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DESIGNING SAFE, SUSTAINABLE, AND INNOVATIVE LEARNING ENVIRONMENTS

Strategies for K-12 and Higher Education

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Safer and More Sustainable Schools

In today's rapidly changing world, the need for safer and more sustainable schools has never been more urgent. Architects, designers, facilities managers, and school administrators must prioritize creating environments that protect students while promoting long-term sustainability. Sustainable materials, energy-efficient systems, and smart technology integration are essential to reducing operational costs and meeting evolving regulatory standards. At the same time, security measures must be thoughtfully integrated into school designs to address modern safety challenges, from natural disasters to threats of violence. By working together, stakeholders can create learning environments that not only safeguard students but also inspire them to value sustainability and prepare them for the future.

This handbook offers a comprehensive guide to the latest design and facility management trends in educational settings, from K-12 schools to universities. It covers crucial topics such as student safety, sustainability, and health-focused design, with insights on strategic planning and innovative solutions. Key articles delve into the integration of retail spaces with student housing, best practices for campus cleanliness and HVAC preparedness, and how schools can leverage cutting-edge technologies like visible light disinfection. Explore case studies of successful projects, including Georgetown University's LEED Platinum student housing and a business school that merges academic and corporate spaces. This resource is essential for administrators, architects, and facility managers dedicated to creating modern, safe, and sustainable learning environments.

Janelle Penny, Editor-in-Chief, BUILDINGS
Jeanie Fitzgerald, Editor-in-Chief, Architectural Products
Carrie Meadows, Editor-in-Chief, interiors+sources

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Future Proof Your Emergency Communications the Code-Compliant Way

Modernizing Emergency Comms: Code-Compliant Solutions for Life Safety. Learn how Cellular LTE ensures reliable and sustainable emergency phones.

In an ever-evolving world where sustainability and risk prevention are of paramount importance, municipalities are seeking ways to modernize their emergency communications systems. Of particular timeliness, pursuant to FCC Order 10-72a1, telecom companies are no longer required to service traditional landlines. Why is this important? Since many telecom companies are no longer maintaining those landlines:

- Service is deteriorating.
- Maintaining existing infrastructure is expensive.
- Delays in installation and servicing are the norm.
- It's difficult to purchase new landlines (if you can get them at all).

When it comes to emergency solutions where life safety is at stake, vulnerabilities such as these simply can't be overlooked. While agencies are exploring alternatives like VoIP (Voice over Internet Protocol) solutions, they must be cautious about overlooking code requirements, especially for essential devices like elevator phones, required by law. It's vital to future-proof your emergency communications in a way that adheres to relevant codes and regulations while keeping safety and risk reduction of utmost importance. When considering landline replacement options for your elevator phones, here are code requirements you simply can't overlook:

BACKUP POWER SOURCES

American Society of Mechanical Engineers (ASME) elevator code requires a 4-hour battery backup for elevator phones in case of a power outage. Specifically, the code dictates the elevator phone provide a "means of communication for at least four hours". The confusion comes when those four hours of talk time are misunderstood as standby time. The difference could have a significant impact during an elevator entrapment when this is the only means of communication. With VoIP, no power to the router means there is no connection to the internet.

PHONE LINE VERIFICATION

When the phone line connected to your elevator is down, your phone line verification system (PLV) must send a visual and audible signal to notify whoever is onsite so the issue can be resolved. Unfortunately, not all communication systems are equipped to do this, and this is an often-overlooked area of code compliance when transitioning away from landlines.

LOCATION IDENTIFICATION AND COMMUNICATION ABILITIES

With VoIP, unfortunately, comes inconsistent dual-tone multifrequency (DTMF). This makes communication difficult, especially when trying to retrieve information from or calling back into a specific device (also code-required).

VIDEO AND TWO-WAY MESSAGING CODE REQUIREMENTS

The 2018 International Building Code (IBC) and the 2019 American Society of Mechanical Engineers (ASME) code standards introduced new elevator requirements for any new construction or modernization in states that have adopted these and later code years as a means of better assisting those who are deaf, hard of hearing, or speech impaired. Elevator emergency communication now must include:

- Two-way (text-based) messaging capability
- Video capability
- A display message to indicate call has been received and help is on the way and/or onsite

Currently, 75%+ of states have adopted codes requiring video and two-way messaging. See elevator code by state here. If your state has not yet adopted one of these codes, it is safe to assume it's coming. It's essential to focus on the future, thinking ahead to how your agency can supply a smart solution that meets this need. When it comes to selecting a landline replacement solution for your elevator phones, you'll want to ensure your solution has sufficient bandwidth to maintain these additional requirements.

So, how can you replace your landlines in your emergency communication devices while being mindful of code?

Our emergency experts recommend Cellular LTE. A cellular elevator phone solution completely eliminates dependency on analog lines by leveraging the nationwide VoLTE mobile network. This provides a reliable, code-compliant, and cost-effective solution for your emergency phones.

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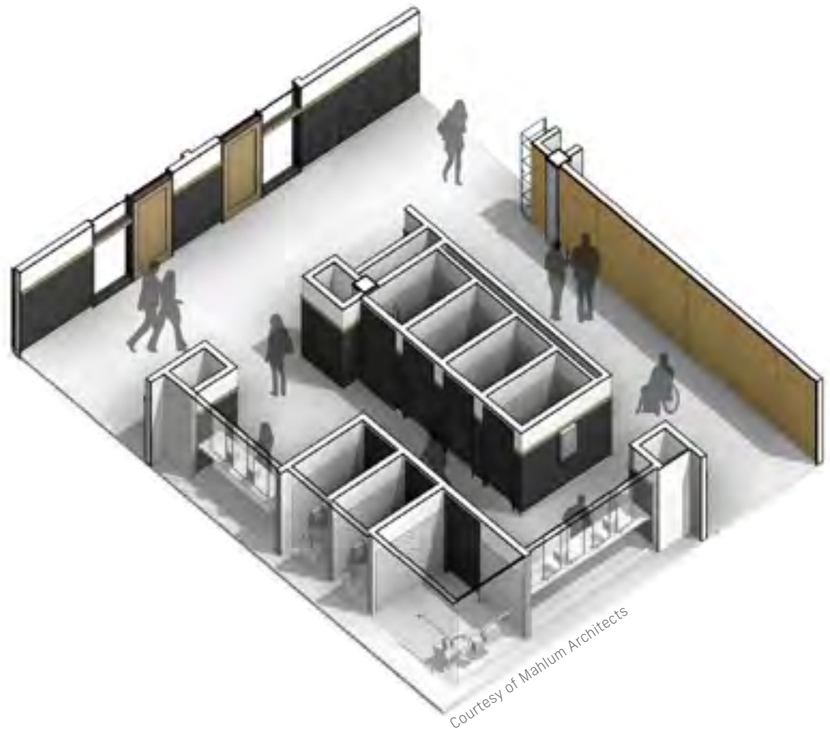

Courtesy of Mahlum Architects

Exploring Design Trends for K-12 Applications

A closer look at how architects are addressing student behaviors, improving the learning environment, and enhancing the sustainability of educational buildings with design.

By Jeanette Fitzgerald Pitts

1. After reading this article, you should be able to:
2. Describe how the inclusive restroom design concept addresses the bad behaviors plaguing bathroom spaces and improves student safety.
3. Summarize the ways that acoustical surfaces, lighting, and HVAC systems are being used to improve the comfort of the learning environment, helping students perform better in class.
4. Identify various solutions that can be incorporated to heighten security throughout a school.
5. Explain some of the sustainability strategies making schools more environmentally friendly.

The design of K-12 schools has never been more front and center than it is today—and for so many reasons. The heightened need for safety and security. Discussions of energy use and sustainability. Exploring the ways typical learning environments fall short and the available solutions that could be applied to improve them. The restroom issue. This course provides a snapshot of how architects around the country are addressing these problems and the design trends emerging for the K-12 space.

TRENDS IN RESTROOMS

School restrooms have long been a bastion for bad behavior but the troublesome activities occurring in these spaces are increasing in risk and

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severity, causing even greater concern for school leaders. From vandalism to vaping, drug use, bullying and full-on physical attacks, many students are starting to cast a wary eye toward the bathroom, when they need to do their business. Aware of many of the issues, schools have attempted to address them with bathroom policies and procedures—capping the amount of time, number of visitors, and even the number of visits a student can make in a semester. Interestingly enough, one of the most effective responses seems to be a physical redesign of the restroom space.

INCLUSIVE RESTROOM FROM GRANT H.S. MODERNIZATION
The inclusive restrooms at Grant High School, designed by Mahlum Architects, increase privacy in the stall, while improving visibility and safety in the larger restroom space.

INCLUSIVE RESTROOMS

The design concept gaining momentum right now is referred to by many different names—open restrooms, inclusive restrooms, single-occupancy restrooms, and gender-neutral restrooms are just a few of the most commonly used terms. There are others. The concept upends several of the features of the conventional 'gang style' layout often seen in K-12 spaces and ultimately improves the restroom experience for students in many ways.

The rows of stalls defined by short doors, thin partition walls, and lots of peekable space are replaced by single-occupancy compartments with full height, acoustically treated, walls and doors. In some designs, each enclosure has its own vent system. This shift dramatically improves the experience of privacy that students have in this very private moment.

