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Post Office into Moynihan Train Hall
+ More Transportation Facilities



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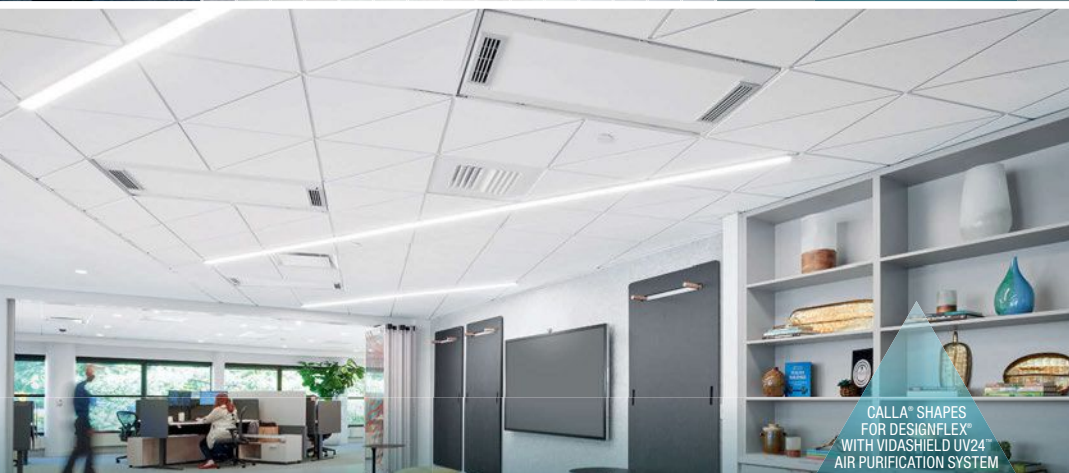


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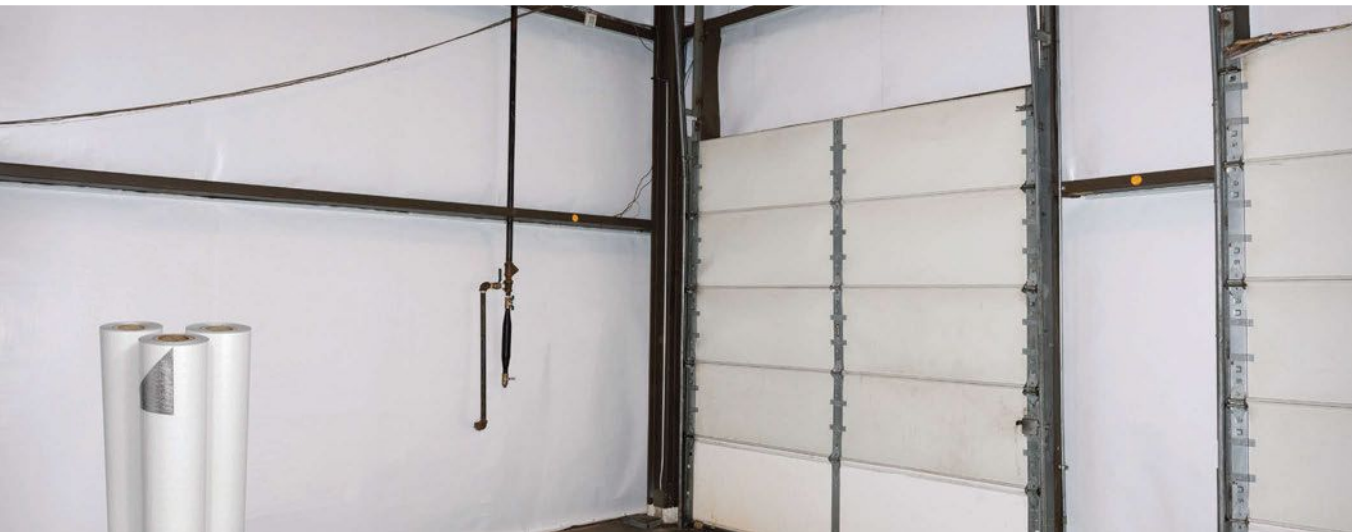
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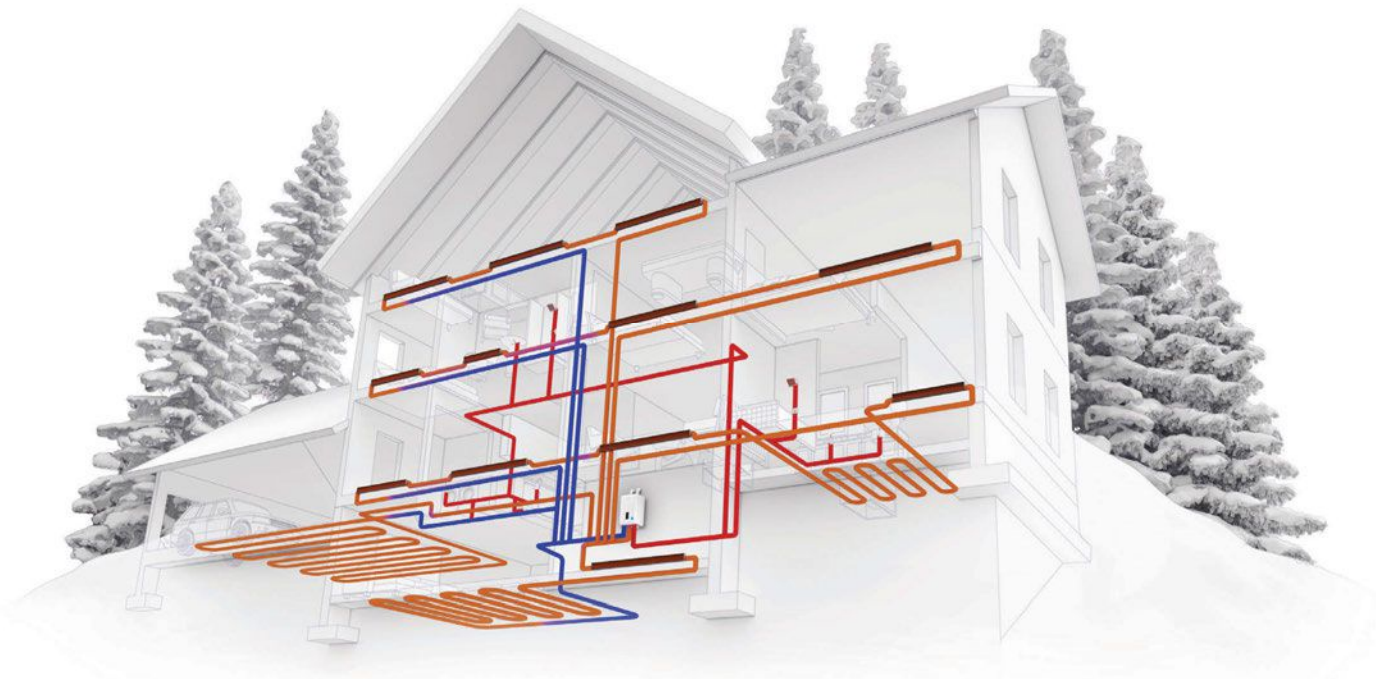
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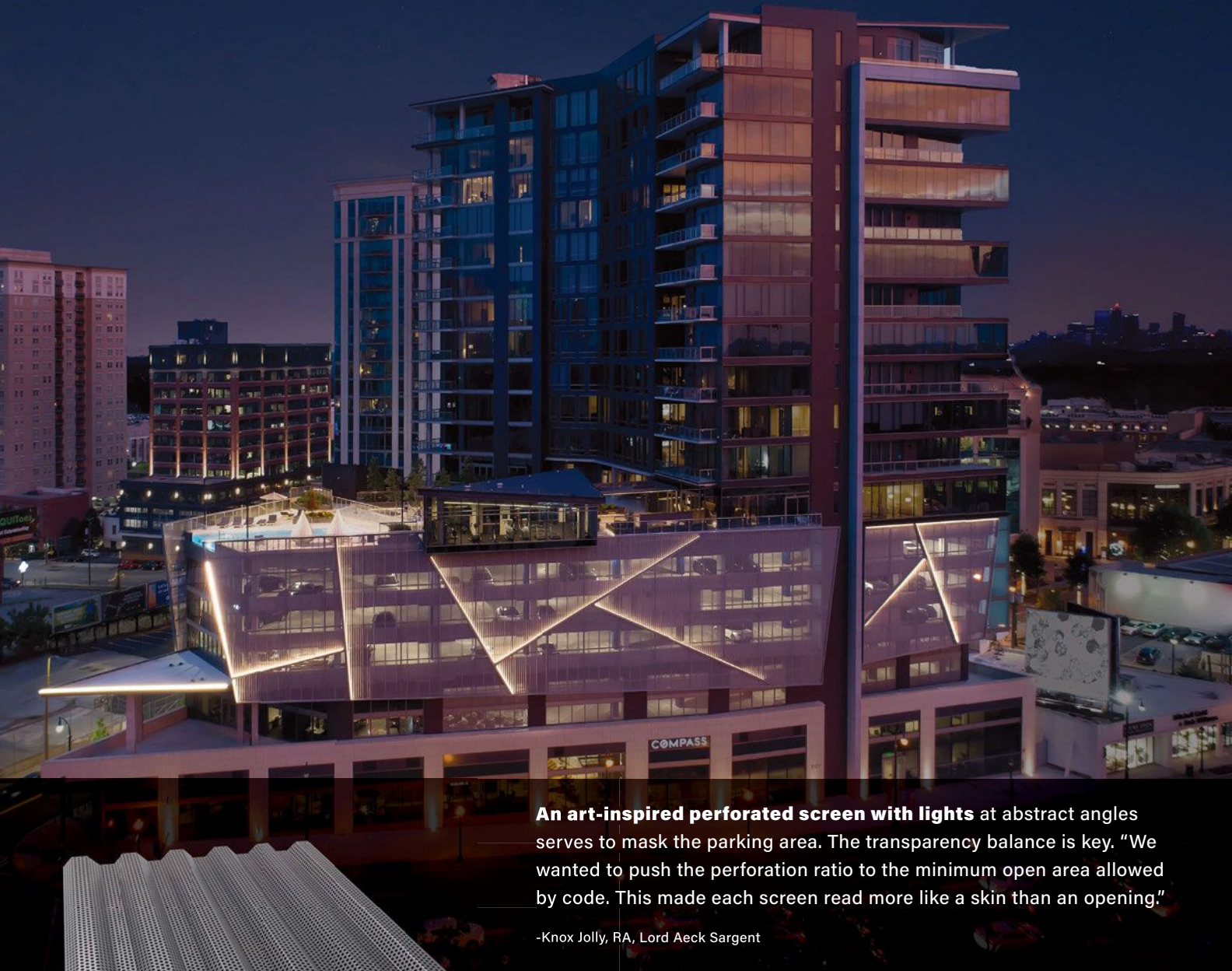
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- Stockholm Central Station



cover

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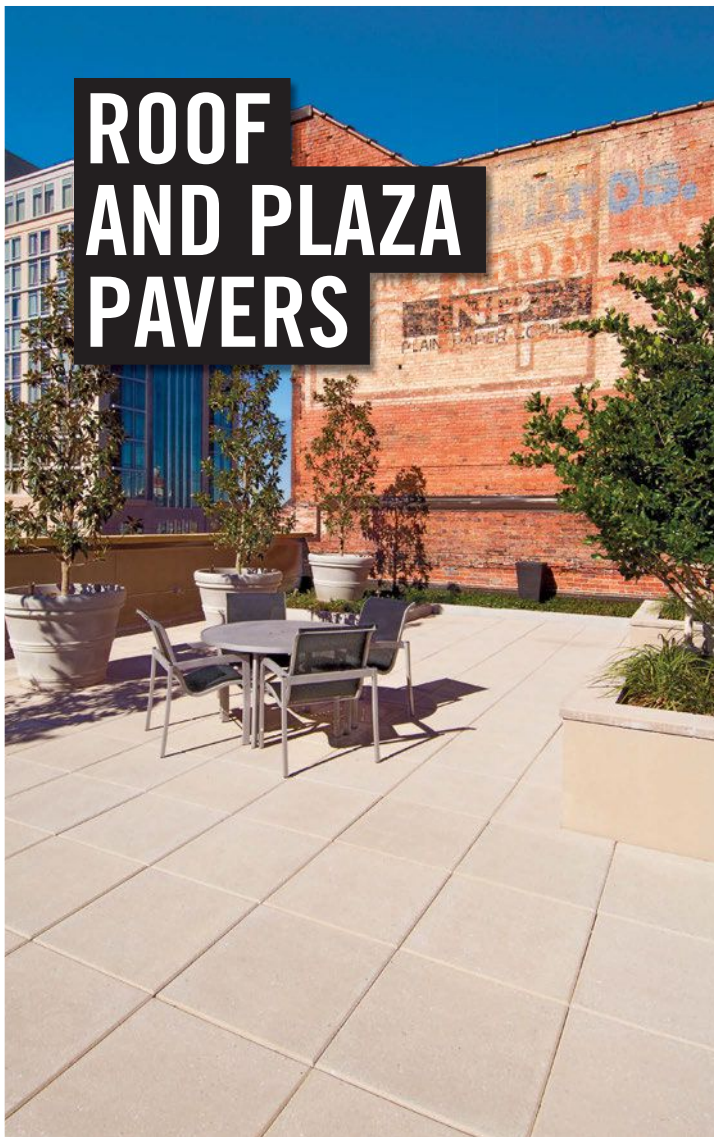
University of Southern Indiana: Physical Activities Center
ARRIS-clip Champagne | Photo: CannonDesign

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RETROFIT // Vol. 13 // No. 2 is published bimonthly by Fisher Media LLC, 98 Booth Meadow Lane, Durham, NC 27713, (919) 641-6321. POSTMASTER: Send address changes to **retrofit**, 2409 High Point Drive, Lindenhurst, IL 60046.

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CALGON, TAKE ME AWAY!

In this business, I've been fortunate to travel quite extensively. I've gratefully journeyed to trade shows in warm, sunny locations when the Midwest's winter has become too much to bear. I've spoken at industry events in sports stadiums across the U.S., including TD Garden; the United Center; even Paul Brown Stadium, home of the SuperBowl Contender Cincinnati Bengals. I've met with advertising customers to explain the magazine's editorial focus in boardrooms and at dinner tables across the U.S. I've traveled all over the world to witness proprietary manufacturing technologies for materials covering the inside and outside of all types of buildings. I've socialized with readers at trade shows and toured their building projects in small communities and major cities.

Getting out and learning what's happening in this industry from the folks who are doing the great work has been one of the major joys of my career. Not to mention, traveling helps me stay informed about what I should be covering in **retrofit**. Needless to say, the past two years have been extremely difficult. I can enthusiastically say I'm ready to travel again!

Who wouldn't take one look at the stunning new Moynihan Train Hall on our cover and want to board a train this very moment? Brian Libby, one of **retrofit**'s regular contributors, was thrilled to write about how a Beaux Arts post-office building was converted into the modern Moynihan Train Hall for Amtrak passengers at Penn Station in New York City. "I come to this as an ex-New Yorker who used to take trains to and from Penn Station frequently," he says. "I was practically praying for an intervention like this, so I was keen to get an understanding of what Moynihan does and doesn't do in terms of addressing the totality of the passenger experience." Libby's affinity for our "Cover Story" shines through in his interview with Jon Cicconi, AIA, a senior associate principal at Skidmore, Owings and Merrill, the firm that designed Moynihan Train Hall. Read the story on page 26.

Since moving away from Chicago in 2014, the city has been calling me back to explore several of its amazing retrofit projects. The Old Main Post Office Building at 433 W. Van Buren Street, which is our "Transformation" feature, is one such building. The former post office, which encompasses two city blocks, holds a unique place in history as the center of the American mail-order industry for many decades. The abandoned building recently was redesigned as office space by Gensler Chicago, which took great care to restore the post office's Art Deco details and use its artifacts as art and sculpture throughout the space. "Our goal was to celebrate the building and its role in Chicago's history. We wanted to continue the building's legacy in every way possible," explains Ashley Rogow, technical designer in Gensler's Chicago office. Read about this magnificent—and immense—adaptive reuse project on page 60.

Despite not traveling again for work in the near future, I am happy to report that as this issue goes to the printer I am embarking on my first family trip since the pandemic began. My husband, four-year-old daughter and I will be boarding a flight to Maui. (We also are taking my mother-in-law as a thank you for being our in-home childcare provider since our daughter was born.) I plan to spend a lot of time on the beach forgetting about winter and COVID.

Cheers to spring and traveling again!

CHRISTINA KOCH

Associate Publisher/Editorial Director
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John Badman, RIBA, leads the residential sector in CallisonRTKL's London office. He brings a wealth of experience in design planning, project management and implementation. In "Business" page 16, Badman outlines how urban car parks, which are not as necessary as they once were, can be reimagined as homes, retail stores, offices, food and beverage venues, fitness centers and logistical hubs—allowing for far more practical space utilization.



Portland, Ore.-based freelance design journalist, critic and architectural photographer **Brian Libby** digs into Moynihan Train Hall, a new gateway for Amtrak passengers at Penn Station in New York City. As a former New Yorker who commuted through Penn Station regularly, Libby always hoped something would be done to make Penn Station less dreary. In our "Cover Story", page 26, Libby uncovers how a massive Beaux Arts post-office building was transformed into New York's next great train station.



Andrea Wilkerson (left), Ph.D., LC, is a senior lighting research engineer at Pacific Northwest National Laboratory (PNNL), supporting the

U.S. Department of Energy Lighting R&D Program. **Sarah Safranek** is a lighting research engineer at PNNL. In "Component", page 50, the duo outlines how lighting system data in two separate projects provided insight into how occupants interacted with tunable lighting systems over days, weeks and months, identifying opportunities for system optimization.



Chicago's Old Main Post Office, a 2.8 million-square-foot building that covers two city blocks, was the centerpiece of the American mail-order industry. By 1996, the post office was too large for daily operations and the U.S. Postal Service abandoned the building. **KJ Fields**, a Portland, Ore.-based **retrofit** contributor, describes in "Transformation", page 60, how Gensler redeveloped the site for office use, restoring the building's Art Deco characteristics and saving historic artifacts from its decades as a post office.



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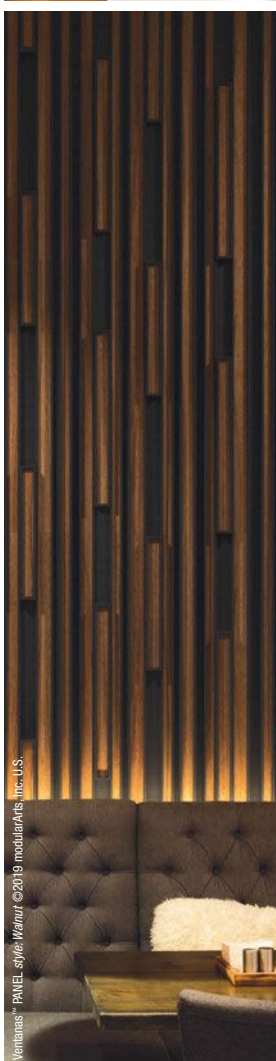
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PARKING REIMAGINED

The Urban Car Park Is a Blank Slate for
Architects and Designers

WRITTEN BY | **JOHN BADMAN, RIBA**



Listed on the National Register of Historic Places in 2016, Broadway Autopark (originally called Knightley's Parking Garage and built in 1949) has been reimagined and repurposed by Shelden Architecture Inc. Once used as a 500-car parking garage, the structure now is a 44-unit, trendy, urban, residential and commercial complex—becoming a community asset to downtown Wichita, Kan.

Often necessitated by a lack of infrastructure related to transit systems or urban planning, cities that are not walkable require car parks wherever personal transportation is necessary. Although they vary in size, function, and overall design, parking structures in urban centers are generally characterized by their massive size and scale. While these spaces ensure that we can fit automobiles as needed, the COVID-19 pandemic, coupled with developments in travel systems and heightened environmental awareness, has reduced the need for parking. But what becomes of the underutilized, abandoned or outdated car parks that we see around us?

