january-february 2022 // retrofitmagazine.com

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2021 retrofit TOP 25 PRODUCTS

9 to 5: A Former Pen Factory Is Transformed into a Home-like Office + More Office Facilities

TREND ALERT: lessons learned from the surfside condo collapse

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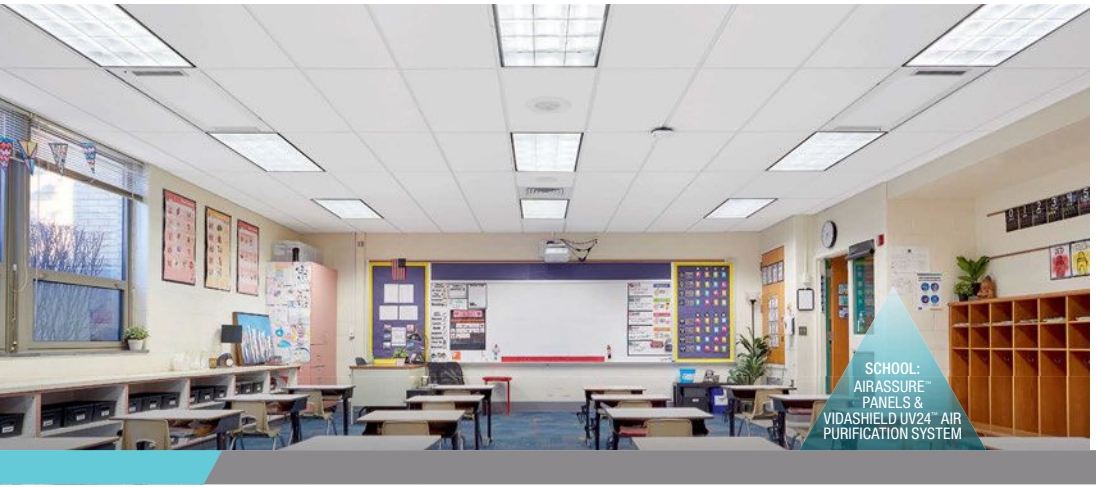
HOSPITAL: AIRASSURE™ PANELS & VIDASHIELD UV24™ AIR PURIFICATION SYSTEM

CONTROL ROOM: AIRASSURE™ PANELS & VIDASHIELD UV24™ AIR PURIFICATION SYSTEM



SCHOOL: AIRASSURE™ PANELS & VIDASHIELD UV24™ AIR PURIFICATION SYSTEM

24

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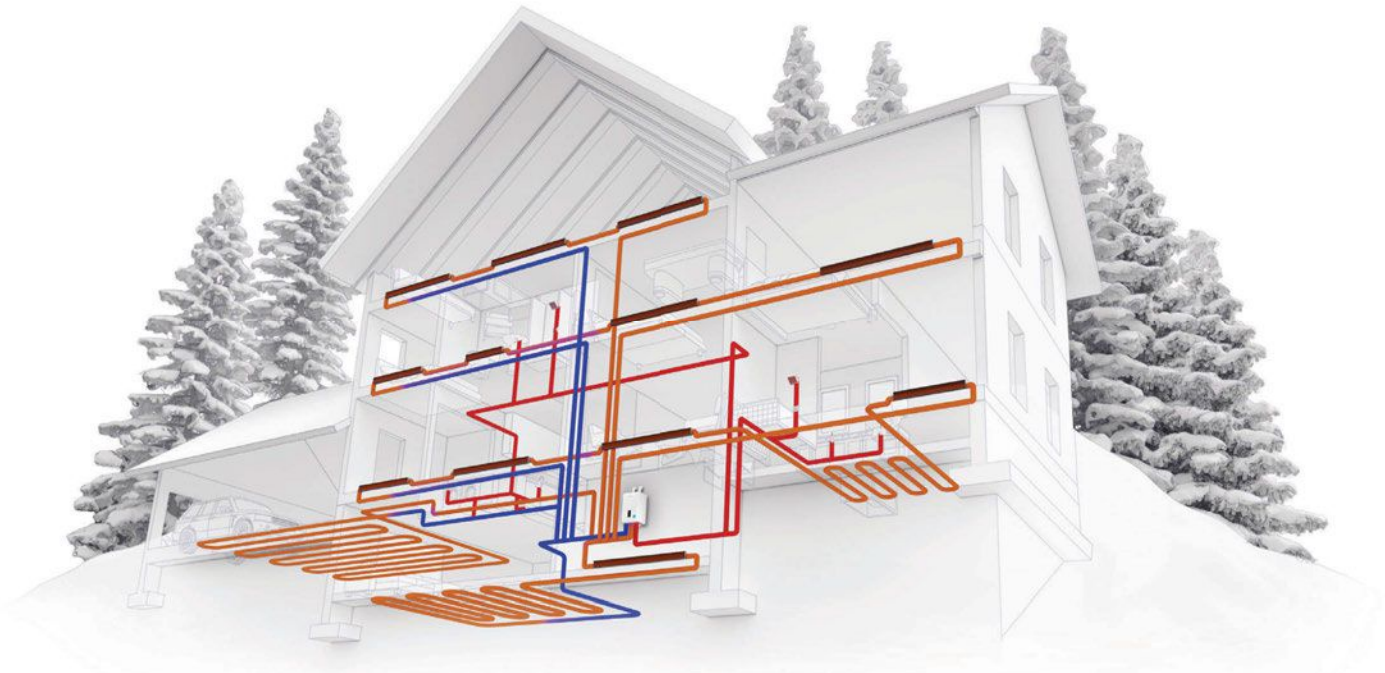

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Whimsical Roofline

Vibrant Dynamic Blue Snap-Clad metal panels brighten the playful roof shapes and walls of two interior courtyards, invigorating this mixed-use building that houses a Chicago Public Library, childcare center and community meeting space.

Altgeld Family Resource Center, Chicago Installing contractor: Progressive Dynamics Architect: KOO LLC
Owner: Chicago Housing Authority Photo: hortonphotoinc.com

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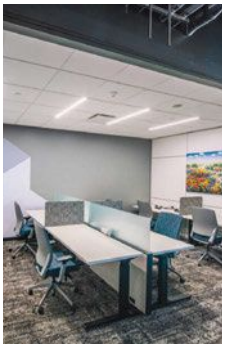
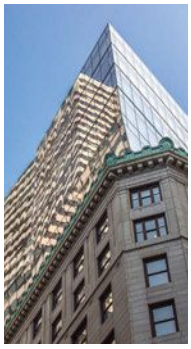
feature projects

A PRESCRIPTION FOR HEALTHY WORK

A California pen factory is transformed into a home-like office for GoodRx.

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PERUSE OFFICE PROJECTS FROM ACROSS NORTH AMERICA:

- O'Hare International Center, Rosemont, Ill.
- Ceridian Canada Ltd., Winnipeg, Manitoba, Canada
- Whitney Architects, Chicago
- Factory LLC, Bethlehem, Pa.
- Congress Square, Boston
- Cedars-Sinai Biomanufacturing Center, West Hollywood, Calif.
- One Broadway Lobby, Cambridge, Mass.
- 191 N. Chester, Birmingham, Mich.
- Bulletin Building, Schuylkill Yards, Philadelphia
- RIOS, Los Angeles

cover

COVER PHOTO: **JASPER SANIDAD**

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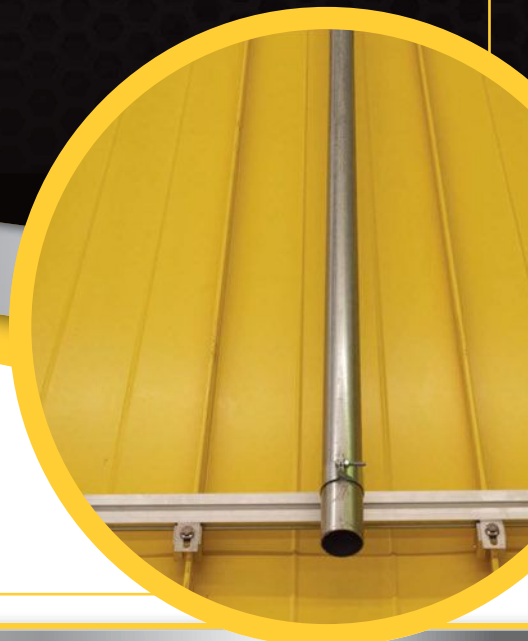

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CONDO MAINTENANCE

If you read this column regularly, you may recall that two years ago I sold my condo in Chicago. Before the sale was final, I had to ask my condo board to write a letter to the prospective buyers stating that reserves were available to pay for deferred maintenance on the building. Ultimately, the letter said the new buyers wouldn't be on the hook, so to speak, for the repairs. Some of the repairs were minor but there was one issue that had the potential to be catastrophic.

Why weren't these maintenance issues resolved in the seven years I lived in the building? From my perspective, my former building's all-volunteer condo board completed only the bare minimum of tasks between meetings. The board also was practically stunted by its desire to follow "protocol". For example, as a concerned owner who was experiencing water leaks in my unit, I called a friend in the roofing industry to inspect our building's roof. I figured my construction industry contacts would be a bonus to the board and our building. When I reported to the board what I had learned from the roof inspection, I was admonished for not following proper protocol; it didn't matter that the inspection was done as a favor to me and didn't dip into our reserves at all. I never offered to help the board again. And I wasn't the only one who avoided dealing with the condo board. When my neighbors spoke up at meetings about concerns related to the building, they were often met with uninterested, and sometimes hostile, responses. Many owners stopped attending board meetings and when meeting minutes were no longer distributed regularly, it was just easier not to request them—rather than deal with the wrath of the board secretary.

When the Champlain Towers South—a 12-story condo building in the Miami suburb of Surfside, Fla.—partially collapsed, killing 98 people, in June 2021, I couldn't help but think of my former condo building. I wondered if Champlain Towers' condo board operated similarly to my former building's board. While reading this issue's "Trend Alert", page 78, I realized it's likely most if not all condo boards have problems.

" … the role of condo associations in governance, building maintenance and code compliance of large structures needs to be assessed," says Jared Blum, Washington counsel for the EPDM Roofing Association, in the article. "While condo owners are usually well meaning, it is clear that the financial reserve requirements for maintaining a multifamily residential structure and the expertise of people tasked with running that structure needs further regulation."

It's possible everyone in the building industry will be impacted by what happened to Champlain Towers South. As pointed out in "Trend Alert" by Nathan M. Gillette, AIA, LEED AP O+M, CEM, director of Natura Architectural Consulting in Grand Rapids, Mich., as well as a ***retrofit*** editorial advisor, codes often evolve in a reactionary fashion.

In fact, after the Surfside collapse, the International Code Council, National Institute of Building Sciences, and Building Owners and Managers Association International held a panel discussion about existing buildings maintenance and inspections specific to Florida. ICC intends to continue these discussions nationally and globally to develop a resource that can be used with the International Property Maintenance Code and be adapted by different jurisdictions.

As we await to see whether any mandates come out of the Surfside collapse, I truly hope the board of my former building was finally motivated to fix the issues on their building.

Christina Koch

CHRISTINA KOCH
Associate Publisher/Editorial Director
retrofit

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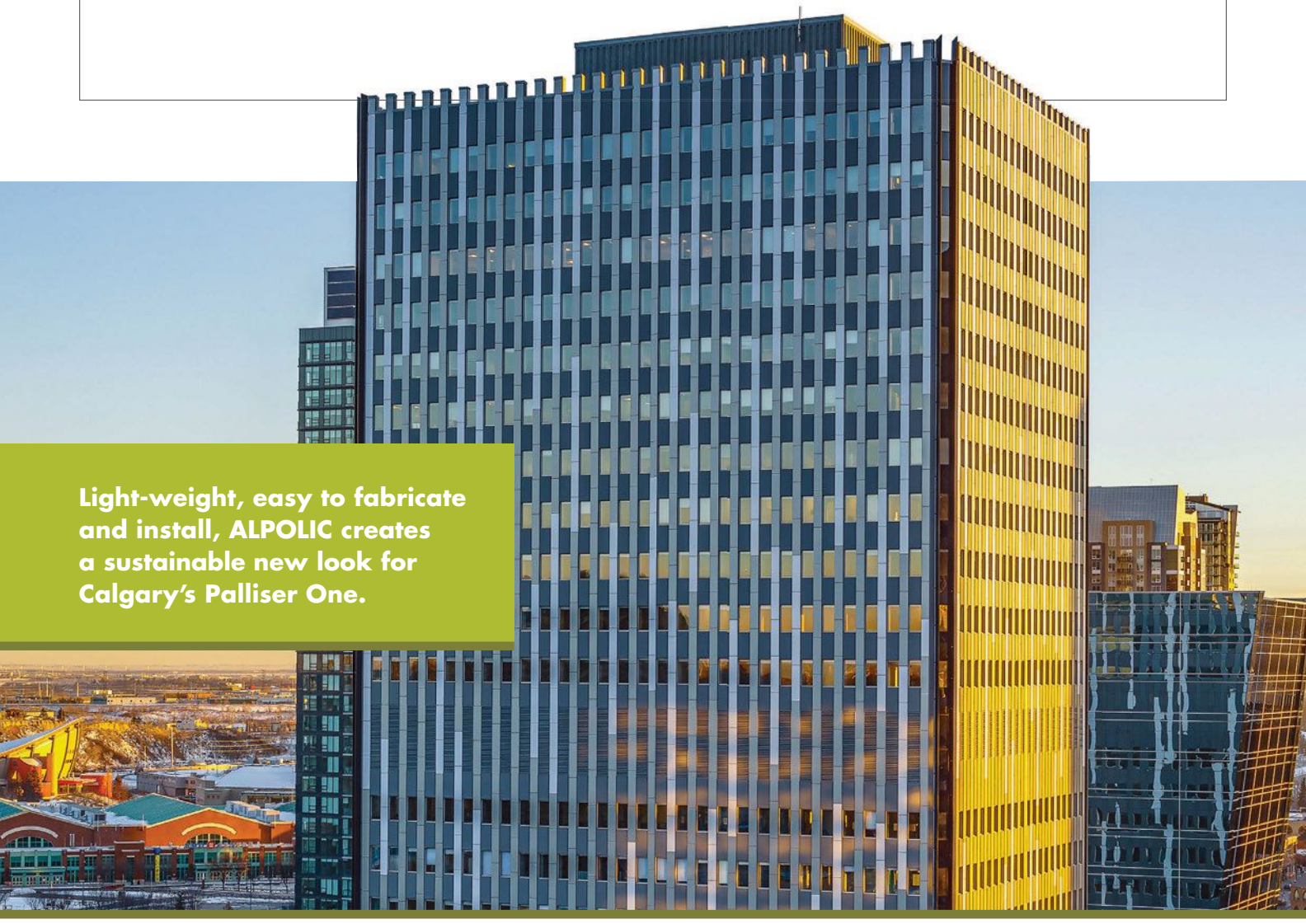

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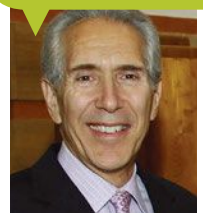

Jared Blum is Washington counsel for the EPDM Roofing Association. He has followed the path of the Infrastructure Investment and Jobs Act as it moved through the legislative process and has intense interest in what happens next. Blum outlines how the law may affect the construction industry in "Guidance", page 30, and shares information about funds available now to support retrofit work that ultimately can be combined with new funding from the infrastructure legislation.

Brent Zeigler, AIA, IIDA, is president of Dyer Brown Architects. As a licensed architect and an NCIDQ-certified interior designer, Ziegler comments about how COVID-19 has affected and will continue to affect the ability to lease Class-A office space. He also suggests strategies that may help boost value of vacant spaces in "Business", page 32.

Nhan Nguyen is senior vice president of Clune Construction. With 22 years of construction industry experience, Nguyen has a track record of leading successful projects for high-profile clients throughout Southern California. Within his portfolio is the GoodRx office, built inside 76,000 square feet of the existing Pen Factory in Santa Monica, Calif. Read about how the design and construction team created an eclectic personal family room that meets the needs of GoodRx's growing staff in our "Cover Story", page 36.

Jeffrey Landau is director of Business Development & Partnerships for Agritecture, an advisory firm for urban and controlled-environment agriculture. In "Component", page 60, Landau outlines 10 benefits of creating a rooftop farm.

PHOTO: SUZANNE ITZKO PHOTOGRAPHY

Benedict Dubbs, AIA, LEED AP, president of Murray Associates Architects P.C., is passionate about new sustainable spaces, adaptive reuse and diminishing urban sprawl. As such, he writes in "Transformation", page 68, about the Pennsylvania Housing Finance Agency's expansion efforts that included saving a deteriorating historic building and building a new addition to Passive House and LEED Platinum standards—all while keeping the agency in downtown Harrisburg.

A Tyson Foods redevelopment in Springdale, Ark., bridges a family legacy with civic revitalization and historic preservation with modern, sustainable design. **KJ Fields**, a Portland, Ore.-based ***retrofit*** contributor, describes in "Historic", page 72, how HOK reclaimed two original buildings and incorporated two new ones along with an atrium for Tyson Foods' Innovation Technology employees.

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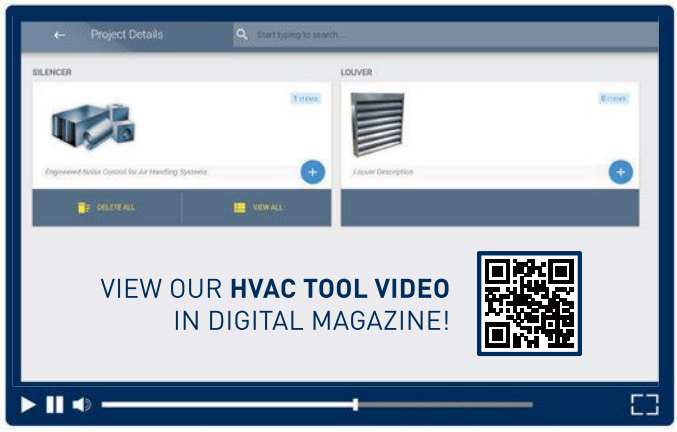

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2021 retrofit TOP 25 PRODUCTS

Products are an integral part of any trade publication. As such, ***retrofit*** is celebrating the 25 products that received the most reader clicks on our website from October 2020 through October 2021. During that time, ***retrofit***'s staff posted approximately 700 products to the magazine's website, so the Top 25 are standouts.

"We consider ***retrofit*** a source for our readers to find innovative solutions and products for their own retrofit projects," says Publisher John Riester. "The Top 25 Products special in our January-February issue is a great resource to our readers, showcasing the products readers' peers thought were most interesting within the pages of ***retrofit*** and on our website."

In addition, at the prompting of our editorial advisory board, we asked the manufacturers to share case studies about how their top products solved a problem or achieved the desired result within a retrofit. Although many manufacturers' products are fairly new, a few manufacturers were able to share actual retrofit projects in which their top products were specified.

Enjoy ***retrofit***'s ninth-annual Top 25 Products!