In addition to offering a better place to do the business, this new design improves the visibility into the more public areas of the restroom and addresses the feeling of entrapment that makes it possible for these spaces to be places where bullying and intimidation occur. The layout of these revised restrooms includes at least two points of entry and exit, making it harder for a person to feel trapped.

In this new design concept, the handwashing area moves from a row of wash basins located opposite the stalls in the enclosed space to an open area. This allows the supervision and visibility of the more general areas in the restroom to be improved, while keeping the private areas even more private. Some designs closely integrate the handwashing space into hallways, providing maximum passersby in terms of students and staff to keep everyone accountable and safe.

One of the biggest changes that this new layout allows is that instead of an entire restroom being designated as either female or male, the area can be identified as gender neutral. The fully enclosed restroom compartments can serve males and females, in complete privacy, and the sinks can be used by anyone. This more inclusive approach also helps to improve the occupation of the area, which improves the overall safety and security of the restrooms as well. This new design concept, whatever the design team happens to call it, is being implemented in K-12 projects around the country. Here's a closer look at the way the restrooms were modified during the modernization at Grant High School, Portland Public Schools, by Mahlum Architects.

GRANT HIGH SCHOOL MODERNIZATION

According to the architect's website, "For the $138 million modernization of Grant High School—an historically significant school located in Portland's Grant Park neighborhood, [Mahlum Architects] led a year-long public engagement process which exposed that the historic structure disadvantaged students of lower socio-economic status, race and gender identity."

The project manager and associate principal at Mahlum Architects, Alyssa Leeviraphan, explained, "During the outreach and engagement

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phase, we heard that there were students who felt threatened during the day, in the restroom. These students drank less water and avoided visiting the restroom, because they didn't feel safe."

"We developed the bathrooms at Grant High School to have full height walls and full doors with an acoustical treatment. There are no urinals. The handwashing area is in a more open area with sightlines that are accessible from the hallway, so the restroom space is easily observable by faculty and staff. Each stall has a lock indicator to display whether the unit is open or occupied and more recent designs have started incorporating a transom window at the top of the stall, that will be illuminated by the lights in the stall that turn on when the stall is occupied in order to show others in the space that the stall is occupied," said Leeviraphan.

At Grant, every restroom in the school was renovated to become an inclusive restroom, with the exception of the restrooms in the locker rooms. The change has been well received. "We've talked to people at the school, since it reopened, and they like the changes to the restrooms. There was some worry that giving students more privacy in the enclosed compartments would create a scenario where students would hide out in these spaces, but that hasn't been the case. We also heard from custodians who were worried about how easily this new solution could be maintained and they actually find a lot of benefit in the way the new bathrooms are organized," she added.

NEXT-LEVEL EASE OF MAINTENANCE

Ease of maintenance is a key concern architects have been addressing in K-12 restroom environments for decades—regardless of the style of the layout. While the maintenance consideration is not new, new technology has been introduced into the market that allows architects to design a restroom that is easier to maintain than ever before. The secret is combining the soap, water, and hand dryer stations into one fixture.

This all-in-one handwashing fixture provides water, soap, and hand drying in one place.

An all-in-one handwashing fixture keeps soap, water, and the hand dryer in close reach at the wash basin. This unique functionality solves many of the maintenance issues that arose simply because of the disparate way that students had to travel through the restroom space to wash and dry their hands. With all the necessary elements in the same place, students won't be splashing water across the sink as they reach for the communal soap dispenser, nor will they drip water on the floor as they trek over to the spot designated for hand drying.

There are also all-in-one handwashing fixtures that are completely touchless, which further improves the level of hygiene that a student can achieve when handwashing.

To continue reading this article, visit https://archdesignmaster.com/courses/exploring-design-trends-for-k-12-applications/

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From Function to Form: How Thoughtful Restroom Design Supports Learning

Design professionals, facility managers, and administrators share a common goal: to create a seamless experience for students, faculty, and visitors. From entryways to classrooms, each space should reflect the institution's unique values. Restrooms are no exception. Their design and upkeep can significantly influence how people perceive the school or university.

A restroom that is clean, well-maintained, and aligned with the institution's aesthetic elevates the user experience. Moreover, restrooms offer an opportunity to showcase an institution's commitment to ecological responsibility. Sustainable choices in materials and fixtures can support climate goals, including achieving certifications like LEED and WELL.

Achieving this balance requires thoughtful planning. From design to maintenance, ensuring energy efficiency, cleanliness, and sustainability must be part of the decision-making process. Clear communication of goals during the design stage is essential for achieving the desired results, from fixture selection to energy efficiency and overall environmental impact.

CLEANLINESS IS KEY

According to a recent global survey by leading market research firm MetrixLab, 58% of U.S. consumers say that a dirty restroom negatively impacts their opinion of an establishment. In educational facilities, cleanliness is critical, and restrooms that appear dirty often have paper towels scattered on the floor, overflowing bins, or clogged toilets.

Choosing the right hand-drying solution is crucial. Hand dryers with electrostatic HEPA (eHEPA®) filtration systems, for example, are a hygienic option, removing 99.999% of viruses from the air. In contrast, studies have found that even unused paper towels can contain germs, including E. coli, posing additional risks. Beyond hygiene, hand dryers also help reduce waste and the potential for clogged toilets.

COST SAVINGS AND ENVIRONMENTAL BENEFITS

Restroom maintenance can be a significant cost factor for educational facilities, where bathrooms see high usage. With 500 uses per day, hand dryers can save an institution over $7,000 per restroom annually when compared to paper towels. The return on investment is often realized within 10 months. These savings are further enhanced by reduced maintenance time.

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Choosing hand dryers over paper towels can also help reduce an institution's carbon footprint. A typical school can lower its emissions by around 3,814 kg per year. Excel hand dryers have been proven to reduce the carbon footprint up to 94% in a recent Life Cycle Assessment comparing their hand dryers to virgin and recycled paper towels. When selecting a hand dryer, look for sustainability certifications like BuildingGreen Approved® and LEED credits, as well as EPD and HPD certifications, which assess a product's environmental and health impact.

DESIGN MATTERS

While hygiene and cost savings are essential, restroom design also plays a significant role in user experience. Modern hand dryer designs now integrate seamlessly into contemporary restrooms, complementing an institution's overall aesthetic. Hand dryers can even feature custom designs, displaying school logos or student artwork.

At Excel Dryer, we recently collaborated with Artists for Humanity (AFH) in Boston to create custom hand dryer covers featuring student art. This project not only enhanced the look of the restrooms but also engaged local youth while contributing to sustainability goals.

A HOLISTIC SOLUTION

Energy-efficient, ecologically certified hand dryers with eHEPA filtration provide a comprehensive solution for educational institutions. These dryers enhance aesthetics, improve hygiene, reduce costs, and support environmental goals—all while creating a positive user experience backed by data. In the end, strategic restroom design reflects positively on the institution, supporting its identity, mission, and values.

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How to Address Student Safety and School Sustainability Strategically

Prioritizing strategic asset management can help facilities reach green goals. Here's how.

By Katie Gramajo

Higher education facilities spend a combined $6 billion each year on energy, with this number only increasing with inflation and the price of fossil fuels continuing to rise. While sustainability has become an emerging priority across sectors, the study shows many in education still haven't engaged, especially with tight budgets, delaying these projects. In fact, a survey conducted by Brightly found that 69% of respondents say ESG isn't a high priority and 53% don't have an ESG strategy in place.

As higher education decision-makers face extreme climate events and shrinking budgets, sustainability must remain at the forefront. This article will explore how facilities managers can ensure infrastructure and asset upgrades will contribute to sustainability goals—and, in turn, fiscal goals—starting with a strategic approach to asset management.

UNDERSTANDING FACILITIES' ENVIRONMENTAL IMPACT

With poor infrastructure grades for higher education and environmental challenges impacting student learning and safety, education facilities managers are feeling an increasing urgency to ensure the health of their assets. They must consider not only how to proactively address short-term infrastructure upgrades but also how to plan for weather-related emergencies that could close schools. For example, some college campuses in Florida were closed for nearly two weeks due to Hurricanes Ian and Nicole in fall 2022, and some were closed for a few days due to Hurricane Idalia in August 2023, potentially followed by more this upcoming hurricane season.

Creating an asset management strategy that incorporates sustainability must begin by identifying where inefficiencies are happening so facilities managers can address the root cause, saving money in the long run.

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Utilizing technology to gather real-time data on all aspects of facilities—from air conditioners and HVAC units to heating systems—enables maintenance and operations leaders to gain insight into the state of their assets, providing proof-points to support decisions about asset health.

Beyond increasing transparency and communication with stakeholders, this data provides tangible details about where utility waste might be happening, which assets need to be repaired or replaced—and when—and where to direct critical funds. In fact, prioritizing sustainability initiatives may also help with college enrollment, with 45% of perspective students ultimately considering environmental sustainability in their college decision.

SAVING ENERGY ON AGING INFRASTRUCTURE

According to the last report card from the American Society of Civil Engineers, American infrastructure was graded a C-, and while students' health and safety have always been a top priority for professors, administrators, and facilities professionals, the COVID-19 pandemic put both primary and secondary assets at the forefront as it shed light on concerns of aging infrastructure. According to the U.S. Energy Information Administration, the average age of campus buildings is about 35.5 years and continues to increase, putting students at greater risk of health and safety issues.