New Life for Car Parks

Today, car parks sit vacant in cities worldwide that are dominated by work/life/play mixed-use structures and walkable components. Consequently, architects and urban developers have posited an

exciting and perhaps more economical address to this emerging issue—we reuse them.

These structures, particularly non-residential, multistory car parks with their abundance of natural light and lowlight spaces, have repurposing potential. We now see opportunities to convert previously underutilized car parks into homes, retail stores, offices, food and beverage venues, fitness centers and logistical hubs—allowing for far more practical space utilization.

The Assessment

Before we consider the conversion of these structures, it's essential to assess their architectural elements and how they influence the car parks' adaptive reuse or retrofitting potential. Key characteristics of a classic multistory parking garage are its regular grid layout and its sloping floors. Coupled with flat roofs, bulky structures and deep floor plates, the transformation of these structures is made simple thanks to car parks' prefabricated, easily manipulatable components.

Benefits of Repurposing

The conversion of car parks provides tangible environmentally conscious and cost-effective benefits. Repurposing car parks minimizes waste production and

eliminates the need for new materials that would have otherwise been utilized for a new structure. Converting an existing car park also keeps costs down because the price of an adaptive reuse project is never more significant than new construction. Even in the instance where a garage is in disrepair, the renovation cost would be equal to or less than the demolition and replacement cost of an entirely new space.

Because of their access to the outdoors, the upper level of converted parking lots also serves as a natural choice for the “regreening” of spaces through the implementation of trees and other flora—mostly due to their access to natural air and light. This simple solution improves the heat-island effect, the phenomena that structures often absorb and reemit the sun's heat at greater rates than natural materials. Greening offers shade and lower temperatures while also adding value to the real estate.

Another unexpected benefit of converting car parks lies in the freedom that it gives designers. When local building regulations are considered, a renovation may potentially exempt developers and architects from considerations necessary for new builds.

Overcoming the Challenges

Despite the benefits, it can be difficult to imagine these car parks as useful beyond their intended function. For example, understandable concerns arise regarding ceiling heights, access to light and structural considerations. Taking note of this, many innovative solutions allow for the



PHOTOS: ESSENTIAL IMAGES PHOTOGRAPHY unless otherwise noted



Broadway Autopark's first floor features a common area with 24-hour fitness center, dog wash and entertainment room. The top four floors of the 5-story building are split between parking areas and long, narrow apartments. All residents have front-door parking. Each floor has 10 apartments on the east side with terraces overlooking Broadway Street and one uniquely shaped apartment on the west side with rounded, curving walls from the existing car ramps.

conversion of these spaces. Ceiling clearance can be remedied by introducing uses that require lower floor-to-ceiling heights, as well as the utilization of thinner flooring finishes and exposed ceiling structure solutions within spaces.

Beyond maximizing size, design considerations can also address issues of light. Utilizing white or translucent materials throughout interiors, in addition to open layouts and façades that allow unobstructed daylight to fill the space, offers solutions to questions of exposure.

When it comes to structural inquiries, removing ramps and reinforcement of slabs is the first step in ensuring building integrity. Beyond this, adding vertical cores and leveling floors offers the stability and infrastructure needed for updated use. The techniques exist to successfully convert these spaces, introducing new functionality and breathing life back into previously empty spaces.

Key Design Principles

With the case for these renovations made, it's necessary to consider design sensibilities when taking on projects of this type. Put simply, key design principles to consider in these spaces are three-fold: flexibility, innovation and connection.

Offering changeable systems, structures and models allow spaces to be utilized in various ways with the ability to adapt to our ever-changing climate. Innovative layouts within these conversions should serve to blur the distinctions between programs themselves, offering guests the full breadth of inter-connected amenities, services or businesses. Further, a unique opportunity exists to foster greater connection by implementing innovative social spaces that have been accelerated because of our new post-pandemic lifestyles. With these principles in mind, car parks become functional spaces that exceed the experiential needs of visitors and ensure that they will eventually return.

As urban centers reinvent themselves to stay in touch with the public's updated needs, it's evident that car parks often take up more space than the benefit they provide is worth. One study from the United

Kingdom estimates that repurposing the nation's 20,000 non-residential car parks could provide nearly 1.2 million homes. (View the study at bit.ly/3Jho23N.) This statistic is staggering and puts into perspective the almost egregious misuse of space that often coincides with the existence of car parks.

Recalibrating spaces to offer purposeful necessities within reasonable distances factors into the urban landscape's overall future, especially of "15-minute neighborhoods". These livable, mixed-use communities where people can shop, relax, exercise and more—all within a walkable distance from their homes and places of work—have shown to be better equipped to handle a health crisis, economic lockdown and financial downturn. The 15-minute neighborhood concept is where Callison-RTKL sees the future of development within cities heading, and the conversion of existing car parks can be seen as an exciting first step in this direction.



All the apartments at Broadway Autopark are one-bedroom units with full-size kitchens. The kitchen cabinets and countertops utilize repurposed toolboxes and industrial material, fitting in with the urban garage theme. The apartments feature polished concrete floors and concrete walls.

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ONE STUDY FROM THE UNITED KINGDOM ESTIMATES THAT REPURPOSING THE NATION'S 20,000 NON-RESIDENTIAL CAR PARKS COULD PROVIDE NEARLY 1.2 MILLION HOMES. THIS STATISTIC IS STAGGERING AND PUTS INTO PERSPECTIVE THE ALMOST EGREGIOUS MISUSE OF SPACE THAT OFTEN COINCIDES WITH THE EXISTENCE OF CAR PARKS.



Looking Forward

In a constantly evolving society, it remains crucial to consider what to do with outdated or unused infrastructure. While demand for parking continues decreasing over the long term, the land value used for parking will only increase through development. Eventually, the higher land value will exceed the cost of structured parking. These lots can then be integrated into new developments or connected to existing ones.

As urban planning increasingly aims to reduce vehicular traffic and prioritize pedestrians, architects and urban land developers will need to provide solutions to reimagine the use of car parks effectively. As we move forward, there are two choices: leave these spaces to deteriorate in the short term, or convert them into something engaging for the communities they exist within for the long term. Ultimately, the benefits (social, environmental, financial) of bringing these new spaces to urban centers through repurposing have the potential to positively impact cities for years to come. 



To read more about Broadway Autopark, see **retrofit's** November-December 2018 issue, page 60, or visit bit.ly/3olJnkp.

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BUILDING PERFORMANCE STANDARDS COALITION

New Federal, State and Local Action Aims to Support Energy-efficient Buildings, Create Jobs and Lower Costs

In late January, President Biden announced during his remarks at the U.S. Conference of Mayors that his administration is teaming up with states, cities, labor, and industry to launch the Building Performance Standards Coalition, a first-of-its-kind partnership between 33 state and local governments dedicated to delivering cleaner, healthier and more affordable buildings.

With nearly 20 percent of the nation's building footprint in their jurisdictions, the partnership facilitates new commitments to design and implement building performance standards at the state and local level; create good-paying, union jobs; lower energy bills for consumers; keep residents and workers safe from harmful pollution; and cut emissions from the building sector. The announcement builds upon the Department of Energy's efforts to upgrade 1 million homes and makes progress toward President Biden's goal to retrofit 4 million buildings and 2 million homes during his first term.

New federal actions, in tandem with close state and local coordination, will

accelerate progress toward reducing building emissions at all levels of government, including states, territories, Tribal nations and local jurisdictions. Federal investments and technical assistance build capacity, expertise, and infrastructure to advance climate action and environmental justice aligned with local- or state-level needs and opportunities.

When building performance standards are designed in partnership with frontline communities and key stakeholders, innovative and equitable solutions can address multiple needs in a community. Energy-efficiency improvements and electrification in multifamily buildings improve indoor air quality, eliminate drafts and protect residents from extreme heat—delivering health benefits and lower health-care costs. For businesses, high-performing buildings are not only good for the world, they are good for the bottom line, attracting higher occupancy rates and generating more revenue.

The actions build on the \$3.5 billion investment for home weatherization in President Biden's bipartisan infrastructure

law, which will make 700,000 homes more energy efficient and lower consumers' electricity bills, as well as will make \$1.8 billion available to state and local governments through DOE to expand building retrofits and policy implementation at the state and local level. And President Biden will continue to work with Congress to extend even more benefits to the American people under the Build Back Better Act.

January's actions include:

■ **A NEW BUILDINGS PERFORMANCE STANDARDS COALITION:** This partnership forms a coalition of state and local governments that represent more than 22 percent of the American population. Supported by labor unions, philanthropy and non-governmental organizations, the coalition has come together to scale programs and policies that reduce emissions across the buildings sector in local jurisdictions. This first-of-its-kind partnership will unlock energy efficiency and electrification across the buildings sector as an engine for job creation all while lowering energy bills for consumers.

■ **MOBILIZING FEDERAL ASSISTANCE:** DOE and the Environmental Protection Agency also announced a series of actions to kick-start building performance standards and policy innovation across the country. Deploying a range of resources, the agencies will help jurisdictions with analysis support, policy design and implementation tools.

PROPELLING POLICY INNOVATION ACROSS AMERICA'S STATES AND CITIES

The inaugural Building Performance Standards Coalition, which represents more than 15 billion square feet of applicable floor space, has come together to scale programs and policies that reduce emissions across America's buildings sector.

■ **ADVANCING STATE AND LOCAL BUILDING PERFORMANCE STANDARDS:** Thirty-three state and local governments announced their participation in the national Building Performance Standards Coalition, founded on a commitment to work with stakeholders, especially frontline communities, to address health, energy affordability and emissions reductions goals across the buildings sector. This participation includes developing policy roadmaps, convening place-based teams to co-create policy, identifying and acting on prerequisites for building performance standards and complementary policies, and sharing results and experiences to forge a community of practice with the ultimate goal of advancing legislation or regulation in each of the represented jurisdictions by Earth Day 2024.

Coalition members include:

State of Colorado	Los Angeles
State of Washington	Milwaukee
Ann Arbor, Mich.	Montgomery County, Md.
Annapolis, Md.	New York
Aspen, Colo.	Orlando, Fla.
Atlanta	Philadelphia
Boston	Pittsburgh
Cambridge, Mass.	Portland, Ore.
Chicago	Prince George's
Chula Vista, Calif.	County, Md.
Columbus, Ohio	Reno, Nev.
Denver	Sacramento, Calif.
Evanston, Ill.	St. Louis
Fort Collins, Colo.	San Francisco
Grand Rapids, Mich.	Savannah, Ga.
Ithaca, N.Y.	Seattle
Kansas City, Mo.	Washington, D.C.

■ **PROACTIVELY PARTNERING WITH THE WORKFORCE:** Expanding our nation's skilled workforce will be required to achieve the collective retrofit goals of coalition members and the president. Members of the nation's building trades and unions have stepped up to proactively partner with member cities and states to train a local workforce to get the job done. They have pledged to work with coalition members as they implement new building performance standards and policies, recognizing that these policies stimulate economic growth and good-paying union jobs. Efficiency workers earn 28 percent above the national median wage, and union workers have higher median earnings than non-union members.

In May 2021, the administration announced a set of new programs (bit.ly/3roFr49) to grow and train the buildings sector workforce and increase retrofit uptake through a building performance standard for the federal building portfolio. Since then, the Office of Energy Efficiency and Renewable Energy has granted more than \$25 million to workforce development and job creation leaders to expand the pipeline of high-skill buildings workers, and the EPA has published a white paper to inform the development of building performance standards and disseminated it across the buildings industry. (View the white paper at www.energystar.gov/buildings/white_paper_metrics.) In addition, the administration has charged an interagency team of subject-matter experts to develop the federal building performance standard policy.

■ **PRIORITIZING EQUITY EXPERTISE AND STAKEHOLDER ENGAGEMENT:** National leaders in equity and environmental justice, community engagement, and building efficiency policy and program design have stepped up to provide policy and equity strategy assistance to coalition members. With support from philanthropic organizations, local governments will ground their climate work in equity and justice through community-driven processes. And non-profit organizations will offer expertise in building decarbonization, including localized policy approaches and stakeholder engagement.

MOBILIZING FEDERAL TECHNICAL ASSISTANCE FOR BUILDING PERFORMANCE POLICY AT THE STATE AND LOCAL LEVELS

DOE and EPA also announced expanded technical-assistance opportunities that can be accessed by Building Performance Standards Coalition members to design, measure and manage local buildings performance policies:

■ **ACTIVATING TECHNICAL ASSISTANCE:** DOE's Building Technology Office will support analyses of existing building stocks and will work with local governments to set emissions-reductions goals with the assistance of better data collection tools. Additionally, DOE will share best practices for state and local governments that are adopting building performance standards, including public and private sector financing options, and will provide analytical support to examine how policies targeting emissions reductions in existing buildings can pave the way for minimum new construction building energy codes.

WHEN BUILDING PERFORMANCE STANDARDS ARE DESIGNED IN PARTNERSHIP WITH FRONTLINE COMMUNITIES AND KEY STAKEHOLDERS, INNOVATIVE AND EQUITABLE SOLUTIONS CAN ADDRESS MULTIPLE NEEDS IN A COMMUNITY.

■ **ENHANCING SUPPORT FROM EPA CLIMATE PROTECTION PARTNERSHIPS DIVISION:** EPA will support policy development and implementation, including through analysis and recommendations of metrics and best-practice toolkits. EPA will provide insight into current building energy-use data as the foundation for jurisdiction-specific analysis and target setting and will enhance ENERGY STAR Portfolio Manager to provide new policy tracking and reporting capability, as well as will assist jurisdictions in using it. EPA will also provide new tools that calculate localized greenhouse-gas emissions to inform reporting, compliance and assessment.

These actions follow a year of inter-agency collaboration to jumpstart building performance policy at the state and local levels, including passage of the bipartisan infrastructure law. 



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COMMERCIAL

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NOW ARRIVING

New York City's Transformation of a Century-old Post Office into Moynihan Train Hall is the Culmination of a Long Journey

WRITTEN BY | BRIAN LIBBY

PHOTO: DAVE BURK & AARON FEDOR,
© EMPIRE STATE DEVELOPMENT | SOM

It was an idea first proposed in the 1990s that took nearly three decades to reach fruition, despite support from governors, senators and even presidents. It's the rebirth of a massive Beaux Arts post-office building by McKim, Meade and White, once considered the nation's foremost architecture firm, into New York's next great train station. It's a shot at redemption after the city demolished a landmark here—the original light-filled, circa-1910 Pennsylvania Station—and replaced it with a subterranean version that to say lacks grandeur is being kind.

Moynihan Train Hall, a new gateway for Amtrak passengers at Penn built from the renovated James A. Farley Building next door (along Eighth Avenue between 31st and 33rd Streets), is a throwback to the great railway palaces of the late 19th and early 20th century. Opened in January 2021 but only now seeing a large capacity of passengers, its glass roof and column-free space give Amtrak passengers the kind of light-

filled, majestic gateway befitting America's largest city and cultural capitol. Although it only affects about 30,000 out of 300,000 daily Penn passengers (most of whom ride commuter lines), after so long underground, everyone is happy to see the light.

"Converting the Farley post office into a modern train station outside of its original intended purpose, it was somewhat of an unknown," says

Douglas Carr, executive director of the Moynihan Station Development Corporation for Empire State Development, a state agency. "But the large column-free spaces that the post office utilized, we knew that would be an asset: for circulation, pedestrian flow, visual connectivity to the tracks and platforms. It was a good canvas to work with."

Today, as thousands of riders pass through Moynihan, "It's hard not to



SOM's DESIGN restored the original glass ceiling that had filled the space, before it was covered and drop ceilings were installed by the post office.



DANIEL PATRICK MOYNIHAN TRAIN HALL

MOYNIHAN
TRAIN HALL

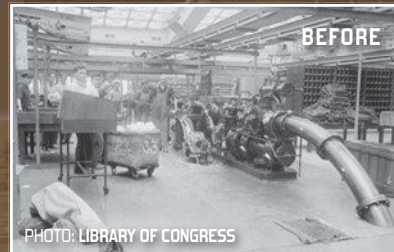


PHOTO: LIBRARY OF CONGRESS

The original mail-sorting room in the Farley building is now the site of the main concourse at **MOYNIHAN TRAIN HALL**.

PHOTOS: DAVE BURK, © EMPIRE STATE DEVELOPMENT | SOM unless otherwise noted

notice the light, the skylights being an iconic feature of the train hall and enabling light into a Penn Station for the first time in over 50 years,” Carr adds. “Clearly that’s transformative in terms of the overall experience.”

RECALLING A LANDMARK

Moynihan station helps restore some of the grandeur of rail travel that was lost with the 1963 demolition of the original light-filled Penn Station. “The old Penn Station was almost like the Taj Mahal of train stations. It was the largest building in the world at the time of its construction, which eventually proved to be difficult for the city to justify when ridership declined with the rise of air travel,” says architect Jon Cicconi, AIA, a senior associate principal at Skidmore, Owings and Merrill, the firm that designed Moynihan. “That’s ultimately one of the reasons why the building ended up being demolished. The greatest ambition of this project was to restore the dignity of rail travel and the humanity of entering the city by train.”

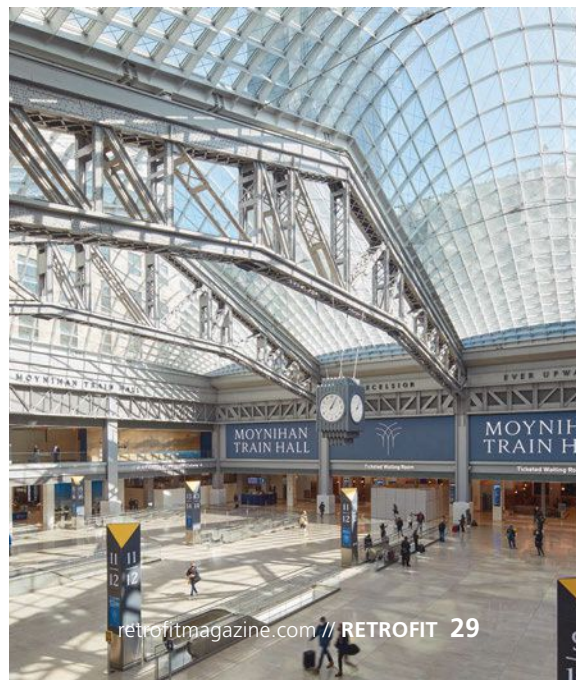
While the project’s gestation took decades, the former post office was an ideal candidate for conversion to a train station because the tracks were already underneath. But unlike at Penn Station, with riders often traveling multiple stories underground to reach their trains, under the Farley there is only one level. “For us, part of the improvement is the intuitive way-finding that you now have in the train hall by being able to see clear expanses back to that column-free space,” Carr explains.

Back when it was still a post office, mail came to Farley on trains, was sorted upstairs and distributed across the Northeast. “There was a literal foundation upon which to build. We didn’t have to increase any train infrastructure capacity that already existed,” Carr says. It also was in some ways a dead ringer for the long-gone old station. The 4-story, granite-clad Farley features on its Eighth Avenue side (facing the former Penn) a long Corinthian colonnade of 20 columns, each over 50-feet tall. The design matched the original Penn’s colonnade, also designed by McKim, Mead and White.

At the same time, building Moynihan and transforming the existing subterranean Penn Station (the busiest train station in the western hemisphere), all



SOM retained some of the Farley building’s original trusses, which give Moynihan Train Hall an industrial aesthetic. Per Jon Cicconi, AIA, a senior associate principal at SOM, the double trusses are entirely riveted—before welding—and were part of an occupiable, walkable catwalk system.





“

THE GREATEST
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— Jon Cicconi, AIA,
senior associate
principal, Skidmore,
Owings and Merrill

”



PUBLIC ART



Moynihan Train Hall is filled with site-specific artwork produced by some of the world's most renowned artists. Commissioned by Empire State Development in partnership with Public Art Fund, the selection of artwork includes pieces by Stan Douglas' series, "Penn Station's Half Century," as an homage to the original Penn Station. The public art display spans more than 80 feet of glass wall and complements a waiting area for ticketed passengers.

while it remained fully operational, "required a highly orchestrated set of track outages," Carr adds, "where we would be able to take over certain platforms for a limited amount of time over the weekends and restore service Monday by 5 a.m."