1 STREET AND PUBLIC AREA LUMINAIRES ARE REMINISCENT OF EUROPEAN LANTERNS

Sun Valley Lighting has introduced its classically styled Marbella LED luminaire for street and public area lighting. The fixture is offered in three models: post top, arm mount and wall mount, all featuring graceful, curving details reminiscent of traditional European lanterns. Marbella fixtures are available in three sizes that feature consistent styling and optics across the family line. Three diffusers and nine distribution patterns are available; diffusers include lens free, clear-patterned acrylic lens and white acrylic lens. The luminaire is available in three LED packages: 20, 36 and 48 LEDs with CCTs that range from 3000K to 5000K, along with amber.

usaltg.com/Marbella.html

2 IMPROVE COMMUNICATION BETWEEN JOB-SITE CREW AND SUPPORT TEAM

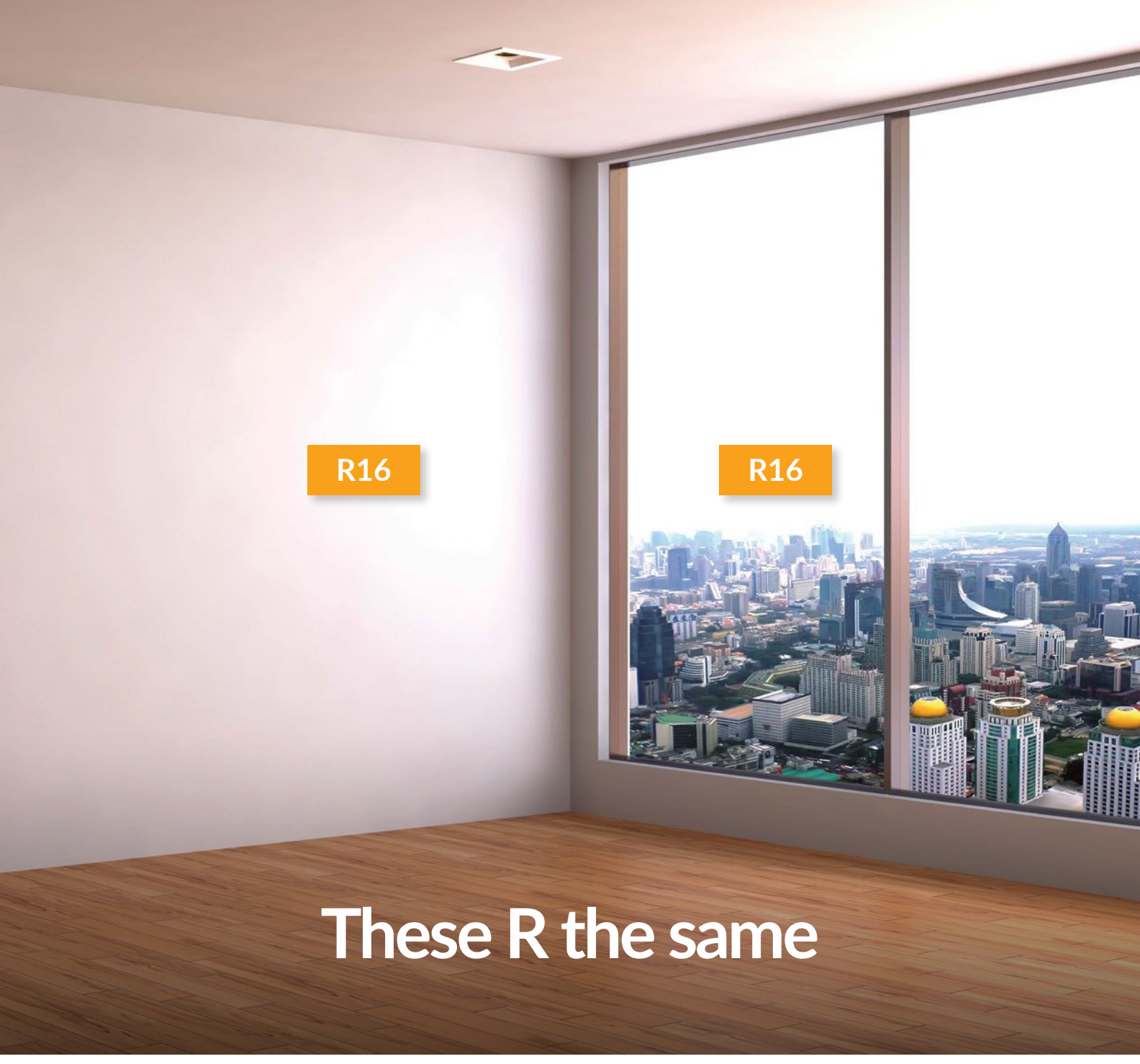
FaciliBuild HUB is a virtual project communication and reporting tool that connects all users on the job site together with all personnel in the office to communicate important project information. The free version is available for individual users on their smartphones, laptops and tablets. After setup, users can build projects; create, assign, and share issues and RFIs; respond to checklists; and invite other teammates to work in the platform. FaciliBuild was founded in 2013 with the vision to revolutionize the commercial construction process throughout a building's life cycle—from concept to final build and beyond.

www.facilibuildhub.com

3 BLOWING MACHINE CAN BE USED WITH FIBERGLASS AND CELLULOSE INSULATION

CertainTeed Machine Works has introduced the BOLT 3 Insulation Blowing Machine, a portable, high-capacity, electric insulation blower capable of quickly tackling fiberglass and cellulose installations. With a 25-cubic-foot hopper, 66 percent more loading capacity than most mid-size commercial insulation blowers, and a powerful blow rate (24-pounds-per-minute for cellulose and 14-pounds-per-minute for fiberglass), BOLT 3 is capable of handling tough jobs, yet slender enough to clear a standard 36-inch doorway. Heavy-duty rotating wheels, lockable casters, and welded steel construction make the BOLT 3 durable and easy to transport between job sites. BOLT 3 includes wireless remote-control options, safety features, and chain and sprocket guards.

bit.ly/3Ga71GU



Get wall-like R-values — with the aesthetic and daylighting benefits of glass.
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4 MANUFACTURED STONE VENEER IS AVAILABLE IN COOL GRAY HUE

Dutch Quality Stone is adding to its wide selection of traditionally crafted manufactured stone veneer products with the debut of the Quail Gray color palette. Featured on the Ledgestone and Weather Ledge profiles, Quail Gray is a contemporary cool gray hue that blends elements of ash and charcoal with light, bright ivory highlights. The Ledgestone profile from Dutch Quality Stone is heavily textured and Quail Gray presents a softer side of the palette, with lighter notes of gray and silver throughout. Weather Ledge is defined by a distressed, aged surface; the ashen tones of Quail Gray are brought to the forefront alongside veins of light gray and cream in the profile.

dutchqualitystone.com

5 STAINLESS-STEEL RAILING OFFERS SAME PROFILE AS CABLE RAILING WITH MORE STRENGTH

Designed for exterior and interior use, Viewrail Onyx Rod Railing preserves the view and uninterrupted air ventilation while providing protection and security. Onyx Rods match Onyx posts, handrail and associated installation hardware to create an integrated railing system. Available hardware includes anchors, tension receivers, angled washers and end kits. The railing is available in 4-, 6-, 8-, 10- and 12-foot lengths. Because it's rigid, it's faster and easier to install than cable. Each rod is 1/4 inch in diameter and won't sag or deform. Viewrail Onyx Stainless Steel Rods are made from 2205 ultra-marine-grade stainless steel.

www.viewrail.com/rod-railing/onyx-rod-railing-system

6 THIN INSULATION PROVIDES HIGH R-VALUE

Kingspan Insulation has debuted OPTIM-R next-generation insulation for roof systems. The insulation comprises rigid vacuum insulation panels with a microporous core, which is evacuated, encased and sealed in a thin, gas-tight envelope. The high level of thermal efficiency—up to R-28 on 1 inch and R-57 on 2 inches using calculated edge thermal-resistance properties—combined with minimal thickness, provides a solution for applications where a lack of construction space or depth is an issue. OPTIM-R can meet increasingly stringent energy codes without the conflicts of tight egresses and access points, as well as railing and HVAC systems, that thicker, low R-value insulations can run into.

www.kingspan.com/us/en-us/about-kingspan/kingspan-insulation

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7 UNIT SIMPLIFIES INSTALLATION OF AIR-TO-WATER HEAT PUMP

Enertech has released the Advantage air-to-water heat pump. The Advantage simplifies and makes radiant, in-floor heating, up to 100 percent of domestic hot water, and forced air heating and cooling functionality easily accessible for HVAC contractors and end-users. The Advantage incorporates all of the necessary pieces, factory-installed, within the indoor and outdoor module in a monobloc design. The unit provides more than 40 percent savings on operation when compared to traditional air-source systems and over 60 percent compared to propane and fuel oil systems. Even at freezing (32 F), the Advantage can operate at a 4 COP.

enertechusa.com

The Garrison family has always been interested in renewable technology and, therefore, was eager to install the new Advantage air-to-water heat pump along with a solar PV roof array. With 40 percent savings on operation compared to traditional air-source systems, along with no refrigerant lines outside the home and efficiencies down to -13 F, the Advantage heat pump is the turnkey solution to modern heating, cooling and hot water needs. This family is set for the future of electrification, $0 monthly utility bills (through the coupling of the solar array), and long-term dependability and sustainability year-round. This system uses two units: one is inside the home and the other is outside. It contains no ground loops and uses no fossil fuels. The unit is integrated with vapor-injection technology, connected controls and cloud-based system monitoring.

8 WINDOW FIBERGLASS SHOWCASES STRENGTH IN ASTM TENSILE AND BEND TESTS

Pella Impervia Fiberglass has displayed superior strength over wood, vinyl, aluminum, wood/plastic composites and other fiberglass materials used by leading national brands in tensile and three-point bend tests performed in accordance with ASTM D638 and D790 testing standards. Pella's fiberglass material achieves commercial-grade strength and is engineered for resistance to water, wind and outside noise. On average, Pella Impervia Fiberglass was 1.8-times stronger than conventional fiberglass (tensile testing performance based on testing seven samples of each material using ASTM D638 test methodology), had two-times the tensile strength of aluminum and was two-times stronger than aluminum in a bend test (three-point bend testing performance based on testing seven samples of each material using ASTM D790 test methodology).

www.pella.com/ideas/windows/pella-impervia

Located in the heart of Oklahoma, the Ash Street Place Assisted Living Community is subjected to warm temperatures throughout the year. Tenants were too warm in the building and cooling costs were too high. Although the old windows had air-conditioning units, the units struggled to keep up with the heat.

As the building owner began his search for new windows for his commercial building, he had a few goals in mind:

- Excellent energy efficiency.
- Ability to keep residents, including his mom, comfortable.
- Flexible sizing (new windows had to accommodate air-conditioning units).
- More modern color to update the exterior.

To help the building owner create a more comfortable space, energy-efficient Pella Impervia Fiberglass windows with SunDefense low-e glazing were used. The SunDefense glazing helps reflect heat away from the building to keep it more comfortable. These new windows were installed with a P-tack system, where the window frame opens without a sash to allow for air-conditioning units. The strength and lasting durability of Pella Impervia Fiberglass windows, combined with a modern black finish, completely refreshed the assisted living building's façade.

9 ACOUSTIC LUMINAIRE FEATURES INSERT FOR ADDITIONAL SOUND ABSORPTION

A-Light has expanded its Absorb family of acoustic luminaires with the introduction of its Absorb I fixture. The luminaire is available with uplight, downlight or both. The vertical acoustic panels feature a distinctive flanged design. A special insert within the structure, unique to Absorb I, provides additional sound absorption in a space. Available in 2- and 4-foot lengths, Absorb I can create unique shapes by connecting fixtures at different angles. Fixtures can be combined with a discreet joiner system hidden within the luminaire's felt for seamless designs. Continuous runs, squares or rectangles can be created using 90- or 180-degree angle joiners.

absorbi.alights.com

10 NON-CONDENSING GAS FURNACE IS EASY TO INSTALL

Allied Air Enterprises has expanded its gas furnace offering with the Ducane, Concord and Allied 80G2E 80% Two-Stage Constant Torque (CT) gas furnace with easy-to-sell benefits and providing a smoother progression from entry-level single-stage product to two-stage true variable speed furnaces. The furnace is built for easy installation, serviceability and consistent temperatures while using less energy. With multiple configurations and built-in technology, the two-stage gas furnace offers dependable performance and supports independent wholesale distributors' over-the-counter business. The product features a constant torque ECM blower motor that helps produce consistent airflow and even temperatures, and its two-stage gas valve adjusts heat output.

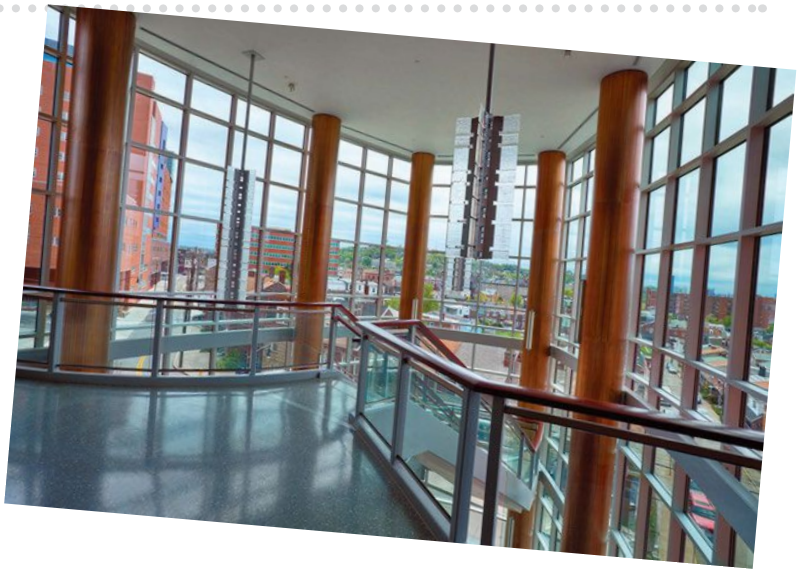
alliedair.com

11 OVERSIZED GLASS PRODUCT MEETS DEMAND FOR LARGE SPANS OF EXTERIOR IGUS

Vitro Architectural Glass (formerly PPG Glass) has launched *Titan* glass, an oversized glass product for large-scale exterior insulating glass units (IGUs). *Titan* glass is available with a wide range of Vitro high-performance magnetron sputtered vacuum deposition (MSVD) coatings to optimize performance and aesthetics. Titan glass products are 130 by 240 inches, an increase from the maximum size of 130 by 204 inches previously available. Available initially in heavy thicknesses of 8 and 10 millimeters, *Titan* glass can be manufactured with *Solarban* 60, 70, 72, 90 or R100 glass coatings for added solar control and clear, *Acuity* or *Starphire* glass substrates.

VIEW A VIDEO

www.vitroglazings.com



12 SEALANT PROVIDES ADHESION ON METAL, FLEXIBLE DUCTS AND OTHER HVAC APPLIANCES

Red Devil's D-Seal Water-Based Duct Sealant, which is designed for use in conjunction with metal fasteners, is suitable for all types of HVAC duct systems, including metal ductwork, fiberglass and duct board. Suited for commercial HVAC applications, D-Seal is specially formulated for permanent flexibility and adhesion. It has excellent water-resistance and sealing strength, exceeding all SMACNA Pressure & Sealing Classes and is UL 181A-M and B-M approved. Designed for indoor and outdoor use, D-Seal features a fast-dry time on high, medium and low-pressure systems, as well as UV, mold and mildew resistance and low VOCs.

www.reddevil.com

13 TAKE FULL CONTROL OF SEASONAL ILLUMINATION

American Lighting has added a seasonal product line by Twinkly Pro to its product assortment. As a Twinkly partner, American Lighting offers its established distribution lines and hands-on, full-service approach to assist with layouts and ensure seamless installation of the new Twinkly Pro products. Twinkly Pro offers an intuitive and scalable process to streamline complex installations and provide unlimited creative possibilities. Users can enjoy the advanced capabilities of the Twinkly app to help map LED bulb positions and wrap any desired shape, then apply effects with pixel-perfect precision. The innovative mapping functionality combines various views of an installation to create a virtual layout and precisely control an entire display of lights as one single object.

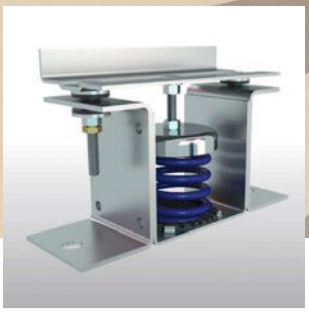
americanlighting.com/twinklypro

14 XPS MEETS NEW ENVIRONMENTAL REGULATIONS FOR GLOBAL WARMING POTENTIAL

On Jan. 1, 2021, Canada and several U.S. states enacted stringent environmental regulations to address concerns about high-Global Warming Potential (GWP) hydrofluorocarbon (HFC) blowing agents. FOAMULAR NGX (Next Generation Extruded) insulation, developed by Owens Corning, is extruded polystyrene (XPS) insulation that contains a proprietary blowing agent, eliminating HFC 134a. FOAMULAR NGX delivers a 90 percent reduction in blowing-agent GWP compared to legacy FOAMULAR insulation and is optimized to demonstrate a greater than 80 percent reduction in embodied carbon. In developing the insulation, research and development teams sought to reduce the blowing agent's GWP without sacrificing the material's high R-value per inch, wide range of compressive strengths, moisture resistance and durability.

www.owenscorning.com/en-us/insulation/commercial/foamular-ngx

KINETICS COMPACT **SPRING ISOLATOR**



Kinetics KCI ASHRAE Type 4 Spring Isolators are compact, lightweight, restrained, spring isolators. A plated steel assembly limits lateral and vertical movement of the supported equipment during an earthquake or wind storm. An angle top plate or threaded bolt option are available for equipment attachment.

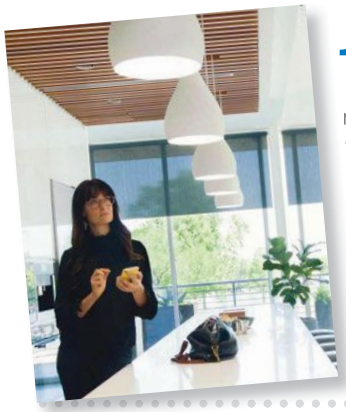
KCI is recommended for restrained isolation of small to medium sized pieces of mechanical equipment near critically quiet areas when there is also need for Wind or Seismic restraint. Can also be used with strut to isolate equipment farms.

AHR EXPO LAS VEGAS JAN 31 - FEB 2, 2022

VISIT KINETICS
AT BOOTH #C2420

kineticsnoise.com | A CATALYST ACOUSTICS GROUP COMPANY

KINETICS Noise Control®



15 ADAPT LIGHTING AS BUILDING NEEDS EVOLVE

Athena is a simple, flexible, all-in-one solution from Lutron that elevates everyday moments with the magic of light. Its enhancements deliver new ways for designers to realize their visions and access even more tools to create dynamic, agile environments that adapt as building needs evolve. The Athena enhancements include new categories of control, including the ability to handle any fixture, any load type, any control technology from one centralized place. An upgraded app now includes a "Places" feature that enables lighting designers to manage multiple projects at once and offer remote support and quick fixes, without visiting the project site. Ketra's new Lightbar Slim is a sleek, low-voltage, modular luminaire that extends Ketra light to more architectural conditions—designed to seamlessly blend under shelving, inside toe-kicks, along small coves and any other small spaces.

bit.ly/3rx3aQo

16 ASPHALT SHINGLES ARE DESIGNED TO WITHSTAND HIGH WINDS, HAIL

In the world of asphalt shingles, manufacturers like IKO are developing robust products, such as the Nordic line of performance laminate asphalt shingles, to address some of the most challenging conditions that a building may face. Armed with a layer of polymer-modified asphalt designed to withstand potential damage from hail, IKO's Nordic shingles have earned the highest marks in industry testing, including a Class 4 Impact Resistance Rating on the four-level ANSI/FM 4473 scale. And their UV-resistant granules ensure the roof can stand up in any weather conditions, no matter the season. IKO's ArmourZone nailing area and FastLock sealant are engineered to help Nordic shingles resist the force of 130-mph winds, reducing the risk of shingles getting damaged or blown off when high-wind storms strike.

www.iko.com/na/residential-roofing-shingles/performance/nordic

17 BOILER IS SUITABLE FOR MULTI-ZONE AND COMBI RESIDENTIAL APPLICATIONS

Weil-McLain's ECO Tec boiler meets nearly all residential application needs. It features a long-lasting fire tube heat exchanger and is available in combi versions with response time and domestic hot water (DHW) output designed to meet the demanding needs of residential replacement applications. ECO Tec is easy to install, use and service, and operates whisper quietly. It is available in four heat-only sizes ranging from 80 to 199 MBH. The combi versions are available in three sizes—110, 150 and 199 MBH—with hot water output up to 5.4 gallons per minute and features Weil-McLain's advanced ECO BOOST technology to provide rapid DHW response. ECO Tec also includes built-in zone control, connects up to four thermostat inputs, and features an easy-to-use setup wizard and heating system presets.

www.weil-mclain.com/eco-tec

Michael Bartholomay-Berreth, the owner of a 107-year-old home in Fargo, N.D., sought an advanced hydronic heating solution for a major basement finishing project and to alleviate his existing heating woes on the first and second floors of the 2,700-square-foot, two-story Craftsman.

"Upon inspection, the heating system consisted of a very old boiler and an old gravity system with pipes hanging below the ceiling and 2 1/2-inch lines connected to the boiler," says John Robinson of Esser Aire Serv Plumbing & Heating. "With limited space for the boiler replacement, the homeowner sought a single boiler solution to heat the basement's new radiant floors and provide multi-zone capability for the main- and second-floor radiators."

After careful review, Robinson recommended installing a Weil-McLain brand high-efficiency ECO Tec 150 MBH gas boiler featuring powerful, intuitive controls and built-in zone control designed to provide targeted, abundant heat for all levels of the home.

With the radiant heat and the new concrete flooring installed in the basement, the team connected the radiant flooring and all the existing cast-iron hot water radiators on the upper levels of the home to the new ECO Tec boiler. The team also installed an indirect tank for hot water—also powered by the ECO Tec boiler.

"I've been monitoring the boiler to see how the system works and to use the cool touchscreen," Bartholomay-Berreth says. "I like to see which zones are receiving heat at any given time to learn more about how it works. The unit is pretty slick. Its intelligent boiler control is able to supply higher temperatures to the radiators and water heater for them to operate as designed and a lower temperature to the radiant floor system for a warm even heat."

Most importantly, the house is warmer and more comfortable. "This is a special house that has been around a long time," Bartholomay-Berreth notes. "And our new boiler system lets us appreciate and enjoy it that much more."

