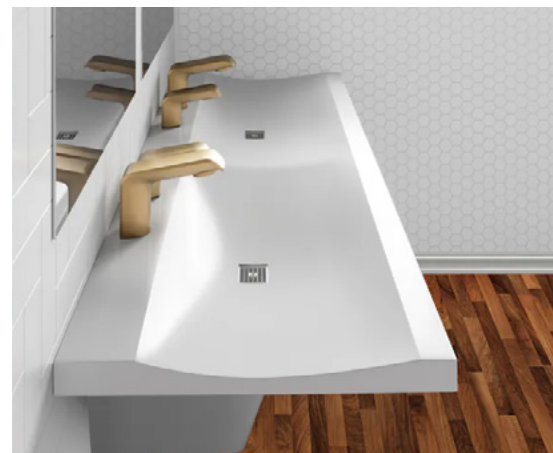
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WILD WONDER

AkzoNobel's Color of the Year is Wild Wonder, a golden hue inspired by the warm tones of harvested crops. The color seeks to create a sense of energy and positivity through its connection with nature. "Wild Wonder speaks to us in a language we instinctively understand. Nature is what inspires us and makes us feel better," said Heleen van Gent, creative director AkzoNobel's Aesthetic Center.

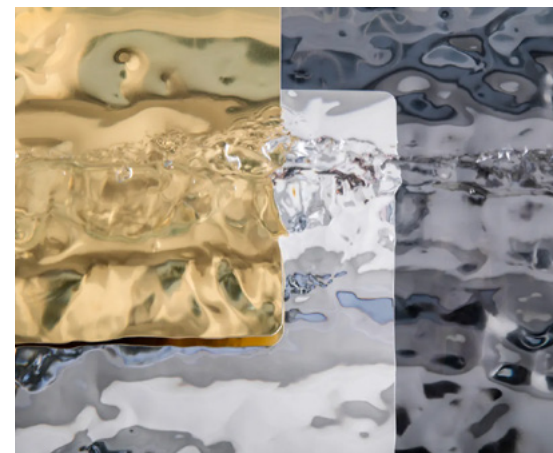
akzonobel.com



EVERO MATTE QUARTZ MATERIAL

Bradley's Evero Matte is a fresh new quartz material cast into curved handwashing creations with no fabrication or seams. This material, made from a sustainable blend of bio-based resin and a unique mixture of extra fine grade quartz, is GREENGUARD-certified and offers a luxurious, velvety texture. The smooth, non-porous surface also repels water and resists water marks. This stunning one-piece construction is free from unsightly caulk lines and discolored seams. The sleek appearance also inhibits mold and bacteria growth creating a more hygienic handwashing experience.

bradleycorp.com



WATERWORLD

Chemetel's Waterworld features an embossed water effect pressed into thin sheets of anodized aluminum that captures and refracts light for designs that are constantly changing and engaging with every viewpoint. Finishes come in polished, mirrorlike and satin metals in clear, brass and black but Waterworld is also available on more than 35 solid metal designs in the Chemetel collection. The aluminum is also a softer metal that can be more easily fabricated by design professionals than stainless, which requires metal cutting and bending equipment.

chemetal.com



NEW PATH

New Path is Shaw Contract's first carbon-neutral carpet tile collection constructed on its StrataWorx backing. Using EcoSolution Q100 fiber technology in its construction, New Path achieves the lowest embodied carbon footprint of any Shaw Contract carpet tile collection so far. EcoSolution Q100 is a 100% recycled content nylon fiber allocated from pre-consumer sources that establishes a low embodied carbon footprint when used in conjunction with StrataWorx backing; Shaw offsets the remainder of the carbon footprint with the purchase of verified carbon offsets.

shawcontract.com

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Check out these other resources

GETTING TO NET ZERO: CARBON SOLUTIONS FOR TODAY'S CLIMATE CHALLENGES

This eHandbook on decarbonization offers building and design practitioners with practical and valuable content to help them meet their sustainability goals. Inside, you'll find information on how to calculate the carbon footprint of your interior renovations, as well as how to reduce that impact through smart product specification. It also offers several cost-effective strategies to help you achieve your sustainability target, as well as present a regenerative framework for tackling the climate crisis.

[Download Now](#)

HEALTH BY DESIGN: A PRESCRIPTION FOR CREATING HEALTHIER ENVIRONMENTS FOR OCCUPANTS

Nowhere is the trend toward healthy commercial buildings more important than in healthcare environments. This eHandbook showcases the importance of designing spaces that take into account the ways a building can support health and wellness, from specifying the right materials for the rigorous cleaning demands of healthcare facilities to re-evaluating products and materials, and to the importance of implementing

touchless technologies.

[Download Now](#)

A COMPREHENSIVE GUIDE TO INDOOR AIR QUALITY

Indoor air quality has always been of vital importance, but never has it demanded more attention from architects, designers, building owners and facility managers than it does today in the wake of a global pandemic. This eHandbook offers the most up-to-date information available on the subject.

[Download Now](#)

FUTURE PROOFING YOUR BUILDING: WHERE HVAC AND SUSTAINABILITY COME TOGETHER

Variable refrigerant flow (VRF) zoning systems solve many of the challenges associated with commercial construction and facility management. It's time to ask yourself: is VRF right for my facility? This eHandbook explores that question.

[Download Now](#)

THE IMPORTANCE OF ACOUSTICS IN THE BUILT ENVIRONMENT

Every design choice impacts acoustic quality, and noise levels in a room can impact health, concentration and productivity—just ask anyone who's worked in an

open office before. This eHandbook will help you better understand the fundamentals of how acoustics work in buildings, identify ways to improve acoustics and make the connection between acoustics and wellness clearer.

[Download Now](#)

REDEFINED & REDESIGNED: HOSPITALITY SPACES IN THE COVID ERA

In this eHandbook, we look at the evolution of hotels into streamlined, touchless experiences with stringent cleaning practices. We also explore how meeting and event spaces have changed during the pandemic, repurposing guest rooms as temporary office space, and the "staycation" trend that may be here to stay.

[Download Now](#)

WELLNESS: THE FUTURE OF BUILDING DESIGN, CONSTRUCTION AND OPERATIONS

This new eHandbook gathers tips and strategies from leading design professionals and building owners on how to make sure your building is fostering wellness.

[Download Now](#)

SHORT- AND LONG-TERM STRATEGIES FOR HEALTHCARE DESIGN AND OPERATIONS

While we understand more about COVID-19 today than at the outset of the pandemic, it will continue to reshape the way medical facilities are designed and operated. We assembled this eHandbook: to offer guidance from trusted sources to help hospital staff and designers alike with the decisions they need to make today—and tomorrow.

[Download Now](#)

REOPENING THE OFFICE BEST PRACTICES

In this eBook, we've assembled a preview of numerous guidelines and white papers with practical information on getting your workplace ready for reopening from some of the most respected organizations and architectural firms, including direct links to download the complete reports.

[Download Now](#)

BUILDING AMENITIES THAT ATTRACT AND RETAIN TENANTS

Download this eHandbook if you are considering how to incorporate and leverage the amenities you offer to draw people back to your building and help keep them coming back.

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