THIRD DESIGN'S A CHARM

The architects at SOM first designed Moynihan station in the late '90s, but it was not what you see today. Each of three versions turned the massive former mail-sorting room—with its wide-open, column-free space—into the new waiting area. Each design restored a version of the original glass ceiling that had, before it was covered and drop ceilings installed by the post office, filled the space. Yet over time, the design got simpler and more of the Farley's DNA was retained.

The first iteration, which dazzled Sen. Daniel Patrick Moynihan (the project's biggest elected champion) and even President Bill Clinton in the late '90s, featured a large combination skylight and glass pavilion rising hundreds of feet above the station. "I remember being in grad school and seeing the design of that come out," Cicconi says. "That

was one of the reasons I wanted to come to SOM, actually."

The second, in the 2000s, featured a glass ceiling over the former mail-sorting area, as the current Moynihan does, but eliminated all the building's distinctive ceiling trusses, allowing the glass to all but disappear and resembling a view of the open air. For the third and final design, which got built, SOM for the first time retained some of the original trusses, which give Moynihan Train Hall not just Beaux Arts but an industrial aesthetic. "They certainly don't make trusses like this anymore. It's entirely riveted. It was before welding," Cicconi says. "They're all double trusses, too, because it was all part of an occupiable, walkable catwalk system."

Even so, a glass ceiling inevitably recalls classic Victorian railway palaces. "We were very much aware of that reference and people making that connection," Cicconi says. "There's something about a large vault that both maximizes the volume inside and also kind of uplifts you in some way. It feels very civic."

The architects also made a point of orienting Moynihan's concourses to the outside, near windows, "so you're always oriented to

RETOFIT TEAM

OWNER // Empire State Development, esd.ny.gov, in a public-private partnership with Vornado Realty Trust, www.vno.com; The Related Cos., www.related.com; Skanska, www.skanska.com; MTA, new.mta.info; Long Island Rail Road, new.mta.info/agency/long-island-rail-road; Amtrak, www.amtrak.com; and Port Authority of New York and New Jersey, www.panynj.gov

ARCHITECT // Skidmore, Owings & Merrill, www.som.com

- Roger Duffy, FAIA, design partner
- Colin Koop, AIA, design partner
- Laura Ettelman, AIA, managing partner
- Marla Gayle, AIA, project manager
- Jon Cicconi, AIA, senior design architect
- Andrew Lee, AIA, design architect
- Joyce Ignacio, senior technical coordinator
- Andrew Melillo, site representative

STRUCTURAL ENGINEER // Severud Associates, (212) 986-3700

MEP/FP/IT/TELECOM // JB&B, www.jbb.com

SKYLIGHT STRUCTURAL ENGINEER // Schlaich Bergermann Partner, www.sbp.de/en

HISTORIC BUILDING RESTORATION // Building Conservation Associates Inc., www.bcausa.com

RAIL ENGINEER // Systra, www.systrausa.com

CIVIL/GEOTECHNICAL ENGINEER // Langan, www.langan.com

LIGHTING DESIGN // Domingo Gonzalez Associates, www.dgalight.com

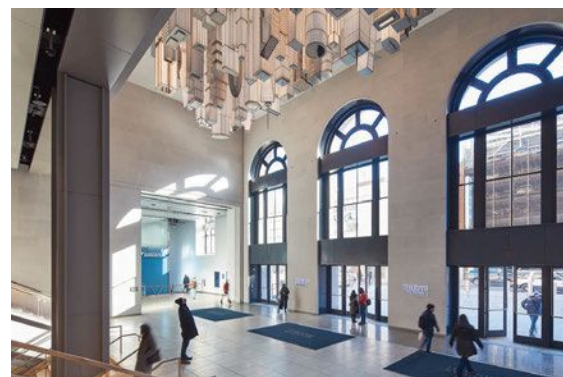
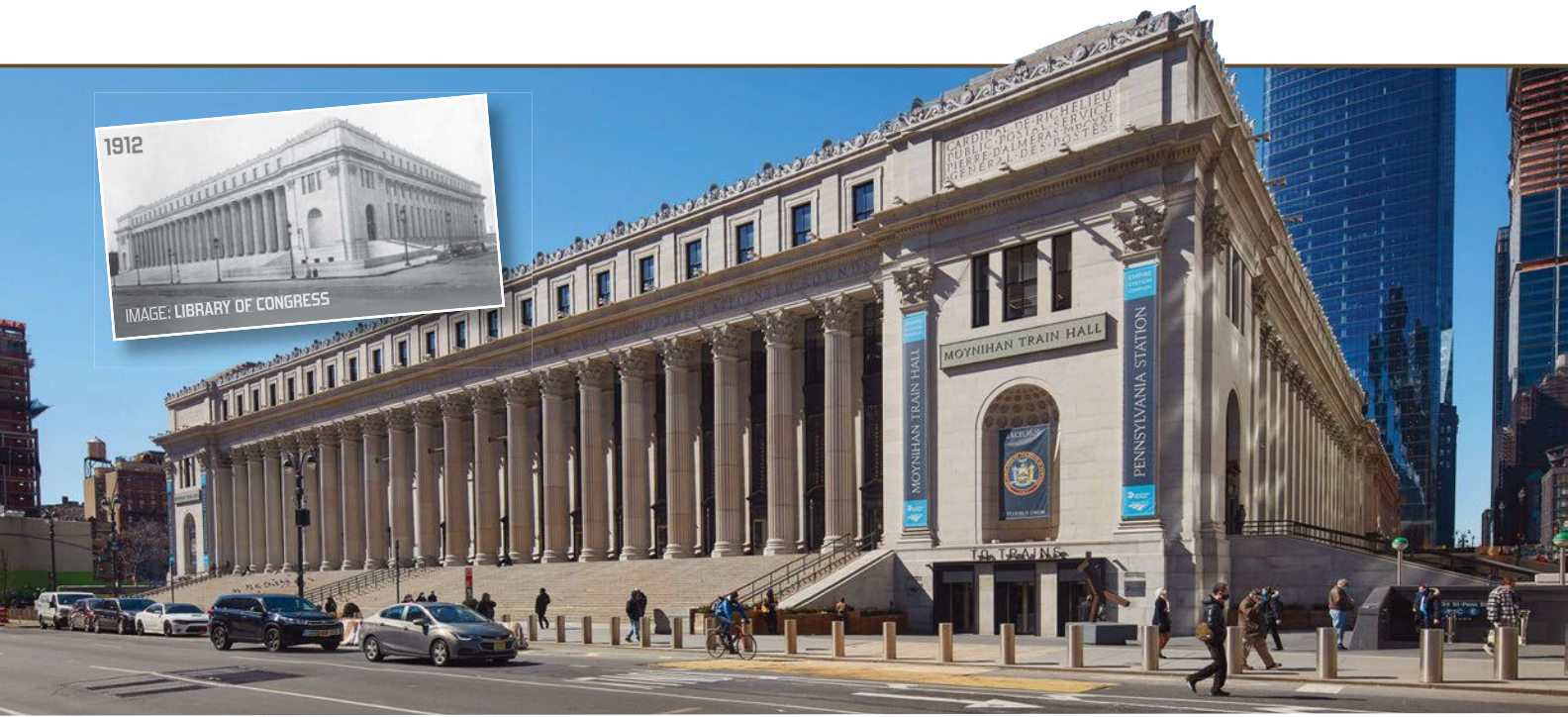
ACOUSTICS/AUDIOVISUAL // Cerami & Associates, www.ceramiassociates.com

SECURITY DESIGN // Thornton Tomasetti, www.thorntontomasetti.com; Weidinger Protective Design Practice, www.thorntontomasetti.com; and Ducibella Venter & Santore, www.rossbar.com/history-dvs

HISTORIC PRESERVATION // Higgins Quasebarth & Partners LLC, www.hqpreservation.com

TRAIN HALL CLOCK DESIGN // Peter Pennoyer Architects, www.ppapc.com

MOYNIHAN TRAIN HALL BRAND IDENTITY // Watson & Co., watsonandco.com



■ ■ ■ MATERIALS

MARBLE FOR FLOOR AND WALLS OF MAIN CONCOURSE // Tennessee Quaker Gray Marble from Tennessee Marble Co., www.tnmarble.com

TERRA COTTA // Boston Valley Terra Cotta, bostonvalley.com

INTERIOR METAL PANELS // Permasteelisa, www.permasteelisagroup.com

SKYLIGHT GLASS // Seele, seele.com

MARBLE FOR ESCALATOR FACINGS, FLOORS AND WALLS OF AMTRAK AND LIRR SPACES // Covelano Silver Marble from Covelano Marmi SRL, www.goeflanermarmor.it

DIGITAL DISPLAYS OPTIC CABLING // TiniFiber, www.tinifiber.com

PUBLIC ART, "PENN STATION'S HALF CENTURY" // Stan Douglas, artist, art21.org/artist/stan-douglas

PUBLIC ART PRINTING // Alice Direct-to-Glass Printing on 12MM Low-Iron Tempered Glass by GGI, generalglass.com

The 4-story, granite-clad Farley building features on its Eight Avenue side (facing the former Penn) a long Corinthian colonnade of 20 columns, each over 50-feet tall. The design matched the original Penn's colonnade; the Farley building and original Penn Station were designed by McKim, Mead and White.

the city and you're always taking advantage of the fact that you're not in the dungeon of Penn Station," Cicconi adds. "How can we enhance that more? That was the big design driver for the project."

WHERE PAST MEETS FUTURE

Moynihan Train Hall comes with a corresponding series of upgrades to Penn Station and its infrastructure, including new daylight entrances also designed by SOM, as well as a planned Hudson River tunnel called Gateway that will substantially add capacity. They were conceived not just to improve riders' experiences but as part of "a shift in the center of gravity westward," as the architect calls it. Existing western

Manhattan neighborhoods, like Chelsea and the Meatpacking District, began the trend in the early 2000s while Hudson Yards has added new real estate above the open rail yards that had been there. "Moynihan really starts to set the groundwork for bigger-picture or bigger-scale improvements in the overall neighborhood and district," Carr agrees. "It becomes a catalyst for future redevelopment of the area."

For now, Moynihan Train Hall seems like more than just a majestic new railway station befitting the grandness of New York itself, more than a hybrid of classical architecture and modern engineering. It's a step into the city's future. 



A CELEBRATION OF ARTISTIC INGENUITY

Thanks to the partnership of the Public Art Fund and Empire State Development, Moynihan Train Hall is replete with artworks created by some of the most renowned artists working today. Among these, the remarkable *Penn Station's Half-Century* series by Stan Douglas, which spans more than 80-feet of glass wall and was inspired by historical moments that occurred within the original station. **GGI was honored to play a role in bringing this series to life.**

Penn Station's Half-Century

By Stan Douglas

Commissioned by Empire State Development in partnership with Public Art Fund for Moynihan Train Hall

©Stan Douglas. Courtesy of the artist, Victoria Miro and David Zwirner.

Photo: Nicholas Knight, courtesy Empire State Development and Public Art Fund, NY



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► RETROFIT TEAM

ARCHITECTS: Gensler San Jose, www.gensler.com/offices/san-jose, and Eaton Hall Architecture, eatonhallarchitecture.com

BUILDER: TICO Construction, www.ticoinc.com

► THE RETROFIT

San Pedro Street is one of downtown San Jose's liveliest streets, offering a variety of dining options, events and a weekly farmers market. However, a 3-story parking structure created an uninviting dead zone on one side of San Pedro Street. The San Jose Downtown Association (SJDA) sought to activate the entire street by repurposing the ground floor of the parking garage into four, 400-square-foot micro-retail spaces for local business owners and replacing five street-parking spaces with a parklet.

The project required a strong collaboration between the Department of Transportation, Gensler and Eaton Hall Architecture, plus SJDA Street Life Manager Jason Su and the retail-space operators San Jose Made. The Knight Foundation provided key funding.

The city of San Jose's Department of Transportation allowed this concept to be implemented in its parking garage, showing a commitment to activating the east side of San Pedro Street and giving entrepreneurs an opportunity to test concepts in the marketplace.

Gensler worked with SJDA to design a solution that would foster a flow of civic engagement, starting with the pedestrian experience and

leading to a new kind of retail experience. Chris Hall of Eaton Hall Architecture built upon Gensler's vision, supplying the final drawings that brought the design to fruition. His commitment to the project was invaluable as the team navigated the complexities of installing these shops in the public garage.

The design utilizes the existing architecture of the garage, adding retractable wood doors, large colorful graphics, a vibrant mural created by a local artist and customizable panels for signage, all of which draw people inside. The outside responds to playful humanistic connections to the street with lush potted plants and vibrant outdoor furniture within the parklet. MOMENT has become a destination place for the entire community.

The retail spaces, run by San Jose Made, feature woman-owned businesses for varying durations. After a year of being open, there have been eight local businesses in the spaces and 12 jobs have been created.

The extraordinary micro-shopping district awakens the eastern side of San Pedro Street; integrates with the rest of San Pedro Square; appeals to the community at large, especially San Pedro customers; and made believers out of those who said it couldn't be done.

The success of the retail spaces has led several brokers, developers and other interested parties to contact the city of San Jose to consult on including smaller footprints in their projects in the hopes of landing MOMENT-style tenants.

PHOTOS: GENSLER
unless otherwise noted







HELENA REGIONAL AIRPORT |

Helena, Mont.





PHOTOS: HEIDI LONG, LONGVIEWS STUDIOS INC.

►► RETROFIT TEAM

ARCHITECTS AND INTERIOR DESIGNERS: CWG Architecture, cwg-architects.com, and PSH+, pshplus.com
 GENERAL CONTRACTOR: Dick Anderson Construction, daconstruction.com
 CEILING INSTALLER: Just Rite Acoustics, justriteacoustics.com

►► MATERIALS

The Passenger Terminal Expansion, which opened in October 2020, added 20,000 square feet of new space and more than 300 seats inside of the secured area beyond the TSA checkpoint. With these improvements, the airport is able to simultaneously serve six aircraft and their passengers.

Three of Rockfon's metal ceiling systems served as the terminal expansion's basis of design. PSH+ selected linear and curved shapes in multiple sizes and a choice of finishes.

Above the new, expanded TSA screening checkpoint, Just Rite Acoustics installed 4,400 square feet of Rockfon Planar Plus 4-inch aluminum linear ceilings with perforations and an acoustical backer. This acoustical enhancement allows the ceiling system to achieve an NRC rating of up to 0.90. Ceilings with high NRC ratings absorb sound, which helps keep conversations at a comfortable level, enhancing speech privacy, reducing stress and allowing travelers to hear important announcements.

The visible surface of Rockfon's linear metal panels was finished in Satin Silver to emphasize the terminal's new, modern look. White finishes were applied to the other Rockfon aluminum ceiling panels to present a bright, clean appearance.

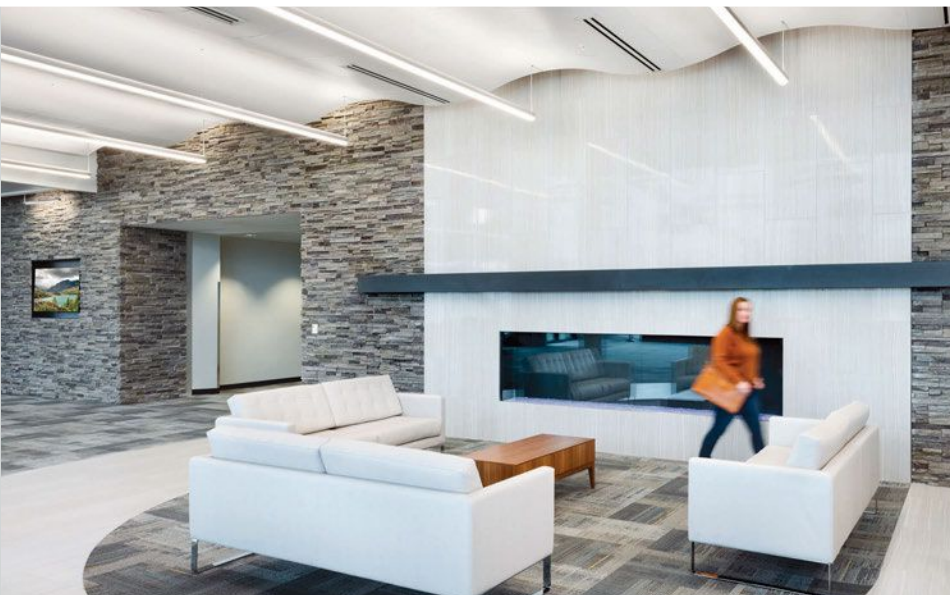
Prior to the expansion, grab-and-go snacks were the sole food option offered inside the security checkpoint, and only 177 seats were available. Now, there are 500 seats, a new Smokejumper Landing bar and restaurant, charging ports and 16 Wi-Fi hotspots within the terminal.

Complementing these amenities, the ceiling showcases a relaxing waveform created with 1,100 square feet of Rockfon Curvgrid 2- by 6-foot panels. This two-directional curved ceiling system arches and undulates along the interior wall and above the bar. Tight joint splices and miters accentuate the Curvgrid panels' smooth, rolling appearance. Rockfon's patented primary carrier also reduces labor-intensive hanger drops by more than 50 percent.

Near the gates, Rockfon Spanair Torsion Spring 2- by 8-foot aluminum panels were selected for their crisp aesthetic and easy access to the plenum. The torsion-spring mounting lets maintenance staff easily remove the panels when needed to access the plenum for ventilation, audiovisual, fire suppression, security-system upgrades or future renovations.

Helping support healthy indoor air quality for airport staff and passengers, Rockfon's metal ceilings contain no organic compounds and are simple to clean. Manufactured with 75 to 100 percent recycled content, Rockfon's metal ceiling systems can be 100 percent locally recycled at the end of their useful life.

CEILING SYSTEMS MANUFACTURER: Rockfon, www.rockfon.com



GRAND CENTRAL TERMINAL | New York



PHOTOS: EXCEL DRYER

► RETROFIT TEAM

HAND-DRYER INSTALLER: Grand Central Terminal Electrical and Mechanical Maintenance Team, www.grandcentralterminal.com

► MATERIALS

Grand Central Terminal was listed on the National Register of Historic Places in 1976. With the building and its rich history preserved, the first of many restoration projects commenced. As new technologies emerged, thoughtful planning was given to upgrading systems and integrating energy-efficient and sustainable products.

The restrooms have been an area of particular concern. Originally outfitted with paper-towel dispensers, restroom floors were often strewn with errant waste, and the sinks and toilets clogged with improperly disposed of paper towels, despite routine cleaning and maintenance. To eliminate these problems and other issues associated with paper towels, like the inherent labor, maintenance and waste, hand dryers were considered a sustainable solution. However, finding a product that could meet performance needs without compromising the integrity of the original architecture was a challenge.

While considering the XLERATOR hand dryer, the maintenance team learned it has a dry time of 8 seconds—tested to guidelines from the Global Hand Dryer PCR published by UL Environment—and it uses 80 percent less energy than conventional hand dryers. It represents a 95 percent cost savings when compared to paper towels, eliminating their labor, maintenance and waste. Eliminating paper towel waste also provides environmental benefits. A peer-reviewed (ISO 14040 standard) Life Cycle Assessment of XLERATOR confirmed it reduces the carbon footprint of hand drying by 50 to 75 percent compared to traditional hand dryers and even 100 percent recycled paper towels.

Ultimately, 24 XLERATOR Hand Dryers replaced paper towels throughout the public and office-space restrooms of the terminal. The sensor-activated dryers reduce touchpoints and feature custom covers with a vandal-resistant coating that fits in with the terminal's décor.

XLERATOR MANUFACTURER: Excel Dryer, exceldryer.com



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APPLETON INTERNATIONAL AIRPORT | Appleton, Wis.