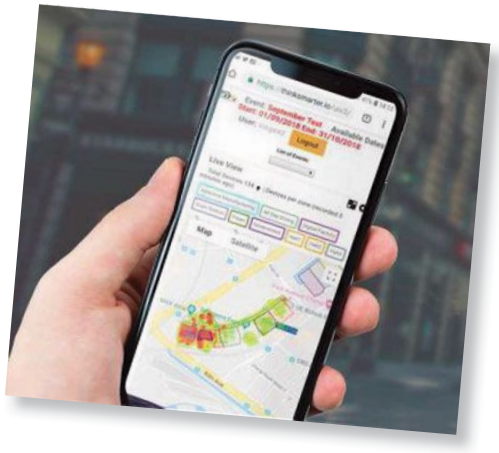
PHOTO: WEIL-MCLAIN

18 BOOKMATCH SLABS OF QUARTZ

Cambria has introduced bookmatching—the use of two mirror-image Cambria slabs, set side by side on the same surface like the pages of an open book. Available in nine 1-centimeter designs in Cambria Matte and high-gloss finishes, Cambria's bookmatching technique elevates commercial and residential applications, such as wall cladding, shower and fireplace surrounds, backsplashes and islands. Convenient pre-matched slabs and precise vein matching enable stunning visual effects. The bookmatching technique is bold, transforms any space, and has a pleasingly symmetrical effect making the grain stand out and the space feel custom and elevated. Bookmatched slabs are available to order with an estimated 14-day lead time, depending on the order. The bookmatched slabs must be purchased in quantities of two and are available in jumbo slabs only.

cambriausa.com

19 CROWD ALERT TOOL MANAGES SAFE SOCIAL DISTANCING



GlobalReach Technology has launched a tool to help manage safe social distancing as offices and venues reopen. Crowd Insights uses existing public Wi-Fi networks to collect anonymous location, volume and movement data, even without user authentication. Pre-set limits identify crowding, triggering alerts to help the venue proactively manage social distancing and keep customers and staff safe. Alerts, real-time and historic reports are delivered through the Crowd Insights dashboard. The information can also be shown on digital displays for citizens, customers, passengers and others to take their own action.

globalreachtech.com

20 EMERGENCY AND EXIT LIGHTS INCLUDE SELF DIAGNOSTIC TESTING CAPABILITY

Nora Lighting's Wet Location Emergency and Exit Lights feature three updated models that all include self-diagnostic testing, manual test switch, 90-minute backup battery, and brownout and short circuit protection. The fixtures have impact-resistant polycarbonate housings with flame-retardant/wet-location ratings and are designed for egress lighting where non-corrosive splashing and dripping may occur. The lights are UL-listed and meet or exceed UL 924, NFPA 70 and NFPA 101 Life Safety Code. They include Dual Head Emergency (NE-970) with two 2.5W fully adjustable LED emergency heads; LED Exit and Emergency Combination (NEX-720-LED) with dual 3.2W adjustable heads and exit sign; and LED Exit Sign (NX-617-LED) with red or green letters and optional cold weather heater.

noralighting.com

21 HID REPLACEMENT SERIES FEATURES WATTAGE AND COLOR SELECTABLE SWITCHES

EarthTronics has introduced its LED High Lumen Wattage & Color Selectable Series to provide flexibility and full radial illumination to ensure correct light levels for internal and external applications. Each lamp in the series delivers 150 lumens per watt to easily replace up to a 400-watt HID lamp on a Mogul EX39 base for a wide range of applications, such as barns, basements, bathrooms, stairways, storage areas and security applications. Available with a 4000K and 5000K color select switch, EarthTronics offers 42- and 60-watt, 56- and 80-watt, and 70- and 100-watt selectable switch units that can be set at the time of installation. The 42/60-watt selectable HID replacement produces 6300 and 9000 lumens, while the 56/80-watt selectable unit delivers 8400 and 12000 lumens. The 70/100-watt selectable unit provides 10500 and 15000 lumens.

www.earthtronics.com/hid-5-18

22 INDUSTRIAL WOOD COATINGS CENTER ON SOOTHING COLOR PALETTES

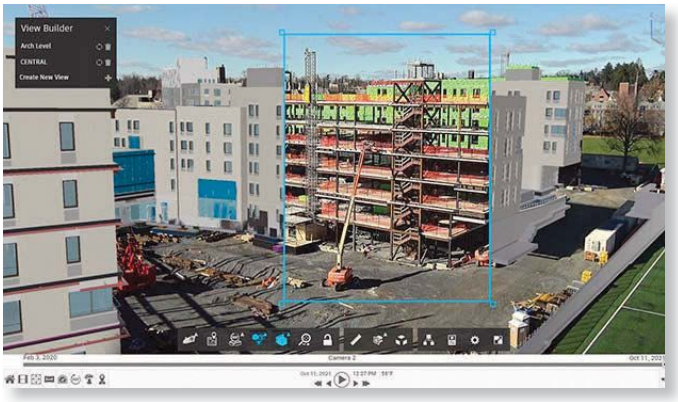
Axalta has introduced Wood Vibes: Blossom, the 2022 edition of its Industrial Wood Coatings color trends campaign, which focuses on home interior color trends, including wood finishing trends. The collection is inspired by nature, centering on soft, neutral and soothing color palettes that will induce the feeling of comfort and wellbeing. Wood Vibes: Blossom is inspired by the restorative power of horticulture. As people long for comfort and healing, research has proven that flowers and plants have a positive impact on wellbeing. Using specific hues of flowers invites good vibes into a home. The color palette includes White Magnolia, Thistle Beige, Heather Brown, Lavender Bush, Blue Hydrangea, Green Cactus, Gray Santolina and Black Rose.

www.axalta.com/wood_us/en_US.html

23 INTERIOR DOOR LATCH IS MAGNETIC

INOX has introduced the TL7 Magnetic Tubular Latch, the industry's first magnetic latch for interior doors. The new hardware solution uses magnetism to latch the door rather than an old-fashioned strike-plate lip that physically forces the latchbolt into the strike's box, providing quieter, sleeker mechanical movement and additional aesthetic options. Unlike standard latches, the TL7 Magnetic Tubular Latch keeps the bolt retracted when the door is open. Then, magnets composed of the rare-earth element neodymium located in the strike latch instantly and quietly snap the bolt in place to latch the door, rendering the latch and strike completely invisible. Turning the lever retracts the bolt for easy passage. The TL7 Magnetic Tubular Latch is available with more than 30 lever options and a variety of finishes.

www.unisonhardware.com



24 JOB-SITE CAMERAS CAN DELIVER IMAGERY TO PROJECT MANAGEMENT SOLUTION

EarthCam's live job-site cameras can now capture and deliver imagery to Autodesk Build, the new project management and field execution solution available to users globally, as well as BIM 360 and PlanGrid. EarthCam engineers are ensuring that actionable visual information is promptly available for each new feature as Autodesk expands capabilities for Autodesk Build. Many of EarthCam's existing Autodesk Construction Cloud integrations are already fully compatible with Autodesk Build. On the design side, comprehensive use of live construction cameras is becoming the new norm for VDC teams.

www.earthcam.net/vdc

25 LED WRAP LUMINAIRE REPLACES FLUORESCENT WRAPS

Powered by Barron Lighting Group, Trace-Lite indoor and outdoor commercial and industrial lighting announces the addition of the BWQ Series 4-foot Economy LED Wrap Luminaire. The BWQ Series is a cost effective, 4-foot-long LED wrap luminaire that is a replacement for traditional fluorescent wraps. It is designed to deliver general ambient lighting in a variety of indoor settings. The BWQ is cULus listed for damp locations; DesignLights Consortium qualified; and features easy ceiling surface mount installation, making it a suitable choice for new construction and retrofits. The BWQ provides up to 4400 lumens; long-life, uniform illumination; is available in 3000K, 3500K, 4000K and 5000K CCT; and includes standard 0-10VDC dimming capability.

bit.ly/3dfKVqc

THE INFRASTRUCTURE INVESTMENT AND JOBS ACT

What's In It for the Construction Industry?

WRITTEN BY | **JARED BLUM**

In the weeks since President Biden signed the Infrastructure Investment and Jobs Act, Washington has gone into overdrive. On Capitol Hill, along K Street and in virtually every construction industry association, staff members are poring over the complex legislation—or perhaps just its 57-page summary—to gain insight into how this $1.2 trillion package might be spent.

At the same time, the federal agencies (primarily the departments of Transportation and Energy) that will oversee this spending must come up with programs to implement the new law and get this money to those who will spend it. Eventually, state and local officials will be responsible for creating the new assets funded by this bill, and that will mean hiring more workers and perhaps reaching into their own coffers to match or extend the impact of federal funding.

All this adds up to a complex pipeline, and it will most likely be a year or more before the first funds start to flow. This does not mean, however, that any public- or private-sector entity that would like to access some of these funds can delay the process of learning what is in the bill. Just as important, it's essential to understand now that significant resources will be needed in the future just to complete the application process.

Although there was major disagreement in Congress over how much to spend and how to spend it, in the final analysis few disputed the need to inject major new funding into our national infrastructure: The system as a whole earned a barely passing C- score from the American Society of Civil Engineers earlier this year. As Washington counsel for the EPDM Roofing Association (ERA), I have been engaged for months in following the path of this law as it moved through the legislative process. ERA joined with other construction advocacy groups based in Washington to support enactment of the infrastructure investment act. I share the widespread intense interest in what happens next.

For anyone engaged in the construction field generally, and the retrofit market specifically, there is no doubt that this whopping investment could yield benefits. It may be in the form of direct financial support for a new project or the less direct benefit that will derive, for instance, from being able to depend on more efficient transportation services. For all of us, it's essential to watch how this generation-defining infrastructure overhaul will play out. For the here and now, it's just as important to keep our eye on other federal funds that support our industries, primarily the BRIC Program. More details on that later, but first, here's what we know for sure about the investment act:

Most of the programs addressed by the legislation target long-ignored needs in our ports, rail systems, trucking infrastructure, availability of clean water and electric grid resilience. Certainly, this law is a significant plus for the construction industry in its overall upgrade of transportation and communication within the country. America's highways and rails facilitate the delivery of virtually all of the components and finished products that go into a retrofit project. Likewise, chemicals, such as those used to manufacture high-performing polyiso insulation or code-compliant fire retardants that are used to enhance the safety of roofing products, are delivered by truck or rail.

Additionally, while it may not be readily apparent that this funding will help support specific construction projects, a close read of the available information so far yields some clues. For instance, some of these funds will be used to make passenger stations accessible to all users, projects that will most likely involve or inspire larger retrofit projects. Public-facility retrofits on schools, municipal buildings, and judicial and public-safety offices to increase energy efficiency likewise will most likely require construction work.

Although the passage of the Infrastructure Investment and Jobs Act has been hailed enthusiastically on both sides of the Congressional aisle and by many state and local leaders, it's essential to understand that patience is going to be required throughout the stakeholder community as the mandates laid out in the legislation are turned into accessible funding. The good news is that there are funds available now that could support retrofit work and ultimately be combined with new funding from the infrastructure legislation. The Building Resilient Infrastructure and

Communities (BRIC) Program, which was enacted by Congress in 2018 to provide pre-disaster mitigation funding for communities, is currently accepting applications at a funding level of $1 billion for 2021 applicants. BRIC also will receive $1 billion additional funding over the next five years as specified in the infrastructure act.

Carteret County in North Carolina is one example of a local jurisdiction that has applied for BRIC funds and is waiting for the outcome of its application. The county is pursuing a $500,000 BRIC grant to help fund construction of a new fire station. The estimated cost of the total project is $3.5 million. The county has already been approved by the N.C. Department of Public Safety, the entity that actually applies to FEMA and would administer the funds, to proceed to the full application stage of the multi-step grant process.

The fiscal year 2021 application period for the BRIC program opened on Sept. 30, 2021, and closes on Jan. 28, 2022. Interested parties should touch base with their respective State Hazard Mitigation Officer or Department of Public Safety for information about current funding and to ask about future application requirements or deadlines for submitting information. While the federal government sorts out procedures to distribute the admittedly much larger infrastructure bill funding, local communities can apply for BRIC dollars now. This much more immediate funding, whether for new construction or retrofit projects, can jumpstart a much-needed building project and further invigorate our essential industry. Just as important, it can build the technical skills that will be needed to access funds that will eventually be available through the Infrastructure Investment and Jobs Act.

For anyone engaged in the construction field generally, and the retrofit market specifically, there is no doubt that this whopping investment could yield benefits.

LEASE UP AND BOOST VALUE

In the Post-COVID Era, Class-A Properties Need New Strategies

WRITTEN BY | BRENT ZEIGLER, AIA, IIDA

PHOTOS: DYER BROWN ARCHITECTS

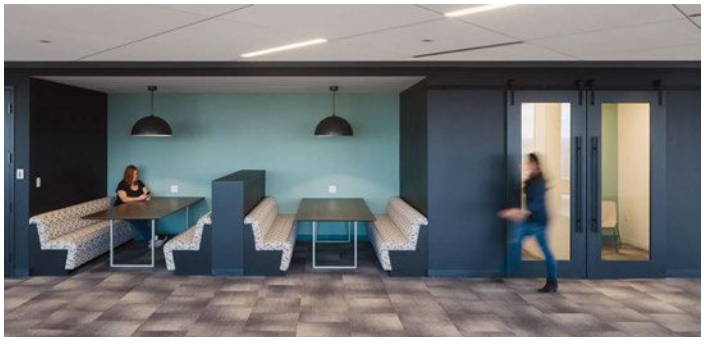
Although the optimistic among us may perceive the pandemic is winding down, try telling that to the owners of office buildings and their leasing agents. Currently the vacancy rate across the country is still averaging about 15 percent—actually higher than at the close of 2020, indicating that many tenants are not renewing. Meanwhile gross leasing volumes are down, as well, suggesting that the hybrid workforce model encourages renting smaller spaces. This reality is taking its toll on real-estate portfolios: In Midtown Manhattan, according to The Real Deal, which covers real-estate news, office building values are down more than 16 percent, representing over $28 billion in lost value.

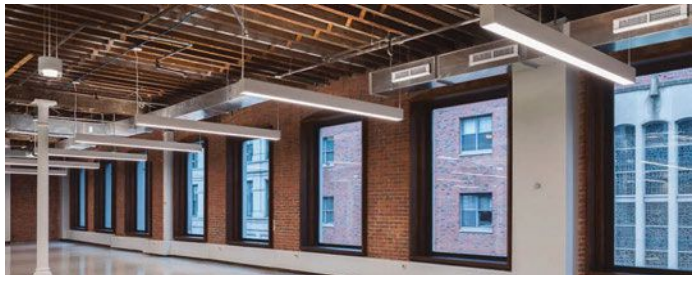
These indicators may very well be transitory, and a year from now those figures may have completely turned around. But some of the effects of the pandemic are going to be more permanent, such as the shift to hybrid models and more remote work, which employees like because of the flexibility. Either way, building owners and managers are faced with the question of how best to invest. Many are focused on leasing up, which means investing in short-term strategies for securing new tenants and reducing vacancy rates among assets in their portfolio. Others are eyeballing the trends and planning for the future, including repositioning to appeal to growing markets.

Both of these strategies are valuable. Working with trusted consultants to cut through the trends and buzzwords and identify workable approaches, savvy property owners and managers can reduce vacancies short-term and implement cost-effective plans to build value for the long haul.

The 'Spec Suites' Question

As a design firm with a studio devoted to working with





owners and property managers to help them lease up, Dyer Brown Architects typically handles a certain number of requests for building out marketing suites and spec suites. In Spring 2020, we noticed that the volume of such requests had roughly doubled over a very short period, and our studio leaders wanted to investigate why. Reaching out with a short survey to a number of longstanding clients and industry colleagues—folks working at the executive level in commercial brokerages and large property management concerns—we hoped to learn more about why they thought investing in finished turnkey office spaces with staged furniture was a better option than "white-boxing" (stripping back and painting a light neutral color), especially considering the uncertainty in the Class-A marketplace.

We learned quickly that a consensus had formed around more or less how the market had changed since COVID's onset and ensuing shutdowns, what prospective tenant firms are now looking for, and why spec suites made good sense—for certain property types, that is. James Russell, an experienced property manager at Cushman & Wakefield in Boston, responded: "Some vacant areas need it more than others. When we get back third-generation space originally rented in the 1990s, we find less marketability, especially with so much desirable sublease space currently on the market."

With so many long-term tenancies ending last year, Russell's insight makes good sense. He added that certain spaces and floors often show well without investing in a spec-suite buildout when they are "on the good side of the building with nice

Certain spaces and floors often show well without investing in a spec-suite buildout when they are "on the good side of the building with nice views and natural light." The most challenging spaces to lease are more likely to benefit from a full spec-suite installation.

views and natural light." The most challenging spaces to lease are more likely to benefit from a full spec-suite installation. For more inherently appealing suites, those with good light and enjoyable views, white-boxing makes better financial sense.

Consultants with good client engagement skills and research habits can glean a lot of great information from property owners and facility managers, making it easier to anticipate client needs (including the needs of tenant firms) and track shifts in market trends. The following are a few additional key points from this informal survey:

- Location, as always, is key. Prospective tenants looking at your assets in high-value neighborhoods will probably have deeper pockets and their own vision for a workplace. For suites in these buildings, simple white-boxing will typically be the wiser choice.
- Design strategically. When working with architects and designers to complete spec suites, be sure to lean on contemporary palettes of finishes and materials, which show best and have the broadest appeal.
- Remember, less is more. Spec suites should be built out to be as open as possible because it's easier and less costly to add a wall or a feature after the fact than to demolish one.

Strategic Upgrades

Turning to the tasks of maintaining and growing asset value over the long term, a quick look at some market fundamentals suggests there are opportunities for shrewd investment. Commercial owners who are comfortable with thinking over the horizon should look at their portfolios and begin to consider whether their Class-A office properties could be upgraded or converted to support other uses, especially those that yield a per-square-foot premium. It will take next-level investment and strategy to gear up for tenants with specialized needs, but the outlook in the ever-booming biotech and life-sciences sector—in markets like Boston, New York and Atlanta, as well as in smaller research hubs emerging nationwide—suggests it's worth the effort.

Growth in these industries shows no signs of slowing down and, in fact, may be accelerating. According to research from Coldwell Banker published in June 2021, employment in life sciences reached a record high in March 2021, and demand for research space across all major markets is up 34 percent from mid-2020. In Boston, most of the recently inked large-scale lease agreements are for biopharmaceutical corporations: CRISPR Therapeutics, for example, signed up for 260,000 square feet downtown while, over the river in Cambridge, Mass., Bristol Meyers Squibb has leased 360,000 square feet.

Whatever the new use, renovation costs are a factor. Exploring conversions to other new uses may be intriguing—affordable housing, for example—but the robust and resilient life-sciences sector would seem to offer a more immediate opportunity

… FOR OWNERS WHO ARE ALREADY CONSIDERING REPOSITIONING ONE OR MORE ASSETS, THE ADDED COSTS FOR RESEARCH-FOCUSED UPGRADES ARE MORE THAN REASONABLE, ESPECIALLY WHEN ONE FIGURES IN THE POTENTIAL FOR SIGNIFICANTLY HIGHER PER-SQUARE-FOOT RATES …

to build value. It's important to note the research spaces used by biotech and life-sciences tenants must meet elevated requirements for life safety. Engaging directly with owner groups and management teams in close consultation can help put them on the fast track to capitalizing on life-sciences sector momentum.

The good news is that many existing Class-A properties have infrastructure that is readily upgradeable, making it possible to quickly and cost-effectively pivot certain assets to support non-specialized, flexible research. Typical research floors require electric, water, gas and data ports be available across the active laboratory. Building in flexibility is critical as research modes may change rapidly, so specifying benches and casework that can be easily moved and rearranged is advisable. Likewise, investing in plug-and-play infrastructure connections can help tenant research groups get up to speed quickly upon move-in or when they switch modes. The most important feature is ventilation: For the health and safety of occupants, most jurisdictions require minimum standards for air exchange and for the availability of hooded vents lab benches.

These upgrades may sound challenging, but for owners who are already considering repositioning one or more assets, the added costs for research-focused upgrades are more than reasonable, especially when one figures in the potential for significantly higher per-square-foot rates, not to mention fewer vacancies.

Traditional office leasing returning to a pre-pandemic scale at some point in the future is certainly possible, and only a fool would try to predict the future. But the life-sciences sector has demonstrated enormous resilience and growth even during disruptive periods. Owners with large, well-located commercial facilities, whether in major bioscience markets or in areas emerging as growing research hubs, would do well to start working with trusted consultants on cost-benefit analyses for converting Class-A office properties into flexible research space.

A PRESCRIPTION FOR HEALTHY WORK

A California Pen Factory Is Transformed into a Home-like Office for GoodRx

WRITTEN BY | **NHAN NGUYEN**

PHOTOS: **JASPER SANIDAD**
unless otherwise noted

Founded in 2011, GoodRx is an app-based health-care company that tracks prescription drug prices in the U.S. and provides free drug coupons for discounts on medications. The demand for discount pharmaceuticals has resulted in rapid growth for GoodRx.

When GoodRx representatives chose a 76,000-square-foot office space in the Pen Factory in Santa Monica, Calif., as the site of their new headquarters, they envisioned an eclectic personal family room that would meet the needs of GoodRx's growing staff. In addition, GoodRx leadership wanted the new workplace to encourage wellness and community, similar to how the company conducts business.