Along with these concerns, in 2021, APPA estimated that American higher ed campuses possessed facility backlogs north of $112 billion, underscoring the urgent need for advanced technologies to manage and address these issues. This comes at a time where higher education institutions are also being hindered by budget cuts, with schools such as Pennsylvania State University, University of Connecticut, and the University of New Hampshire each facing multimillion-dollar funding losses earlier this year. By investing in technology solutions, higher education institutions can help streamline facility management, prioritize infrastructure upgrades, and effectively tackle these backlogs.

So, what can be done about these infrastructure challenges? Facilities managers are likely to see renewed interest in infrastructure with the U.S. Department of Education's Research and Development Infrastructure Grant Program, introduced in early 2024. This program offers a promising solution by providing funding for Historically Black Colleges and Universities, Tribal Colleges and Universities, and Minority-Serving Institutions to improve higher education infrastructure. It supports upgrades to campus facilities, enhances physical infrastructure, and aids in the development of research centers and institutional support structures. By targeting these areas, the program aims to address critical infrastructure needs and improve overall campus conditions.

THE ROAD AHEAD

College and university facilities account for 5% of U.S. commercial building emissions and comprise over 5 billion square feet of space, leading to nearly $14 billion in annual energy costs. Estimates suggest that sustained efforts in the higher education sector could yield more than $1 trillion in energy savings over 10 years, according to Global Philanthropy Partnership.

University campus utility costs continue to increase year over year. To avoid about 25% of those energy and operational expenses, education facility decision-makers must invest in long-term sustainability solutions, such as asset investment planning software (AIP). As facility and operational leaders manage with fewer resources to maintain safe and healthy campuses, the right technology can enhance efficiency, enable strategic planning for sustainable infrastructure updates, and optimize fund usage.

The long-term benefits of putting such sustainability initiatives into play go beyond the immediate cost savings. They enhance student health and safety, improve campuses, and create a positive impact on campus reputation and student recruitment. While the challenges may be significant, the opportunity and potential outcomes are equally substantial.

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Thomas Watkins

Making Retail a Reality

Integrating ground-level retail with student housing.

By Jeffrey M. Smith

Mixing off-campus housing with retail is revolutionizing the student housing landscape. Students value the shopping and dining opportunities, and university administrators are pleased when students do not venture too far from campus and lose touch with the university experience. When properly planned and designed, these developments can be a boon to enrollment.

In recent years, a remarkable transformation has occurred in off-campus student housing as developers work with colleges and universities to create residential facilities that support recruitment and retention, foster engagement and socialization, and provide a conducive environment for academic success. This trend has given rise to a surge in housing projects that embrace mixed-use concepts, and retail spaces are at the forefront of their design.

With retail spaces adjacent to campus, universities can activate the campus edge and provide a valuable amenity for their students. Students have access to a wide range of dining options and can socialize with their peers without traveling far from campus. The convenience and accessibility greatly enhance student life.

Integrating retail spaces in off-campus housing complements universities' efforts to create a vibrant campus environment. By expanding the scope of amenities available to students, these developments can be attractive selling points for prospective students and strengthen the university's commitment to providing a comprehensive living and learning experience.

AUBURN UNIVERSITY

Covering four acres, 320 West Mag is one of the largest student housing developments adjacent to the campus of Auburn University in Auburn, Alabama. The apartment complex, on the north edge of campus, was

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designed to create a thriving mix-use community. It has a multilevel fitness center, resort-style pool, coffee shop and tech center. But what really attracts students to the housing is the Chick-fil-A restaurant on the premises.

That the fast-food outlet would be a hit with students was no surprise. Chick-fil-A had operated at the site since 2003. However, its popularity caused traffic problems as cars waiting in the drive-thru would back up onto an adjacent street. The developer acquired the existing restaurant site, assembled adjacent parcels, and set out to create a 4.16-acre, 719-bed community that reincorporated the restaurant into the ground floor along with an additional 7,685 square feet of commercial space.

With Chick-fil-A essentially grandfathered in as a first-floor tenant, the layout had a significant effect on the design of the building. Chick-fil-A's main concern was to avoid the traffic problems prevalent in the restaurant's previous iteration. Because the student housing building had access on all four sides, the project team worked to gain access to the restaurant's drive-thru window from Thomas Street on the west side and a secondary entrance on the east side. These requirements mainly drove the internal housing layout and the location of the parking deck.

The design of 320 West Mag responded specifically to the restaurant's design requirements. Planners knew precisely how many vehicles the drive-thru would need to accommodate, and the team dedicated most of the west side of the building to the drive-thru to eliminate any probability of traffic jams in all directions. Successfully integrating a ground-floor drive-thru presented several challenges. The development team had to accommodate the restaurant's kitchen, service, trash, and parking requirements and respond to the city's desire to access the drive-thru via Thomas Street.

Consideration also had to be made for large trucks. The solution was a long, continuous ramp that accommodates two lanes where customers enter on the high side of the site along Thomas Street and gently ramp down to the order kiosks. This enables 27 cars to queue inside the parking deck before ordering.

Environmental and safety concerns related to fumes from idling vehicles in the drive-thru were also addressed. In addition, the design had to address many specific adjacency requirements for these building types, such as the pass-through window being a certain distance from the service door.

With two corners of the development occupied by a Subway restaurant and a university-owned parking lot, the designers set out to vertically connect all the amenities for the residents, including the retail area, into the first two levels of the building. The residential units were built around three separate elevated courtyards. The design provides several access points to the outdoor courtyards and many units with views of the outdoor amenity areas.

When mixing residential with retail, security and safety must always be at the forefront of all design decisions so that non-resident customers of the retail space do not have access to the private living units. At the same time, the design team wanted to create a sense of community for residents by including common areas where students can gather. A coffee shop serves as a hospitality lobby. The outdoor pool, fitness center, and study areas are at the podium level. The club and fitness spaces look out over a pool, which is 16 feet up and has great views of the university. There are also beautiful, inviting, study areas.

ATLANTA AMENITIES

The Standard at Atlanta – a mixed-use development for students attending Georgia Tech and Georgia State – provides another example of how enhancing the ground-floor experience of a university housing development can promote connectivity.

At 19 stories, The Standard has 257 furnished residential units along with 10,783 square feet of commercial space. Included among its many amenities is a Starbucks coffee shop with drive-thru lanes.

Often, project designers have to shoehorn retailers into a multilevel building constructed above them. Many of these projects in urban settings have similar challenges with retailers on the project site, so project teams often make them part of the new building as a condition for incorporating their land.

Unlike on-campus sites where retailers rely primarily on student walk-up traffic, these urban projects often require that the building have ground-level retail on the street front facades. When this occurs, project designers are responsible for the retailer's mechanical and structural issues, such as intake and exhaust. To address city requirements related to active use at street frontages, the project team has additional

conditions to consider regarding mechanical system intake and exhaust, as well as servicing, which often need special design solutions to harmonize with the residential program design above.

As the competition for students becomes increasingly competitive, forward-looking university and development leaders are finding that housing is a critical area for building and retaining enrollment. Schools can enhance socialization and engagement, while keeping students on campus, by providing the amenities and accommodating the features they value most. Dynamic, pedestrian-friendly communities are essential to expanding a vibrant campus life, and that goal can be achieved by making retail a reality.

Jeffrey M. Smith, AIA, LEED AP, is Vice President with Niles Bolton Associates. He can be reached at jsmith@nilesbolton.com.

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Clean Campuses, Healthy Spaces

Cleaning plays a critical role in achieving IAQ improvements in schools and universities.

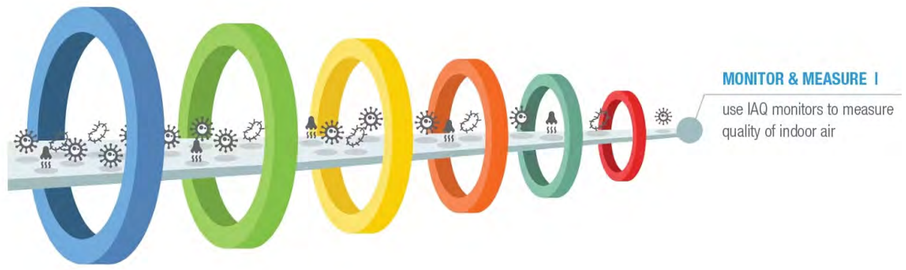
By Keith Schneringer

Over the last 100 years, society has seen significant gains in public health with regard to water quality, outdoor air pollution, food safety, and general health, hygiene, and sanitation. Several improvements have been crucial in evolving the building occupant wellness expectations of students, faculty, and visitors at a school or university campus.

Where does Indoor Air Quality (IAQ) fit in public health advancements, and what's needed for a total facility care approach for campuses going forward?

The Covid-19 pandemic and recent wildfires in some areas have demonstrated the dramatic need for improvements in IAQ on higher education campuses. How institutions clean and maintain the built environment on campuses plays a vital role in achieving more healthful IAQ.

Enhanced IAQ cleaning protocols help reduce the spread of infectious respiratory diseases, protect against airborne allergens, and diminish the effects of wildfire smoke and other indoor air pollutants.



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IAQ IMPACT

Americans, on average, spend up to 90% of their time indoors.

Considering that indoor air is typically two to five times more polluted than outdoor air, is it any wonder that one in five Americans suffers from allergies and asthma?

Joseph Allen, director of the Healthy Buildings Program at Harvard T.H. Chan School of Public Health, makes the case that facility managers now play a more significant role in the health of building occupants than their personal care physicians do.