► RETROFIT TEAM

ARCHITECT: Mead & Hunt, meadhunt.com
GREEN WALL INSTALLER: SMA Construction Services, www.smaconstructionservices.com
GREEN WALL MAINTENANCE: Beauty By The Yard, www.beautybytheyardllc.com

► MATERIALS

The renovation and expansion of the TSA checkpoint at Appleton International Airport (ATW) features a 276-square-foot green wall installed with the LiveWall Indoor Living Wall System. The three-sided living wall serves as a green design element that has a natural, biophilic calming effect.

"We set out to make ATW's TSA checkpoint the most visually appealing and pleasant in the U.S.," says Patrick Tracey, marketing manager, ATW. "The living wall is essential in realizing this goal."

The transformation of the security area is part of a multimillion-dollar renovation and reconstruction of 50,000 square feet of ATW's commercial passenger terminal. The project included opening up and maximizing the space in the security area and establishing dedicated lanes for entering the security lines from the terminal and exiting to the terminal from the gates. Adding glazing, at the exterior and for interior partitions, brightens up the area with borrowed light.

The living wall is situated at the end of the security lines in the "composure area," where passengers can sit, put their shoes back on and gather their belongings. The living wall section facing the TSA checkpoint is 10 feet, 8 inches by 8 feet, 3 3/8 inches. The wrapped corner section is 6 feet, 8 inches by 10 feet, 11 3/8 inches. The section facing toward the gates is 10 feet, 8 inches by 10 feet, 11 3/8 inches. In total, the wall includes 148 LiveWall modular planter boxes,

which are high-impact, UV-resistant, architectural-quality moldings. They contain reusable inserts that hold the growing medium and contain a mix of five different indoor plants.

"The LiveWall green wall softens the feeling of the terminal, where many other materials for the flooring and walls are hard," says Scott Volberding, C.M., ACE, ATW's operations and maintenance manager. "Not only does it provide a calming effect, it quickly became an unexpected attraction."

"Travelers are delighted with the wall," Tracey adds. "We see passengers taking selfies in front of the wall after they go through security. Their positive experience of the living wall makes for a memory they want to save and share on social media."

INDOOR LIVING WALL SYSTEM: LiveWall, livewall.com/products/indoor

ELMIRA CORNING REGIONAL AIRPORT

Horseheads, N.Y.

► RETROFIT TEAM

ARCHITECT: Fennick McCredie Architecture, www.fmachitecture.com

► MATERIALS

About 3,055 square feet of Fabricoil was used in three unique applications for the \$61.5 million expansion and revitalization project at the airport. The 5/16-inch, 15-gauge aluminum Fabricoil is used for window drapery, a privacy partition and a security gate for Taste NY Bar. The coiled wire fabric is finished in Antique Bronze and secured using Cascade Architectural's operable Steel Secura Track attachments.

"Airport management was concerned about sun coming from the southwest," says Nancy Felts, AIA, LEED AP, project manager, Fennick McCredie Architecture. "We specified Fabricoil to curve around the perimeter of the departing gate lounge, which provides solar shading to keep guests comfortable while allowing visibility out to the courtyard."

The Fabricoil window treatment extends past the floor-to-ceiling glass windows of the lounge to double as a partition separating the open space and public charging stations. This coiled wire fabric divider gives users privacy while working on laptops or mobile devices.

Fabricoil also is used as a side-folding security gate for Taste NY Bar within the airport, utilizing the same Steel Secura Track with bottom bolt attachments and side hook bolt locks to secure the area during closed hours. Fabricoil security gates come available in multiple locking configurations, including lock and key intermediate footbolt options. They also can be equipped with a series of channels, handles, batons and other reliable hardware components for customization.

"The Fabricoil installations add an elegant aesthetic touch to the airport's interior spaces and it performs just as we need it to," Felts adds.

FABRICOIL MANUFACTURER: Cascade Architectural, www.cascade-architectural.com



SOUTHWEST TRANSIT | Eden Prairie, Minn



PHOTOS: SHEET METAL SUPPLY LTD.

►► RETROFIT TEAM

ARCHITECT: Hay Dobbs Architects,
www.haydobbs.com

METAL PANEL INSTALLER: Minnkota Architectural
Products Co., www.minnkotaap.com

►► MATERIALS

SouthWest Transit is the public transit agency for the Twin Cities suburbs of Chaska, Chanhassen, Eden Prairie and Carver, offering service from downtown Minneapolis, the University of Minnesota, Normandale Community College and the Best Buy headquarters.

SouthWest Transit relocated its corporate office to co-locate all staff, dispatch, drivers, maintenance, operations, planning and business operations under one roof. The existing maintenance facility was expanded and remodeled to reflect the space and operational needs of the staff co-location.

"Our goals were to develop operation efficiencies through the staff co-location and develop operational and resource efficiencies through

reduction of the deferred maintenance backlog," explains Gary Hay, RA, CID, principal, Hay Dobbs Architects. "We wanted to reinforce the SouthWest Transit brand and co-location philosophy, as well as the company's commitment to innovation."

The agency's expansion was relatively small, about 2,000 square feet on the second floor, but the exterior renovation was larger to tie in the original building with the expansion. Hay says metal panels were specified for the remodel because of their lightweight qualities and minimal structural impacts to the existing construction. "Metal panels offered a variety of panel shapes, expressions, configurations and application flexibility," Hay says. "These products offered the opportunity to select custom colors, reflecting the SouthWest Transit brand."

Sheet Metal Supply delivered 2,300 square feet of 1-millimeter RHEINZINK flatlock panels (60 inches by 16 inches) and 600 square feet of

18-gauge Cor-Ten flatlock panels (20 inches by 16 inches). Other manufacturers supplied 1,700 square feet of aluminum panels in two special colors, 16-feet and 8-feet tall, as well as 800 square feet of flush aluminum soffit panels.

Hay says RHEINZINK and Cor-Ten products offer the benefits of minimal maintenance and sustainability. "RHEINZINK provided the flexibility necessary for the building," he says. "It allowed the design team to develop the desired panel configurations and customized corner details. Cor-Ten was selected for its weathering properties and provides similar flexibility to RHEINZINK. It was installed in its natural form and is weathering, reflecting the conditions of the site."

METAL PANEL SUPPLIER AND FABRICATOR:
Sheet Metal Supply Ltd.,
www.sheetmetalsupplyltd.com

BEFORE



INNOVATE YOUR VISION

"The beautiful Elysian Beach Resort is located next to the St. Thomas Yacht Club on the eastern end of the island of St. Thomas. In 2017, Hurricanes Irma & Maria created catastrophic damage on the island, including the destruction of many roofs. The existing composite tile roofing material on the resort's buildings were replaced with aluminum CastleTop shingles for its inherent design and its resistance to high wind events."

- Rooftops Silicone Distributors, Inc.

CastleTop
in Ascot White

Elysian Beach Resort | St. Thomas, US Virgin Islands
Contractor: Rooftops Silicone Distributors, Inc.



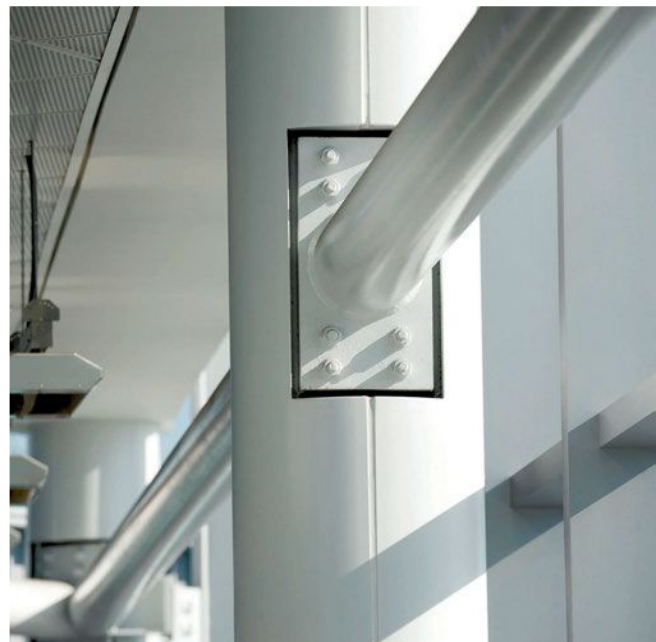
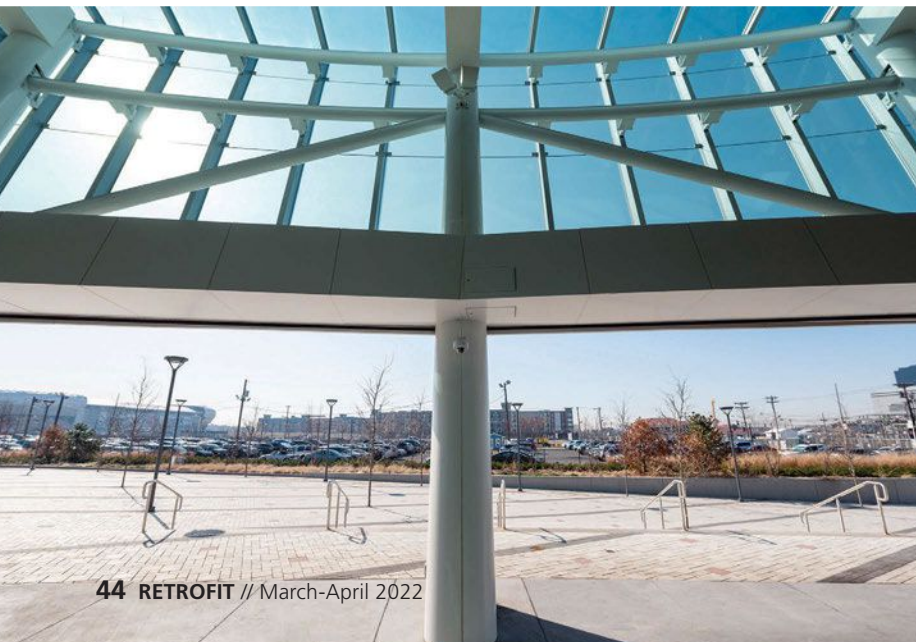
ATAS International, Inc.
Sustainable Building Envelope Technology

HARRISON PATH TRAIN STATION

Harrison, N.J.



PHOTOS: SAF





►► RETROFIT TEAM

METAL PANEL INSTALLER: BAMCO Inc.,
www.gobamco.com

LAND SURVEYOR: Kennon Surveying Services Inc.,
kennonsurveying.com

BIM MODELING: Microdesk, www.microdesk.com

GLAZING CONTRACTOR: County Glass & Metal,
www.countyglass.com

ENGINEER: WSP, www.wsp.com

ARCHITECTS: Dattner Architects, www.dattner.com, and
 Port Authority of New York and New Jersey,
www.panynj.gov

►► MATERIALS

Constructed in 1936, the original station featured a cramped design and lacked accessibility for those with disabilities. The project goal was to revive the train station to provide greater, easier access for all travelers through a bright and modern architectural design.

The defining architectural characteristic of the revitalized Harrison PATH station comes from the large-scale, curving glass curtainwalls secured via a series of vertical, horizontal, and diagonal columns and beams. For the main vertical columns, the team at BAMCO Inc. selected SAF to fabricate a series of intricate column covers that required manufacturing a litany of components with complex geometries.

The project included 8,900 square feet of more than 600 individual metal panels and column-cover components. The main, oversized vertical columns at the front of the structure are encased in SAF's M-2000 1/8-inch aluminum column covers.

"At the time of the project, BAMCO had limited capabilities of rollforming panels that exceeded 10-foot lengths, so we needed to rely on a company that was capable of fabricating the oversized columns for the project," explains Ryan Kusmick, project manager at BAMCO. "We have worked with SAF in the past and, given the complex geometries of the design, we wanted to go with a competent fabricator that we were comfortable with."

SAF had to carefully engineer the column covers for the train station so they could accommodate various penetrations and cutouts that serve as connection points for the intersecting beam structure. In addition, the ground-floor portions of the column covers feature rails for vertical sliding doors. This was yet another complexity to take into consideration during 3D modeling and fabrication—one that needed to be executed flawlessly to allow for the doors' operation. The SAF column covers are painted in a Fluropon Special White PVDF finish.

"The Harrison PATH station was a difficult project in terms of engineering and design. We scanned the as-built steel structure with the help of Kennon Surveying Services Inc., who laid out the point-cloud data. Microdesk then took this data and created the BIM model," Kusmick adds. "That information was all unfolded and relayed to SAF, who delivered on the design. We are very pleased with the outcome."

METAL COLUMN COVERS: SAF, www.saf.com



MEMPHIS INTERNATIONAL AIRPORT

PHOTOS: ERIC MUELLER PHOTOGRAPHY

►► RETROFIT TEAM

PRIME ARCHITECT: UrbanARCH Associates,
www.uarch.com

AVIATION ARCHITECT: Alliance, alliance.us

GENERAL CONTRACTOR: Flintco, flintco.com

GLAZING INSTALLER: Tull Brothers, tullinc.com

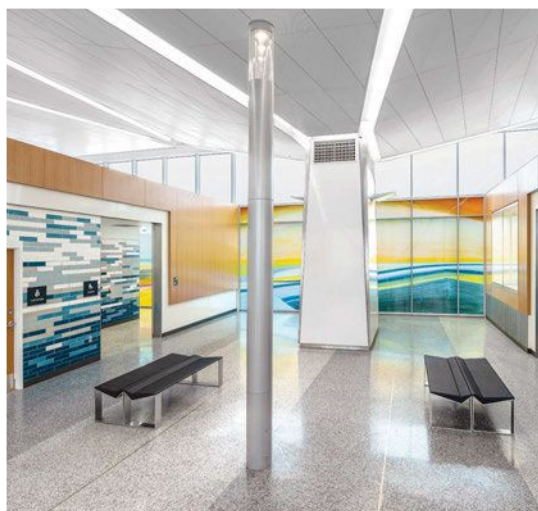
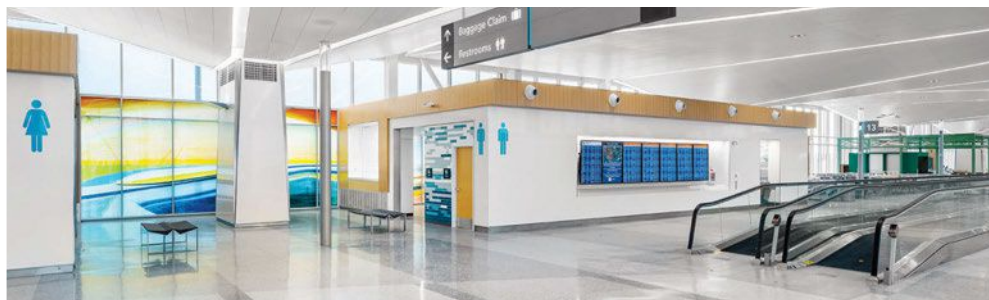
►► MATERIALS

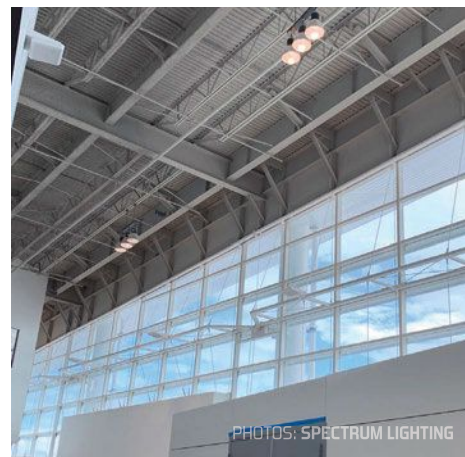
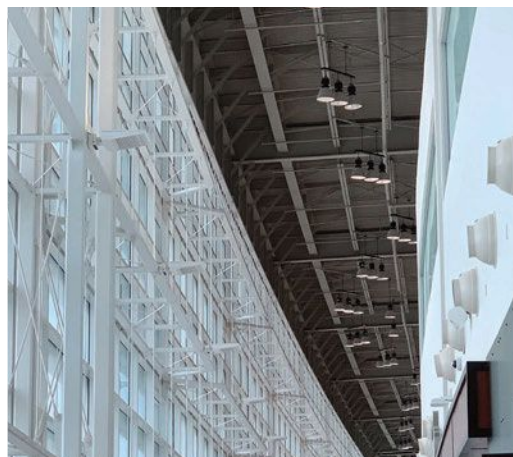
As one of the busiest airports in the country, Memphis International Airport is implementing a multiphase capital improvement plan that includes the consolidation of airline and retail operations into Concourse B, as well as higher ceilings, larger gate areas and moving walkways. As part of the modernization plan, View Smart Windows, which use artificial intelligence to optimize the amount of natural light entering the terminal while controlling heat and glare, are being installed throughout the concourse.

"The modernization of the B Concourse will reinvent the Memphis travel experience and welcome millions of travelers to the Memphis community," says Scott Brockman, Memphis International Airport's president and CEO. "View Smart Windows are a key component of this reinvention, ensuring that natural-light levels remain ideal for passenger comfort."

In a study on natural light and the airport experience (bit.ly/3GLsoiw), passengers who boarded at concourses with View Smart Windows reported a 68 percent higher satisfaction rate and rated the airport as 33 percent more modern, efficient, bright and comfortable. Seats in gates with View windows were also 15-degrees cooler than those with traditional windows, contributing to higher revenue for retailers (bit.ly/3In08l6) and significant energy-cost savings because of lower cooling requirements.

SMART WINDOW MANUFACTURER: View Inc.,
www.view.com





LOUIS ARMSTRONG NEW ORLEANS INTERNATIONAL AIRPORT

► RETROFIT TEAM

ARCHITECTS: Atkins North America Inc., www.atkingsglobal.com; Pelli Clarke & Partners, pcparch.com; and Manning Architects, manning.xyz
LIGHTING DESIGNER: HLB, hlblighting.com

► MATERIALS

HLB contacted Spectrum Lighting to design a high-bay luminaire with a specific output and distribution, delivering specified foot-candles, as part of the project. Consequently, Spectrum Lighting created a custom three-fixture mounting

bar to hold the three high-bay-type luminaires. The company also designed a special 60-degree beam downlight series used throughout the space. All fixtures supplied were required to utilize the same LEDs and drivers for ease of long-term maintenance by the airport.

Spectrum Lighting's sales and engineering teams worked in coordination with the lighting design team and architects to design and produce a fixture to meet exact specifications. Optical reflector design for high bays and downlights were done in-house, and the fixtures were tooled, spun

and manufactured by Spectrum Lighting's skilled designers and craftsmen. The custom three-fixture mounting bar also was designed and manufactured in-house.

The electrical contractor worked out installation details with the design team at Spectrum Lighting's Massachusetts factory. Changes made to the mounting system during this meeting allowed the contractors to pre-assemble fixtures in their shop and ship to the site ready to install.

CUSTOM LIGHTING MANUFACTURER: Spectrum Lighting, www.speclight.com



PHOTOS: BOON EDAM



STOCKHOLM CENTRAL STATION

► RETROFIT TEAM

ARCHITECT: AIX, www.aix.se

► MATERIALS

Designed in 1871, Stockholm Central Station has a long, proud history, and the building itself features magnificent artwork and architecture. The building is historically listed and, as such, officials have an obligation to protect its architectural features in any upgrades or renovations. In addition, current commuters place a high emphasis on using a facility that is efficient, sustainable and easily accessible while being aesthetically pleasing. A dignified, impressive entrance is key to a comfortable customer experience and is proven to leave a lasting impression on the visitor.

"The goal was to let people experience the whole atmosphere of this historic building, from floor to ceiling. We also wanted to have the old and the new come together in a natural way," says

Architectural Conservator Johan Rittsél with AIX. Jernhusen, the station owners, and AIX have been collaborating for 15 years to restore Stockholm Central Station to its former glory while creating a contemporary center. The entry solution needed to be true to the authentic beauty and atmosphere of the original space while meeting the modern demands placed on traffic flow and energy savings.

Consequently, Stockholm Central Station features a set of three Boon Edam all-glass, three-winged Crystal Tourniket automatic revolving doors along with integrated heaters. Each door can accommodate 1,740 persons per minute in both directions, in addition to managing climate control. The Crystal Tourniket doors also include collapsible door wings, which create an easy escape route in the event of an emergency. The entrance complements the classic architecture of the entrance hall while letting in as much daylight as possible.