Completed in May 2020, GoodRx's new office is a creative space with enviable amenities, including a coffee bar with a full-time barista; a library composed of structural steel; a meditation and yoga facility; three interconnecting stairs; a mezzanine for group huddles; game room; and a speakeasy with a restored 100-year-old bar from Glasgow, Scotland.

FROM FACTORY TO FANTASTIC

Built in 1956, the Pen Factory manufactured and distributed hundreds of millions of Paper Mate ballpoint pens per year and employed many people in the area until the facility closed in 2005. After closing, the building was supposed to become part of a Transit Village with office and retail space, as well as nearly 500 housing units. This plan was very unpopular in the community and never came to fruition. Later, new owners worked to transform the space into a multitenant creative workplace, ready to house new tenants, like GoodRx. GoodRx representatives were drawn to the space in the Pen Factory because, unlike their last cookie-cutter office on multiple floors of a Santa Monica high-rise, this space offered them the opportunity to really establish themselves in the Los Angeles world of technology as a purpose-driven company in a space that was entirely their own.

Visioning for this project was intentionally focused on ways to make the process equitable, accessible and inclusive, bringing aspirations for wellbeing and sustainability front and center to the project. Architecture firm RIOS utilized focus groups, consisting of GoodRx

ARCHITECTURE FIRM RIOS UTILIZED FOCUS GROUPS, CONSISTING OF GOODRX LEADERSHIP AND MID-LEVEL EMPLOYEES, AS WELL AS VARIOUS CONSULTANTS, TO SHAPE THE SPACE'S DESIGN.

RETROFIT TEAM

GENERAL CONTRACTOR // Clune Construction, www.clunegc.com

ARCHITECT // RIOS, www.rios.com

PROJECT MANAGER // AMA Project Management, www.amapm.com/home

MILLWORKER // Artcrafters Cabinets Inc., www.artcrafter.com

STRUCTURAL STEEL SUBCONTRACTOR // Unicon Group, (818) 505-9275

ELECTRICIAN // Nazzareno Electric, www.nazzareno.com

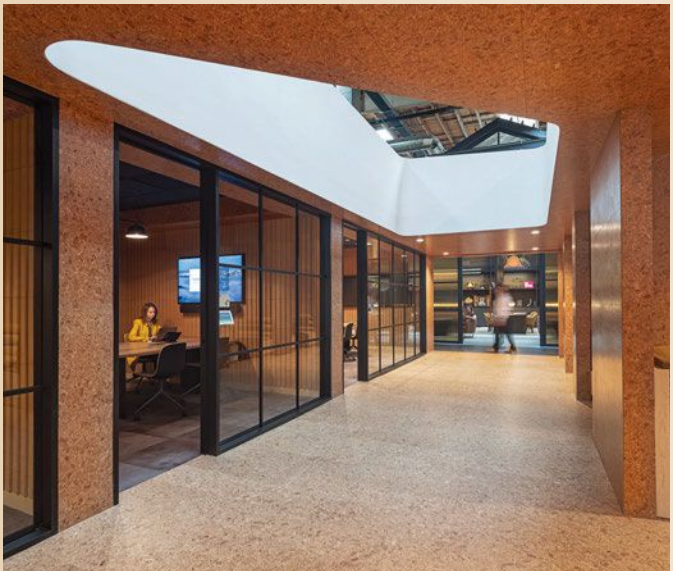
leadership and mid-level employees, as well as various consultants, to shape the space's design. The main takeaway was the desire for a creative and unique space that allowed for flexibility and would accommodate a hybrid work environment.

The design of GoodRx's headquarters was conceived using an urban design point of view, meaning the design team wanted the office to function like a city, constantly evolving and incorporating diverse settings all under one roof. The circulation "loop" features a stained concrete black band on the floor for wayfinding. Large, open areas can accommodate growing staff numbers but still feel cozy no matter how many individuals are present. The use of local, upcycled materials increases connection to the local community.

The design palette is raw and industrial, yet warm. RIOS' team designed the space with a hospitable feel. Convenient amenities, like a juice and coffee bar; an abundance of greenery; and warm materials, like corduroy, exude hospitality. Within the larger scope of the warehouse-style office, there are areas intentionally closed off that provide a more intimate feel. Large industrial containers, covered with upcycled oriented strand board, create some of these intimate spaces, as well as nod to the building's history, alongside elements like the steel gantry, once used in the production of ink pens.

Like most companies, GoodRx is operating in a hybrid work environment. Company leadership has found that employees want to be social when they are in the office. Because of this, 80 percent of seating is unassigned, allowing employees to choose their daily work

The 76,000-square-foot space that houses GoodRx features unique amenities, including a "Central Park" communal space, used for companywide meetings and presentations from the CEO, and a restored 100-year-old bar from Glasgow, Scotland.



GoodRx is operating in a hybrid work environment. Because of this, 80 percent of seating is unassigned, allowing employees to choose their daily work environment. Currently, employees have an estimated 150 square feet per person.

PANDEMIC IN PLAY

GoodRx's headquarters opened in May 2020, at the height of the COVID-19 pandemic. Because of Centers for Disease Control and OSHA guidelines, it was a challenge to complete the project on a condensed 22-week timeline with fewer subcontractors onsite. General Contractor Clune Construction incorporated longer working hours and Saturdays into the schedule to make up for the limited capacity and social distancing. To provide additional safety to trade partners, Clune Construction contracted a full-time licensed vocational nurse to screen for COVID before anyone entered the building.

The pandemic also led to the closing of manufacturing facilities and delays at the Port of Los Angeles. This resulted in delays in material delivery to the project. To keep the project moving, several installations were performed out of sequence based on material that was available while still meeting the design intent of the project. For example, delivery of the cable tray that runs the electrical cords throughout the building was delayed for two months. To maintain the schedule, the construction team installed the infrastructure before the cable trays arrived. Upon arrival, the team worked seven days a week to ensure the installation of the cable trays was performed on schedule.

environment. Currently, employees have an estimated 150 square feet per person.

HEALTH-FIRST CULTURE

As an expression of GoodRx's brand, the design emphasizes wellness in the workplace. For example, the space opens to surrounding gardens and a dog park that extends the length of the building. Bike storage and showers are available to encourage healthier forms of transportation to work.

Six skylights bring natural sunlight throughout about 35 percent of the facility, complementing light from the existing windows.

The "Central Park" area is an open, communal space used for companywide meetings and presentations from the CEO. Its name was inspired by the interior planters filled with live, lush plants, tree specimens and native shrubs. The plants, trees and shrubs are watered using a self-contained irrigation system that can be dropped into decorative pots.

In response to the COVID-19 pandemic, nearly everything in the building is touchless. For example, the existing front entry door and all door locks were modified by the Clune Construction team to be opened by card readers on each employee's mobile phone. If a phone with the card reader is in close proximity, doors will automatically unlock. In addition, the front entry door automatically opens and closes to avoid viral spread.

Because GoodRx's headquarters was once a pen manufacturing facility, there was a residual concentration of ink in the surrounding soil and groundwater. To alleviate this, the development team installed a Vapor Mitigation System (VMS) to keep vapor from entering the building. During construction, the Clune Construction crew worked closely with the project's environmental and health consulting company to protect the VMS system, keeping the system fully operational at all times and ensuring everyone's safety.

Finally, the building's rooftop HVAC features UVC equipment that sanitizes incoming forced air, cleaning 99.9 percent of harmful bacteria.

A VISION COMES TO LIFE

One of the major features of the GoodRx

(continues on page 42)

Stack Thin Stone

Make an impression with our versatile thin stone

For recladding or new construction, our unique calcium silicate stone delivers the aesthetic and performance of natural stone. At only 3/4” thick, ARRIS-tile is lightweight, adheres like tile and comes in a range of beautiful colors, with custom options available. Arriscraft’s thin stone products make it simple to incorporate premium stone on virtually any project.

headquarters was also a major challenge. The installation of the structural steel that supports the library, three interconnecting stairs, mezzanine and executive offices was identified as a critical focus from the beginning of the schedule. The team removed the building's existing glass storefront, which is more than 15-feet high by 10-feet wide, to move the pieces of steel into the space.

The team sourced 75 percent of the furniture for the headquarters locally. In addition, 98 percent of all items used in the headquarters came from suppliers within a 30-mile radius. In response to COVID-19 impacts on sourcing materials, the team employed local designers and fabricators to provide most materials, which was a win-win for the team and community. [Learn more about how the pandemic affected this project by reading "Pandemic in Play", page 40.]

One of the most unique parts of the project was the installation of the bar within the speakeasy. St. Mungo's Bar was designed by Charles Rennie Mackintosh in the early 1900s for the St. Mungo Vintners Pub in Glasgow, Scotland. When the pub closed in 1975, the bar was purchased and shipped to California, where it was stored in a warehouse for more than 40 years.

The bar is made of solid, heavy wood and required 10 workers to gently carry it to GoodRx's speakeasy. The original bar, countertop, wood panels, brass work and even stained-glass windows were carefully installed by the construction team and are now the feature of the beautifully designed speakeasy.

The complex nature of the Good Rx project meant constant collaboration between all members of the design and construction teams. The end result was a new highly collaborative headquarters that has transformed GoodRx into a welcoming and wellness-focused space. GoodRx employees love coming into the office and appreciate the safe and natural environment the design and construction team created together.

MATERIALS

CUSTOM ACOUSTICAL CEILING PANEL // TURF, turf.design, and USG, www.usg.com

ACOUSTICAL CEILING TILE // Armstrong Ceiling & Wall Solutions, www.armstrongceilings.com

ACOUSTICAL WALL PANELS // Zintra, www.mdcwall.com/acousticsolutions/explore-zintra, and Spinneybeck, www.spinneybeck.com

CARPET TILE // Shaw Contract, www.shawcontract.com

WALK-OFF MAT // Milliken, floors.milliken.com

SDT AND VCT FLOORING // Armstrong Flooring Inc., www.armstrongflooring.com

CORK FLOOR TILE AND WALL TILE // Capri Collections, www.capricollections.com

WRITABLE WALL FILM // Peer Hatch, peerhatch.com

PAINT // Dunn-Edwards Paints, www.dunnedwards.com

SPEAKEASY PRINTED WALLPAPER // Innovations, www.innovationsusa.com

PLASTIC LAMINATE PANEL // Formica, www.formica.com

FRP WALL PANEL // Glasteel, www.glasteel.com

SOLID SURFACE // Caesarstone, www.caesarstoneus.com

TILE // Fred + Cathy, fredcathy.com; Daltile, www.daltile.com; and Clé Tile, www.cletile.com

METAL WIRE MESH // McNichols, www.mcnichols.com

DRAPERIES // KM Fabrics, www.kmfabrics.com

ENGINEERED HARDWOOD // Duchateau, duchateau.com

CONTAINER IRRIGATION SYSTEM // Tournesol, www.tournesol.com/products/category/container-irrigation

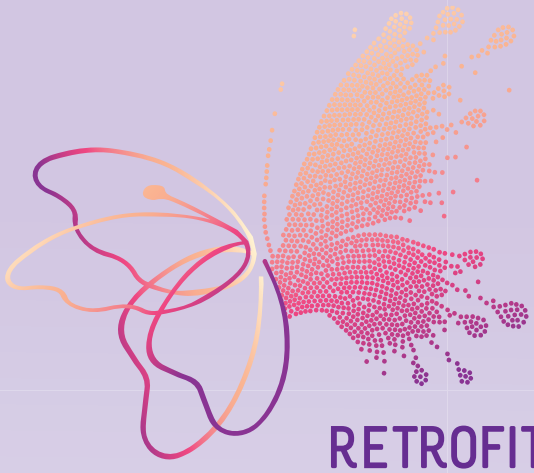
MOBILE ACCESS CONTROL // Openpath, www.openpath.com

AUTOMATIC DOOR OPENERS // Horton Automatics, www.hortondoors.com

UVC SYSTEM // Steril-Aire, www.steril-aire.com

SLIDING GLASS DOOR // Kawneer, www.kawneer.com

VIEW THE **2021** WINNERS AT
www.retrofitmagazine.com/category/2021-awards



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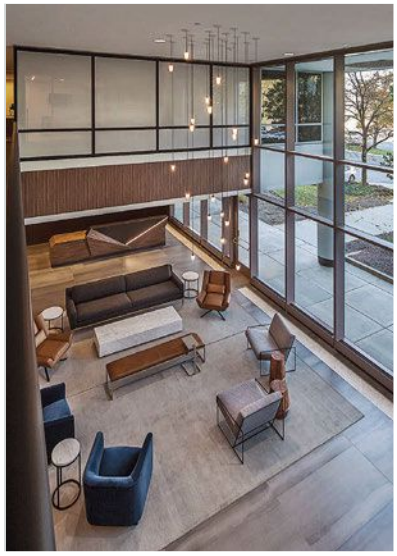
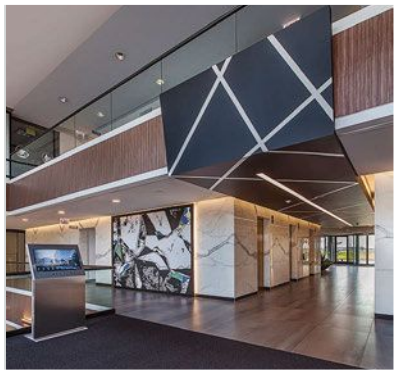
O'HARE INTERNATIONAL CENTER | Rosemont, Ill.

PHOTOS: **JEFF GARLAND PHOTOGRAPHY**
unless otherwise noted





RETROFIT TEAM

INTERIOR DESIGNER: Davis & Davis Interior Design, www.davisinteriordesign.com
ARCHITECT: Fitzgerald Architecture Planning Design, www.fitzgeraldapd.com
CONTRACTORS: Ostrander Construction, www.ostranderconstruction.biz, and BEAR Construction, www.bearcc.com

MATERIALS

The design team opted for creative and easily cleanable design elements that activate curiosity. Existing granite is covered with large-scale porcelain tile. New flooring resembles pressed metal, and walls look like white marble. A custom chandelier cascades from the main lobby down to the lower lounge, drawing the eye through the levels. In the auditorium lounge, the designers developed a new seating area with high-top tables serviced by an underutilized coat closet turned coffee bar.

The following is a sampling of materials used in the project:
COMMERCIAL-GRADE FLOORING: Shaw Contract, www.shawcontract.com; Mohawk Group, www.mohawkgroup.com; and Patcraft, www.patcraft.com
FLOORING: IRIS, www.irisus.com
FLOOR AND WALL TILES: Fiandre Architectural Surfaces, www.granitifiandre.com
DECORATIVE WALL PANELS: Interlam, interlam-design.com
SPECIALTY WOOD WALL PANEL: Plyboo, www.plyboo.com
SPECIALTY METAL PANELS: Moz Designs, www.mozdesigns.com
DIGITAL PRINTED LOBBY IMAGES: MDC Interior Solutions, www.mdcwall.com
CUSTOM LOBBY PENDANT: Kuzco Lighting, kuzcolighting.com
INTERIOR LED LIGHTING: Pure Lighting, purelighting.com; Finelite, www.finelite.com; Coronet, coronetled.com; and Klus, klusdesign.com

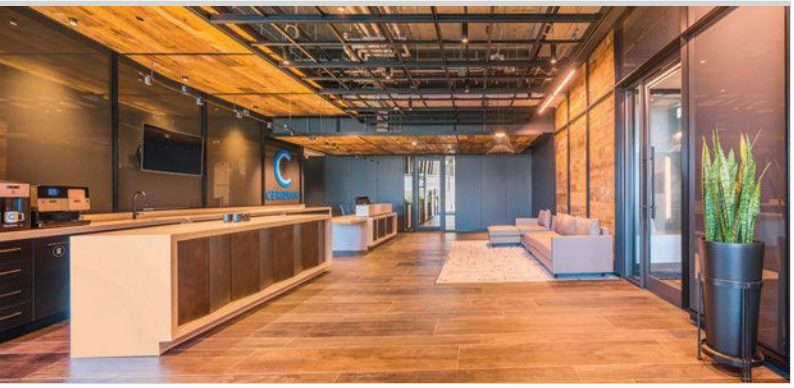
THE RETROFIT

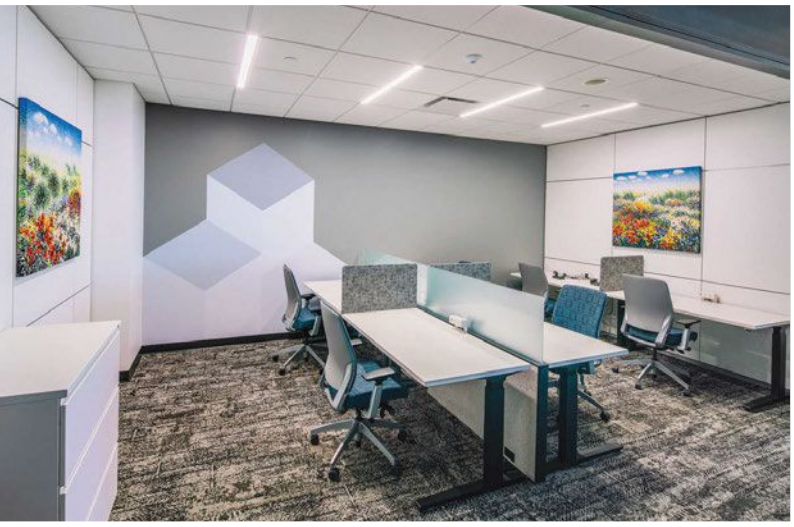
Located adjacent to Chicago's famed airport, the O'Hare International Center had become unappealing to current and prospective office tenants. Red-granite floors and walls enveloped the entire lobby and an outdated security desk in the center appeared like a relic from yesteryear. The space needed thoughtful and strategic enhancements, increased light levels, and engaging and dynamic amenities.

Davis & Davis Interior Design accepted the task of reimagining the center's interior, including two lobbies, an auditorium and lounge area, a lower-level lounge area and an outdoor patio. "The goal was to ensure that the building's occupants are engaged as they progress through the lobby to the elevator core and on to the amenity pavilion," explains Michelle Davis, principal and design director for Davis & Davis Interior Design.

The 12,500-square-foot project was completed in 2020.

PHOTOS: GERRY KOPELOW





CERIDIAN CANADA LTD. | Winnipeg, Manitoba, Canada

RETROFIT TEAM

ARCHITECT AND INTERIOR DESIGNER: Environmental Space Planning, esp-intdesigners.com
ELECTRICAL AND MECHANICAL ENGINEER AND LIGHTING DESIGNER: KGS Group, kgsgroup.com

MATERIALS

When third-floor space at True North Square unexpectedly became available, Ceridian Canada, a human resource software company, snapped up the lease. It was a unique opportunity to move its entire Winnipeg team to a single-floor, 25,000-square-foot space.

The open-concept design for Ceridian Canada has a distinctly urban edge with high industrial ceilings, reclaimed wood accent walls, splashes of bright color and bold graphic accents. Exterior walls of windows offer views and substantial daylight to the space. Much of the open-office area was intentionally laid out with a view to the windows.

Lucien Lalonde, senior electrical engineer and commercial M & E department head at KGS Group, managed the project, including lighting design. "General lighting was intended to be clean and seamless," Lalonde says. "The architect did not want any visual clutter, so we utilized recessed luminaires in many areas."

KGS Group used Slot 2 linear luminaires from Mark Architectural Lighting throughout the project, including a flush lens recessed pattern configuration in boardrooms and black pendants in open and closed offices, as well as more casual meeting spaces.

Particular attention was paid to lighting in the meeting rooms to avoid shadowing.

"We have found that the standard Lambertian distribution optics with the Slot 2 luminaire provide a great level of illumination in all directions," Lalonde notes. "By placing two rows over the outside long-edge of the meeting table, we were able to attain an excellent quality of light with limited shadowing."

Slot 2 luminaires provide static white and tunable white light distribution with dimming capability. Complete with an nLight wired digital lighting control platform, employees have control of output and color. Because of the substantial natural light on the floor, the system also includes daylight sensors that automatically monitor and adjust lighting output throughout the day and evening. The energy-efficient Slot 2 fixtures, and options like the occupancy sensors and dimming capabilities, will significantly contribute to overall energy efficiency on the floor.

In larger meeting rooms, secondary lighting was added with Indy LC6P cylinders and wall washers to assist with any light-level contrast in the space. Indy LC6P cylinders also were used in corridors, the kitchen and some lounge areas. Three Aperture pendants, manufactured by Eureka Lighting, are suspended through cutouts in a unique wooden drop ceiling over the kitchen counter.

"The client is pleased with the outcome," Lalonde explains. "We were able to deliver a great lighting design with multiple levels of lighting control to suit their needs."