Thinking differently about cleaning protocols can help eliminate, substitute, or apply engineering or administrative controls to address hazards posed by airborne particulates before they ever reach the HVAC system – or building occupants' lungs.

Regular deployment of portable air purifiers supplemented with periodic use of personal protective equipment (PPE) for increased exposure risks can help mitigate against airborne transmission of infectious aerosols and help protect the health of building occupants.

So, what does cleaning differently look like?

It looks a lot like green cleaning with a few important evolutions and modifications.

ENTRYWAY IAQ

First, deploy entryway matting systems to help trap and remove dirt, moisture, and other particulates so they don't enter a building in the first place. Did you know that 70% to 80% of the dirt in buildings is tracked in on the bottom of shoes? These particulates then circulate within a building until removal.

Entryway matting systems can help eliminate airborne particulates so they don't have to be dealt with later.

CLEANING IAQ

Next, clean hard floors and other horizontal and vertical surfaces with microfiber instead of traditional cleaning tools like cotton mops and feather dusters. Microfiber is more effective at trapping and removing dirt, moisture, and other particulates from all surfaces than other cleaning tools that frequently just move dirt and particulates around to settle somewhere else in a building.

Also, use vacuum cleaners with filtration. Vacuum cleaners certified by the Carpet & Rug Institute Seal of Approval Green Label have been proven to trap, remove, and, most important, keep particulates contained so they are not redistributed to settle on surfaces and be breathed in by students and other building occupants. High-Efficiency Particulate Air (HEPA) filters are available for many vacuum cleaners and can provide even better filtration.

For other cleaning equipment, consider solutions that collect and remove particulates instead of just moving them around. Think autoscrubbers instead of mops for cleaning floors, no-touch cleaning caddies instead of cleaning cloths for cleaning restrooms, and floor burnishers with dust skirts and active vacuum dust capture instead of those without. In addition to helping with IAQ, mechanizing the cleaning process helps the cleaning staff be more effective and efficient.

For cleaning chemicals, consider those that are third-party certified to meet standards from Green Seal, UL ECOLOGO, or EPA Safer Choice. These certified products have been demonstrated to have a reduced effect on human health and the environment, and recent studies have concluded that these products also typically emit fewer Volatile Organic Compounds (VOCs) than traditional products used for the same purposes. VOCs can cause respiratory irritation for cleaning staff as well as students and faculty.

Consider also cleaning chemicals with supplemental certifications that address VOCs specifically, including UL GREENGUARD and Clean Air Choice Cleaners Certification from South Coast Air Quality Management District – each of these standards conducts air chamber testing with these cleaning chemicals to identify those which have low or no VOCs.

Disinfectant bowl cleaners and air purifiers can help mitigate potential exposure of students and staff to the pathogens aerosolized and spread throughout a restroom.

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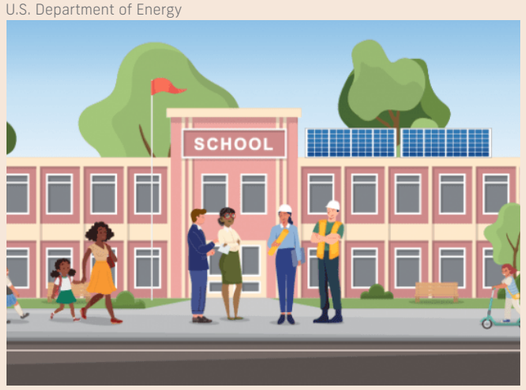

FEDERAL PROGRAM OFFERS $180 MILLION FOR SCHOOL ENERGY UPGRADES

The **U.S. Department of Energy** has opened applications for the 2024 Renew America's Schools Prize, which will award $180 million to districts engaging in strategic partnerships to build capacity and carry out energy upgrades at K-12 schools.

The aim of the awards is to lower energy use and costs, improve indoor air quality, and foster more healthful learning environments.

"There's nothing more critical than investing in the health and education of our nation's children," said U.S. Secretary of Energy Jennifer M. Granholm. "This program's first round of funding saw an unprecedented influx of applications, requesting billions in school infrastructure upgrades."

The 2024 Renew America's Schools Prize will invest an anticipated $180 million in school facilities that demonstrate the need for energy improvements and financing. The program will focus on schools that serve disadvantaged communities, including those with a high percentage of students eligible for free and reduced-price lunch, or which qualify as rural.

The energy department says in a news release that eligible improvements – such as new HVAC and ventilation systems, building envelope and lighting projects, alternative fuel (such as electric) vehicles and infrastructure, and renewable energy technologies – will improve energy performance or lead to improvements in student, educator, and staff health.

By reducing energy use, these improvements can reduce building operating costs – the second highest operational expense for schools.

Learning environments that have been enhanced with better indoor air quality, lighting, and other upgrades can boost student health outcomes and improve overall well-being and academic performance, the energy department says.

Competitive proposals will consist of energy assessments and building improvement projects across a portfolio of 10 or more school facilities. A portfolio may be composed of school facilities from one or more districts.

In 2023, this program's first round of funding awarded $178 million in Renew America's Schools grants, which benefited over 90 school facilities across 22 states.

To access the 2024 Renew America's Schools Prize, visit https://www.herox.com/renewschoolsprize. To view the tools and resources that will support an application, visit /scep/renew-americas-schools.

RESTROOM IAQ

For restroom air, floor drain trap seals help protect building occupants from pests and odors that can be spread throughout a building via pipes and plumbing. Using bioactive drain maintainers also helps mitigate the odors caused by fats, oils, and greases in the pipes, and helps keep the drains flowing when incorporated into a regular drain care protocol.

Bioactive chemistry is typically a low-VOC way to clean restrooms; several formulas have received third-party green certification and are effective at remediating organic matter typically found in restrooms that cause malodors and provide a haven for pathogens to grow.

To combat the negative effects of "toilet plume" on the quality of restroom air, disinfectant bowl cleaners and air purifiers can help mitigate potential exposure of students and staff to the pathogens aerosolized and spread throughout the restroom with each flush.

WASTE IAQ

When designing waste management protocols, be mindful of pathogens that may be present in waste, recyclable, and compostable materials, and mitigate against potential exposure. Collecting, moving, and storing these waste materials should be focused on containing them to avoid producing malodors or any other airborne particulates of concern. Again, bioactive chemistry can be used to keep receptacles and carts clean from organic material and residue buildup.

AIR PURIFIER IAQ

The next step is to begin cleaning the air. Bringing portable air purifiers into building spaces can help clean up airborne particulates not addressed by the enhanced IAQ cleaning protocols described previously. The U.S. Environmental Protection Agency, the Centers for Disease Control and Prevention, and the American Society of Heating, Refrigerating, and Air Conditioning Engineers all recommend air purifiers using HEPA filters. These air purifiers have been proven to mitigate against Covid-19, cold and influenza, and seasonal allergies. They also are effective at clearing out smoke from wildfires, cigarettes, cigars, and marijuana.

PPE IAQ

For any particulates not addressed by cleaning differently with enhanced IAQ protocols, or by using air purifiers, PPE can be deployed to protect students

and staff from harmful particulates during times of increased risk.

PPE is the last step in mitigating hazards not addressed by protocols designed to eliminate, substitute, or engineer out a hazard.

In understanding the important roles enhanced hand hygiene, surface cleaning and high touchpoint disinfecting play in protecting public health, one can see the critical role that cleaning also plays in mitigating exposure to airborne allergens, malodors, and infectious pathogens at schools and universities.

Keith Schneringer is Senior Director of Marketing, Facility Care + Sustainability, at BradyPLUS.

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Courtesy of Kenall Lighting

Indigo-Clean technology in use at Chelsea High School's weight room, in Michigan. Exercise facilities have been considered high-risk for transmission of harmful bacteria because of their enclosed environment, shared equipment, and close contact between users and staff. Clinically proven to reduce harmful bacteria, 405-nanometer lighting technology can be installed to provide continuous disinfection.

Visible Light Disinfection in School Athletic Facilities

Chelsea High School in Michigan successfully integrates 405-nanometer lighting for an enhanced cleaning protocol in its weight room.

Cliff Yahnke

For children and adolescents, moderate-to-vigorous physical activity and exercise are associated with a decrease in depression and improvements in self-esteem, concentration, and sleep. Fortunately, many school gyms and weight rooms have reopened or are reopening, but the COVID-19 pandemic continues to underscore the importance of cleaning protocols. With recent developments in germicidal LED technology, some school districts have integrated lighting in their cleaning protocols and installed products that effectively kill SARS CoV-2, influenza A, *Staphylococcus aureus*, and a list of pathogens that affect health and wellness.

According to the National Federation of State High School Associations' and the Sports Medicine Advisory Committee's "Guidance for opening up high school athletics and activities," decreasing potential exposure to respiratory droplets is critical to preventing the spread of COVID-19. It recommends "adequate cleaning schedules should be created and implemented for all athletic facilities to mitigate any communicable diseases; and prior to an individual or groups of individuals entering a facility, hard surfaces within that facility should be wiped down and sanitized (chairs, furniture in meeting rooms, locker rooms, weight room equipment, bathrooms, athletic training room tables, etc.)."