"Boon Edam was very focused on finding

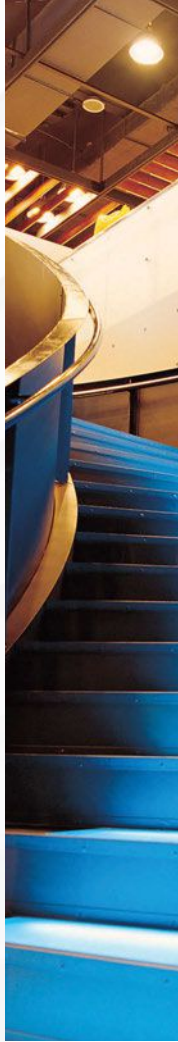
the right door solution for us, even taking us on research tours so we could try out different door solutions," says Anne Teresiak, an AIX architect.

A primary challenge was concealing the entrance's technical aspects so as not to interfere with the overall user experience and impression of the entrance. The motors were built into the floor; the control boxes were designed to be situated at a lower level in the building; and the vertical heaters were integrated into the centerline of the doors.

Peter Appलगren with Jernhusen, adds: "The revolving doors are now an integrated part of the entrance hall. We've managed to capture the ambience of the old while making sure we meet the modern demands of energy savings, as well as maintaining high-volume traffic flow."

REVOLVING DOORS MANUFACTURER:

Boon Edam, www.boonedam.com/en-us/products/revolving-doors



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DATA INFORMS DESIGN

How Can Lighting System Data Add Value?

WRITTEN BY | **ANDREA WILKERSON, PH.D., LC, AND SARAH SAFRANEK**

The talk of data informing design still feels a bit dissonant—perhaps because it conjures images of buildings and spaces that look otherworldly or of a monotonous environment devoid of natural variations.

However, it is important to recognize that the concept of data informing design is already affecting our daily lives, probably more than we realize. How many times have you opted in or out of allowing software to gather information to improve your user experience? Pick up a basket or push around a cart at a big-box store and you may be providing data regarding your path in the store, including how long you stare at the shelves trying to select a loaf of bread among the abundance of options.

This data is then used to optimize product layout.

If software developers and retailers are leveraging data from actual users to improve design, it seems the building industry is missing out on an important opportunity. Although the COVID-19 pandemic did highlight some opportunities to leverage occupancy data for targeted cleaning and ventilation, there are many potential avenues to explore.

Lighting System Data

In the lighting industry, there has been much talk of intelligent, connected lighting systems with limitless possibilities, but given we are still in the early days, these systems likely feel unintelligent and have many limitations. The collection of data by



PHOTO: SKYE STUDIOS ON UNSPLOASH

manufacturers is an opportunity to speed the maturing of lighting systems and add value to systems by providing this data to end-users. This initially sounds like a great idea to many end-users, but without the ability to easily use the data, often it just sits on a server somewhere, waiting.

Data detailing the state of the lighting system is increasingly available, either directly from the lighting system or fed from the lighting system to the building automation system. For a recent neonatal intensive care unit (NICU) project, lighting system data was acquired from the building automation system, requiring no additional equipment or hardware. Meanwhile, in a project in a hospital behavioral health unit (BHU), the lighting control system did require a server that was installed

onsite for storing the data. These datasets provided insight into how the occupants interacted with tunable lighting systems over days, weeks and months, identifying opportunities for system optimization.

Optimize for the Occupant

Analyzing the control data for both projects demonstrated that the multiple layers of light provided by the different luminaires in different zones were actively used by the occupants, along with dimming. The color of light varied automatically throughout the day in both projects' patient rooms with occupants having control over intensity but not the color.

Although lighting preference is often thought to be random, the data from both projects revealed the patterns of

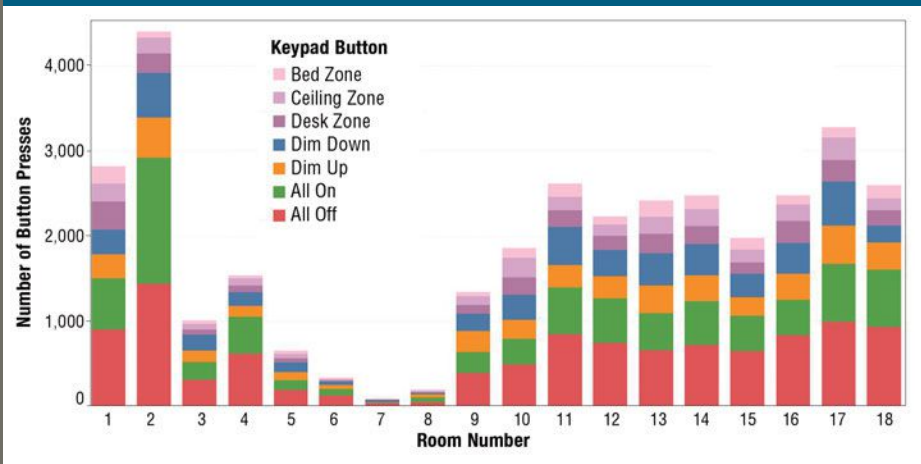
LEARNING HOW
OCCUPANTS INTERACT
WITH THE **LIGHTING**
SYSTEM ALLOWS FOR
CONTINUOUS IMPROVE-
MENT, AND THESE
LESSONS LEARNED ARE
ESSENTIAL FOR STRENGTH-
ENING INDUSTRY BEST
PRACTICE DOCUMENTS.

DATA FROM THE BEHAVIORAL HEALTH UNIT



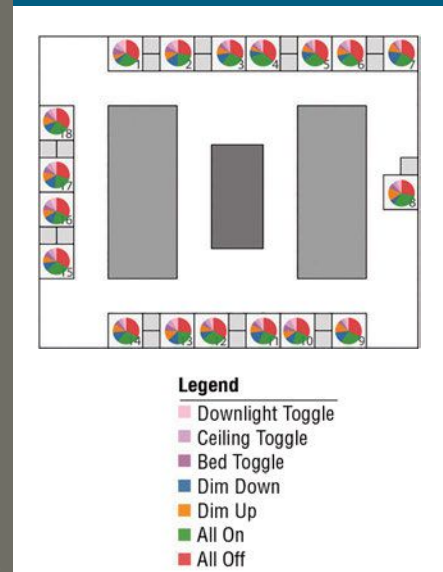
Analyzing the control data for this hospital behavioral health unit demonstrated that the multiple layers of light provided by the different luminaires in different zones were actively used by the occupants, along with dimming.

BUTTON PRESS PER ROOM



Comparison of Button-press Data by BHU Patient Room for the Entire Monitoring Period: Each button pressed is summed by room, ranging from approximately 800 button presses. The data were not normalized by occupancy, and some rooms were less occupied than others.

BUTTON PRESS BY PATIENT ROOM

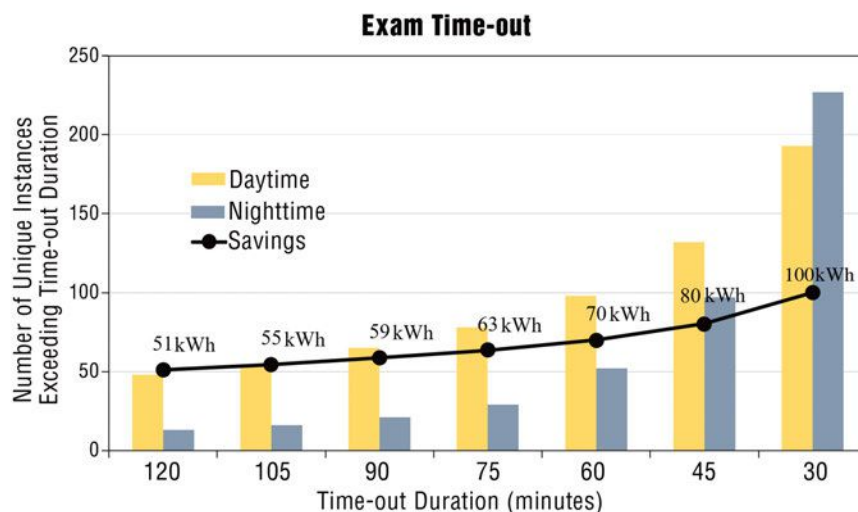


preference in these spaces. For BHU, the security-guard room had the most overrides overall, but these overrides mostly occurred after one of the seven daily transitions, indicating that this particular transition was not acceptable. This nuanced issue, which was clear when analyzing the data, likely would not have been identified otherwise. The data also provide robust feedback over time compared to more traditional methods, such as a survey at one point in time taken by only a subset of occupants.

Optimize for Energy Savings

Data collected in NICU patient rooms revealed opportunities for energy savings by minimizing the extended periods of time when the lights were left on without need. For example, a linear luminaire above each patient bed was the primary light source throughout daytime hours, automatically turning on at 7 a.m. and off at 9 p.m. Six downlights were available in the room for additional light, and selecting the exam mode on the lighting control

TIME-OUT OPTION FOR EXAM MODE



ENERGY SAVINGS for the NICU's five rooms is calculated by identifying extended instances of the exam mode during daytime and nighttime hours (frequency indicated by the bars) and calculating the difference in energy resulting from a switch to the primary linear luminaire only.

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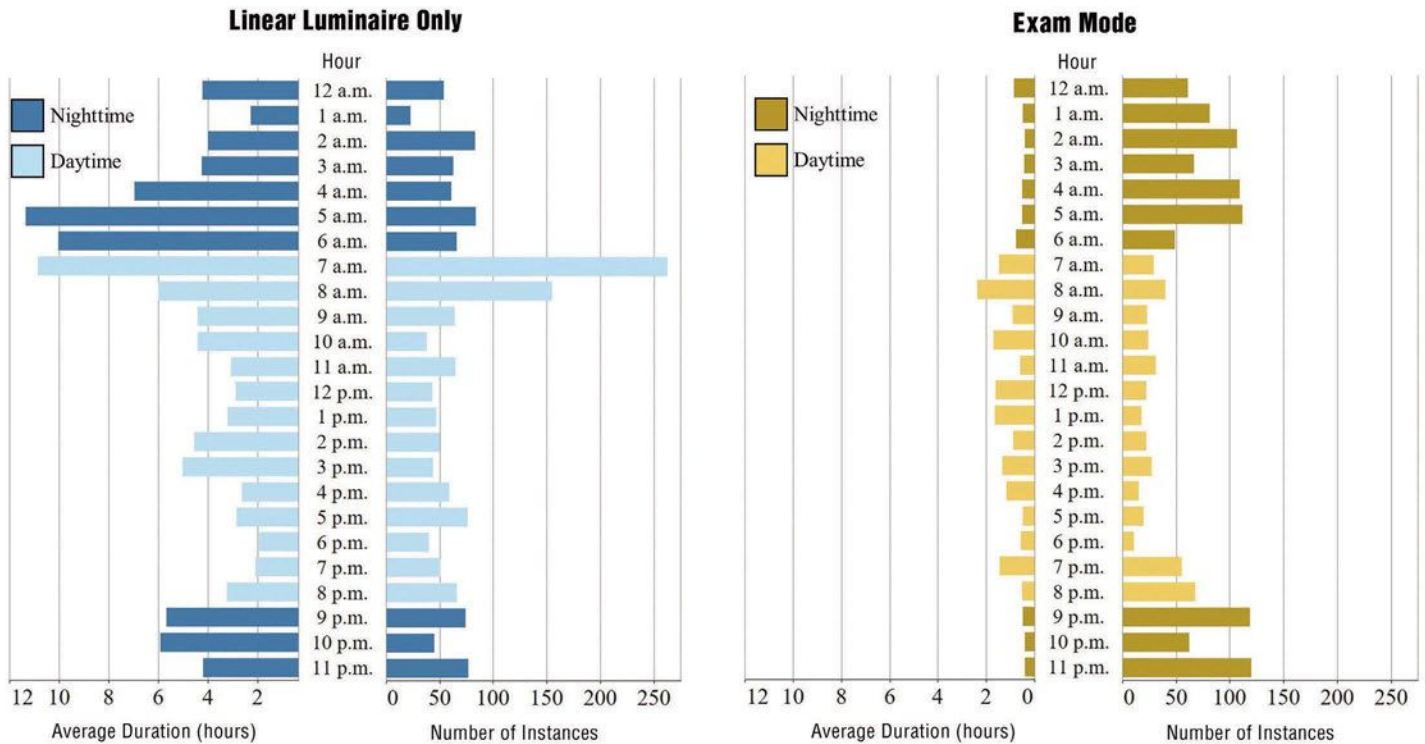
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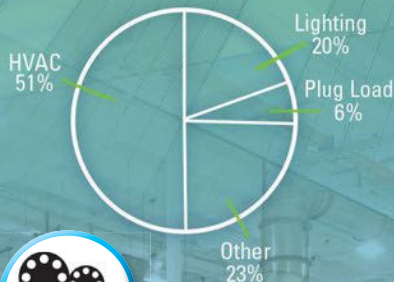


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keypad would turn on these downlights to full brightness. Although the exam mode was specifically intended for patient examinations and procedures, it was often left on for extended periods. Across the six months analyzed, giving occupants control over the lighting system did not result in a considerable increase in energy use. Limiting the duration of exam mode would save additional energy by adding a time-out to the programming of the control system.

Feedback for Best Practice

Lighting control system data provides feedback that is valuable not just for manufacturers and facility managers.

« Instances are recorded for the timeframe in which a mode was initiated in the NICU. The instances are summed over the entire monitoring period with the duration averaged for each of these instances per hour for daytime (7 a.m. to 8:59 p.m.) and nighttime hours (9 p.m. to 6:59 a.m.).

Lighting specifiers and designers benefit by learning how the lighting systems are used by the actual occupants of the space, which is particularly important when adopting new technology.

During the design process there are countless decisions made based on what lighting system might get installed and how occupants might respond, yet often after the building is occupied there is no time for actually understanding how well the lighting system supported occupants. Learning how occupants interact with the lighting system allows for continuous improvement, and these lessons learned are essential for strengthening industry best practice documents.

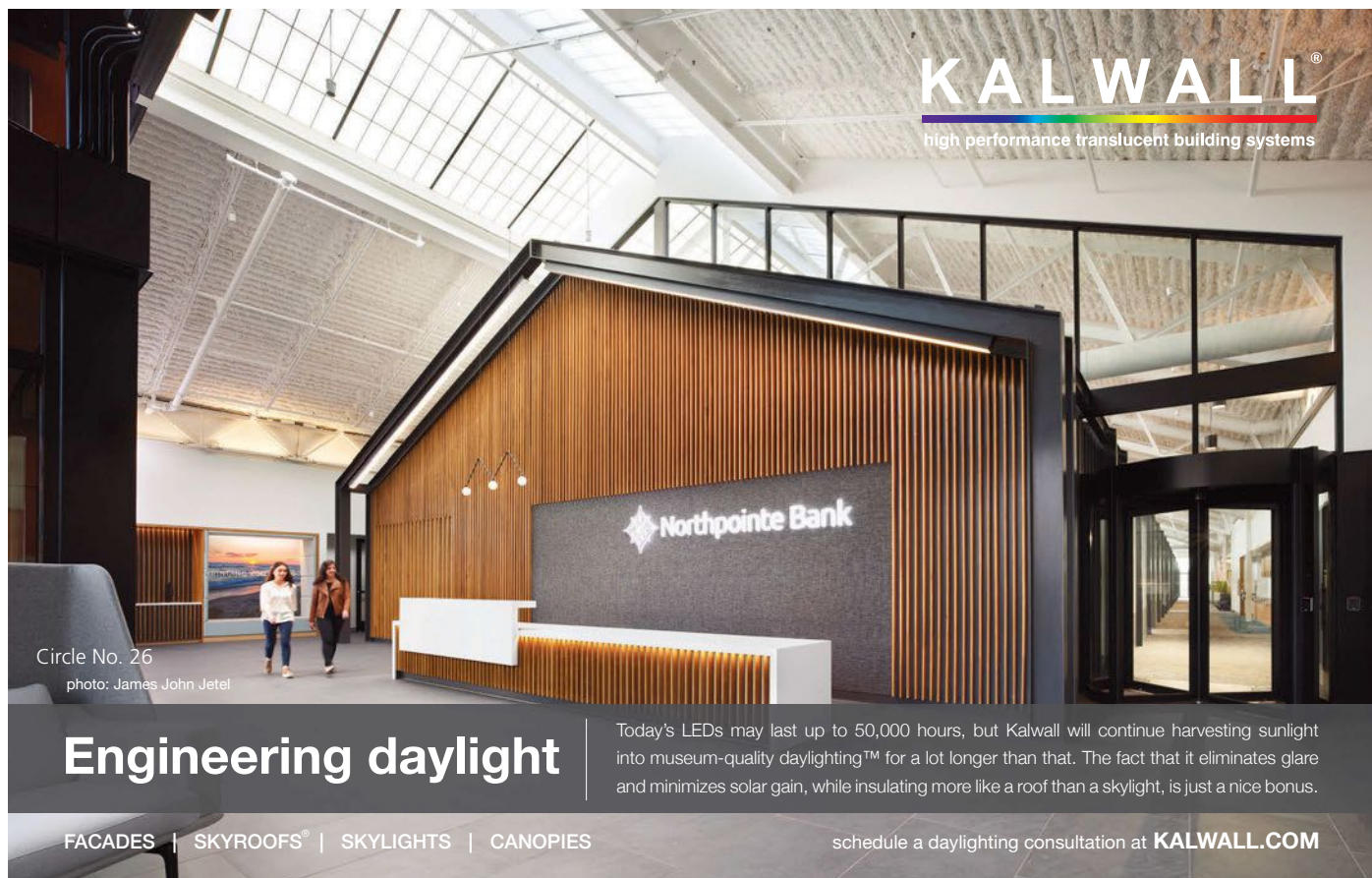
As choices and features continue to increase, data help designers and manufacturers clarify what lighting features are valuable, what lighting features are too much and what is the right level of choice for occupants in varying applications.

A Look Toward the Future

The flexibility of advanced control systems

is often touted as a benefit, and using data to identify ways to improve system performance takes advantage of this flexibility. Data can help with refinement during commissioning, providing opportunities to ensure that the lighting system is operating as intended. These refinements will be unique to each space, based on the day-to-day activities of occupants. In the case of the NICU and BHU projects, the data revealed opportunities to save energy and adjust to the automatic lighting transitions to better serve the occupants.

Currently, those benefiting from access to actionable lighting system data is limited and more work is needed to expand the perceived value of data to a broader group of end-users. In January 2022, a major U.S. lighting company announced a collaboration with Microsoft to expand its lighting and building controls capabilities. With these types of collaborations likely to increase, it is easy to imagine that the substantial time required to analyze, understand and apply building system data will soon be a remnant of the past. 



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#ENERGYGOALS

A HISTORIC RAILWAY STATION USED FOR OFFICES AND A MUSEUM ACHIEVES 21 PERCENT ANNUAL ENERGY SAVINGS



BUILT IN 1913, THE 24,730-SQUARE-FOOT HISTORIC BRICK BUILDING PRESENTED UNIQUE CHALLENGES FOR IMPROVEMENTS.

The Western Maryland Railway Station in Cumberland, Md., was built in 1913 and operated as a passenger station by the Western Maryland Railway until 1959. The building went through various transformations, housing offices until 1988 when the Western Maryland Scenic Railroad began service.

Savings Measure	Cost	Savings	Notes
HVAC replacement	\$266,300	\$5,000 annually	Replaced 10 HVAC split systems with DX air-conditioning systems, using hydronic coils as the main heat source.
Lighting replacement	\$54,370	\$3,600 annually	Replaced 550 short-lifespan fixtures with LED bulbs and fixtures.
Building envelope upgrades	\$11,660	\$3,500 annually	Included installation of building insulation and air sealing.

Today, the station continues to operate as a heritage railroad, a railway operated as living history to recreate or preserve scenes from the past, while serving as the headquarters of the Canal Place Preservation and Development Authority (CPPDA).

