COLLEGE MOVES FROM STEAM HEAT TO STAND-ALONE BOILERS

ROOFTOP AMENITIES IN CHICAGO

FROM BANK TO UNIQUE CORPORATE HEADQUARTERS

july-august 2017 / retrofitmagazine.com

retrofit

Time Travel:

Historic Rehabilitation Resurfaces Golden Age of Rail at Century-old Train Station + More Transportation Projects

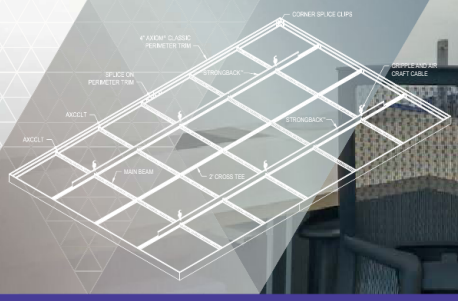
TREND ALERT: the great outdoors

THIS ISSUE IS INTERACTIVE!

See Page 12

RETROFIT ACOUSTICS
MADE EASY

Formations™ Acoustical & Accent Clouds are easy to specify and install with pre-cut components and a wide range of standard panel options. The clouds absorb sound from top and bottom to more effectively control noise. See how easy it can be to retrofit great acoustics at armstrongceilings.com/formations



PRODUCTS: FORMATIONS™ CLOUDS IN COLORATIONS® COLORS, CALLA® TOTAL ACOUSTICS™ PANELS, SUPRAFINE® SUSPENSION SYSTEM, AXIOM® TRIM
LOCATION: BRANDSTAR STUDIOS, DEERFIELD BEACH, FL / DESIGNER: KALYN ROTHAUS

Inspiring Great Spaces®

Armstrong® CEILING SOLUTIONS

Circle No. 1

LED for HID RETROFIT

CHOOSE THE *RIGHT* RETROFIT

Light Efficient Design provides the *PERFECT FIT* for optimal performance!

Using Generic "Corn" Lamps
can result in lumen loss, lower efficacy and poor zonal distribution

HIGH/LOW BAY (22 models)

RECESSED CAN/FLOOD (17 models)

POST TOP/BOLLARD (36 models)

WALL PACK/SHOE BOX (25 models)

Visit led-llc.com/freeretrofit to register and receive a FREE sample!*

*Some restrictions apply

Circle No. 2

Light Efficient Design

Many models also available as PLUG 'nPLAY

www.led-llc.com

WIRE-LESS RETROFIT SECURITY

The SDC EntryCheck® E70 Series features Bluetooth enabled management software and 10,000 event audit trails.

EntryCheck® is a simplified solution requiring no wires, fewer components, less labor and costs for access control of single doors up to 3,000 users. Perfect for basic and multi-level high security retrofits.

For details and specifications: www.SDCSecurity.com/E70

SDC Security Door Controls

the lock behind the system

SDCSecurity.com • 800.413.8783 • service@sdcsecurity.com

Circle No. 3

Available at GOKEYLESS

LG
Life's Good

CONTROL THE FUTURE NOW

LIMITLESS VISION | INNOVATIVE TECHNOLOGY | UNPARALLELED COMMITMENT

For the first time ever, the power of VRF technology can directly integrate into a building management system.

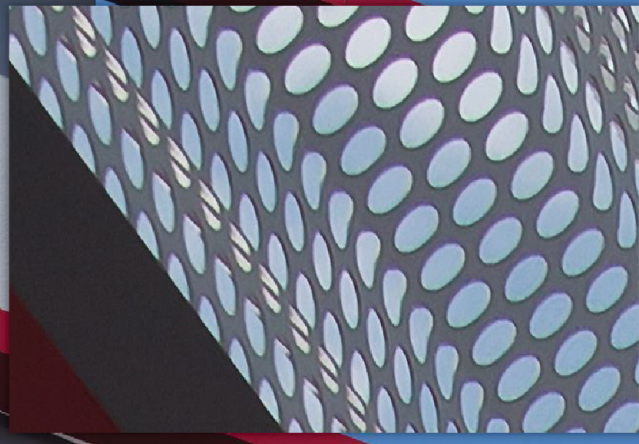
TAKE CONTROL WITH **LG MultiSITE™**

lghvac.com

Circle No. 4

Perforation Perfection

I-Drive 360 Parking Deck, Orlando, FL
Owner: I-Drive Live 360
Architect: Finfrock, Apopka, FL
General contractor: Finfrock, Apopka, FL
Installing contractor: Mullets Aluminum Products, Sarasota, FL
Profiles: 7.2 Corrugated perforated
Color: Musket Gray



"Petersen can provide a nearly endless combination of perforation hole sizes and patterns to meet virtually any architectural design need."