SLOT 2 LINEAR LUMINAIRES: Mark Architectural Lighting, marklighting.acuitybrands.com
INDY LC6P CYLINDERS: Acuity Brands, www.acuitybrands.com
APERTURE PENDANTS: Eureka Lighting, www.eurekalighting.com

WHITNEY ARCHITECTS | Chicago

RETROFIT TEAM

INTERIOR DESIGNER: Whitney Architects, whitneyad.com

MATERIALS

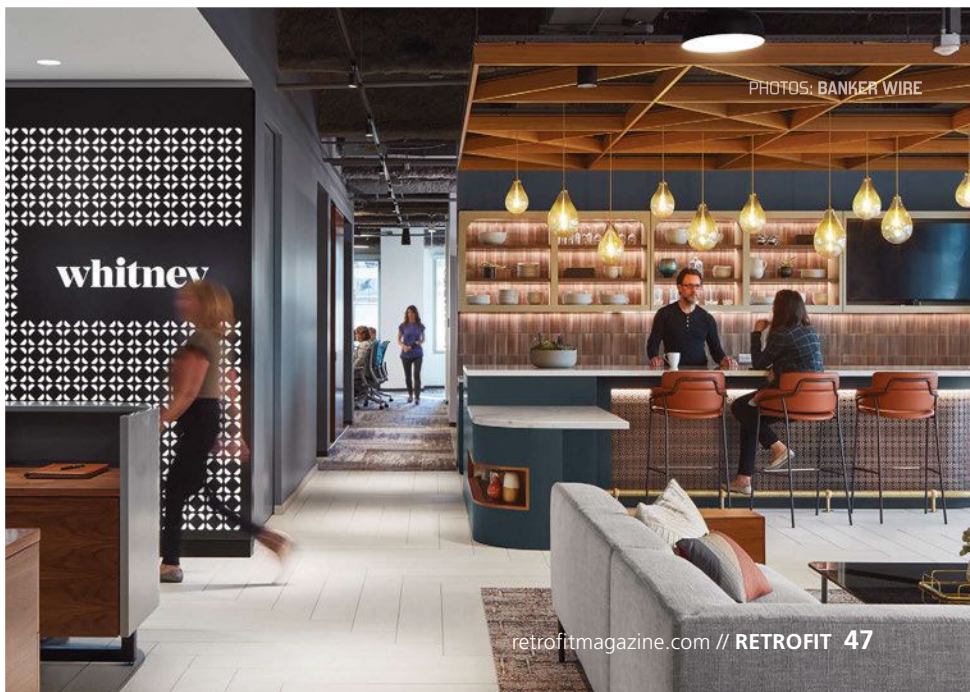
When Whitney Architects leadership decided to move their long-term headquarters to downtown Chicago, the firm required a space that exemplified its key brand values and the spatial solutions required of a bustling firm—an office that prioritized a design-forward, flexible activity-based work environment.

Upon arrival, guests are welcomed into the heart of the space—the work café, designed as a testament to the hospitality the firm extends to visitors and staff, as well as its client-focused approach. To help realize this brand value, the design team turned to Banker Wire's M33-5—an architectural flat wire mesh pattern—within the café and bar space. The wire mesh, specified in an antique copper-plated finish, helps create an eclectic aesthetic when paired with the rich colors and layered textures in the room. The result is a space that is approachable, warm, and exudes a sense of home and belonging.

For the bar itself, the design team required a material with specific technical requirements—one that could be curved around the length of the front of the bar, where the bar stools are placed. The large surface area of each M33-5 wire—and the proportionate amount of open area—makes it a well-balanced weave, suitable for a wide range of design concepts and applications. In addition, the undulating wave-like appearance of each wire enables light to be reflected at all angles. When specified in this refined antique copper-plated finish, the end-result is simultaneously subtle and palpable.

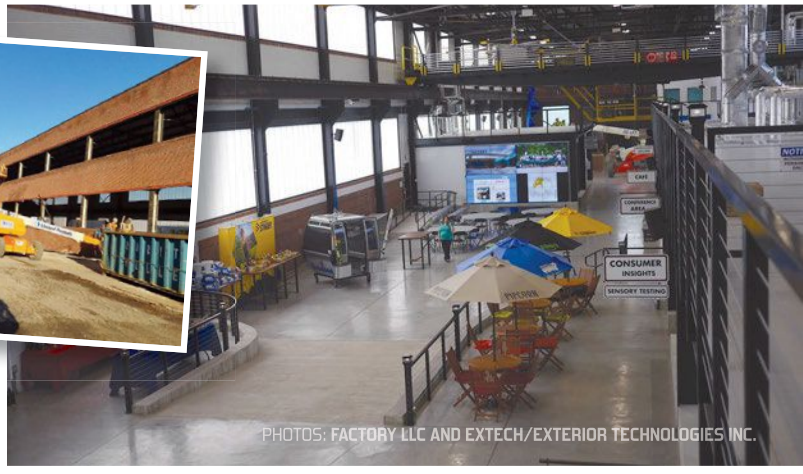
"The pattern is unique and does not appear as your typical mesh design—it has a large-enough scale to have some presence but is not overwhelming when placed with the other design elements," explains Kate Logan, design director, Whitney Architects. "The antique copper-plated finish works perfectly with the rest of our color and materials palette in this area of the office, providing a nice contrast to the dark green background; the rest of the millwork; and the bright white, large-scale quartz countertops."

M33-5 WIRE MANUFACTURER: Banker Wire, www.bankerwire.com



PHOTOS: BANKER WIRE

FACTORY LLC
Bethlehem, Pa.



PHOTOS: FACTORY LLC AND EXTECH/EXTERIOR TECHNOLOGIES INC.

RETROFIT TEAM

DEVELOPER, DESIGN-BUILDER: J.G. Petrucci Co. Inc., www.jgpetrucci.com
ARCHITECT: Cerminara Architect, www.cerminaraarchitect.com
GENERAL CONTRACTOR: Iron Hill Construction Management, www.ironhillcm.com
GLAZING CONTRACTOR: Hutt's Glass Co. Inc., www.huttsglass.com

MATERIALS

An old steel mill has been transformed into a new business incubator for food and consumer-packaged goods known as Factory LLC. Providing natural light while promoting a comfortable, creative and productive interior, EXTECH/Exterior Technologies Inc.'s LIGHTWALL 3440 interlocking polycarbonate translucent wall system replaced the broken and empty window openings on the brick exterior.

To maximize access to natural light, Factory's workspaces are positioned along the 40,000-square-foot building's perimeter. EXTECH's team engineered and custom-fabricated the tongue-and-groove polycarbonate wall assembly as rectangular, fixed, punched and expansive strip window units. The seven longest horizontal stretches span more than 20-feet wide by 8-feet tall.

The openings on the southern elevation were specified with a translucent, opalescent appearance to softly diffuse the interior daylight and minimize glare. Transparent panels were preferred for the building's three other sides. All the polycarbonate panels have a UV-resistant coating on the exterior surface to manage unwanted solar heat gain and maintain a desirable, consistent interior temperature.

The units are framed in aluminum and finished in a Statuary Bronze baked enamel. The framing members' interior and exterior metal surfaces are separated and insulated to improve thermal performance. The combined polycarbonate glazing and thermally broken framing also contribute to reducing the building's demand on electrical and HVAC systems, optimizing energy efficiency and lowering associated utility costs.

LIGHTWALL 3440 MANUFACTURER: EXTECH/Exterior Technologies Inc., extechinc.com

THE RETROFIT

Formerly known as the Mill Depot, the facility was built in the early 1900s for Bethlehem Steel as a shop to mill its tool- and hand-hammered alloy steel. Other metallurgical businesses made use of the space until 2014. Columbia Associates purchased the vacant and aging property in 2017.

According to Joe Petrucci, project executive for J.G. Petrucci Co., the team's vision "paid homage to the building's industrial roots by replicating the industrial window style and preserving one of the original cranes that was used by Bethlehem Steel. By keeping these features, the team retained the character of the old Bethlehem Steel building while bringing new life into it with this exciting food-innovation use."

Factory's modern building opened in 2019 and its concept serves as a "scale-up" facility and investor for food, beverage and pet brands. The inviting, collaborative space features a best-in-class commercial kitchen with live video capabilities and food safety areas. Refurbished shipping containers serve as unique office spaces.

Factory also provides resources, including capital, team members, office space and industry connections, to start-up companies. Factory's current investment portfolio includes Stuffed Puffs, a marshmallow filled with milk chocolate, and Honey Stinger, a sports nutrition brand offering chews, gels and hydration mixes, as well as other brand partners.

CONGRESS SQUARE

Boston

RETROFIT TEAM

ARCHITECT: Arrowstreet, www.arrowstreet.com

MATERIALS

Adding a 7-story curtainwall to three 1900s-era bank buildings in downtown Boston, Arrowstreet's design team sought a lightweight material to contrast the structures' original granite and limestone façades. The firm's solution is reflected in the sparkling jewel box, fabricated with Solarban 60 Starphire glass by Vitro Architectural Glass and featuring a trendy soffit design, that is now perched atop the newly conjoined office buildings.

"We felt strongly the materiality and massing of the new addition needed to be distinct from the existing buildings to preserve their original character," explains Jason King, AIA, LEED AP BD+C, senior associate, Arrowstreet. "The custom unitized curtainwall system incorporates ultra-transparent Solarban 60 Starphire glass, providing striking views into and out of the building and allowing the addition to feel lighter above the weightier masonry building below."

To integrate the 24-foot cantilevered glass box, the design bends inward along Congress Street, adjacent to Post Office Square, at the exact point where the 1904 and 1906 building façades connect beneath it. The faceted, angular design then extends downward through the existing building on the north façade, forming the building's second entry point and connecting it to the popular boutiques and cafés located along Quaker Lane.

"While coordinating these faceted curtainwall panels with the existing structure was challenging, the result is a wonderful moment where the juxtaposition of old and new is no longer experienced from afar," King adds.

Arrowstreet's soffit scheme, which is a custom-designed fiberglass-reinforced plastic with a gold finish, conveys a deep, rich texture that enables the glass to float gracefully above the century-old masonry and complement the existing cornice line.

In addition to the glass box, Solarban 60 Starphire glass was installed in 2-story curtainwall sections adjacent to the buildings' historical main entrance on Water Street. Because the original street-level windows were dark and faced with decorative metal grillwork, the beautifully crafted details of the interior lobby were hidden from public view.

"By introducing Starphire glass at the ground level, we were able to showcase those historical elements and rebrand the building from dark and uninviting to bright and welcoming," King says.

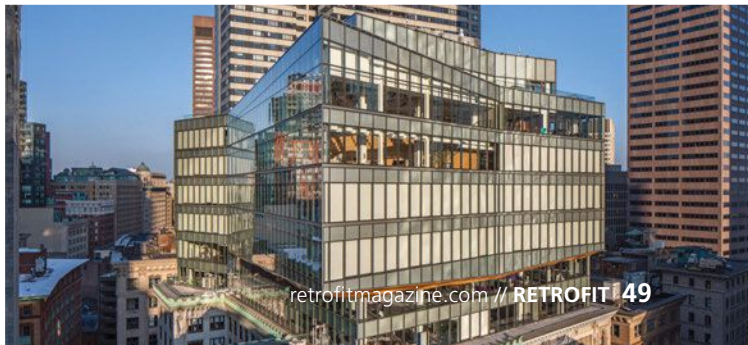
The Congress Square renovation consolidated three sets of elevators, restrooms and stairwells from three separate buildings into one central elevator core. By replacing the lightwell, previously obstructed by surrounding buildings, with Solarban 60 Starphire glass, the lobby was transformed into a bright, daylit, energy-efficient space.

The project features exterior roof decks on levels five, 10 and 17, providing beautiful garden-like spaces where tenants can work, meet and take breaks while enjoying fresh air and majestic views of Beantown. While indoors, employees also are afforded striking city views through the low-e-coated Starphire Ultra-Clear glass, which is 87 percent less green in color than ordinary clear glass.

When coated with Solarban 60 solar control, low-e coating, Vitro Architectural Glass' low-iron glass delivers visible light transmittance of 74 percent while blocking 59 percent of the sun's heat energy, helping it to create a balance of energy-saving daylighting and solar control.

SOLARBAN 60 STARPHIRE GLASS MANUFACTURER: Vitro Architectural Glass, www.vitroglazings.com

PHOTOS: VITRO ARCHITECTURAL GLASS



CEDARS-SINAI BIOMANUFACTURING CENTER | West Hollywood, Calif.

PHOTOS: COURTESY HDR, LAWRENCE ANDERSON PHOTOGRAPHY

RETROFIT TEAM

ARCHITECT, INTERIOR DESIGNER, LAB PLANNER AND STRUCTURAL ENGINEER: HDR, www.hdrinc.com
MECHANICAL, ELECTRICAL AND PLUMBING ENGINEER: Affiliated Engineers, aeieng.com
COST ESTIMATOR: C.P. O'Halloran, www.cpohalloran.com
ACOUSTICS: Newson-Brown, newsonacoustics.com
WIND/EXHAUST ANALYSIS: CPP, cppwind.com
GENERAL CONTRACTOR: Rudolph & Sletten, www.rsconstruction.com

MATERIALS

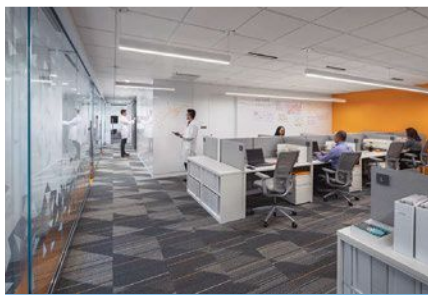
The following is a sampling of materials used in the project:
BACKLIT FACETED WALL SYSTEM: Lindner, www.lindner-group.com
BACK-PAINTED GLASS WITH STEM CELL IMAGE: Forms+Surfaces, www.forms-surfaces.com
RECEPTION DESK: K & Z Cabinet Co., kzcabt.com
GLASS WALL SYSTEM, SLIDING AND SWING DOORS: C.R. Laurence Co. Inc., www.crlaurence.com
LARGE CEILING TILES: Claro by Decoustics, decoustics.com/products/claro
OFFICE CEILING GRID SYSTEM: Armstrong Ceiling & Wall Solutions, www.armstrongceilings.com
POLISHED/STAINED CONCRETE: Ameripolish, www.ameripolish.com, and L&M from Laticrete, laticrete.com
CARPET: Interface, www.interface.com, and Milliken, floors.milliken.com
DECORATIVE LIGHT AT RECEPTION: Sonneman, sonnemanlight.com
CORRIDOR ROUND LIGHTS: Louis Poulsen, www.louispoulsen.com
BLUE GLASS AT ROOF: Glasswerks, glasswerks.com
FURNITURE: Herman Miller, www.hermanmiller.com
BIOSAFETY CABINETS: Baker, bakerco.com, and Labconco, www.labconco.com
LAB BENCHES: Mott Manufacturing, mott.ca
CLEANROOM WALL AND CEILING SYSTEM: Gordon Architectural + Engineered Solutions, www.gordon-inc.com, and Plascore, www.plascore.com
CLEANROOM SLIDING DOORS: ASSA ABLOY, www.assaabloyentrance.us
LAB FLOORING: cGMP from Dur-a-Flex, www.dur-a-flex.com, and Mipolam from Gerflor, www.gerflorusa.com

THE RETROFIT

The Cedars-Sinai Biomanufacturing Center (CBC) is a destination for the research, development and biomanufacturing of induced pluripotent stem cells (iPSCs) and other cell-based medicines for early-based clinical trials for regenerative cell applications. Innovation lies within the science and the design. While iPSCs challenge assumptions about what's possible in medicine, the design of the new center challenges ideas about what's possible with commercial real estate. Located in the iconic Pacific Design Center (PDC), the space broadens the definition of what a "showroom" can be and interrogates common knowledge about what can and cannot "fit" within the building.

Designed by Cesar Pelli in the 1970s, PDC hosts the West Coast's top decorating and furniture market. The location of the CBC in PDC offers key advantages, including a location near the Cedars-Sinai Medical Center campus in landlocked West Hollywood and the potential for PDC's inherent prestige to attract world-renowned talent to help advance the center's mission. Architects and engineers developed a design solution that complements the design pedigree of other spaces in the building while incorporating a highly technical, expertly sequenced and architecturally sensitive engineering solution to meet the requirements of biomanufacturing.

Opened Oct. 2020, this new 23,300-square-foot facility was recently recognized as Lab of the Year by the Scientific Equipment and Furniture Association, as well as honored in *Fast Company*'s 2021 Innovation by Design Awards.



ONE BROADWAY LOBBY
Cambridge, Mass.

PHOTOS: ADRIAN WILSON

RETROFIT TEAM

INTERIOR ARCHITECT: Elkus Manfredi Architects, www.elkus-manfredi.com
GENERAL CONTRACTOR/CONSTRUCTION MANAGER: Moriarty, www.jm-a.com
ACOUSTICS: Cavanaugh Tocci Associates Inc., www.cavtocci.com
MEP ENGINEER: Vanderweil, www.vanderweil.com
LIGHTING DESIGN: HDLC Architectural Lighting Design, hdlclighting.com
ART CONSULTANT: Emily Santangelo, emilysantangelo.com

MATERIALS

The following is a sampling of materials used in the project:
ACOUSTIC WALL PANEL: Xorel Artform by Carnegie, carnegiefabrics.com/xorel-artform
RUGS, LOUNGE AREA: Oryza by GAN, www.gan-rugs.com
RECEPTION DESK CLADDING: Delform, www.delformstudios.com
DRAPERY BEHIND RECEPTION DESK: Malta by Carnegie, carnegiefabrics.com
WOOD AT THE BANQUETTE, STAIRS AND PLATFORM: reSAWN TIMBER Co., resawntimberco.com
LARGE PIVOT "GARAGE" DOOR: Turner Exhibits Inc., www.turnerexhibits.com

THE RETROFIT

The Massachusetts Institute of Technology Investment Management Co. (MITIMCo) pursues long-term investment returns for MIT, sustaining the school's world-class education and cutting-edge research. The One Broadway office tower is part of MITIMCo's real-estate portfolio.

Incorporating techniques from hospitality design, the 4,500-square-foot lobby feels warm and welcoming. Tenants and guests can choose from a variety of intimate, collaborative seating options to use for work and meeting clients.

Design highlights include:

- The custom-designed reception desk designates two security check-ins while being a single, cohesive design element.
- The lobby forges connections to a ground-floor restaurant via a wall-size, glass garage pivot-door. Designed for flexibility, the door opens to transition the lobby into a lounge-like extension of the restaurant, accommodating parties and corporate events.
- Wall treatments, furniture, built-ins, light fixtures, and drapery create definition between the seating and work areas within the large single space, eliminating the need for building additional walls or structures, maintaining the sense of openness.
- Seating options begin at the entry with a wooden banquette that leads visitors to other seating areas behind reception. Located directly behind the translucent curtain backdrop separating the reception desk from the seating behind, a touchdown high-top table with bar stools offers ample space for co-working and computer work.
- Tucked along an inside wall, a glass-doored conference room supports private meetings while allowing light to filter into the room.
- Acoustical solutions to the space's challenging surfaces include colorful bands of acoustic fabric-wrapped wall tiles that provide a welcome focal point for the space, felt wall panels above the banquette, acoustic plaster on the suspended ceilings over the reception desk and acoustic tiles within the waffle ceiling openings, as well as large area rugs.
- Design touches, such as a handsome red and gray pin-striped wallcovering and a light-hearted table lamp in the passageway from underground parking, announce to all that they are entering an intriguing environment.

The pre-COVID design concept can be easily adapted to post-pandemic protocols and will continue to serve as a tenant and community amenity as initially envisioned with today's greater emphasis on alternative workspaces within the office destination.

191 N. CHESTER
Birmingham, Mich.

PHOTOS: GREENHECK

RETROFIT TEAM

ARCHITECT: Biddison Architecture + Design, www.biddison-ad.com
ENGINEER: Ghafari Associates LLC, www.ghafari.com
CONTRACTOR: Systematic Heating & Cooling Inc., www.systematicheating.com
MANUFACTURER'S REPRESENTATIVE: Michigan Air Products, www.michiganair.com

MATERIALS

191 N. Chester is a former church built in 1926. Surnow Co. repurposed the property, preserving the exterior while building an addition comprised of glass, metal and stone for a refined, modern look. The transformation from a church to a 27,000-square-foot, Class-A office space required major renovations to the mechanical and electrical systems, including HVAC. The building owner was particularly concerned about providing an energy-efficient workplace for tenants. The COVID-19 pandemic also raised concerns about the need for air filtration to minimize the spread of viruses.

An energy recovery ventilator, Model ECV-30 with a polymer core, provided better energy transfer efficiency and a lower pressure drop to reach the required levels. Its size also made installation easier for the smaller space in the mechanical room. The ECV-30 allows for the use of MERV 8 and MERV 13 filtration. The filtration combined with the HVAC system's high ventilation rates improves indoor air quality and meets code requirements. Filtering and ventilation minimize issues with harmful particles, including those particles causing illness. Intake and exhaust louvers (Model ESD-635) protect wall openings for the energy recovery unit.

Jason Zilka, owner of Systematic Heating & Cooling Inc., was impressed with the Greenheck ECV-30 product. "I highly recommend this unit for its efficiency and quiet operation. The level of quality in its construction, ease of installation and maintenance is impressive."