The 24,730-square-foot brick building houses offices, a museum and two small retail shops. The facility also features a C&O Canal National Historic Park exhibit and associated visitor's center. The CPPDA is an independent agency of the state of Maryland.

Energy-efficient Upgrades

The state of Maryland renovated the facility primarily to address occupant comfort issues. For example, building occupants used space heaters in their offices and workstations to address drafts and uncomfortable temperatures in the building.

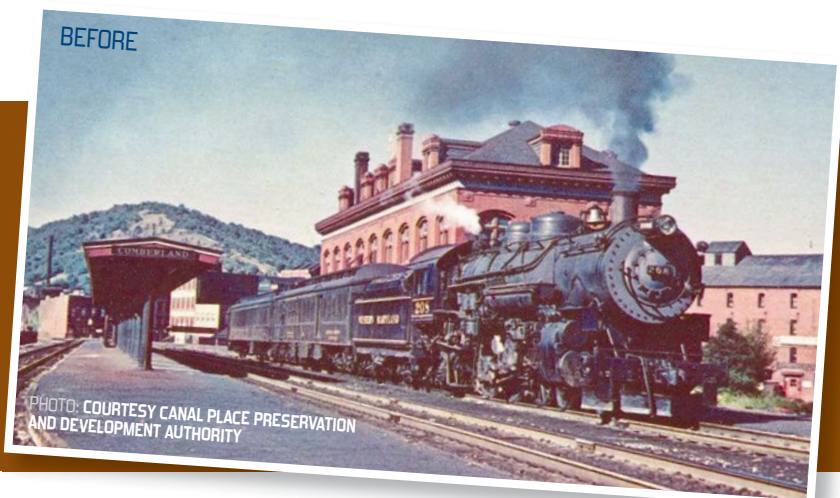
Although the historic facility presented unique challenges for improvements, a comprehensive building upgrade resulted in 21 percent annual energy savings and an annual cost savings of \$12,100 (compared to a 2016 baseline).

CPPDA worked in collaboration with the Maryland Energy Administration and Department of General Services to conduct an energy audit of the facility with support from the U.S. Department of Energy. The audit identified several cost-effective energy-conservation measures, including replacement of the building's 20-plus-year-old HVAC system; updates to the lighting system, including replacing more than 500 light fixtures with LEDs and installing occupancy sensors; and improvements to the building envelope, involving air sealing and insulation.

The table (above) lists the facility upgrades



TRAINS REGULARLY CARRIED PASSENGERS AND FREIGHT THROUGH THE WESTERN MARYLAND RAILWAY STATION DURING THE MID TO LATE 1900s. THIS PHOTO IS BELIEVED TO BE FROM THE 1950s.





ANNUAL ENERGY USE

Baseline (2016)

145 kBtu/sq.ft.

Actual (2019)

114 kBtu/sq.ft.

ENERGY SAVINGS:

21%

ANNUAL ENERGY COST

Baseline (2016)

\$41,500

Actual (2019)

\$29,400

COST SAVINGS:

\$12,100

SOURCE: EUI

AFTER THE UPGRADES, CANAL PLACE PRESERVATION AND DEVELOPMENT AUTHORITY REALIZED 70 PERCENT IN COST SAVINGS FROM REDUCED MAINTENANCE AND REPAIR OF THE HVAC AND LIGHTING SYSTEMS.

implemented at the Western Maryland Railway Station with associated costs. These measures were essential to improving occupant comfort while reducing the historic building's energy consumption and costs.

In addition, CPPDA realized significant cost savings from reduced maintenance and repair of the HVAC and lighting systems. The facility was budgeting more than \$5,000 annually to maintain and repair the HVAC system, which had to be regularly recharged with coolant because of leaky refrigerant lines. The lighting upgrade provided maintenance savings of \$3,600 annually. Combined, the renovations have cut station maintenance costs by more than 70 percent annually.

Better Buildings

In December 2021, the U.S. Department of Energy (DOE) recognized the state of Maryland for energy-efficiency advances

made through DOE's Better Buildings Challenge. As a partner in the program, Maryland reduced its energy intensity by 20 percent across a buildings portfolio of 9 million square feet. The state now has committed to another goal of 15 percent energy reduction across a broader portfolio of more than 90 million square feet.

DOE partners with public and private-sector organizations to make commercial, public, industrial and residential buildings more efficient, thereby saving energy and money while creating thousands of jobs. To date, more than 950 Better Buildings Partners have shared their innovative approaches and strategies for adopting energy-efficient technologies. Discover more than 2,500 of these solutions in the Better Buildings Solution Center at betterbuildingsolutioncenter.energy.gov/solutions. 



Materials

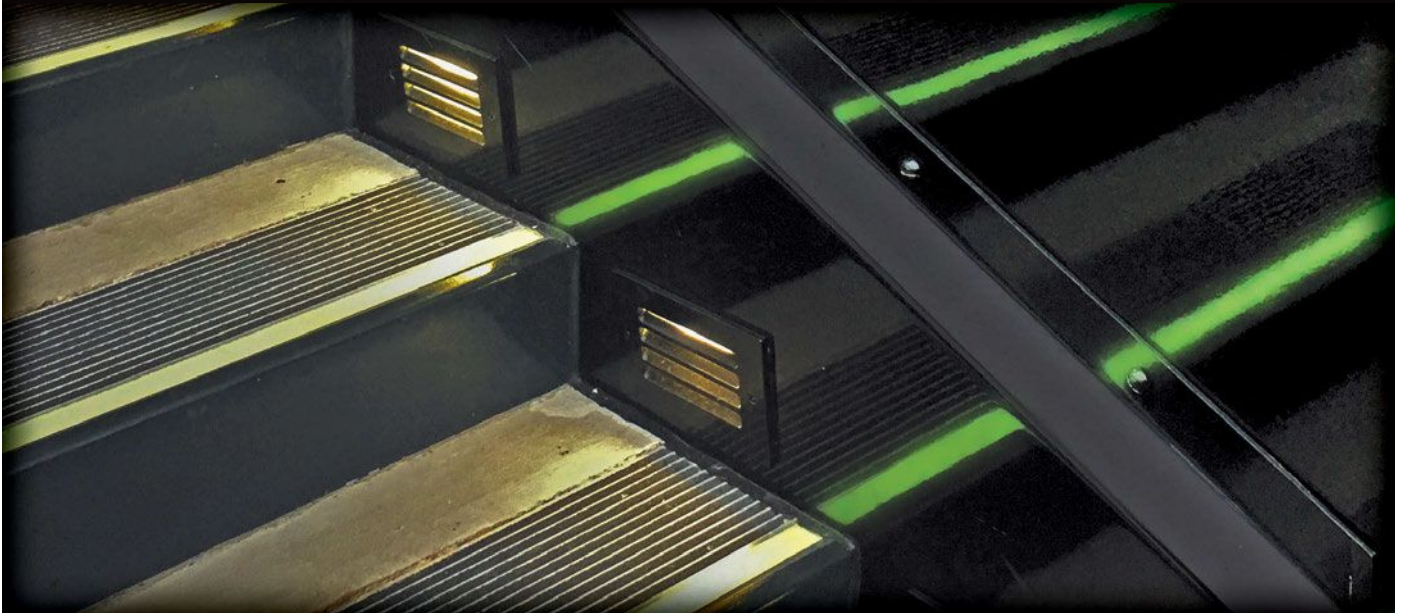
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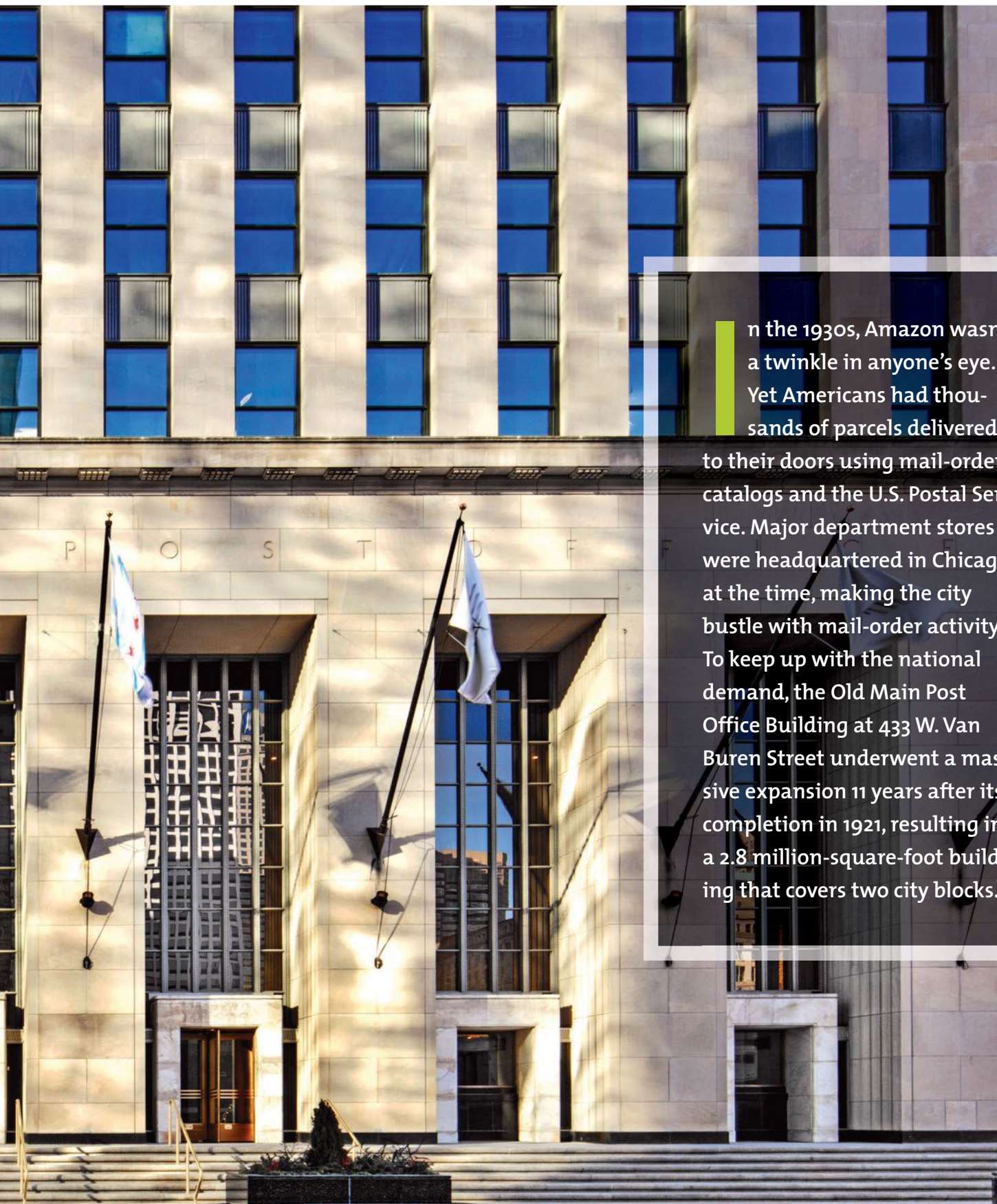


FIRST-CLASS ICON

Chicago's Old Main Post Office Is Reinvented as Office Space with Amenities and Details that Celebrate the Building's History

WRITTEN BY | KJ FIELDS

PHOTOS: ERIC LAIGNEL unless otherwise noted



In the 1930s, Amazon wasn't a twinkle in anyone's eye. Yet Americans had thousands of parcels delivered to their doors using mail-order catalogs and the U.S. Postal Service. Major department stores were headquartered in Chicago at the time, making the city bustle with mail-order activity. To keep up with the national demand, the Old Main Post Office Building at 433 W. Van Buren Street underwent a massive expansion 11 years after its completion in 1921, resulting in a 2.8 million-square-foot building that covers two city blocks.

» RETROFIT TEAM

OWNER // 601W Companies,
www.601wcompanies.com

ARCHITECT AND INTERIOR DESIGNER
// Gensler Chicago, www.gensler.com/offices/
chicago

LEASING // Telos, www.telosgroupllc.com

PROPERTY MANAGEMENT // JLL,
www.us.jll.com

GENERAL CONTRACTOR // Bear
Construction, www.bearcc.com

STRUCTURAL ENGINEER // WSP,
www.wsp.com

MEP/FP ENGINEER // McGuire Engineers,
www.mepcinc.com

PRESERVATION ARCHITECTS // McGuire
Igleski & Associates Inc., www.miarchitects.
com, and Wiss, Janney, Elstner Associates Inc.,
www.wje.com

HISTORIC ADVISOR // MacRostie Historic
Advisors LLC, www.macrostiehistoric.com

FAÇADE/FORENSICS CONSULTANT // Wiss,
Janney, Elstner Associates Inc., www.wje.com

CIVIL ENGINEER // V3, www.v3co.com

LANDSCAPE // Hoerr Schaudt,
hoerrschaudt.com

MILLWORK // Navillus Woodworks,
www.navilluswoodworks.com, and T.H. Snyder,
thsnyder.co

FURNITURE SUPPLIER // Office Revolution,
office-revolution.com

LIGHTING SUPPLIER // KSA Lighting &
Controls, www.ksalighting.com

**HISTORICALLY ACCURATE WINDOW IN-
STALLER** // Auburn Windows, auburncorp.com

BEFORE



BEFORE PHOTOS: TOM ROSSITER

“As the centerpiece of the American mail-order industry, this building has enormous significance to the city, state and country,” says Ashley Rogow, technical designer in Gensler’s Chicago office. “So many people were employed there, and it became a symbol of Chicago’s importance, distinguishing it from large East Coast cities, like New York.”

By 1996, the post office was too large for daily operations and the U.S. Postal Service abandoned the building. It sat vacant for two decades and began to decay with exterior pieces literally falling off onto the highway below. The iconic structure retained its grandeur, however, and was listed on the National Register of Historic Places in 2001. Developers, 601W Companies, purchased the site in 2016 and retained Gensler along with an extensive multi-discipline team to redevelop the site for office use. Even before programming began, the team replaced and reattached exterior limestone and terra cotta, as well as restored the main lobby area.

High Priorities

“One of the first and most important things we did was professionally photograph the interiors’ existing conditions,” Rogow recalls; she served as a designer on the adaptive-reuse project. “The photos document what we couldn’t salvage, and we used many of them as beautiful, almost ghostly art pieces inside the space. But in the grand lobby, we were able to restore nearly all original materials. It’s like stepping back in time to 1934.”

Art Deco pieces in the lobby include original wall panels, marble floors, plaster ceilings and gold mosaic tiles decorated with bronze medallions that adorn large alcoves. The medallions showcase all the different ways the mail was delivered: pony express, steam engine, plane, truck, postal carrier, etc.

Double-helix mail chutes cut through multiple levels, but code requirements didn’t allow open penetrations between floors. The team brainstormed unique scaffolding with safety systems so construction workers could insert decking inside the chutes and seal off each floor.

Packages formerly flew down the chutes onto tables lined with mail rollers to move

(continues on page 66)





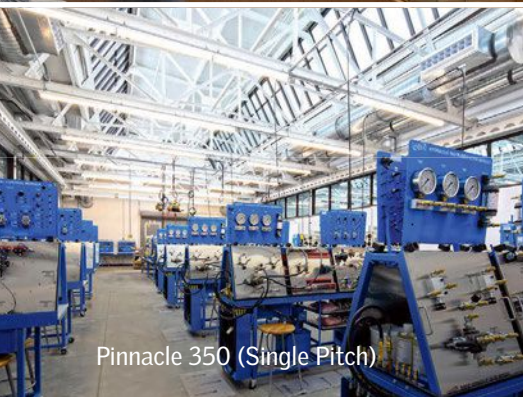
A 3.5-acre rooftop park features undulating hills, beehives, real trees and 40,000 different plant species supported by a new substructure with built-in irrigation. Building tenants also enjoy basketball and tennis courts.





Pinnacle Series (Single Pitch)

Architect: BNIM | Photo: © James Ewing/JBSA



Pinnacle 350 (Single Pitch)



VELUX Modular Skylights (VMS Ridgelight)



Horizon C-Series Canopy

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CoLaboratory Chicago

VELUX Modular Skylights transform a 1916 bow truss warehouse into a light-filled co-working space.



BEFORE



AFTER



Due to its prefabricated design, the VELUX Modular Skylight system eliminates the need for on-site glazing, allowing it to be installed quickly and in practically any weather.

CHALLENGE

Find a commercial skylight system that would enable architects to use older bow trusses as an architectural feature while also flooding the interior of the co-working space with natural light. Furthermore, an active railway runs right in front of the building, so creating a construction site outside was not a possibility.

SOLUTION

Fifty-one VMS modules in the Step Longlight configuration fill the atrium with natural light, while two, 50-foot VMS Ridgelight structural systems, each with 24 skylight modules, replace old skylights damaged by graffiti.

Location

Chicago, Illinois

Project Type

Renovation

Year of Construction

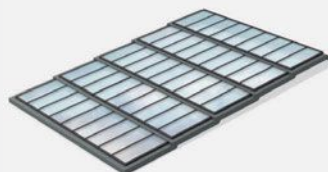
2020



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Products used in project

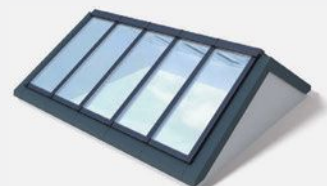
VMS Step Longlight includes multiple rows of skylight modules connected to create a large glass roof, making it suitable for extra-large roof openings.



VMS Step Longlight

VMS Ridgelight structural system is a dual-pitched ridgelight for use on flat roofs or a roof apex.

VMS Options: available in electrically operable venting modules with remote-controlled shades for light control.



VMS Ridgelight

“OUR GOAL WAS TO CELEBRATE THE BUILDING AND ITS ROLE IN CHICAGO'S HISTORY. WE WANTED TO CONTINUE THE BUILDING'S LEGACY IN EVERY WAY POSSIBLE.”

—Ashley Rogow,
technical designer,
Gensler

the mail. The original rollers were unsafe, so Gensler sourced new rollers, flipped them vertically and backlit them to become a 3D, textural wall-art installation.

The team also saved several huge mail scales sunk into the floor, where mail carts were once rolled over and weighed in batches via old-fashioned dials. “The scales are like steam-punk sculptural elements,” Rogow notes. “We saved these really interesting artifacts and repurposed them in unique ways.”

From 1911 to 1966, the Post Office Department offered government-backed savings for individually held accounts. To hold deposits, the Chicago Old Main Post Office included multiple bank vaults. The largest, a steel-reinforced concrete box built into the first floor, had 6-foot, 8-inch by 8-foot, 8-inch vault doors weighing thousands of pounds. The team pinned open the colossal doors to be visible to the tenant, and the windowless vault can be used as a small office or storage space.

In the concierge area, small pieces of mail and antiques from the 1920s and '30s sourced from across Chicago serve as reminders of days gone by.

“Our goal was to celebrate the building and its role in Chicago's history,” Rogow asserts. “We wanted to continue the building's legacy in every way possible.”

Challenges Addressed

Listed on the National Register, the building's exterior needed to remain as close to original conditions as viable. Designers were allowed to modify the main entry to align with the new office-space programming but—other than the northside lobby space—truck-loading docks lined the ground floor. Working in collaboration with the state of Illinois and National Historic Landmarks officials, the team created new entrance doors in the same size, shape and location as the former loading docks and added stairs and ADA ramps.

To match the historic paint color, they removed peeling paint chips from the building and examined the layers under a microscope. The team replaced more than 2,000 exterior windows with energy-efficient ones that mirror their historic counterparts right down to the mullions' profile.