VISIBLE LIGHT DISINFECTION TECHNOLOGY IN ACTION

In 2019, voters in Chelsea, Mich., approved an $81 million school bond issue, paving the way for several projects, including a new auxiliary gymnasium to relieve an overcrowded facility at the high school. The school district planned to improve its weight training offerings for students and expand access for middle-school athletes and the community. The new facility would include two basketball practice courts, a competition court, and a 6,500-square-foot weight room.

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Engineer Rich Coburn, a project manager at Strategic Energy Solutions, in Berkley, Mich., along with project architect Kingscott, in Kalamazoo, Mich., knew the weight room would be a popular destination and prioritized occupant health and safety in its design. Exercise facilities are considered high risk for transmission because of their enclosed environment, shared equipment, and close contact between users and staff. "There are always concerns about germs and bacteria when you create spaces such as weight rooms," Coburn says. "When this project came up, it seemed like the perfect space to utilize 405-nanometer lighting technology."

Using a combination of 405-nanometer indigo and white LEDs, Coburn specified Kenall Manufacturing's Millenium Stretch luminaires, which use Kenall's dual-mode Indigo-Clean technology to emit narrow spectrum light that kills viruses and bacteria while providing ambient illumination for the space. (*Disclosure: The author is chief scientist and head of clinical affairs for Indigo-Clean at Kenall Manufacturing.*) The luminaires use this wavelength, which falls into the visible light spectrum, to continuously kill harmful viruses and bacteria in the air and on surfaces. When the space is occupied, the luminaires operate in white disinfection mode. When the facility is closed, the fixtures switch to indigo light to provide a higher level of disinfection.

Standard room occupancy sensors control the operating mode, and the electrical inputs are identical to a typical LED luminaire. The continuous whole-room disinfection technology kills many harmful pathogens, including SARS-CoV-2, influenza A, and methicillin-resistant *Staphylococcus aureus* (MRSA).

Throughout the night, the luminaires disinfect the equipment with a deep cleaning. Because the technology maintains the reduced viral and bacterial levels between regular cleanings, the maintenance team can focus on other tasks.

Coburn worked with the lighting manufacturer to calculate the appropriate dose of 405-nanometer light for each room. They considered common illuminance levels for general lighting applications, the fixture design, and previous clinical studies conducted in occupied rooms with 405-nanometer fixtures. These studies demonstrated the validity of this methodology, while also incorporating the normal use of the room into the performance criteria.

USER REACTION AND ASSESSMENT

The fixtures also provide toolless access for ease of relamping and maintenance, which are important issues for Mills and his team. "Since these fixtures also use LED technology, they have a longer lifetime then older lighting technology, which will reduce maintenance costs," Mills says.

The reaction to the disinfecting luminaires has been positive. "I've worked in many school districts over the past 12 years, but this is the first time I've encountered these lights," says Ron Mills, the school district's director of operations. "They're a welcomed addition for disinfecting and cleaning, and I hope we can add them to other rooms throughout the district's schools."

In fact, as part of an upcoming lighting upgrade project this summer, the school will be installing the technology in two wrestling rooms, where staph such as MRSA can linger in the mats. The district is also considering an installation at its middle school weight room.

To date, testing has not been conducted to confirm the luminaires' effectiveness. Since the weight room was newly constructed, baseline data was not collected to determine if the germicidal lighting has been effective. However, now that the luminaires have been in use for a year, the school district is considering measuring this.

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Aluflam's True Aluminum Framing, in Conjunction with the New CONTRAFLAM® One Interlayer Glass Technology, Delivers Bigger and Brighter Fire-Rated Systems

Aluflam North America, a leader in fire-rated aluminum/glass construction, is excited to announce a significant advancement in their true aluminum framing system. Through the utilization of Vetrotech's groundbreaking CONTRAFLAM® One interlayer technology, Aluflam can now provide improved performance in a single intumescent chamber solution across all performance ratings.

So, what does this mean for architects and designers? The Aluflam aluminum framing system is already the preferred choice for architects seeking a fire-rated solution without compromising on aesthetics. By combining CONTRAFLAM® One interlayer glass technology with Aluflam framing, architects can now incorporate much larger openings, representing an increase of up to 40%.

This opens up new possibilities for projects to feature bigger windows and brighter, more inviting interiors.

In addition to larger openings, by utilizing the most advanced fire-resistive glass technology, architects and designers can take advantage of the highest visible light transmittance, a broader range of temperature resistance, significant weight savings, and up to 35% less embedded carbon than the previous generation of Contraflam.

The Aluflam fire-rated solutions are well known for their ability to seamlessly blend with non-fire-rated glazing systems. The framing can be customized with most architectural finishes.

"We're excited about the evolution of CF1 in terms of the enhancements that we can make to our existing system offerings," says Aluflam President Peter Lindgren. "In fact, Aluflam has always prided itself in the ability to meet the aesthetic and functional needs of the architect and designer. CF1 will definitely add to these capabilities."

Jerry Cucchi, Aluflam Sales adds, "CF1 will allow for many designs to be free of intermediate vertical and horizontal framing elements as this evolution of the Contraflam product has allowed us to increase the daylight sizes by more than 40%."

The Aluflam Group is a recognized, worldwide leader in fire-rated aluminum/glass construction. Aluflam North America operates in the United States out of modern manufacturing facilities in Cerritos, California, and has established a nationwide reputation for top-of-the-line true aluminum vision doors, windows, and glazed wall systems.

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How to Prepare Your School's HVAC System for Spring

Spring is bringing warmer temperatures and blossoming flowers, but it's also bringing pollen that will aggravate seasonal allergies. Here's what you need to know about prepping your K-12 school's HVAC for spring.

By Peter Snow

While spring is great for warmer temperatures and blossoming flowers, the season can be problematic for K-12 schools looking to deliver fresh, clean air to their students. Seasonal allergies can create disturbances in a child's ability to learn. According to the Children's Hospital of Philadelphia, symptoms of seasonal allergies can include a stuffy or runny nose, sneezing, itchy eyes and nose, sore throat and cough. In addition, these allergies can also cause fatigue and poor concentration in school due to lack of sleep, an increase in ear and sinus infections, asthma exacerbations and behavioral issues from discomfort.

Mechanical HVAC systems provide the perfect solution to help combat seasonal allergies, but it's important to have them prepped and ready for when the pollen begins to invade our air space. Managing the three main components of indoor air quality (IAQ)—filtration, ventilation and humidity control—schools can provide excellent air quality while also giving their students and staff an excellent experience.

HVAC PREPARATION

Ventilation, filtration and humidity controls are all vital when enhancing IAQ. Ventilation is a necessity to ensure clean fresh air is being pushed into the classrooms. It's important for facility managers to make sure the minimum amount of outside air is being introduced into the space so students and faculty are getting an ample amount of fresh air. If a room is under-ventilated, indoor air pollutants may not be effectively diluted. If the space is over-ventilated, your HVAC unit may be working harder than it needs to without providing comparable results. In addition, this will also result in wasted energy and wasted money. Ensure that your HVAC unit's ventilation controls are on a setting that maximizes output.

The next area of focus should be your unit's filtration system. While bringing in fresh air is extremely important, your system's filtration capability is needed to filter out allergens. ASHRAE recommends commercial facilities use MERV 13 filters to provide a greater defense against allergens and airborne pathogens if your HVAC unit is compatible. These filters can eliminate particles as small as 0.3 microns such as dust/pollen, auto exhaust and mold spores.

Humidity can also play a role in allergens during the spring. If humidity is too low, allergens can dry up and flake off into the air. Drier air can also make students' nasal passages and throat dry out, causing even more irritation from allergens. On the opposite side of the spectrum, high humidity can promote mold growth, which will increase the number of mold spores in the air. Humidity controls allow facility managers to set the relative humidity in the space. It is ideal for humidity to remain between 40-60% to maximize comfort.

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POSSIBLE HVAC UPGRADES

Upgrades to your HVAC system can provide additional protection against allergens in the air. Filtration upgrades, like Needlepoint Bipolar Ionization (NPBI), can provide an extra defensive layer during the spring. NPBI works by releasing ions into the airstream using an existing HVAC unit as the delivery method. Once those ions are released, they form bonds with particles in the air. These bonds create larger clusters of particles, which makes them easier to filter from the air.

A ceiling-mounted ultraviolet air disinfection system can also be installed in schools to further aid HVAC systems in providing clean air. While these units are installed separately from the existing HVAC system, they can assist in minimizing the number of particulates in the air. Using an ultraviolet germicidal irradiation (UVGI) chamber and air circulating fans, airborne pollutants are drawn into the chamber, where the pollutant is neutralized by UV-C.

Systems like these can improve IAQ by assisting your current HVAC unit in eliminating airborne pollutants and pathogens.

PREVENTATIVE MAINTENANCE

While you may be making all the necessary changes and upgrades to ensure your HVAC solution is prepped for spring, preventative maintenance is the glue that holds everything together. Preventative maintenance is necessary to provide optimal performance. One of the best ways to maintain maximum efficiency is to develop a maintenance plan that includes a factory-certified unit inspection. Regular inspections are included in most maintenance agreements. There are several things facility managers can expect during an inspection:

- Installation of new filters
- Cleaning external surfaces, in addition to cleaning and vacuuming inside the cabinet
- Checking all electrical connections and mechanical connections
- Checking the condensate drain line (on high efficiency units)
- Brushing and vacuuming all the coils
- Checking and recording operational data of cooling or heating operations

Having your school's HVAC system maintained regularly will not only ensure it's providing excellent IAQ, but it's also extending the life of the system while reducing energy consumption.