Meanwhile, Model DG provides 100 percent outdoor air to the building's enclosed heated executive parking garage. Model DG works in tandem with a Model SE exhaust fan equipped with the energy-efficient Vari-Green motor to ensure the garage has a constant source of fresh air while exhausting harmful fumes from vehicles.

Exhaust fans, models CUE and SP-A, address the indoor air quality of restrooms and other parts of the facility. Both use direct-drive, low-maintenance Vari-Green motors and are certified for AMCA Sound and Air.

ENERGY-RECOVERY VENTILATOR, MAKEUP AIR, AND EXHAUST LOUVER AND FANS MANUFACTURER: Greenheck, www.greenheck.com

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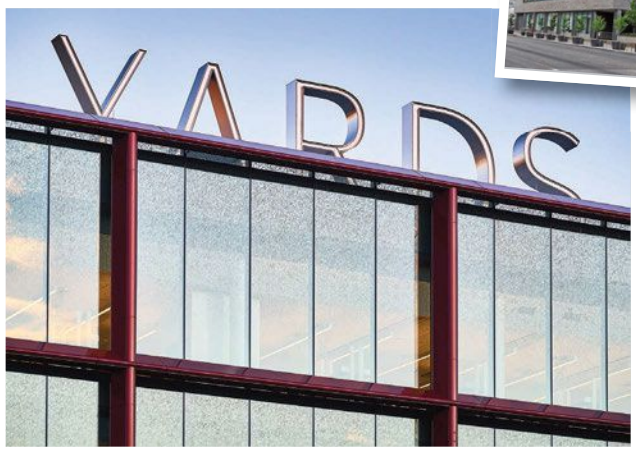
BULLETIN BUILDING, SCHUYLKILL YARDS | Philadelphia

PHOTOS: KIERANTIMBERLAKE/MATTHEW KRISSEL



RETROFIT TEAM

ARCHITECT: KieranTimberlake, kierantimberlake.com
STRUCTURAL ENGINEER AND FAÇADE ENGINEER: Thornton Tomasetti, www.thorntontomasetti.com
STRUCTURAL ENGINEER (CONSTRUCTION PHASE): Keast & Hood, keasthood.com
MEP ENGINEER: db | HMS, dbhms.com
LIGHTING DESIGNER: Tillotson Design Associates, www.tillotsondesign.com

LANDSCAPE ARCHITECT: West 8, www.west8.com
CONSTRUCTION MANAGER: Hunter Roberts Construction Group, www.hrcg.com
EXTERIOR ENVELOPE CONTRACTOR: National Glass & Metal Co. Inc., www.ngmco.com

MATERIALS

Built in 1955 for the *Philadelphia Bulletin*, the largest afternoon paper in circulation in the Northeast, the Bulletin Building was a massive, unadorned structure that had been partially renovated in the 1990s. KieranTimberlake retained the solid structure and replaced its exterior envelope with a glazed façade that appears to be held in place by a large-scale 3D "frame." The frame is actually extruded from the façade and floats in front of the curtainwall. The frame's glossy "Galaxy Red" PPG Coraflon powder coating, formulated exclusively for the project, helps make the Bulletin Building the main attraction in the city's new Schuylkill Yards development.

Visually, the new façade composition evokes the monumentality of the original building while opening the building's external envelope. By peeling away the original monolith of brick and incorporating floor-to-ceiling windows, KieranTimberlake floods the building with natural light. Depending on conditions, the glass will be highly reflective or highly transparent. The glazing includes a ceramic frit pattern that is composed of fonts used by the *Philadelphia Bulletin* newspaper.

CURTAINWALL: Erie Architectural Products, www.erieap.com
GLAZING: Interpane, www.interpane.com/en
ALUMINUM FINISHING: Spectrum Metal Finishing, spectrummetalfinishing.com
CORAFLON POWDER COATINGS: PPG, www.ppg.com
REPAIR/RESTORATION OF STRUCTURAL GLAZED BRICK: Glen-Gery, www.glengery.com
SIGNAGE: Nova Industrial Arts, novaindustrialarts.com

RIOS | Los Angeles

RETROFIT TEAM

ARCHITECT, LANDSCAPE ARCHITECT, INTERIOR DESIGNER, GRAPHIC DESIGNER AND LIGHTING DESIGNER: RIOS, www.rios.com
GENERAL CONTRACTOR: Reaume Richardson, reaumerichardson.com
MOBILE INTERIOR PLANTER INSTALLER: Harold Jones Landscape Inc., (805) 582-7443
MURAL ARTIST: Aaron Kai, www.aaronkai.com

MATERIALS

The following is a sampling of materials used in the project:
FURNITURE DESIGN AND FABRICATION: MASHstudios, mashstudios.com
UVC SYSTEM DESIGN AND INSTALLATION: Control Air Enterprises, controlac.com
OVERHEAD FANS: Big Ass Fans, www.bigassfans.com
TILE: Fred + Cathy, fredcathy.com
LOCKERS: Heartwork, heartwork.com

THE RETROFIT

When RIOS sought a new home in 2017, the search led to the intersection of Crenshaw and Exposition. New growth in the area has been attributed to the 2016 introduction of Metro's Expo line, which will connect to Los Angeles International Airport, leading to more growth. The 32,000-square-foot bow-truss building is adjoined to a 20,000-square-foot warehouse. The only walls inside delineate spaces for meeting and making, including a home for a laser cutter, CNC mill, focused workspaces and collaboration tables.

The space fuels RIOS' desire to explore the new frontier of workplace design using its own office as a laboratory. The grittiness and "light touch" within the space is intentional to remove any notion of preciousness and further the ideas of exploration, evolution and flux.

Working from home in 2020 as a result of COVID-19 brought about an entirely new set of issues to explore within—and connected to—the workplace. RIOS embraced the change, and as its team supported those working from home with laptops and distributed working platforms, the team simultaneously shifted the workplace model at their physical address.

The density increased from 203 square feet per person to 515 square feet, with bookable desks and employee lockers holding essential work items. Teams can book desks together or work autonomously. The configuration acknowledges that working from home is here to stay but also underscores the importance of coming together in a physical space. Workplace culture and social interaction, as well as kickoff meetings and project charettes, are more successful with in-person interface. With that in mind, a series of collaboration tables, which bring teams together and connects them with colleagues working remotely, are interspersed throughout the space.

The design also considers important wellness items, like airflow with UVC systems installed at all air intake locations within the HVAC, the addition of over-scaled fans to keep air moving, and an abundance of plants to act as biophilic partitions and provide lushness. A materials lab allows the act of material selection to be celebrated. Selected materials become part of project collections via mobile project carts that can be moved to wherever important live or virtual discussions are occurring.

PHOTOS: JASPER SANIDAD

MINNESOTA POWER | Cloquet, Minn.

» RETROFIT TEAM

MECHANICAL CONTRACTOR: Eclipse Inc.
HVAC DESIGN SUPPORT AND MANUFACTURER: Mitsubishi Electric Trane HVAC US, www.metahvac.com

» THE RETROFIT

Minnesota Power is a regional utility company, serving 145,000 customers in northeastern Minnesota. Staff members pride themselves on promoting energy-efficient technologies and saving customers money. Like many of its customers, Minnesota Power faces efficiency challenges within existing and aging facilities. This led leadership to pursue a high-performance HVAC retrofit in its 5,000-square-foot Cloquet office, which houses the utility's customer service and linemen.

After seven years of failing compressors, humidity issues and frigid winters, a defective HVAC system needed replacement. "For four summers in a row, we didn't have air conditioning. We went through winters with only baseboard heat and hot summers with fans running constantly," expresses Craig Kedrowski, business service advisor, Minnesota Power. "The HVAC units seemed to be 'fighting' one another and the vendor was not responsive in helping us with our system's issues. It prompted us to seek out another solution."

Local mechanical contractor Zach Wehr from Eclipse Inc., who had worked with Minnesota Power's conservation program, invited Jake Sajevic, account manager, Trane, to tour the office. Their goal: determine the issues with the existing system and offer a solution. Ultimately, Wehr and Sajevic chose CITY MULTI from Mitsubishi Electric Trane HVAC US as the solution. The pair invited Mark Totino, commercial area sales manager, METUS, to visit the property and consult on the system's design.

The design includes an R2-Series Heat Recovery System with Hyper-Heating INVERTER (H2i) technology, as well as two PKFY Wall-Mounted Indoor Units, 10 PEFY Horizontal-Ducted Indoor Units and three Lossnay Energy Recovery Ventilators to bring in fresh, outside air. Twelve Smart MEs and one AE-200A Centralized Controller were specified for system management. Each tie into Minnesota's Power's building automation system at the Duluth headquarters, streamlining efficiency and comfort control.

Another benefit: the VRF system doubles as a display of energy-efficient performance for the company's current and future customers. "Because we recommend this equipment in our conservation program, we were interested in having a showcase where we present simultaneous heating and cooling," Kedrowski says. "Beneficial electrification is something that's really coming along."

In the Cloquet office's conference room, two indoor units each connect to an individual thermostat that lights up blue or red for cooling or heating, respectively. "Side-by-side, they'll be able to show and explain the concept of heat recovery. This building is a testament to their support of electrification," Totino notes.

However, Minnesota winters pose a big challenge with electrification: extreme cold. "There are some unique hurdles the farther north you go," Sajevic adds. "Our design's low-ambient temperature is -20 F and it can get even colder. I've talked with engineers all over the region and they think VRF is a great technology but only a few are comfortable specifying it because of the low-ambient conditions we face." For Sajevic, combining supplemental heat with VRF technology is a win-win; customers get clean, energy-efficient energy with back-up heating for freezing winters.

"For many developers and engineers, their gut reaction is to explain why electric heat is super expensive to run. What I explain to them is that when paired with Mitsubishi Electric's H2i units, the auxiliary heat will almost never run," Sajevic says. "For this project, we're going to continue to submeter the electric heat going into next winter and we've interlocked the controls system with our CN-24 accessory, which enables supplemental heat sources. We'll be able to verify how often the supplemental heat actually runs and under what outdoor conditions it is enabled."

Wehr agrees, especially as a commercial engineer in the region. "First and foremost, the technology has come a long way, especially in terms of payback, life expectancy, rate of return on investment and performance, though I can understand the apprehension of some based on past technology. That said, the system we installed at Minnesota Power will kick off at -25 F and switch to supplemental heat. I have the highest confidence in the equipment. I've had it in my building since 2008 with no issues."

Since installation, the system has only received positive feedback, especially in regard to the simultaneous heating and cooling. "I'm glad we finally got this rectified," Kedrowski says. "Our coworkers are loving it. We have some people that want their room 80 F even in the summer and then some want it 65 F. The Mitsubishi Electric system allows them to do that."

> **BECAUSE WE RECOMMEND THIS EQUIPMENT IN OUR CONSERVATION PROGRAM, WE WERE INTERESTED IN HAVING A SHOWCASE WHERE WE PRESENT SIMULTANEOUS HEATING AND COOLING.** — *Craig Kedrowski, business service advisor, Minnesota Power*

PHOTOS: **MITSUBISHI ELECTRIC TRANE HVAC US**

THE SINCLAIR | Fort Worth, Texas

» RETROFIT TEAM

MANUFACTURER'S REPRESENTATIVE:
Texas Air Systems,
www.texasairsystems.com

HVAC EQUIPMENT MANUFACTURER:
LG, www.lghvac.com

» THE RETROFIT

The Sinclair's mission is to create an unforgettable and luxurious experience for its guests in a classic building environment. The hotel's owner and design team sought state-of-the-art technology to power, sustain and manage the entire property while carefully maintaining the historic building's unique design and architectural details.

It was paramount that the Sinclair renovation include the right mix of advanced technologies to deliver an exceptional guest experience. The hotel aimed to be low-voltage and the management team explored Power-over-Ethernet (PoE) technology to help achieve many of the Sinclair's energy-efficiency and forward-thinking technology goals.

In this drive to create a beautifully designed and technologically advanced space, the building's owner and managers were required to play within the confines of the existing structure as much as possible. First, there was a need to replace the inefficient air-conditioning system (an older-model chiller system) that had taken up precious real estate on the property's lower level, upper level and rooftop—areas that could be repurposed for other uses.

The hotel required individual control of its HVAC system throughout 164 guestrooms (featuring 50 different room types) and sufficient heating and cooling for the lobby bar, reception area and a large basement restaurant.

For the HVAC system, LG's award-winning Multi V IV Heat Recovery unit was selected for its ability to provide individual room comfort for each space within the larger property. Offering a compact footprint without sacrificing power, the Multi V IV contributes to building energy efficiency, high performance and flexibility in design, and installation options. Installation versatility was a key factor because the historic Sinclair building was restricted in regard to lower ceilings, as well as space for outdoor equipment.

Recognizing the importance of quieter operation, especially in the Sinclair's guestrooms, Texas Air Systems recommended versatile wall-mounted units and LG ceiling cassettes that did not require bulky ductwork to accommodate the tight ceiling area constraints while supporting the tranquil environment required of guestrooms. The technology works behind-the-scenes, translating to the overall comfort and experience of a guest's stay.

Texas Air Systems also specified LG's AC Smart controller, which allows for virtually seamless control of the HVAC system for the building management team. This innovative control solution compatible with a variety of applications offers a single LG platform that drives VRF technology and energy efficiency. Property managers now can easily manage, set, and monitor the building's heating and cooling performance.

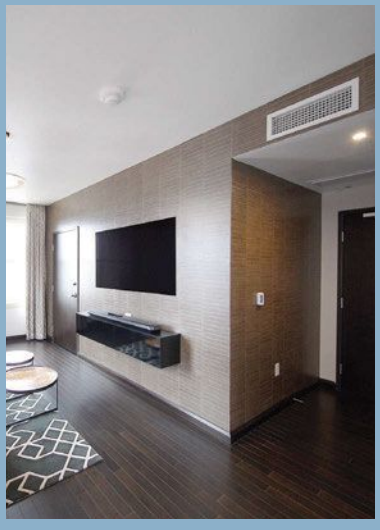
After switching to VRF, the hotel was able to gain a significant amount of usable floor space for the large lower-level restaurant and top-floor executive suites. On the exterior of the Sinclair, LG outdoor units with slim, minimal features were installed to further save space.

For nearly the same cost as a traditional system, the Sinclair now has a highly reliable, energy-efficient HVAC solution that is designed to deliver effortless occupant comfort and convenience.

The developer also incorporated an array of LG OLED hotel TVs into every guestroom. Premium OLED displays deliver a picture with perfect blacks and incredible color, even from wide viewing angles. It uses self-lighting pixels that can be individually turned on and off for exact control of image brightness and quality, delivering infinite contrast ratios optimized for high-dynamic range content. In addition to the guestroom displays, a number of other LG commercial displays are featured throughout the property's public spaces, including in the lobby, restaurants and bars.

The Sinclair is a groundbreaking example of the hotel of the future. "There's no hotel as forward-thinking as ours—from the power generation of the entire building to the most advanced tech toys, like the OLED TVs found in each room, the Sinclair is a study in high-class high-tech," says Farukh Aslam, CEO of Sinclair Holdings.

» AFTER SWITCHING TO VRF, THE HOTEL WAS ABLE TO GAIN A SIGNIFICANT AMOUNT OF USABLE FLOOR SPACE FOR THE LARGE LOWER-LEVEL RESTAURANT AND TOP-FLOOR EXECUTIVE SUITES. «



PHOTOS: **LG**

URBAN ROOFTOPS: An Untapped Resource

WRITTEN BY | JEFFREY LANDAU

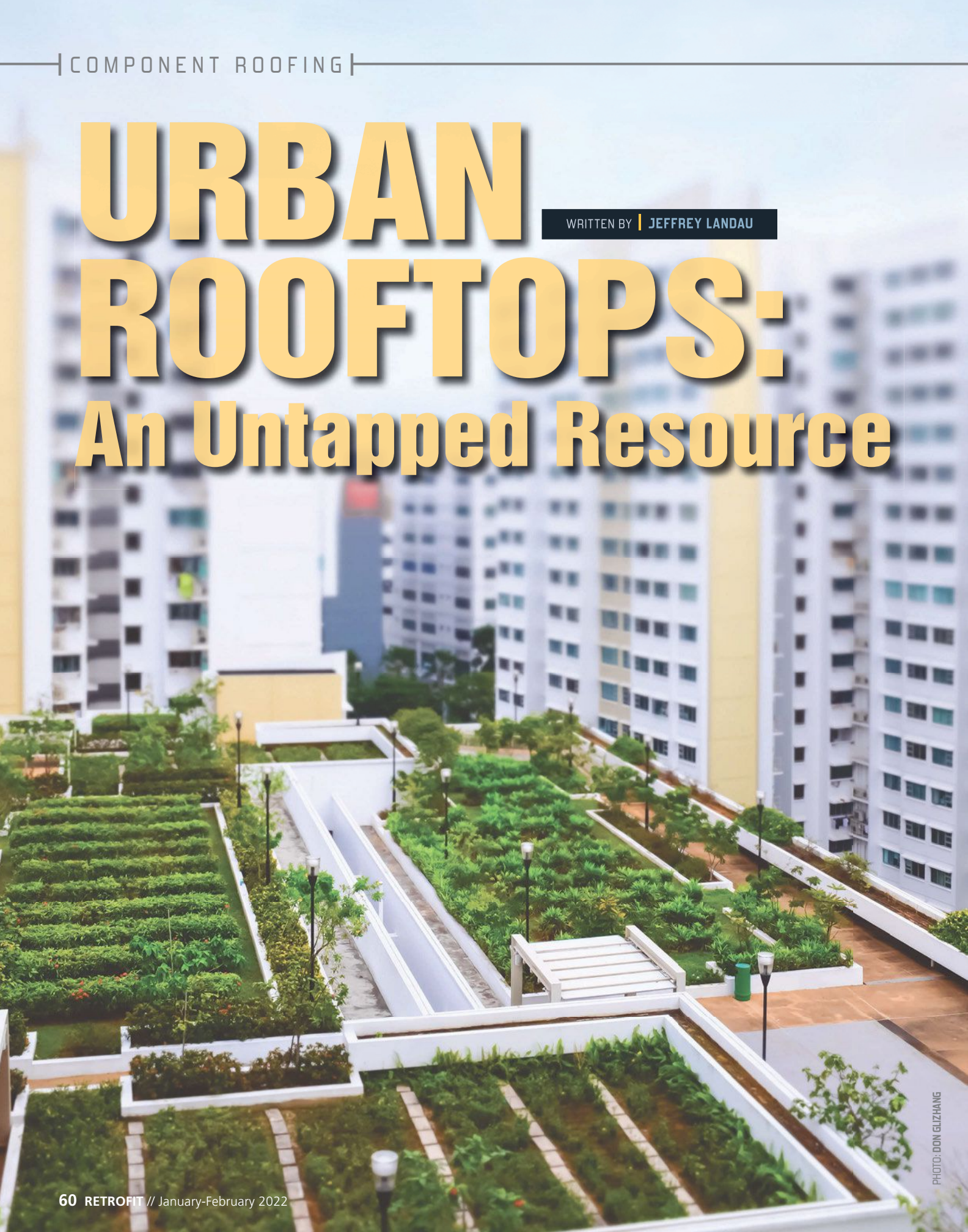


PHOTO: DON GUZHANG

PHOTO: MIT

Ten Reasons Your Building Can Benefit from Creating a Rooftop Farm

The United States has lost more than 11 million acres of farmland to development over the last 20 years. A recent report by American Farmland Trust (bit.ly/3CcH2wg) shows that agricultural land is increasingly being converted, fragmented or paved over, challenging local and regional food systems.

In that same amount of time, the global population has increased from 6.19 billion in 2001 to 7.9 billion in 2021. This rapid population growth and lack of agricultural land create an urgent need for more food production in underutilized spaces.

The 2018 study, A Global Geospatial Ecosystem Services Estimate of Urban Agriculture (bit.ly/3DkN3bE), estimated almost 1.4 million hectares of available rooftop spaces for farming in cities globally. With street-level space at an ever-increasing premium in urban built-up cities, rooftops are an unused area ripe with potential for food production.

Although selecting the correct cultivation and production methods for these rooftops will be a challenge—some methods require at least 1 acre of space to be commercially successful—rooftops are the single greatest opportunity to grow food in cities.

» IT HAS BEEN ESTIMATED THAT ALMOST 1.4 MILLION HECTARES OF ROOFTOP SPACES ARE AVAILABLE FOR FARMING IN CITIES GLOBALLY. «

PHOTO: MIT

ROOFTOP FARMS HAVE LONG BEEN KNOWN TO PROVIDE PSYCHOLOGICAL BENEFITS. URBAN GREEN SPACES PROVIDE SANCTUARY TO PLANTS, INSECTS AND PEOPLE.

HOW TO ACCELERATE ADOPTION OF ROOFTOP FARMING IN NORTH AMERICA

To accelerate the use of underutilized rooftops as rooftop farms, cities need to provide more data and guidance about zoning and best practices for rooftop gardens and farms. Currently only 25 cities in North America have programs or incentives to encourage green roof development—whether for food production, energy production or community engagement.