While vacant, a leaking roof and broken

MATERIALS

METALWORK // Chemetal, www.chemetal.com, and McNichols, www.mcnichols.com

STONework // Indiana Limestone, www.indianalimestonecompany.com

CUSTOM POSTCARD WALL (LANDING) // ER2 Image Group, www.er2image.com

SCONCES (LEASING) AND PENDANT FIXTURES (LEASING, CONCIERGE) // Roll & Hill, www.rollandhill.com

BOCCE COURT PENDANT FIXTURE // Tech Lighting, www.techlighting.com

SCONCES // Rejuvenation, www.rejuvenation.com

PENDANT FIXTURES // Spectrum Lighting, www.speclight.com

LIGHT FIXTURES // USAI Lighting, www.usailighting.com

ESCALATOR PANEL // Terramai, www.terramai.com

CUSTOM SIGNAGE // Archetype, archetypeesign.com

FLOOR TILE (CONCIERGE AND GYM) // Crossville, www.crossvilleinc.com

PANEL FABRIC (LIBRARY) // Carnegie, carnegiefabrics.com

SOFA (LEASING) // A. Rudin, www.arudin.com

SIDE TABLES // Arteriors, www.arteriorshome.com

CHAIRS (LEASING) AND BLACK TABLE (LIBRARY) // RH, rh.com

CUSTOM BENCHES (LEASING) AND CUSTOM COMMUNAL TABLES (LIBRARY) // Kramer Design Studio, www.kramerdesignstudio.com

ROOFTOP FURNITURE // Vondom, www.vondom.com

ARMCHAIRS // Bernhardt Design, bernhardtdesign.com

GREEN CHAIRS // GUBI, www.gubi.com

STOOLS (BAR) // Andreu World, www.andreuworld.com

RUGS (CONCIERGE, LIBRARY) // Oscar Isberian Rugs, isberian.com

CARPET // Milliken, milliken.com

WALLCOVERINGS // Architex, www.architex-ljh.com; Designtex, www.designtex.com; FilzFelt, www.filzfelt.com; Innovations, www.innovationsusa.com; Maharam, www.maharam.com; Tiger Leather, tigerleather.com; and Wolf-Gordon, www.wolfgordon.com

LAMINATES // Abet Laminati, abetlaminati.com/en; Formica, www.formica.com; and Laminart, www.laminart.com

SOLID SURFACING // Diresco, www.diresco.be/en; DuPont, www.dupont.com; HanStone, hyundailncusa.com/hanstone-quartz; Terrazzo & Marble Supply, www.tmsupply.com; and Wilsonart, www.wilsonart.com

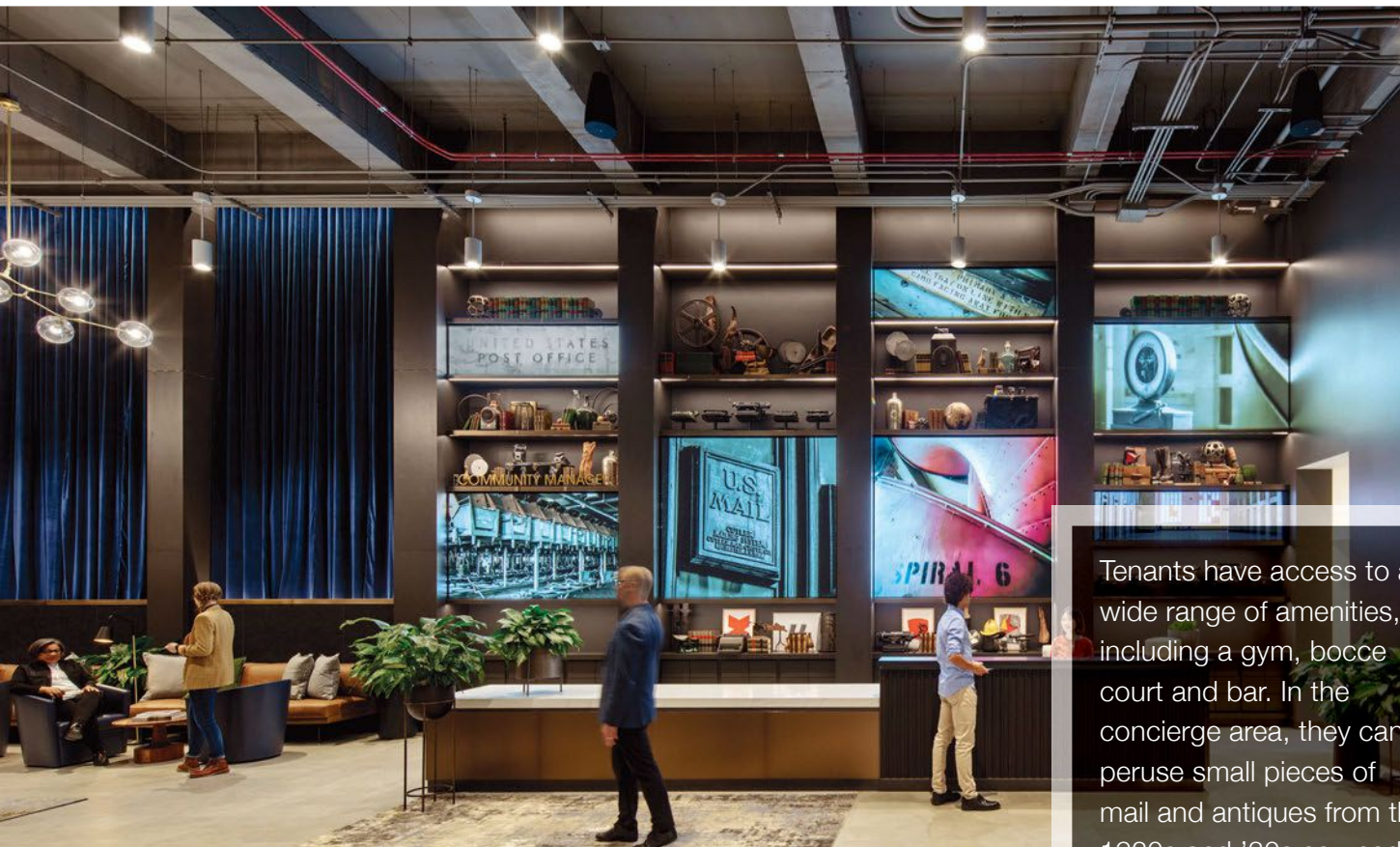
FLOORING // ecore, www.ecoreintl.com; Pantim Wood Products, pantimhardwoodflooring.com/product/palladio; and Pliteq, pliteq.com

CEILINGS AND ACOUSTICAL SURFACES // Armstrong Ceiling & Wall Solutions, www.armstrongceilings.com, and International Cellulose Corp., www.spray-on.com

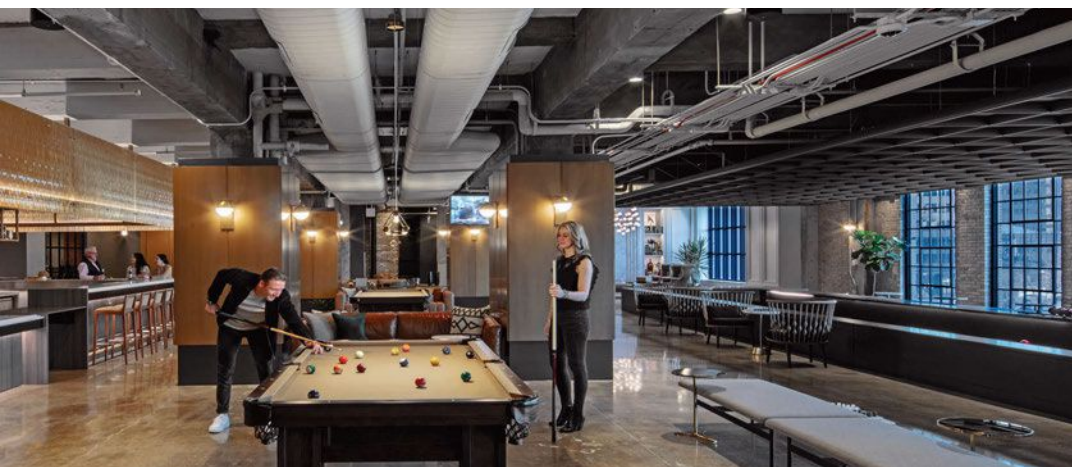
VINTAGE ACCESSORIES // State Street Salvage Chicago, www.etsy.com/shop/statesstreetsalvage

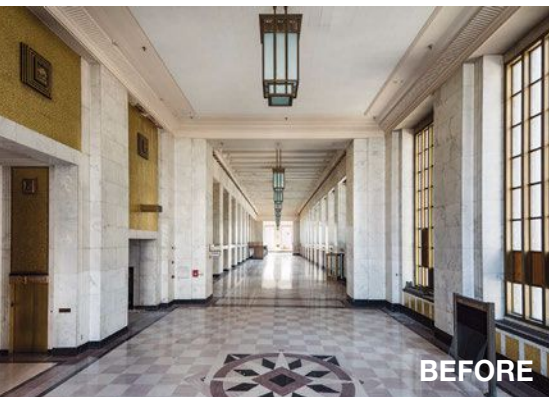
2,400 HISTORICALLY ACCURATE WINDOWS // Fabricated with Solarban 60 Solar-control, Low-e Glass from Vitro Architectural Glass, www.vitroglazings.com, by Wausau Window and Wall Systems, www.wausauwindow.com

PAINTS // Armourcoat, armourcoat.com; Benjamin Moore, www.benjaminmoore.com; PPG Paints, www.ppgpaints.com; and Sherwin-Williams, www.sherwin-williams.com



Tenants have access to a wide range of amenities, including a gym, bocce court and bar. In the concierge area, they can peruse small pieces of mail and antiques from the 1920s and '30s sourced from across Chicago that serve as reminders of the post office's heyday.





windows brought 20 years of moisture inside. “The engineers estimated between one and two Olympic-sized swimming pools of water had absorbed into the concrete,” Rogow says. “This was a significant problem because we weren’t sure how to make anything adhere to it.”

After resealing the building with a new roof and windows, the team used temporary HVAC equipment to pump very dry air into the building for more than a year while other construction activities were underway. Then, they replaced the building’s mechanical equipment and continued to run de-humidified air into the space until the concrete finally dried out.

The Old Main Post Office relied on rail service, and the building sits atop 18 active Metra and Amtrak train lines. Consequently, a smoke plenum exists below the first-floor slab. The plenum is a sheet-metal, steel-rod-hung, 3-foot-deep crawl space containing channels with fans that collect train exhaust, run it up through chimneys within the building and expel it outside.

“We didn’t have a basement to sink new escalator or elevator pits nor plumbing for food service on the first floor,” Rogow remarks, “so we built a 4-foot-high plinth out of structural steel, concrete and high-density foam that helped keep the platform light.”

Existing freight elevators were converted into passenger elevators and ADA ramps were added. New first-floor escalators transport occupants to the second floor, where the team added new elevators that rise into the upper 8 stories. A raised platform to house plumbing will also serve the future food hall. Despite the platforms, the double-height volume of the first floor—rising 37-feet tall in the lobby area—still offers an impressive sense of spaciousness.

Because trains still stop and idle beneath the building, the team located

Gensler was able to restore nearly all the Art Deco pieces in the lobby, including wall panels, marble floors, ceilings and gold mosaic tiles decorated with bronze medallions that adorn large alcoves. The medallions showcase all the different ways the mail was delivered: pony express, steam engine, plane, truck, postal carrier, etc.

the public food hall on the north half of the first floor. When the food hall opens during a future construction phase, its lively atmosphere will make train vibrations less noticeable.

Initial plans for the post office organized the structure to allow a future highway to run directly through the main floor, but by the time Interstate 290 (known as the Eisenhower Expressway to locals) was constructed decades later, truck heights had increased. The building's entire second floor had to be raised in 1955 to accommodate the plan, and a new concrete structure was added.

"To accommodate the non-contiguous first floor, we added escalators that allow tenants to walk in, then up and over an internal overpass. But if you didn't know the highway was below you, you'd never guess it," Rogow explains.

Delivering Regeneration

With a footprint of more than 55 acres, the project helped kickstart area redevelopment as high-profile tenants, like Ferrara Candy Co., HomeChef, Walgreens, Cboe Global Markets and Uber, moved into the building. Tenants have access to a wide range of amenities, but the most sought-after is the 3.5-acre rooftop park. To give the sprawling park character, the team carved undulating hills across the roof using lightweight foam.

"Being on the rooftop feels like you're in a different part of the city—one of the most beautiful spaces that you just never found before," Rogow says. "It's so seamless, it's like the park simply grew in that spot."

In addition to basketball courts and tennis courts, the park includes beehives, real trees and 40,000 different plant species supported by a new substructure with built-in irrigation. The building's structural columns (initially designed to bear heavy equipment inside) carry the substructure's load down to the building's foundation, which is comprised of more than 300 individual caissons.

Rogow encountered a multitude of surprises working inside the monumental historic building. "This project made me much more flexible in the way I design," she says. "You have to have a goal in mind but still recognize you'll discover the unexpected along the way. I learned so much about construction from this era, and this incredible project gave me a new lens on Chicago's history." 



ROUGH ROAD AHEAD

THE NEW YEAR FINDS THE CONSTRUCTION INDUSTRY STRONG BUT FACING MATERIAL CHALLENGES AND RISING COSTS

WRITTEN BY | ALLAN BARRY

For many years, the commercial construction sector experienced historic growth. After years of pent-up demand were unleashed following the Great Recession, owners and developers were finding easier and more favorable financing, and architects and contractors were busier than they'd ever been.

In the first quarter of 2020, the U.S. Chamber of Commerce's Commercial Construction Index was at a strong score of 74 out of 100. The quarterly economic index is designed to gauge the outlook for, and resulting confidence in, the commercial construction industry. Contractors across the country are surveyed each quarter to better understand their levels

of confidence in the industry and top-of-mind concerns, so it is a good finger on the pulse of the commercial construction industry.

And then came COVID-19. Since the arrival of the virus in early 2020, we have been in uncharted territory. As the overall economy plummeted in 2020, many wondered if construction might find itself in a

position similar to where it was in 2008 in the wake of the financial crisis.

Fortunately, that hasn't been the case. In general, construction showed itself to be solid and resilient through 2020 and 2021. While the Commercial Construction Index score dropped to 56 when pandemic shutdowns took effect, the score has been rising again. It was back to 65 in the fourth



PHOTO: DILOK KLAISATAPORN

quarter of 2021, which—while still below pre-pandemic levels—indicates steady positive growth.

“At the start of 2021, the pandemic slowed things down and there were some geographic regions that had shutdowns but, even with this, construction did significantly better than other industries because the work is outdoors,” says Joseph Natarelli, CPA, national construction services leader for Marcum LLP, a national accounting and advisory services firm.

New Year, New Challenges

As we enter a new year, the construction industry is looking at a mixed bag. Some good, some bad. COVID is back and the industry is facing a new set of obstacles. Underlying conditions remain strong, but now owners, architects and contractors must contend with instability in the cost and availability of materials, as well as a lack of qualified labor to bring everything together.

Forecasters and industry professionals see a year ahead with activity on the rise,

but on a rockier path than we’re used to. The latest Commercial Construction Index states that 45 percent of contractors report turning down work because they can’t find enough skilled workers, and 62 percent of contractors report high levels of difficulty finding skilled workers. In addition, 97 percent of contractors indicated cost fluctuations have had a moderate to high impact on their businesses. That’s up 23 points year-over-year.

“Overall, I think the commercial construction market is in good shape, given all

“WE’RE LOOKING AT A PERIOD OF STRONG GROWTH, AND THAT’S EVEN WITH THE HEADWINDS OF INFLATION, WORKFORCE SHORTAGES AND SUPPLY-CHAIN ISSUES. WE’LL GET PAST THOSE ISSUES, THOUGH IT WILL BE A LITTLE PAINFUL.”

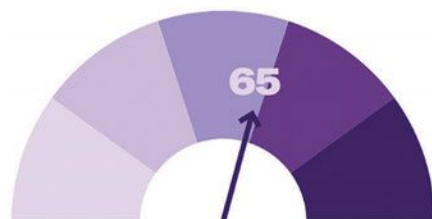
—Curtis Dubay, senior economist, U.S. Chamber of Commerce

the pressures that are being put on it and that have been put on it for the last two years,” says Curtis Dubay, senior economist with the U.S. Chamber of Commerce. “It’s in a better place than it has been throughout the pandemic and is getting better. That said, it could be better. The challenges plaguing the larger economy are also impacting commercial construction. These include a lack of workers, supply-chain issues and inflation.”

“The main negatives facing the construction sector can be boiled down to ‘the three Ps,’ which are prices, people and productivity,” says Richard Branch, chief economist at Dodge Construction Network. “Material prices have risen sharply over the course of the past year, leading to project delays and cancellations. Meanwhile, the shortage of skilled labor has left businesses scrambling to get jobs done in time. In addition, construction has lagged other industries in introducing new technology to improve on the job site, as well as back-office productivity.”

“If material prices continue to rise and construction companies are unable to access materials in time, it will become very difficult for any construction company to accurately bid a job,” Natarelli explains. “Estimating teams are left guessing what the price point is for any given material. When you add the labor shortage, companies are having to utilize more overtime than anticipated. With these extra costs, you will see profit margins continue to shrink at an exponential rate.”

“For many years, people stopped warehousing and construction was all about on-time delivery, fabrication and eliminating the need to store materials,” recalls Andy Holub, vice president and director of pre-construction and special services for Chicago-based Clune Construction. “Nowadays, nobody can get anything on time. When I talk to suppliers, they



The Commercial Construction Index is 65 for the fourth quarter of 2021.



The U.S. Chamber of Commerce’s Commercial Construction Index is designed to gauge the outlook for, and resulting confidence in, the commercial construction industry.

SOURCE: U.S. Chamber of Commerce’s Commercial Construction Index

are warehousing more. They are buying commodities, like steel studs, when the prices are good. The other thing is that our trade partners don’t commit like they used to. We might say we want it in 12 weeks and they will say they don’t know if they can do it. We get a lot of disclaimers saying they aren’t responsible for delays due to COVID.”

Root Cause

So how did we get here? The consensus view seems to be that the construction industry, as well as the larger economy, are facing pressures that are a combination of the impact of COVID essentially stopping the global economy for a time, as well as other underlying issues that predate the pandemic. For example, the construction industry was already dealing with a lack of skilled labor before 2020, but the pandemic amplified that problem significantly.

“We’re currently living in the time of the Great Resignation, where millions of people have left their jobs. These positions supply a lot of materials for the construction industry, and their loss is causing a lot of

these delays,” Natarelli explains. “My hope would be that as we get deeper into 2022 and collectively get a better handle on the pandemic, we will see a lot of these vacant positions get filled, which will help put the construction industry back on track.”

“The supply-chain issues are pandemic-related and workforce-related. Those will work themselves out over time,” Dubay adds. “Inflation is driven by the high demand for goods, and the restarting of the service-sector economy. There is a lot of money out there to be spent. We have high demand with a lack of goods because of supply-chain issues, so high demand and low supply push up prices.”

“My fear is escalation isn’t stopping. We’re seeing a lot of cost increases, and controlling that is difficult,” Holub notes. “People are busy, and when people are busy and asked for a budget, they just throw out numbers. Something that might cost \$10, they’ll quote you \$20. They’re hedging their bets and I have to ask myself if I need to put escalation on top of that or if they have it covered. It can be a lot of money. Fees are competitive right now because people want work and need work. But as things get busier, those will increase, as well.”

“We have the workforce issue, with 3.7 million more job openings than workers available, so wages are rising and businesses are passing those off to customers as much as they can. And on the monetary side, the Fed has increased its balance sheet by more than \$5 trillion since February of 2020,” Dubay explains. “That is now trickling out into the economy and putting more upward pressure on prices. The workforce and supply chain will work themselves out. The monetary issue with the Fed is a big unknown.”

Positive Prospects

All of this translates to a lot of headaches

(continues on page 74)



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and headwinds in the short term, but the good news is that it appears the conditions underlying commercial construction and the overall economy remain strong. There is optimism that 2022 will be a good year for the industry, even with all the twists and turns.

"I'm hopeful this is a hiccup. My understanding is that we have a backlog because companies had to shut down and couldn't make product. The demand on steel stud is far greater than the U.S. can produce right now," Holub says. "That's probably a year away from correcting itself. But we've learned a lot about how to handle the situation. And demand is still there. There are still tower cranes and buildings going up."