READY FOR SPRING

The pretty flowers that bloom during spring come with the trade-off of seasonal allergies. Pollen can create uncomfortable conditions for students in K-12 classrooms because of the adverse effects they cause. Mechanical HVAC units provide a greater defense against these troublesome particulates. Using controlled ventilation, filtration and humidity controls, facility managers are well-equipped with what they need to maintain great IAQ. With proper maintenance, these units should provide excellent results throughout the spring season.

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Sponsored by Patcraft

K-12: Sustainable Environments That Foster Learning

CREATING CURIOUS SPACES FOR CURIOUS MINDS

In its elemental, primary form, a room is a blank canvas. A starting point. Through curious design, we transform these spaces into a foundation – designing for the future inside. These are the spaces that are thought-provoking and inspiring, designed to spark creativity and new ideas. From hands-on instructional experiences to communal classrooms, these evolving spaces take on a new form and prepare the students of today for the careers of tomorrow.

Learning environments shape the student experience, enhancing connections for all who walk the halls. Whether it's a collaborative area designed for connection or a focus area designed for reflection, we create space for mindful moments. However, spaces that promote wellbeing often go beyond the elements of biophilic design; they incorporate the foundations of sustainable design. Design that connects our inner spaces with our outer world.

HOLISTIC SOLUTIONS: DESIGN, PERFORMANCE AND SUSTAINABILITY

Flooring plays an important role in the design of learning environments. Products should be durable and high-performing, easy to clean and easy to maintain, while also providing design options for branding, wayfinding and definition of space. Each of these attributes is necessary, providing a comprehensive solution for a holistic approach to the design of education spaces.

The design community is seeking solutions that address a range of needs, and there is an increased demand for products that address material health and sustainability credentials. Sourcing products that are cost-effective is important within education spaces. Finding solutions that are performance-driven, beautifully designed and sustainable is top of mind, and they must fall within allocated budgets. Design should not have to sacrifice responsibility to meet price or performance standards.

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TRANSFORMING MATERIAL PERFORMANCE THROUGH CIRCULAR DESIGN

Patcraft is focused on providing balanced solutions that address both market needs and design goals through the creation of innovative products. ReMaterial is a PVC-Free, fully recyclable resilient flooring solution, transforming material performance through circular design. Defined by its materiality and measured by its performance, the collection provides a holistic flooring solution at a core price point—providing a cost-effective, sustainable option that meets growing market expectations for PVC-free product solutions.

Featuring a multi-layer core that can withstand extreme indentation up to 2,500 psi, ReMaterial is constructed for high-demand, high-traffic areas and is backed by an industry-leading 25-year warranty. An ExoGuard+® finish resists scratches and abrasions, ensuring long-lasting quality and appearance retention. Products can be fully recycled through Patcraft's re[TURN]® reclamation program, creating an ingredient stream that reduces raw material extraction from the earth and lowers the embodied carbon footprint of future products to continue the cycle of creating new products out of old.

From the material health and durability of its products to how they are manufactured, Patcraft strives to close the loop and lower the overall embodied carbon of its products. ReMaterial reflects a cumulative approach to product development, addressing solutions through a combination of performance, sustainability and design attributes. It is an innovation that will continue to evolve as the next generation of resilient flooring—taking the material ingredients that we have and giving them new life on a journey of circular design.

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Courtesy of Jason O'Rear / Gensler and GastingerWalker&

This Business School Blurs the Lines Between Collegiate and Corporate

Wichita State University's new business school is a collaborative environment that connects students and industry partners. This innovative space is a master class in educational design.

By Jennie Morton

An angular facade, a central atrium and an outdoor footbridge with Wi-Fi are just the start of the student experience at Wichita State University's Woolsey Hall. Home to the Barton School of Business, the facility is a master class in forward-looking educational design. Its architecture deliberately parallels today's contemporary workplaces.

"Woolsey Hall, although the home for the Barton School of Business, has had an impact on the entire Wichita State campus. It is a vibrant hub of activity for students across all disciplines both during daytime classes and well into the evening," according to Emily Patterson, executive director of facilities planning for Wichita State University. "The building is not only beautiful and inspiring, but it has many spaces that foster collaboration and spark the entrepreneurial spirit our community is known for."

Wichita State tapped the expertise of Gensler, in collaboration with its partner GastingerWalker&, to create an innovative space for the business school. The 125,000-square-foot hall is based on three guiding principles: dynamic convergence, warm hearths and night vision.

Courtesy of Jason O'Rear / Gensler and GastingerWalker&

The shape of the Promise Bridge, zinc paneling and curved facade of Woolsey Hall are nods to Wichita's influence on the aviation sector.

EXTERIOR PRESENCE

Woolsey Hall stands at the intersection of two distinct campuses: the original main section and the newer Innovation Campus, which is configured as a business park. It features facilities for industry partnerships such as Airbus, Spirit AeroSystems (a Boeing manufacturer), Textron Aviation (maker of Beechcraft and Cessna) and Deloitte's Smart Factory.

"Woolsey Hall is a vehicle that brings industry and education together," explained Ryan DePersia, technical director at Gensler Chicago. "It not only acts as the heart of the business school community, but it enables Wichita State to further leverage its existing relationships with corporate and government partners."

Wrapped in a zinc shell, the gently curved exterior is an elegant reference to the area's deep history with aerospace engineering. Bands of interlocking wood panels are a nod to the university's agricultural roots and wheat iconography. Large expanses of glass allow the building to glow at night, providing a beacon to the many students who take evening courses.

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INTERIOR INGENUITY

With three stories of communal, instructional and academic support spaces, Woolsey Hall is a marked contrast over the business school's original home. Not only had it outgrown its previous location in a 1970 building, but it needed a modern level of functionality.

"The old building no longer met today's approach to applied and experiential learning. The classrooms weren't designed for flexibility, and it was limited for events without a multipurpose room or auditorium," DePersia said. "There were also the typical challenges with thermal comfort and natural light."

The new hall offers open and enclosed study spaces, meeting rooms, a 300-seat auditorium, ballroom and a cafe radiating out from the building's core. A central atrium with a grand staircase and wide risers is an inviting gathering point. There is adjacency between the school's faculty offices, departments and administration for the first time. Specialty programming like a trading center, recording studio, simulation lab and job interview rooms help students develop competitive skills. A strong emphasize on open spaces encourages collaboration and spontaneous interactions—just like a corporate office.

"By mirroring today's work environments, Woolsey Hall ensures that the pace of education matches the speed of innovation," emphasized Meghan Webster, Gensler principal. "When students have access to an elevated atmosphere, it helps them to aspire to even greater heights and new ways of thinking."

Instructional spaces at Woolsey Hall are designed for the collaborative, project-oriented work that students can expect in future careers.

BRIDGE TO TOMORROW

Spanning 300 feet across a scenic pond, the Promise Bridge connects Woolsey Hall to both campus halves of Wichita State. In addition to a wide lane, it includes a deck extension for study, leisure and conversation. More than just a path, it symbolizes the progression from the students of today to the business leaders of tomorrow.

A former BUILDINGS editor, Jennie Morton is a freelance writer specializing in commercial architecture, IoT and proptech.

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Courtesy of Peter Aaron/OTTO

Georgetown University Debuts LEED Platinum Student Housing

Sustainability is at the heart of RAMSA's design for 55 H St. NW in Washington, D.C. Georgetown University's vision earned LEED Platinum certification.

By Lauren Brant

Courtesy of Peter Aaron/OTTO

A street view of the 55 H St. NW residential building on Georgetown University's Downtown Campus in Georgetown, Washington, D.C.

Georgetown University's Capitol Campus residential building at 55 H St. NW earned a LEED Platinum certification from the U.S. Green Building Council and is the first building at Georgetown to achieve the highest LEED certification.

The university, located in Washington, D.C., pitched the project with the priority to construct a state-of-the-art, sustainable residential building. Robert A.M. Stern Architects (RAMSA) was the building architect and worked collectively through a private-public partnership with the developer American Campus Communities (ACC), interior architect and designer Elkus Manfredi Architects and landscape architect Rhodeside & Harwell to develop the building.

"We wanted to express the emphasis on sustainability through the building's design and architecture," said Will Gridley, associate partner at RAMSA. "We designed very deep windows with big expanses of glass that are shaded as much as possible. The building's character is grounded in sustainability."

Courtesy of Peter Aaron/OTTO

55 H St. NW is a residential building to the south of Gonzaga College High School's Buchanan Field. The back of the building features brick and terracotta panels.

MATERIAL SELECTION

55 H St. NW is an apartment-style residential building for undergraduate and graduate students situated a few blocks from the U.S. Capitol and near Georgetown Law and the School of Continuing Studies. In addition to providing student housing, the building has numerous sustainable features within the construction and usable spaces.

High-performance windows that adjust tints based on the sunlight intensity and indoor temperatures reduce the building's energy consumption. The deep setback windows and the sunshades reduce the energy load and regulate the building's interior temperature.

"On the top floor there is dynamic glass at the penthouse, which changes tint based on the solar intensity," Gridley said. "Seeing it change during the day makes you aware of the building adapting to its environment."