In January 2017, San Francisco's Better Roofs Ordinance was the first U.S. city mandate for solar and living roofs on between 15 to 30 percent of roof space on most new construction. (Learn more at www.nationalgeographic.com/history/article/san-francisco-green-roof-law.) By being first, San Francisco has encouraged other cities to similarly take on the challenge of repurposing their empty gray rooftops.

New York City passed two laws in November 2019, known informally as the Sustainable Roof Laws (bit.ly/3cdnrRQ), to require most new buildings to include a sustainable roofing zone on 100 percent of their available roof space. Denver has also generated a green roof ordinance (bit.ly/3Cdr70N) to limit atmospheric air pollution and reduce urban heat island effects. Meanwhile, Portland, Ore., has an eco-roof requirement (bit.ly/3Hm8mMh), mandating vegetation to cover 100 percent of the roofs on new buildings with a net building area of 20,000 square feet.

If you are seeking to implement a rooftop farm or green roof on your next project, be sure to contact your city's department of planning to see what requirements and incentives the city offers. If you need further assistance, visit www.greenroofs.com and www.agritecture.com.

So why should you consider a rooftop farm for your next building project?

As an architect, developer, building owner or tenant, there are numerous reasons that you would benefit from an urban rooftop farm. Consider the following 10 benefits of this conversion:

1. Food Production

The most obvious benefit of a rooftop farm is food production. In the Bronx, N.Y., an approximate 8,000-square-foot rooftop hydroponic greenhouse was erected on top of a new affordable housing building. This farm, Sky Vegetables, www.skyvegetables.com, introduced fresh and delicious produce to a community with limited access to healthy foods. The farm employs local residents and sells varieties of herbs and leafy greens to local and national supermarkets, as well as reserves a portion of each harvest for the immediate local community, free of charge.

2. Green Building Amenity

In Toronto, Avling Brewery built a rooftop farm on top of its existing restaurant and brewery. (Read more at bit.ly/3oosflo.) With an enclosed greenhouse, the team is able to utilize the excess heat generated from the brewing process to extend the growing season. Plus, the brewery uses the green space for events, education and as a local food hub. By converting its generic concrete rooftop and

redirecting wastewater and kitchen waste, Avling Brewery can produce food hyper-locally and create a more circular business.

3. Mitigation of Urban Heat Island Effect

The heat island effect is the result of a city's highly dense infrastructure that absorbs and re-emits the sun's heat. The concentration of buildings, roads and other structures result in higher temperatures compared to natural green spaces. According to the U.S. Environmental Protection Agency, the heat island effect can increase daytime temperatures in an urban area by 1 to 7 degrees F compared to outlying areas (www.epa.gov/heatislands/learn-about-heat-islands).

Green roof temperatures can be 30 to 40 degrees F lower than those of conventional roofs and can reduce citywide ambient temperatures by up to 5 degrees F. (Learn more from "The Benefits and Challenges of Green Roofs on Public and Commercial Buildings", bit.ly/3kGbnNH, and "Cooling the cities—A review of reflective and green roof mitigation technologies to fight heat island and improve comfort in urban environments", bit.ly/3qH6O9M.) These interventions can help cities avoid extreme temperatures in the face of climate change.

4. Energy Efficiency and Reduced Operational Costs

One of the major downsides to building a green roof or rooftop farm is the upfront costs. According to a study by the University of Michigan, www.governing.com/archive/gov-green-roofs.html, a 21,000-square-foot green roof costs about $100,000 more to install than a conventional roof. But, throughout its lifetime, it would save more than $200,000, thanks mostly to reduced energy needs. The reduced operating costs and lower carbon footprint of this cost-effective design solution are a great benefit of the insulating effect of plants.

For example, in New York, the Jacob K. Javits Convention Center's rooftop glass pavilion, 1-acre farm and 7-acre green roof have been said to reduce the building's energy consumption by 26 percent. Learn more at javitscenter.com/sustainability.

5. Stormwater Management

Thailand is a prime example of a country that faces frequent flooding and could benefit from the stormwater management provided by rooftop farms.

According to World Bank estimates, nearly 40 percent of Bangkok may become flooded each year by 2030 due to more intense rainfall. Thammasat University's 7,000-square-meter rooftop farm in Bangkok, helps better manage this excess stormwater. Learn more about the university's rooftop farm at bit.ly/3FmHASj.

INTERESTED IN IMPLEMENTING A ROOFTOP FARM?

You can start visualizing your rooftop farm with Agritecture Designer, farm planning software that will help you build and compare unlimited models. Learn more at design.agritecture.com.

6. Compliance with Local Laws and Regulations

New York City's Climate Mobilization Act, passed in 2019, is a good reason building owners, architects and developers have for integrating urban agriculture into their developments. The two laws, bit.ly/3x1U2UF, require green roofs or solar panels on all new construction and significant roof renovations for existing buildings. Learn more about mandates for green roofs in "How to Accelerate Adoption of Rooftop Farming in North America", page 62.

7. Eligibility for LEED Credits

Rooftop farms enable buildings to be eligible for LEED credits, a green building rating system developed by the Washington, D.C.-based U.S. Green Building Council. According to USGBC (www.usgbc.org/leed/why-leed), having a LEED-certified building gives building owners a competitive advantage, attracts tenants and helps manage building performance, among other things. Buildings with a rooftop farm are eligible for up to six LEED credits in the following categories:

- Local Food Protection (1 credit)
- Social Equity within the Community (1 credit)
- Heat Island Reduction (2 credits)
- Site Development: Protect or Restore Habitat (2 credits)

8. Building a Habitat for Pollinators

Green roofs help restore biodiversity to urban areas by attracting pollinators that have been pushed out of the city as their natural habitats get paved over. Brooklyn Grange's rooftop farm in New York City boasts rooftop beehives. This allows the 5.6-acre farm to grow vegetables and sell honey to local restaurants and markets.

Increased biodiversity can additionally help improve the health of entire cities because biodiversity is an indicator of clean air and waterways.

PHOTOS: **AGRITECTURE**

> IN TORONTO, AVLING BREWERY'S TEAM IS ABLE TO UTILIZE THE EXCESS HEAT GENERATED FROM THE BREWING PROCESS TO EXTEND THE GROWING SEASON. PLUS, THE BREWERY USES THE GREEN SPACE FOR EVENTS, EDUCATION AND AS A LOCAL FOOD HUB.

PHOTOS: AGRITECTURE

> Sky Vegetables in Bronx, N.Y., employs local residents and sells varieties of herbs and leafy greens to local and national supermarkets, as well as reserves a portion of each harvest for the immediate local community, free of charge.

9. Combining Solar Panels with Green Roofs

Although not commonly assumed, combining solar panels and green roofs can make each component work better. While solar panels can provide shade for plants, reducing the need for watering, the rooftop farm helps lower the temperature of the panels, helping them work better.

The Javits Center's rooftop farm sports more than 3,000 solar panels, making it the largest solar farm in Manhattan. This piece of green infrastructure produces 1.4 megawatts of solar energy for the building. According to New York's governor's office, this number has been "estimated to offset more than 1.3 million pounds of carbon emissions each year". Learn more about the Javits Center's rooftop farm's benefits at bit.ly/30xwESP.

10: Community Development and Wellbeing

Rooftop farms have long been known to provide psychological benefits. Urban green spaces provide sanctuary to plants, insects and people. This additionally aids community engagement and development.

Altius Farms in Denver, a company that builds rooftop farms with tower gardens, employs returning vets as part of its community-minded mission of supplying fresh, healthy produce through a community-supported agriculture harvest subscription program. Through this means, Altius Farms representatives are able to educate their community about nutrition and provide local, wholesome produce for all its constituents.

The Boston Medical Center has a 2,658-square-foot rooftop farm that similarly provides fresh, local produce to hospitalized patients to increase overall wellbeing.

As our climate continues to change and our cities rapidly develop, rooftop farms will provide our communities with a place of refuge. The access to fresh produce, cooler environments and greener landscapes will benefit us all in the seasons to come.

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HYDROTECH CALLS ME OPPORTUNITY.

ORDINARY ROOFS WASTE ME.
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An Affordable Housing Agency Retrofits a Historic Building and Builds a New Addition to LEED Platinum and Passive House Standards

PHFA spared the Hickok Mansion, circa 1904, from the wrecking ball in favor of a more creative plan to integrate the historic structure with a new high-rise tower. PHFA worked diligently with neighbors, city officials and the Historical Architectural Review Board for years to develop a design amenable to all parties.

PHOTOS: DON PEARSE PHOTOGRAPHERS INC. unless otherwise noted

The Pennsylvania Housing Finance Agency's (PHFA's) growth created disconnected departments, and additional space was needed for new employees to continue their affordable housing mission. The agency's urban headquarters in Harrisburg was landlocked by deteriorating historic buildings and a small parking lot. Meeting the agency's expansion needs on the small urban site, preserving historic building elements and integrating PHFA's extreme energy-conservation practices were the biggest challenges of this project.

WRITTEN BY | BENEDICT DUBBS, AIA, LEED AP

To prepare for its expansion, PHFA purchased the adjacent deteriorating historic building, circa 1904. Known as Hickok Mansion, the dilapidated Georgian-Revival landmark is located within the capitol's National Register of Historic Places district and, in 2011, the Historic Harrisburg Association placed Hickok Mansion on its list of endangered properties. PHFA spared the residence from the wrecking ball in favor of a more creative plan to integrate the historic structure with a new high-rise tower. PHFA worked diligently with neighbors, city officials and the Historical Architectural Review Board (HARB) for years to develop a design amenable to all parties.

A Complementary Tower

To begin, a non-historic 1970s Hickok Mansion addition was razed. The site for the new tower would be directly flanked by the oldest clapboard homes in Harrisburg. Extreme care was taken not to damage them during construction. A primary goal of the addition was to insert a new 8-story office tower within a 3-story neighborhood to complement the existing architecture while introducing a new aesthetic above that 3-story elevation.

Community collaboration was welcomed in the development of the design, and the addition went through multiple designs prior to the final contextual solution. Harrisburg has a very rich history of using brick on prominent buildings in the capitol city. Because this project is in a historical district, it was important to use brick as the exclusive material at the base of the new tower. High-performance glass predominates the upper floors of the building with a small section of precast panels uniting the existing and new structures visually. HARB approved the unique addition and appreciated the clean lines of the façade, which reinforces the modern aesthetic of this building in contrast to the surrounding buildings dating back to the 1800s.

Retrofit Challenges

The historic Hickok Mansion and the newly constructed tower have their own separate Passive House systems. The tower addition presented unique opportunities in the design, but the mansion was complicated and had numerous issues that had to be addressed. The historic façade was extremely porous and did not adhere to Passive House standards. A thermal air-barrier was constructed inside the historic exterior that was thermally insulated, airtight, adequately ventilated and mitigates thermal bridging. PHIUS-certified replica windows were

Retrofit Team

PROGRAMMING, INTERIOR DESIGNER AND ARCHITECT // Murray Associates Architects P.C., murrayassoc.com
- Benedict Dubbs, AIA, LEED AP, principal
- Kirsten Watts, LEED AP, interior designer
- Robert Hutchins, RA, project manager

PASSIVE HOUSE CONSULTANT // PassivScience, passivscience.com
- Prudence Ferreira, CPHC

PHIUS+ VERIFIER, LEED CONSULTANT // Steven Winter Associates, www.swinter.com
- Scott Pusey, senior sustainability specialist

SITE/CIVIL AND STRUCTURAL ENGINEER // Whitney Bailey Cox & Magnani LLC, wbcm.com

MECHANICAL, ELECTRICAL, PLUMBING ENGINEER // Bruce Brooks & Associates, www.brucebrooks.com

CONSTRUCTION MANAGER // SitelogIQ, www.sitelogiq.com

GENERAL CONTRACTOR, PHASE I // J.C. Orr & Son Inc., jcorrpa.com

GENERAL CONTRACTOR, PHASE II // Lobar Inc., www.lobar.com

PHOTO: MIKE MIHALO PHOTOGRAPHY

Hickok Mansion Materials

PHIUS-CERTIFIED DOUBLE-HUNG REPLICA WINDOWS AND DOORS // Klearwall, klearwall.com

STRUCTURAL THERMAL BREAK // Armatherm, www.armatherm.com

VARIABLE REFRIGERANT FLOW (VRF) HEAT PUMPS // Mitsubishi Electric Trane HVAC US, www.metahvac.com

PHIUS-CERTIFIED ENERGY RECOVERY AND DEDICATED OUTDOOR AIR UNITS // Swegon, www.swegon.com

EXTERIOR INSULATION SYSTEM // Techna-Duc from PTM Manufacturing LLC, www.ptmmanufacturing.com/techna-duc

ERV DUCT SEALANT // Aeroseal, aeroseal.com

BRICK PAVERS // Glen-Gery, www.glengery.com

BULLET-RESISTANT DOORS // U.S. Bullet Proofing, www.usbulletproofing.com

CAST STONE // Arriscraft, arriscraft.com

INSULATED BARRIER WALL PANELS // CENTRIA, www.centria.com

LIQUID VAPOR PERMEABLE AIR BARRIER // R-Guard from Prosoco, prosoco.com

TPO ROOFING // Johns Manville, www.jm.com

SIMULATED SLATE SHINGLES // Eco Slate from Eco Roofing Systems, www.ecosystemsdistribution.com/eco-slate

SNOW GUARDS // Alpine SnowGuards, www.alpinesnowguards.com

GREENGUARD THERMAL INSULATION // Rockwool, www.rockwool.com; CertainTeed, www.certainteed.com/building-insulation; and Kingspan, www.kingspan.com

RESIN // 3Form, www.3-form.com

GLASS FILM // Fasara Glass Finishes by 3M, www.3m.com

RAISED FLOOR SYSTEM // ACS/Uni-Fab, www.acsunifab.com/underfloor-systems/raised-floor-boxes

CEILING SYSTEMS // Armstrong Ceiling & Wall Solutions, www.armstrongceilings.com, and Fellert USA, www.fellert.com

METAL CEILINGS // Hunter Douglas Contract, www.hunterdouglasarchitectural.com/landing/metal_products.jsp

INTERIOR LIGHTING // BEGA, www.bega-us.com; ConTech Lighting, www.contechlighting.com; Dual-Lite, www.hubbell.com/dual-lite/en; Finelite, www.finelite.com; HE Williams, hew.com; LSI Industries Inc., www.lsicorp.com; and USAI Lighting, www.usailighting.com

SOLID SURFACE // Corian, www.corian.com

LINOLEUM // Forbo, www.forbo.com

DECORATIVE GLASS // Goldray Glass, www.goldrayglass.com

CARPET // Interface, www.interface.com

FURNITURE // Knoll, www.knoll.com

GROUT // Latricrete, laticrete.com

WALL BASE // Roppe, roppe.com

PORCELAIN TILE // Mosa, www.mosa.com, and Garden State Tile, gstile.com

PAINT // Sherwin-Williams, www.sherwin-williams.com

PLASTIC LAMINATE // Wilsonart, www.wilsonart.com

QUARTZ // Corian Quartz, www.zodiaq.com

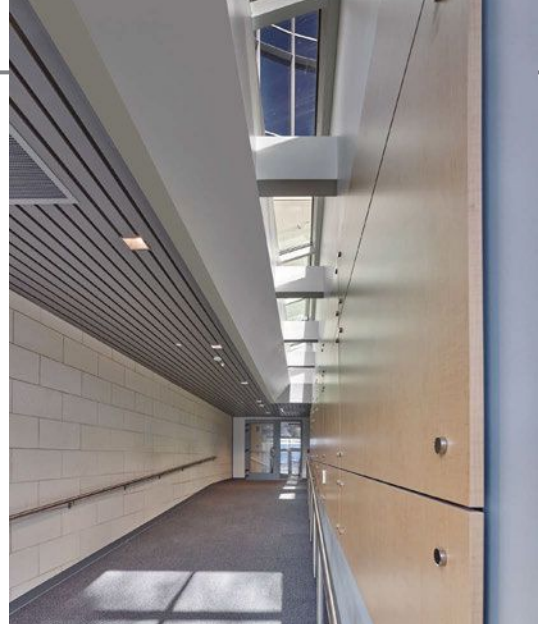
also installed throughout the residence.

The exterior brick was cleaned and restored. However, the base of the residence had severe efflorescence, or crystalline salt deposits, caused by decades of the city salting the street and sidewalks. The façade brick and mortar had salt present two courses deep and the mortar was flaking and crumbling. Because of the severe salt damage, replacing the mortar was not an option. The design solution, approved by HARB, was to install a water-table treatment on top of the damaged brick base of the building to prevent any further damage.

The mansion's front door was not ADA accessible, so its interior entryway was removed, and the exterior doorway was closed and preserved with a historic marker. A new entryway was constructed between PHFA's original building and the residence. This new entrance is adorned with a canopy of fritted laminated glass and exposed galvanized steel, which juxtaposes the heaviness of the cast stone.

Roofing systems also were somewhat complicated. The western and southern portions of Hickok Mansion's roof that are visible to the public had to maintain their historic vernacular. A new simulated slate roof was installed only on these areas to meet the historical requirements. A white TPO roof system was utilized on the remainder of the roof, which was installed lower than the slate roof. Not only does this roof reflect UV rays and heat from the building, which saves energy (and money) to cool the building's interior during the summer months, but it also allowed VRF units to be installed on the roof, hidden from the public's view.

"This project is one of the most innovative and creative building projects to be carried out in downtown Harrisburg in many years, as it



combines two very important attributes," says David Morrison, executive director of the Historic Harrisburg Association. "A sensitivity to historic preservation by virtue of its restoration and preservation of the landmark Hickok Mansion at Front and Locust Streets. Also, the design of the historical retrofit and the new adjacent tower to LEED Platinum and Passive House standards is an achievement that places this project in a class by itself in the country."

A Healthy Work Environment

A staff-centric work environment is the result of careful space planning, as well as the application of 21st century interior design principles. The residence interiors were retrofitted into a training center, community room and multiple conference rooms. Technology, ergonomics, color, texture, pattern, and lighting combine to create a lively, comfortable and high-functioning workplace. Raised flooring systems are the source for heating, cooling and fresh air. Return-air ceiling plenums promote a healthy interior environment by removing all particulates from the staff areas.

Typical office spaces use high amounts of energy with their elevator, equipment, appliances, computers and monitors. To meet LEED Platinum and Passive House criteria, the following systems were integrated to offset energy consumption while maintaining a comfortable corporate environment:

- PHIUS-certified double-hung windows and a 129-panel curtainwall system maintain the insulated airtight envelope.
- AN ELECTROCHROMIC SHADING SYSTEM reduces energy consumption through programmable tinting, managing solar gain and light harvesting.
- SELF-SHADING DESIGN maintains the building's thermal envelope by decreasing its solar gains.
- VRF MECHANICAL SYSTEMS provide comfortable, efficient heating and cooling zones, consume low energy and track energy usage.
- A PHOTOVOLTAIC SYSTEM of 77 solar panels creates renewable energy.
- A LIVING ROOF manages stormwater runoff, extends the roof life and reduces the addition's carbon footprint.
- STORMWATER MANAGEMENT utilizes collected rainwater that is treated and reused onsite in lieu of potable water. This enables the addition to reduce its potable water use by 20 percent.
- OCCUPANT DAYLIGHT ACCESS is available in 75 percent of the occupied spaces with views of at least 25 feet.

This was an ambitious and unique project, and the extreme energy-conserving design and systems have impacted the city's environment, economy and community, plus define future office design practices on a global level. The historic retrofit significantly reduced the carbon footprint of this project and a Whole Building Life Cycle Analysis was conducted on both the historical building and tower addition.

The Benchmark Energy Use Intensity is 56.3 kBtu per square foot per year, and the addition's predicted energy use intensity is 30.3 kBtu per square foot per year. The level of building embodied carbon is 69 pounds per square foot, which is less than the national benchmark. Local and/or recycled materials were utilized to the greatest extent, and most of the interiors can be reconfigured or reused for longevity with key components protected from hazardous risks.

Since its completion, the addition uses 49 percent less energy than similar code-compliant office buildings and returns 20 percent of its solar panel electricity production back to the city grid. PHFA's addition reduces its operational energy and improves performance in energy savings, water efficiency, carbon-dioxide emissions reduction, indoor environmental quality and stewardship of resources—defying global warming. This project proves an inviting, beautiful and comfortable office/work environment requiring minimal energy is possible.

Economic Impact

During the three years of multi-phased construction, the job averaged 30 to 40 construction workers onsite each day, benefitting the local economy. The agency made a concerted effort to use Pennsylvania firms on the construction project as much as possible so that the greatest benefit would go to in-state businesses. The addition permitted PHFA to stay within the city limits, instead of moving to the suburbs, allowing its employees to continue supporting downtown businesses. Plans are already underway to increase the agency's affordable-housing services to the Commonwealth. This continued growth will maintain PHFA's positive impact on the city's economic wellbeing and Pennsylvania's growing affordable housing needs for years to come.