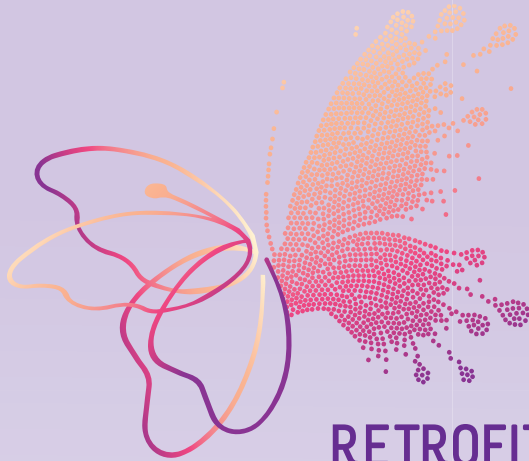
"One of the main positives we're seeing is that the dollar value of projects in the planning stage is near a 14-year high," Branch remarks. "That suggests that as 2022 unfolds, on-the-ground construction activity will pick up in meaningful ways across the country. From a sector perspective, the strongest markets in 2022 will be warehouse, manufacturing, health care, education, data centers and infrastructure."

"I think in 2022, contractors will still be struggling with the supply chain and it will be a tough year from a pricing perspective," Natarelli adds. "But on the positive side, with the infrastructure bill and the potential of other industries picking up production, backlog will be plentiful across the board. Contractors who are in the appropriate financial position, with working capital and equity, will capitalize on the new work generated by the infrastructure package."

"We're looking at a period of strong growth, and that's even with the headwinds of inflation, workforce shortages and supply-chain issues," Dubay says. "We'll get past those issues, though it will be a little painful. It's going to slow growth from where it would be, but we'll still have high growth rates. The key issue for 2022 and 2023 is how aggressive the Fed will have to be fighting inflation, and what policy changes needed to combat inflation will impact the economy and growth. The economy could continue to grow at a strong rate and we'll see the level of inflation come down. If we struggle to get inflation under control, we could see an impact on growth. I don't think it would cause a recession, but it's a thing that does bear watching."

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→ MODULAR CARPET INSPIRED BY SILENCE

Mannington Commercial introduces The Case for Silence, a modular carpet collection that offers two styles crafted to coordinate and support a calm and tranquil environment. A member of the Mannington Design Studio designed the carpet after an experience in an anechoic chamber, one of the quietest places on Earth with a negative decibel sound rating. The designer sat in darkness and silence for 20 minutes, which compelled the brain to seek out any sensory input it could find. The designer's senses were amplified during this time and she began hearing a soft static humming in her ears. The Case for Silence collection is inspired by that humming and combines the flux and variability of the silent chamber experience. Optic Hush conveys the rigidity and formal structure of the anechoic chamber while Static Echo channels the soft yet calming background noise that can be created in our brains when there is an absence of sound. The products are available in 12- by 36-inch tiles and seven neutral colors.

www.manningtoncommercial.com/products/collections/the-case-for-silence



STATIC ECHO



← PVC-FREE WALLCOVERING FEATURES TACTILE FORM

Versa Wallcovering has launched two new designs in its collection of PVC-free commercial wallcoverings. BAREGE is a polished design that pairs a nature-inspired texture with a graphic overlay. The new transitional grasscloth emboss has an innovative level of detail and tactile form suitable for indoor spaces in the hospitality, health-care, retail and corporate

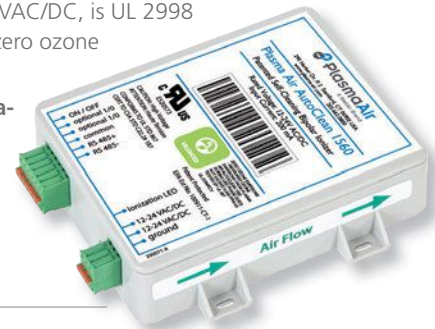
markets. BAREGE's modern/rustic palette coordinates with Barege Texture, which brings this highly useable delicate line work to the forefront in 16 colorways. The PVC-free collection provides specifiers choice in material without compromising the quality and durability of the product. The wallcoverings, which are free of antimicrobials, phthalates, heavy metals, PBDEs and formaldehyde, are Prop 65- and Red List-compliant. A Health Product Declaration is available for all designs.

versawallcovering.com/pvc-free

↘ NEUTRALIZE POLLUTANTS AND MORE AT THE FAN INLET OF AHUS

The Plasma Air AutoClean 1560 is a self-cleaning, maintenance-free needlepoint ionizer that neutralizes harmful pollutants, odors and pathogens. The compact unit automatically removes dust and dirt buildup on the emitters, eliminating the need for any maintenance. It easily can be mounted at the fan inlet of any air-handling system, including RTUs, ptacs, mini-splits, fan coil units and VRF systems. The unit, which will accept 12-24 VAC/DC, is UL 2998 validated for zero ozone emissions.

www.plasma-air.com/products



← WEATHER-RESISTIVE BARRIER APPROVED FOR SLOPED ROOF APPLICATIONS

Georgia-Pacific has announced that ForceField Weather Barrier System is now approved for sloped roof applications. The integrated weather-resistive barrier sheathing system for sloped roofs and walls helps reduce weather-related challenges and delays, simplifies construction, and helps to dry-in multifamily and residential structures faster than traditional systems. The ForceField Weather Barrier System is comprised of the integrated WRB sheathing panels and compatible wall and roof tape accessories. The system meets the water-resistive barrier, air-barrier and roof covering requirements of the International Building Code, International Residential Code and the International Energy Conservation Code. With a greater than 90 percent drainage efficiency, ForceField Weather Barrier System meets Exposure 1-OSB suitable for uses not permanently exposed to the weather.

www.buildgp.com/forcefield



↓ SELECT LED'S LUMEN OUTPUT AND COLOR TEMPERATURE

SYLVANIA UltraLED Dual Selectable RT Downlights are long-lasting, easy to install and reliable. These LED downlights use lighter aluminum housing, which allows for quick and easy installation and delivers optimal performance. The deeper housing also delivers uniform light distribution with less glare. By being able to select the ideal lumen output and color temperature, you can get the best light for your application from one downlight.

This also saves space in your inventory or truck without limiting the options you can offer your customers. The LEDs are ENERGY STAR-listed and CEC-compliant for sale in California. They are Wet Rated, 0-10 volt dimmable and compatible with the SYLVANIA field-installable emergency battery backup unit.

www.ledvanceus.com

➔ SKIRT CONCEALS, PROTECTS FRONT FACE OF SOLAR ARRAY

S-5! has released PVKON-CEAL module skirt for metal roofs. The PVKONCEAL module skirt conceals the front face of the solar PV array, protecting all mechanical and electrical components underneath, as well as creating a clean, finished look. PVKON-CEAL also helps to minimize the intrusion of small animals, debris and unwanted objects under the solar array. PVKONCEAL is made of corrosion-resistant aluminum with a prefinished black high-quality PVDF coating made to last the life of the solar array and the metal roof. The versatile, lightweight solution can be used in two orientations to cover module frames from 30- to 46-millimeters thick.

s-5.com/products/pvkonceal



↑ CHARGE VEHICLES DIRECTLY FROM THE CIRCUIT BREAKER

Atom Power has launched PURPL, an EV charging solution that charges vehicles directly from the circuit breaker and incorporates energy-management technology to keep electricity costs low. These capabilities provide utilities, cities, and property and fleet owners with a dual solution to increase access to EV charging and upgrade electrical infrastructure needed to meet transportation electrification goals. When multiple EV chargers are used for fleets or at multifamily buildings, it increases electricity demand. If the demand exceeds the historic "peak demand", electricity costs increase dramatically. Atom Power's energy-management system can sense demand changes within seconds versus 15-minute gaps for traditional charging solutions. Additionally, because PURPL charges EVs directly from the breaker, the charging station itself does not contain expensive electronics; it's a metal tube or wall box with a charge plug and cable. If a charging pedestal becomes damaged, the cost to replace it is \$400 to \$500.

www.atompower.com



← RAISED FLOOR SYSTEM LIMITS ACCESSIBILITY

Tate Inc. has released Cavity Floor, which is designed for specific applications that require limited or no access to the underfloor area. Like a traditional raised-access floor, Cavity Floor consists of a floor panel supported by adjustable-height pedestals. Instead of the panels resting independently on the understructure pedestals like in a traditional raised-floor application, finish-ready Cavity Floor panels are connected using a tongue-and-groove design. Any desired finish can then be poured or applied on top of the raised floor panels, rendering the underfloor plenum inaccessible. This level solution can reduce screed costs, speed construction and enable the execution of complex

transitions. Limited accessibility to the underfloor plenum will be necessary for routing critical services, like data and power cables, to their desired location. In those scenarios, Hatch Panels can be planned in the floor layout to allow underfloor access as needed but can be strategically placed to limit tampering.

www.tateinc.com/en-us/products/access-floors/cavity-floor-panels

→ MOVABLE GLASS WALLS NOW HAVE SOUND-CONTROL CAPABILITIES

Modernfold Inc. has introduced several additions to its PureView glass movable-wall portfolio. New selections incorporate sound-control capabilities, paired-panel configurations, and versatile FSW-C and FSW-G options. PureView single-panel configurations are fully framed versions with available STC levels of 33, 35 and 37. Meanwhile, paired-panel configurations bring increased operating speed and convenience to straight-line installations. PureView FSW-C and FSW-G configurations employ perpendicular storage. PureView movable glass wall systems include uninterrupted sightlines, daylighting, various glass options, vinyl top and bottom seals, secure interconnecting floor bolts, and a variety of anodized aluminum options and powder coating in more than 170 RAL color options. The line is offered in PureView and PureView Plus, which adds the use of a convertible panel that can be placed anywhere within the wall run to allow for egress.

www.modernfold.com



← DRUM CEILING LIGHT IS MADE BY HAND

Visa Lighting's Riff drum ceiling light takes a popular drum pendant shape and creates a fresh modern interpretation. The simple drum silhouette is created with thin, rolled aluminum. The metal shade is fitted with a contoured inner reflector hand-spun by skilled craftspeople. Riff hangs from the ceiling at the end of a thin power cable, and the wide underside lets a bright and even light layer emanate, illuminating the space below. Rather

than utilize exposed lamping, Riff relies on a flat, acrylic diffuser that sits over the LED sources. Riff's LED diffuser was optimized to reduce glare and create comfortable light. The high-performance downlight pendant is offered in 16-, 24- and 32-inch diameters. Choose between 2700K, 3000K, 3500K or 4000K with a 90CRI option.

www.visalighting.com/featured-riff-drum-pendant-light

→ PANELS ABSORB AND DIFFUSE SOUND

Sound Seal has added S-4200 Tuned Absorber / Diffuser Panels to its Architectural Sound Quality line. The panels, which are suitable for schools, auditoriums, studios and performance halls, are comprised of a fiberglass core that can vary from 1-inch thick up to 4-inches thick along with a perforated 1/8-inch-thick hardboard. The panels are finished in any one of Guilford of Maine's decorative fabrics or an option from Designtex, Maharam, Knoll or a specialty fabric of the customer's choosing. All the standard acoustical wall panel mounting methods can be used with these panels, including impaling clips, Z Clips and Rotofast hardware. The panels are available in standard sizes in 2-foot increments up to 4 by 10 feet with custom-size offerings also available. Customers can choose from four thicknesses and various mounting and color choices.

www.soundseal.com



↘ PREVENT WATER-HEATER SCALE WITHOUT CHEMICALS

Navien Inc. has introduced three chemical-free and environmentally friendly products to refresh its PeakFlow lineup of scale-prevention solutions. PeakFlow S, PeakFlow A and PeakFlow C expand the options made available by Navien to now include point-of-entry and commercial-grade scale prevention. PeakFlow S (standard) is a point-of-use residential solution installed at the cold-water supply line before the water heater to prevent scale buildup within a water-heater system for a flow rate up to 6 gallons per minute. PeakFlow A (advanced) and PeakFlow C (commercial) can be installed at the cold-water line leading into a water-heater system to prevent scale buildup for flow rates up to 10 gpm (PeakFlow A) or 20 gpm (PeakFlow C). PeakFlow A also can be installed as a whole-house point-of-entry system that helps prevent scale for all water flowing through a house. PeakFlow C is designed specifically for commercial water-heating systems that need to prevent scale at larger flow rates.

www.navieninc.com/series/peakflow





← DOOR SLOWS ABILITY TO ENTER LOCKED INTERIOR ROOM

Masonite International Corp. has unveiled its Defendr Door System, which is designed to slow attempts to enter a locked interior room by use of force. It is constructed with an extra heavy-duty core for added strength and Armoured One tactical security glass. Armoured One's security glass is tested using the Shooter Attack Test Method, a method developed by Armoured One and Masonite in consultation with security experts based on the history

of active shooters. A welded steel door frame and ANSI/BHMA Grade 1 hardware are additional critical components of the system. The door system is offered in stained wood veneers, vibrant paint colors and smooth laminate surfaces that complement the aesthetics of any facility. The design options enable architects and designers to seamlessly integrate Defendr into building design while prioritizing safety and security.

masonite.com/defendr

→ PROGRAM, OPERATE AND MONITOR AIR CURTAIN VIA APP

Berner International has added adaptive settings and BACnet compatibility to its Berner AIR to better support client sustainability goals. The Berner AIR is a smart controller and app platform that connects end-users to their commercial doorway air curtains via the internet for programming, operating and monitoring. It boosts energy efficiency by automatically calibrating the airstream performance according to the weather. Berner AIR's onboard Intelliswitch controller reports local weather conditions (via the Berner AIR's internet connection), the doorway temperature (via an onboard sensor) and air curtain model data every 20 minutes to factory servers. Factory-engineered software then uses proprietary algorithms to determine the best volume, velocity and uniformity balance for the given moment and adjusts the fan speed based on current weather. Pinpointing the most energy-efficient of 10 available air curtain fan speeds helps buildings meet energy conservation, sustainability and carbon footprint goals while supporting thermal comfort.

berner.com/advanced-control-technology



← FLEXIBLE STORAGE SOLUTION MEETS NEEDS OF HYBRID WORKPLACES

Hollman Inc. has released its Acoustic Locker Collection, which was developed in collaboration with Gensler. The collection pairs sound-blocking and -absorbing design with smart locking technology from Vecos for a flexible storage solution that meets the needs of today's hybrid workplaces. The lockers have a 0.31 NRC rating. Antimicrobial Nanolam surfacing prevents the growth of mildew and mold. The locker exteriors sport a sharp diagonal pattern; interiors have integrated acoustic panels that double as personal display space. Vecos' smart locking and remote management technology built into every locker provide secure, hassle-free, self-service storage. Badge- and smartphone-based identification and remote management solve the problems of lost keys and forgotten combinations and locker "claiming" behavior, as well as allow easier monitoring and IT integration.

www.hollman.com

↘ PORCELAIN TILE IS CARBON-NEUTRAL

Milestone has pledged to become completely carbon neutral by 2030. As a step toward that commitment, the company has introduced entirely carbon-neutral tile with its Plaster 2.0 collection. The porcelain tile is 100 percent made from inorganic, non-carbon-containing raw materials sourced within a 500-mile radius of the Clarksville, Tenn., factory. The tile design features six bold hues that replicate the artistic layering of venetian plaster. The collection is available in various sizes, including 32 by 32 inches, along with coordinating trim pieces.

www.milestonetiles.com



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MARCH-APRIL 2022

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retrofit

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YESTERDAY
FOR TODAY

WHAT IS YOUR JOB FUNCTION?

- 02 ☐ Architect
03 ☐ Facility Manager
04 ☐ Building Owner
05 ☐ Contractor
06 ☐ Remodeler
10 ☐ Other

WHAT TYPE OF FIRM?

- 02 ☐ Construction
03 ☐ Architectural
04 ☐ Government
05 ☐ Remodeling
10 ☐ Other

HOW MANY EMPLOYEES IN YOUR FIRM?

- 01 ☐ 1-10
02 ☐ 11-20
03 ☐ 21-30
04 ☐ 31-50
05 ☐ 51-75
06 ☐ 76 or more

FIRM'S ANNUAL DOLLAR VOLUME:

- 01 ☐ Less than 1 million
02 ☐ 1-2 million
03 ☐ 2-4 million
04 ☐ 4 million plus

FOR MORE INFORMATION BY PRODUCT CATEGORY:

- 235 ☐ Building Controls
236 ☐ Retrofit Roofing
237 ☐ Retrofit Walls
238 ☐ Insulation
239 ☐ Mechanical Systems, HVAC
240 ☐ Electrical/Lighting
241 ☐ Flooring
242 ☐ Water Management
243 ☐ Solar
244 ☐ Windows/Doors
245 ☐ Clips/Attachments
246 ☐ Fasteners
247 ☐ Tools and Equipment
248 ☐ Paints/Coatings
249 ☐ Glass
250 ☐ Concrete
251 ☐ Snow Retention
252 ☐ Curbs, Vents, Gutters
253 ☐ Window Treatments

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HALF OF ALL COMMERCIAL BUILDINGS WERE CONSTRUCTED BEFORE 1980; THE MEDIAN AGE OF BUILDINGS IN 2012 WAS 32 YEARS. —CBECs 2012, U.S. Energy Information Administration

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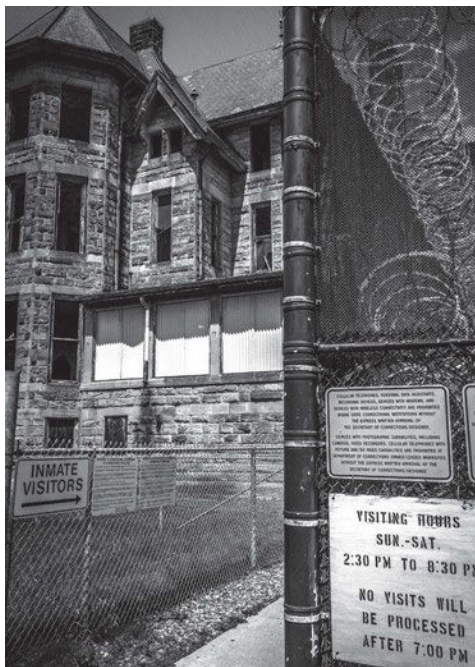
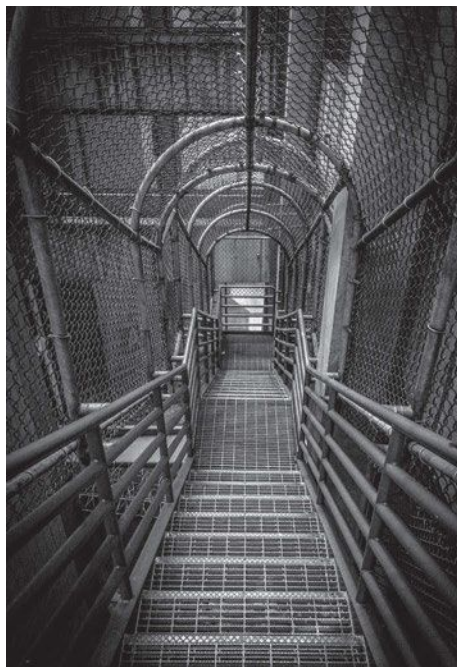
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GHOSTS OF PRISONERS PAST



CONTENT AND PHOTOS: ABANDONED PITTSBURGH, ABANDONEDPITTSBURGH.COM

Pittsburgh's State Correctional Institution—commonly known as Western Penitentiary or Western Pen—was built in 1826. It was relocated in 1882 to this building on the Ohio River. This prison contained 1,280 cells across five levels in two wings.

It reportedly was the first prison to feature gang locks, electric lights, running water, steam heat and a toilet in each cell.

The prison held maximum-security inmates in its early years; later, it hosted inmates who required treatment for substance

abuse. Western Pen closed in May 2017.

Students from Carnegie Mellon University recently used these photos and others taken by the photographer for a senior project in which they considered new uses for the site. [f](#)

PROJECT The Post – Retail
Retrofit of USPS Processing
Center, Waltham, MA

DESIGN Paul Finger
Associates

PRODUCT Plank and
Rectangles in Umbriano™
and Smooth Premier finish

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