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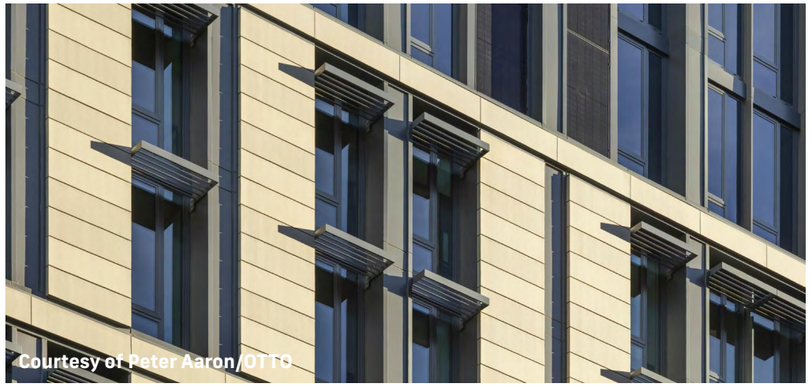
The 12-story, 223,000-gross-square-foot building sits on a three-quarter-acre lot. It is constructed from roughly 7,000 cubic yards of ECOPact low-carbon concrete with a high fly ash content to reduce the carbon footprint. According to the Georgetown University website, flat plate concrete leads to a "40% reduction in greenhouse gas emissions compared to traditional concrete."



A close-up of 55 H St. NW's exterior facade showcases the details of the terracotta panels that building architect Robert A.M. Stern Architects took care to put together. Designed by a German designer, the terracotta panels create a thick facade while covering the dryer vents.

The facade is terracotta panels, supplied by a company in Germany, explained RAMSA partner Kevin Smith.

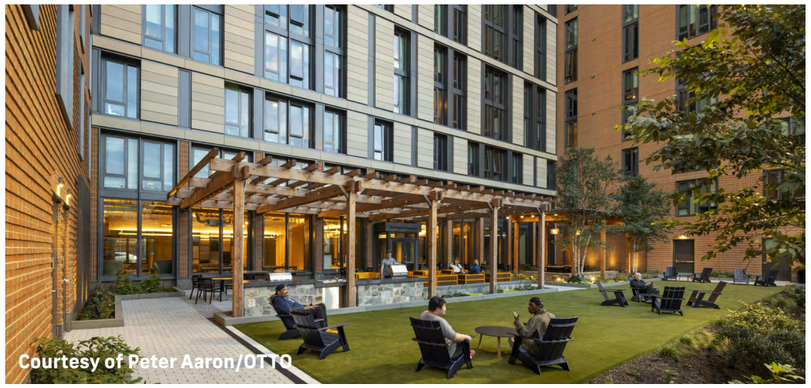
"It's not the first time they've been used in Washington, but we took a great deal of care to put them together in a beautiful way," Smith said. "Everything came through miraculously without any problems during COVID."

The thick terracotta panels cast beautiful shadows onto the building's structure, which allowed the design team to create an aesthetically pleasing building that hid the dryer vents, Smith added. Most terracotta buildings have no depth, but it was the illusion of depth RAMSA wanted to be the showstopping element.

"It is the little things that make a big deal to the perceived quality of buildings," Smith said. "We found a way to hide all the dryer vents inside metal returns, and they disappear because they're all black. You look at most market-rate apartment buildings and there are those little bumps all over."

RAMSA is known for its classical-inspired buildings, but for 55 H St. NW, RAMSA created a contemporary design that nods to its neighbors. The building is situated between two other facilities. One has a historical context from 1992, and the other 2006-constructed building has a historic look, too.

"The depth of the terracotta panels shades against the sun and hides the dryer vents, but they also nod to the deep recesses of the adjacent buildings," said Smith. "55 H St. carries the cornice line prescribed by the height act to reference the building to the west of us."



The outdoor courtyard at 55 H St. NW can be seen by passersby from H St. Lounge chairs and electric grills create spaces for residents to interact.

The materiality of the buildings is tied together with the ground floor featuring metal panels and bits of tan brick. The back of 55 H St. NW is brick. Large glass windows on the ground floor bring in natural light to the lobby and communal spaces that line the street. Passersby can look through the building to the courtyard—a deliberate design Gridley said.

"I'm proud of the facade because the D.C. zoning envelope can force you to design within a box much of the time," Gridley said. "To achieve the level of aesthetic interest and richness that we did with the combination of the terracotta, metal, glazing and depth took a lot of effort."

Solar panels are installed on the green roof and the front-facing side of 55 H St. NW, with a rainwater capture system to water the south green roof plants. These are visible sustainable elements on the LEED Platinum building.

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Georgetown University challenged RAMSA and ACC to maximize the solar footprint on the building. The top two floors have vertical photovoltaic panels integrated into the structure on the south facade, and the green roof has a large solar panel array. A rainwater capture system is used for irrigation of the south-facing green roof plants. The solar panels generate roughly 5% of the energy that the building consumes.

"We filled the roof with as much solar as we could while also having things grow on it," Gridley said. "We found a way to have both a green roof and solar panels. Plants grow under the solar panels."

Additional sustainable elements are the cisterns to capture rainwater for irrigation and the bicycling infrastructure.

55 H St. promotes sustainable transportation for tenants, faculty and staff who commute by bicycle. The building hosts significant on-site bicycle storage as well as access to showers and locker rooms for faculty and staff who ride their bicycles to work.

"If you're thoughtful and do your homework, you can do a lot with modern technology and products," said Gridley.

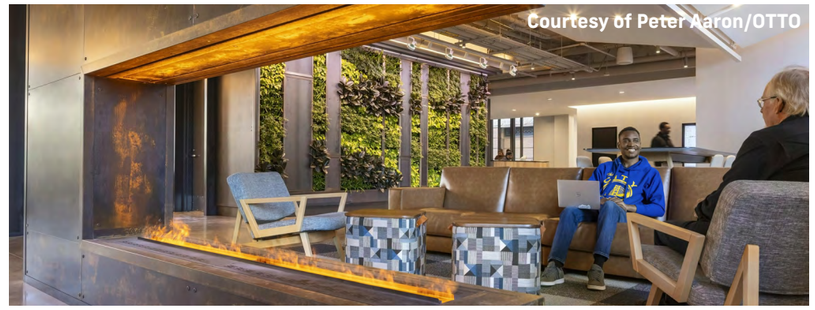
One of the lobby's main features is a green wall adorned with living plants designed by Elkus Manfredi Architects.

COMMUNITY LIFESTYLE

55 H St. NW's entrance is set off from the sidewalk at a 90-degree angle and upon entering the lobby, students see a green wall adorned with living plants and a large outdoor courtyard, which is viewable from the street. Elkus Manfredi Architects designed the green wall.

55 H Street wraps around two exterior courtyards, which use a stormwater retention area that retains excess rainfall and percolates into the ground to enhance a natural rock feature.

The residential building has 476 beds within studio, two-bedroom, three-bedroom and four-bedroom apartments. The penthouse features modern living spaces, common areas like a contemplation space for students to study and engage with peers and a fitness center.



This electric water vapor fireplace serves as the hearth of the parlor space. It offers a safe, energy-efficient and eye-catching feature without introducing a fossil fuel fireplace into the building.

Smith said RAMSA and Elkus Manfredi Architects wanted a fireplace in the parlor, which required creativity as they could not use gas.

"We ended up with this interesting electric fireplace that uses water vapor and lights," he said. "It's fascinating the same way that a fire is and students often hang around it in the cold weather. You need to get quite close before you realize they're not actual flames."

This safe, energy-efficient and eye-catching electric water vapor fireplace is a central hearth for the parlor space. Cool to the touch, the water vapor is adjustable in height and color and does not affect humidity or condensation in the area.

Gas boilers are traditionally a cost-effective source of hot water in apartments. However, RAMSA wanted a greener option. Through a system of air-to-air heat pumps, each apartment has cooling and heating options that provide maximum efficiency.

The design and development teams also wanted to positively influence student behavior, so screens in the lobby display environmental statistics on water usage and energy-saving features floor by floor and unit by unit. They hope residents learn they don't have to sacrifice comfort to live sustainably.

"The whole building system does well and provides the comfort students want," said Smith. "That they also know what they are consuming sends a very good message."

Requirements by Washington, D.C. and Georgetown University challenged RAMSA's team to maximize the use of sustainable materials that sparked the building's sustainability story, now passed onto residents.

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Courtesy of Encore

SUNNY SEATING

The Sunny kids' guest chair by Encore is the ultimate companion for little dreamers and big imaginations. Sunny Kids draws upon the same whimsical design and sturdy construction as its adult counterpart, but in a kid-friendly form.