NEW AND NOSTALGIC

An Adaptive-reuse Project Restores a Historic City Landmark and Creates Space for Innovation

WRITTEN BY | KJ FIELDS

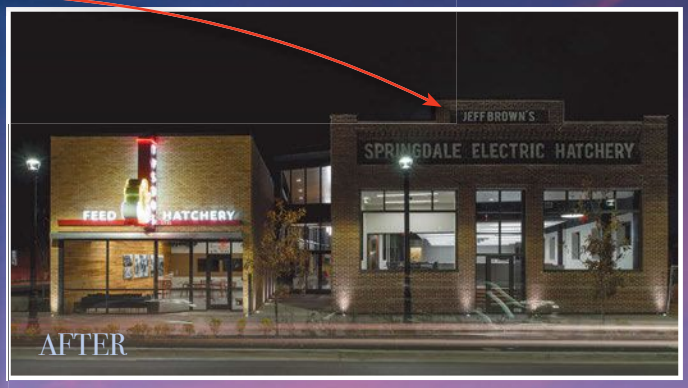
A Tyson Foods' redevelopment bridges a family legacy with civic revitalization and historic preservation with modern, sustainable design. Making investments in Springdale, Ark., where the company got its start, family-owned Tyson Foods shows its commitment to "... drive positive change, solve problems, and make the world a little better every day." One of the company's investments opened in 2017, reclaiming a 1940s brick building on E. Emma Avenue in downtown Springdale that served as Tyson Foods first headquarters from 1947-69.

In addition to rejuvenating a dilapidated site, the Tyson Emma project brought approximately 300 team members to spur growth in the downtown area.

PHOTOS: **RANDY BRALEY** unless otherwise noted

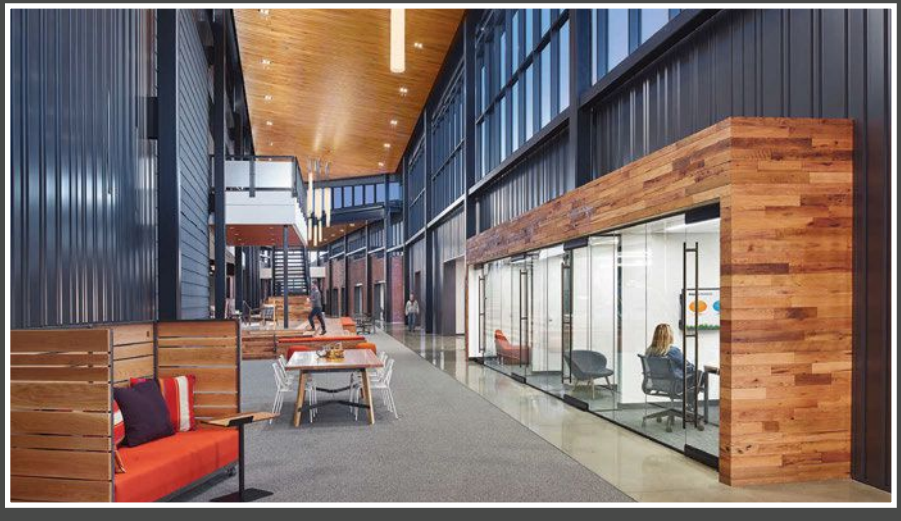

BEFORE
PHOTO: SHILOH MUSEUM OF OZARK HISTORY


DURING
PHOTO: HOK


AFTER
JEFF BROWN'S
SPRINGDALE ELECTRIC HATCHERY
FEED
HATCHERY


AFTER
JEFF BROWN'S
SPRINGDALE ELECTRIC HATCHERY


TYSONS
FIRE LANE



THE FEED BUILDING ON THE SITE COULD NOT BE SAVED AND WAS DECONSTRUCTED. WHITE OAK AND RED OAK FROM IT AND THE HATCHERY, AS WELL AS KNOTTY PINE SALVAGED FROM THE ORIGINAL HEADQUARTERS OFFICE BUILDING, ACCENT THE INTERIOR WALLS, STAIR TREADS AND THE RECEPTION AREA OF THE TYSON FOODS DEVELOPMENT.

"As designers, we fell in love with the project," says Eli Hoisington, design principal at HOK's St. Louis studio, who provided multidiscipline services for the redevelopment. "In the past, agriculture and manufacturing was centered in downtown cores right next to the rail lines. Then Midwest cities and towns suffered because so many people left Main Street. This project is vitally important to Springdale because it brings Tyson back to its roots and spurs the city's renewal."

Three original buildings on the site—Tyson Foods' former headquarters, Jeff D. Brown and Company's Springdale Electric Hatchery next door and a feed building behind the hatchery—formed the Springdale Poultry Industry Historic District. Although the buildings fell into disrepair, the district was added to the National Register of Historic Places in 2011.

The 56,000-square-foot redevelopment reclaims two of the original buildings and incorporates two new ones along with an atrium, creating an interconnected space for Tyson Foods' Innovation Technology employees.

"The history of the buildings was important to the city and the Tyson family, and we needed to interpret their story through the project's design," Hoisington says. "We preserved the site's heritage and supplemented it with modern additions to create a state-of-the-art workspace that fosters collaboration and creativity."

RE-FORM AND EVOLVE

Once the project was underway, assessments revealed the feed building's structure was beyond repair. Despite the fact that it could not be saved, materials found inside the feed building were reclaimed and infused the rest of the development with a special character.

"We deconstructed the building and salvaged a mix of white oak and red oak from the hatchery and feed building's walls, floors and some of the joists," says HOK Project Architect Stefanie Hartman. "In addition to knotty pine salvaged from the original headquarters office building, the reclaimed wood accents the interior walls, stair treads and the reception area."

Hoisington asserts the original wood has a different texture than current building material wood sources. "Older wood tends to come from older-growth trees. The wood

> THIS PROJECT IS VITALLY IMPORTANT TO SPRINGDALE BECAUSE IT BRINGS TYSON BACK TO ITS ROOTS AND SPURS THE CITY'S RENEWAL. *–ELI HOISINGTON, DESIGN PRINCIPAL, HOK*

grain is tighter and denser than the open-spaced wood available today. It's beautiful, and brings an entirely different quality to the project," he notes.

Deconstruction, salvage and repurposing materials is a sustainable use of resources, but Hoisington says saving the two original buildings is the project's main sustainable feature. "All the embodied energy to make the bricks, mill the wood and create the structure was already there. Retrofitting and adding performance to pre-existing buildings is the most sustainable practice we could implement."

Because the remaining two buildings were on the National Register, their original exterior walls had to remain intact to maintain their public street presence. The team conducted research—onsite and from drawings—to uncover changes that occurred over the decades. Some original windows were no longer visible, so HOK returned those fenestrations to the headquarters building and hatchery.

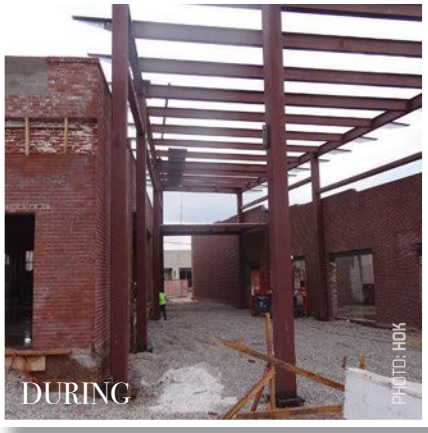
Constructed of brick masonry, the headquarters building and the hatchery needed structural reinforcement.

"In particular, the hatchery's original wood framing had suffered fire, moisture and termite damage over the years and we couldn't salvage the framing," Hartman says. "To create a structural support, we inserted a new steel frame inside the brick masonry walls to withstand gravity and lateral loads."

CLEVER INTEGRATION

To accommodate hundreds of employees, the addition of new building space was anticipated from the project's inception. As they examined the site, however, an unusual opportunity presented itself to the architects.

"One of the key things we could take advantage of was the old alley between the headquarters and hatchery," Hoisington recalls. "We converted the alley into an atrium that straddles the two original buildings and two new ones linking everything together. It's a special hub that gives people a place to gather."



THE ALLEY BETWEEN THE HEADQUARTERS AND HATCHERY WAS CONVERTED INTO AN ATRIUM THAT STRADDLES THE TWO ORIGINAL BUILDINGS AND TWO NEW ONES.

The floors of the two original buildings across the alley didn't align, so stairs in the atrium made of the reclaimed wood help occupants transition from one side of the development to another. The original architecture of the headquarters building steps down on its eastern façade, and the new taller buildings are located on the southern portion of the site. The atrium's design is "stepped" into two pieces to accommodate the differing building heights and bring visual symmetry to the overall redevelopment.

Inside, the atrium showcases exposed structural steel columns and curtainwall supports, clerestory windows and a ceiling made of new rift-cut white oak veneer with a teak stain.

Drawing on his past experience working with projects listed on the National Register, Hoisington knew the Secretary of the Interior urges designers to clearly delineate between the original and modern elements of historic retrofits. At Tyson Emma, designers set the atrium and the height of the new construction back from the E. Emma Avenue street view to highlight the original buildings' historic and cultural importance. Intentional use of lighting also differentiates the old and the new.

"We carefully lit the exterior with low lighting in the foreground to celebrate the masonry," Hoisington explains. "The original buildings are lit from the outside and the new buildings glow from the inside."

HOK's lighting team worked with the company's interior architects to specifically design lighting fixtures and chandeliers inside the building. Interior materials subtly convey an agricultural industry vernacular with walls made of black-finished painted aluminum metal siding, black structural steel square columns, concrete floors, wood and existing masonry.

The buildings include a gallery, meeting space and large gathering space for the Tyson Foods employees. The project is adjacent to the Razorback Greenway shared-use trail and employees are encouraged to enjoy Springdale's temperate outdoor weather with a bocce ball court, shuffleboard and a fire pit on the west side of the facility.

LEGACY AND CATALYST

Tyson Foods' investment in downtown inspired others to follow as new developments opened across the street from the facility and restaurants moved into the area.

While the project sparks fresh vitality in the neighborhood, the preserved buildings kindle nostalgia. To signify Tyson Foods' return to the site, the company recreated its 1940s neon chicken sign for the front of the original office building.

"The restoration resonated with the Tyson family and brought back memories for the people of Springdale," Hoisington says. "These buildings hadn't been occupied for a while, and people came by whose parents or grandparents worked in the buildings and recognized it as part of their heritage. It was amazing to watch people in the community see their own story in these buildings, too."

RETROFIT TEAM

ARCHITECT, INTERIOR DESIGNER, LANDSCAPE ARCHITECT, STRUCTURAL ENGINEER, SPACE PLANNING AND LIGHTING // HOK, www.hok.com
ACOUSTICS // AcoustiControl, www.acousticontrol.com
MECHANICAL, ELECTRICAL AND PLUMBING ENGINEER // HSA Engineering Consulting Services, www.hsaconsultants.com
CIVIL ENGINEER // Engineering Services Inc., www.engineeringservices.com
GENERAL CONTRACTOR AND ROOFING CONTRACTOR // Milestone Construction Co., www.mstonecc.com

MATERIALS

CEILING TILE // Armstrong Ceiling & Wall Solutions, www.armstrongceilings.com
INTERIOR LIGHTING // Focal Point, www.focalpointlights.com; 3G, 3glighting.com; and Juno, juno.acuitybrands.com
EXTERIOR LIGHTING // Lumenpulse, lumenpulse.com, and BEGA, bega-us.com
WINDOWS // Kawneer, www.kawneer.com
CARPET // Tandus, commercial.tarkett.com/en_US/brand/tandus-centiva, and Bentley, www.bentleymills.com
FABRICS AND TEXTILES // Maharam, www.maharam.com; HBF Textiles, www.hbftextiles.com; and Designtex, www.designtex.com
FILM // 3M, www.3m.com
METAL PANELS // CENTRIA, www.centria.com
PAINT // Sherwin-Williams, www.sherwin-williams.com
HIGH-PRESSURE LAMINATE // Arborite, www.arborite.com, and Pionite, www.panolam.com/pionite
HARD SURFACE FLOORING // Bolyu, www.efcontractflooring.com
SOLID SURFACE // Cambria, www.cambriausa.com; Recycled Surfaces, www.facebook.com/recycledsurfaces; and KRION from Porcelanosa, www.porcelanosa-usa.com/products/krion-solid-surface
CONCRETE // Diamond Hard from Euclid Chemical, www.euclidchemical.com
TACK PANEL // WallTalkers from Koroseal, www.koroseal.com/products/walltalkers
TILE // Stone Source, www.stonesource.com; Mosa, www.mosa.com; and Daltile, www.daltile.com
WALL BASE // Wallflowers from Flexco, www.flexcofloors.com
WOOD // Boardwalk Hardwood, www.boardwalkhardwood.com

CODE RED

FLORIDA CONDO COLLAPSE BRINGS ATTENTION TO THE IMPORTANCE OF PROPER MAINTENANCE

PHOTO: JOE RAEDLE

On Thursday, June 24, 2021, the Champlain Towers South—a 12-story condo building in the Miami suburb of Surfside, Fla.—suffered a catastrophic failure. The partial collapse of the building killed 98 people and injured many more.

WRITTEN BY | ALLAN BARRY

Although the full causes of the collapse are still under investigation, the tragedy served as a stark reminder that buildings can be subject to degradation and failure over time. Structures and façades don't just take care of themselves. They require inspection and maintenance. Postponing upkeep and ignoring issues can turn into a literal recipe for disaster.

An event such as this motivates professionals across all disciplines to ask how this could have happened and discuss what can be done to make sure it doesn't happen again.

Cautionary Tale

"Some structural failures are obvious, triggered by an external event like a bomb blast, earthquake, hurricane or tornado," explains Gary Mancini, managing principal with Thornton Tomasetti in New York. Mancini specializes in the investigation, renovation, repair and restoration of buildings. "But most failures are usually a combination of smaller, mundane issues that accumulate over time.

"Buildings don't usually collapse, but too much deferred maintenance can create problems," Mancini continues. "There are warning signs, such as cracks and spalls, that should not be ignored. Those are signals that the structure is experiencing wear and tear and you need to deal with those issues."

"A lot of information is still coming out [about the Surfside collapse], but the clearly identified column-spalling issues, particularly in the pool pump room, was the canary in the coal mine," says Nathan M. Gillette, AIA, LEED AP O+M, CEM, director of Natura Architectural Consulting in Grand Rapids, Mich., as well as a ***retrofit*** editorial advisor. "The structure was failing at an accelerated rate and there didn't seem to be a sense of urgency to get it fixed."

As the design and construction industry reckons with the severity of the Surfside event and starts to look around at the aging building stock in many cities, there has been much discussion about the roles maintenance and codes have to play in preventing future tragedies.

"This kind of occurrence was avoidable," says Jared Blum, Washington counsel for the EPDM Roofing Association in Washington, D.C. "However, there are questions arising from so many issues, ranging from the structural weaknesses in the building materials and their use, to the slow follow-up by local inspection officials to the condo owners themselves, who failed to respond in a timely manner to the repair needs."

Codes

In the wake of the Surfside collapse, many have questioned how our system of codes and inspections could have let something like this go unnoticed and unaddressed. The reality is that codes are a very complex, localized patchwork and by no means a perfect system or safety net.

"It's important to remember that codes provide a minimum. They don't necessarily give you the best or the optimum," Mancini says. "For example, Florida code says you have to recertify a building after 40 years for structural integrity. That's a long time. And it's not to say that people don't look at their buildings more frequently than that but, depending where you are in the country, it isn't necessarily mandated."

Codes often do evolve in a reactionary fashion, with events like Surfside creating initiative for change and improvement.

"Look at historic incidents, like the Cocoanut Grove fire in Boston in 1942," Gillette says. "People couldn't escape the burning building because they couldn't work the revolving doors fast enough. That is why there is now a code requirement to have a swinging door next to the revolving door when it is used as a means of egress. It's too early to know what will shake out of this incident, but there will be code changes because of it."

"Our building codes and inspection policies should be designed to ensure that incidents like this collapse are avoidable," Blum adds. "It's essential that the public have confidence in the security of their homes and workplaces."

But how much can codes do to help prevent failures like this? What kinds of changes could help? It is important to be informed by the past but focused on the future.

"One of the potential changes is revisiting inspection frequency and dialing back the time between them where it makes more sense," Mancini says. "Building stocks in many cities are getting older, and older buildings are in need of more enhanced maintenance over time. Already we're seeing, all over the country, local ordinances requiring more frequent inspections."

Financial Barriers

Although codes could potentially offer some guidance and incentive to keep a closer eye on buildings with more regularity,

there is still the difficult challenge of ensuring that proper maintenance is applied over the life of a building.

"I think there will be stricter regulations that discourage deferred maintenance and maybe even require condo associations to create and maintain cash reserves," Mancini says. "The problem is there is often pressure on condo boards not to spend money. Residents may be willing to spend money on a new lobby or recreation room but less willing to spend money on patching concrete or tuckpointing masonry."

"There is a giant disconnect between what happens after the time a municipality issues a certificate of occupancy and during the time of occupancy," Gillette says. "A code official will respond to a complaint about the building, but for the most part it's reactive rather than proactive. A bank may require an owner to put replacement reserves aside to pay for future capital expense, but that is only for the life of the bank loan. Those reserves are not comprehensive and there may be enough money to pay for a roof replacement but nothing to address major structural issues."

"The recent passage of landmark infrastructure legislation provides a good opportunity, as well as a major incentive, to review building codes and ensure that new construction meets standards that will protect the public," Blum says. "In addition, the role of condo associations in governance, building maintenance and code compliance of large structures needs to be assessed. While condo owners are usually well meaning, it is clear that the financial reserve requirements for maintaining a multifamily residential structure and the expertise of people tasked with running that structure needs further regulation."

"There are tools that might be helpful, such as implementing the International Property Maintenance Code in some areas," Gillette says. IPMC is a model code from the International Code Council that regulates the minimum maintenance requirements for existing buildings. It is intended to protect public health, safety and welfare, while not unnecessarily increasing construction costs; not restricting the use of new materials, productions or methods of construction; and not giving preferential treatment to particular types or classes of materials, products or methods of construction.

"It's not comprehensive, but it's a start," Gillette continues. "I would like to see something that ties all these dots together into a cohesive plan for maintaining a building over time. There's no easy way to accomplish that, but small incremental steps will build momentum."

"It comes down to finance, especially for condos," Mancini says. "One thing that might come out of this is creating better funding mechanisms for ongoing repairs and maintenance, maybe a government fund that associations can borrow from at a low interest rate. The financial barriers need to be lowered. That is one of the biggest issues to overcome."

Better Practices

Along with prescriptive changes in codes and rethinking how we conduct upkeep of structures already built, an event like the Surfside condo collapse also provides an opportunity to rethink and improve how we construct and maintain buildings in the first place.

"I think we'll see more aggressive standards for specifying concrete construction in aggressive environments," Mancini says. "That might include concrete strength, air entrainment, rebar cover, or anything else that can potentially lead to premature deterioration and failure. There will be heightened standards for new construction, as well as for repairs and renovations."

"We need to look back at the construction practices encouraged by regulations promoted in 1980. Much has been written about the fact that, due to tax incentives at that time, there was an explosion of construction that was not always quality-controlled," Blum says. "As much as 80 percent of premature building wear expenses are related to moisture in one way or another. Water is the most significant factor in the premature deterioration of buildings."

Whether on the inspection and maintenance side or on the construction side, addressing the integrity of our buildings comes down to a change in mindset. There can be a tendency to ignore issues or wait for someone else to deal with them later. A more proactive approach can save money and lives in the long run.

"The wishlist for me would include more frequent inspections. And there is technology to help with that, like drones and even the use of AI to supplement the engineer's own eyes in identifying problems," Mancini says. "I equate it to going to the dentist. You go every six months for a cleaning and checkup so you don't have to get a root canal. If you avoid the dentist long enough, you end up with a more serious problem. It always pays to have regular inspections and intervention."

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—Gary Mancini, managing principal, Thornton Tomasetti

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A CENTURY-OLD GENERAL STORE HOUSES NOTHING BUT MEMORIES

PHOTO: BILL GNECH, WWW.THEAPPLEGROUP.COM

Founded by H. T. "Pegleg" Weirich in Spring Bluff, Mo., the Spring Bluff General Store survived a fire before being purchased by George C. Busch in 1926. According to an article about Spring Bluff's history published in the *Missourian*, Busch extended credit to many locals who would have gone hungry during the Great Depression.

In his autobiography, *A Miracle of Grace,* E. Glenn Hinson described the general store:

"The store was typical of its kind in the 1930s—one room about 50 feet square with wood and glass cases lining three sides. Horse collars, hames, and harnesses hung along the walls near the ceiling. Wall shelves bulged with canned goods, chewing tobacco, shoes, socks, clothing, and myriad other things. Wooden barrels with meal, flour, sugar, and other bulk items squatted on the floor everywhere."

The Busch family eventually sold the general store in 1946. During the next 40 years, it had a host of owners until it finally closed in 1986. Today the store sits silently in the Missouri countryside, filled only with the ghosts of its past.

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