Put Sunny anywhere from casual playrooms to sophisticated study nooks. Designed by Rainlight.

www.encoreseating.com

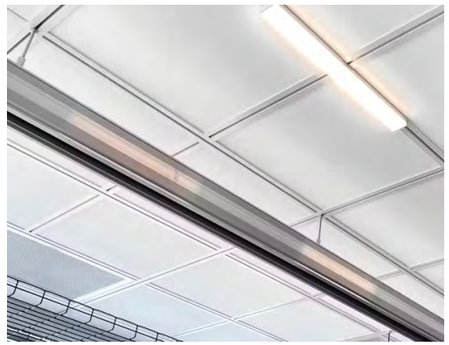
Courtesy of HON

CONFETTI COLLECTION

HON's Confetti collection features a Floor Lounge and Floor Cushion, colorful, portable, customizable seating solutions tailored for classrooms and K-12 media centers. The lounge is 30" W and 32.5" D, with a seat height of 12" and a seat depth of 17.25". The cushion is 16.5" W and 16.5" D, with a seat height of 3". Fabrics come in vibrant and neutral colors. A floor cushion cart is also available for cushion storage. Integrated handles make for easy portability.

www.hon.com

Courtesy of Armstrong World Industries

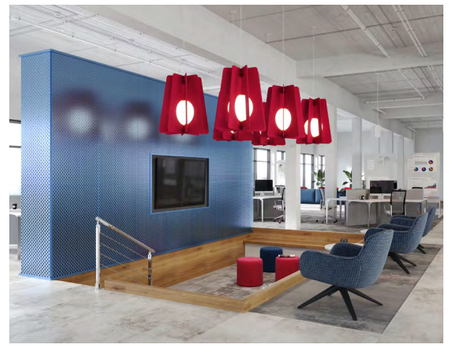


DYNAMAX PLUS BY ARMSTRONG CEILINGS

The Armstrong World Industries' DynaMax Plus Ceiling System, a structural ceiling solution with increased load capacity and flexibility, joins the existing Armstrong DynaMax structural grid system. It supports 6- and 8-ft. rod drop spacing, unlike typical 4 ft., allowing direct attachment to steel joists or concrete tees and fewer rod drops needed. Available sizes: 2 ft. x 2 ft., 2 ft. x 4 ft., 4 ft. x 4 ft. and other module sizes. Can suspend mid-span loads up to 1,090 lbs. at L/360 and up to 1,800 lbs. for static point loads. The system is fully accessible and integrates with standard suspension systems for future expansions and upgrades.

www.armstrongceilings.com

Courtesy of Eureka Lighting



ELKE SUSPENDED LUMINAIRE

A striking new line of luminaires from Eureka Lighting features prominent shapes and bold colors. The Elke pendants are inspired by the Color Field painting movement of the 1950s and come in 30 decorative colors in multiple sizes. Each pendant features eight acoustic felt panels that radiate from a central globe diffuser. Suitable applications include lobbies, transition spaces, open work areas, conference rooms, school common areas, libraries, and reception areas.

www.eurekalighting.com

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Courtesy of Genetec

SECURITY CENTER SAAS

Genetec's Security Center SaaS is a scalable, open, and unified software as a service (SaaS) solution that combines access control, video management, forensic search, intrusion monitoring, automation, and other advanced security capabilities. Built with cybersecurity and privacy at its core, Security Center SaaS features enterprise capabilities and open architecture that enable systems to handle complex workloads where it makes more sense to deploy them, rather than forcing a choice of all on-prem or all cloud.

The software can centralize the monitoring and management of multiple sites, making it ideal for a range of verticals, from retail to education, corporate campuses, banking, and more. It can serve low-density deployments with a handful of direct-to-cloud services and scale up to thousands of sites and devices with hybrid storage and processing. Operators can manage operations from a SOC (Security Operation Center) or on the go through web and mobile applications.

www.genetec.com

Courtesy of Vitro Architectural Glass

VACUMAX VACUUM INSULATING GLASS (VIG)

VacuMax vacuum insulating glass (VIG) integrates with any traditional (and even nontraditional) glazing system to maximize insulation performance. With wall-like R-values up to R20, VacuMax VIG delivers insulation performance that is two to four times better than conventional insulating glass and six to ten times better than standard monolithic glass. It can also achieve increased acoustic performance for dramatic noise reduction and reduced center of glass condensation at temperatures as low as -58°F.

The newest generation of VacuMax VIG is now manufactured exclusively with Solarban 70 solar-control, low-e glass by Vitro and can be used alone as nominal ¼" glass to replace monolithic (single-pane) glass without needing to replace the framing system.

VacuMax VIG was installed on the newly renovated Hugel Welcome Center at the Lafayette College campus in Easton, PA. It is the first project in the U.S. to feature VacuMax VIG.

www.vitroglazings.com

Courtesy of Louis Poulsen

AJ OXFORD

The AJ Oxford Table Lamp from Louis Poulsen was originally designed as a table pin lamp for the long rows of oak tables in the dining hall of St. Catherine's College in Oxford. It will be reintroduced in stores this spring in two sizes and a monochrome color palette while staying true to its uniquely graphic expression. Both sizes will be available with or without the top metal shade, the taller size coming in a pin mounting version without it (the shade).

www.louispoulsen.com

Courtesy of Scale 1:1

SIDEKICK

Sidekick from Scale 1:1 is a collection of mobile work pedestals that helps to bridge the gap between hybrid, in-office and remote employees. The 3-in-1 solution includes the benefits of a sit-to-stand desk, mobile pedestal and storage unit to offer unprecedented flexibility. Companies can add and remove these pieces instantly in response to the ever-changing needs of their team. Four distinct variations (types T, C, B and W) include a variety of offerings including tabletops on pneumatic lifts, casters, a locking tambour door, box file drawer units, padded seats, foot stirrups and more. Available in multiple finishes for ultimate branding and personalization capabilities.

www.scale1to1.com

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Exploring Design Trends for K-12 Applications

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Aluflam's True Aluminum Framing Delivers Bigger and Brighter Fire-Rated Systems

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Courtesy of Bradley Corp

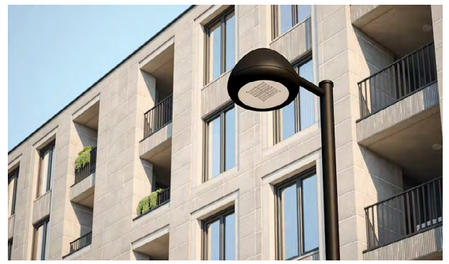
TLX SERIES EXPRESS LAVATORY SYSTEM 4-STATION MODEL

Bradley's attractive TLX Series Express lavatory system is now available in an extended 4-station model. A seamless, complete handwashing package that maximizes value and hygiene, and delivers long lasting performance.

The Express TLX 4-station lavatory system is nothing short of impressive. The elongated basin creates a sleek, streamlined look — yet is compact enough to save on wall space. Cast-formed solid surface material is easy to clean and repair. And fewer plumbing connections speed up installation. With a price point comparable to Bank of China sinks or laminate countertop, no other handwashing solution brings this level of value, style and performance.

www.bradleycorp.com

Cyclone Lighting



MOCHI OUTDOOR LUMINAIRE

The nature-inspired silhouette of the Mochi outdoor luminaire departs from traditional dome styling, bringing a softness to urban settings while delivering dependable lighting performance. Available in side or pendant mount models, Mochi can be configured to work in a variety of spaces where safety is a priority, such as streets, commercial buildings, transit, parks, waterfront pathways or bike paths.

Its seamlessly integrated cast aluminum push-button latch provides one-handed access to the driver for easy replacement. An innovative hinge also allows the luminaire to remain open for maintenance without needing an additional security system. Cyclone's high-performance Orion light engine ensures maximum output capacity. The luminaire is fully sealed and IP66 rated. It's tested for 100,000-plus hours of service. Choose from more than 14 light distribution types, including backward optics. Standard color temperatures are 3000K and 4000K.

www.cyclonelighting.com

Courtesy of Tubelite, photo credit Brian Austin

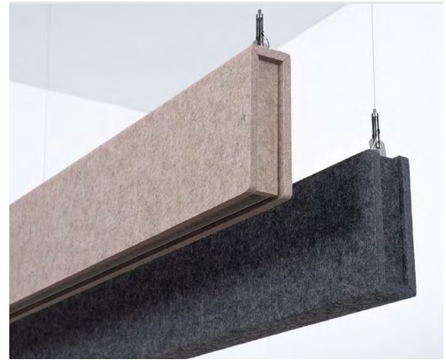
THERML=BLOCK THERMAL PERFORMANCE DOORS

This redesigned entrance system offers the highest thermal performance door available. Using a new patent-pending "poured over strut" thermal separation construction, Tubelite Therml=Block doors can achieve a 0.50 U-value, based on glazing with a center-of-glass 0.24 BTU/ft2-hr-°F value. These high-performance entrances are available up to 10 feet tall. Along with standard anodized and painted finishes, these doors allow for dual finishing options and different colors on the interior and exterior.

"Thanks to our client partnerships and their valuable insights, we are excited to introduce our enhanced entrance systems. These include our new Therml=Block doors with very high thermal performance to meet today's Model Energy Codes and help our clients achieve their customers' ambitious project requirements," said Mary Avery, senior director, product management for Apogee Enterprises' Architectural Framing Systems segment and Tubelite products.

www.tubeliteusa.com

Courtesy of LightArt



ACOUSTIC STRATA

LightArt's Acoustic Stratta boasts not just slim sophisticated lighting but also sound absorption up to 11 sabins, all wrapped up in one sleek fixture. The aluminum structure has high-efficiency LEDs embedded for uplight, downlight and unlit capabilities, as well as warm dimming and tunable white and RGBW options. It also has minimal, linkable components, making it connectable for continuous ceiling applications and configurable iterations in the future.

www.lightart.com

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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.
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THE BEAUTY & BENEFITS OF BIOPHILIC DESIGN IN THE BUILT ENVIRONMENT

Biophilic design is a hot trend in design, but what is it and how can building professionals incorporate these strategies for the benefits of occupants? This eHandbook offers best practices for applying biophilic design in the built environment.
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.
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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.
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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.
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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

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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.
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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.
Download Now