Dave Landis, architectural/technical sales manager, Petersen Aluminum

7.2 PANEL PERFORATED

Musket Gray - Energy Star - Cool Color

CASE STUDY

PACGREENINFO.COM
YOUR GREEN METAL RESOURCE

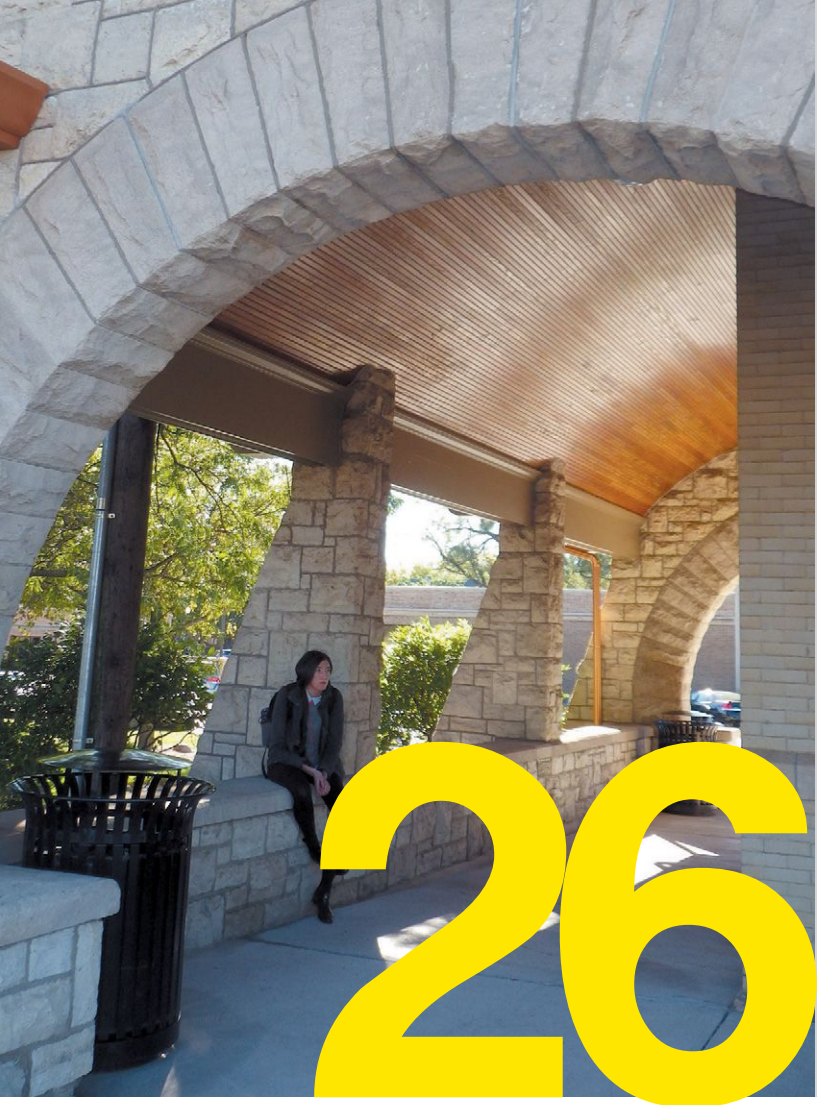
PAC-CLAD PETERSEN

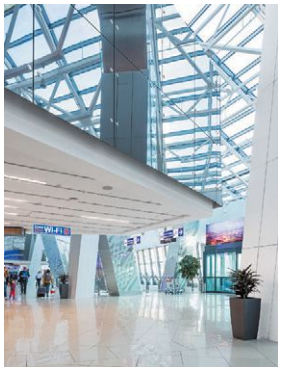
PAC-CLAD.COM | **IL: 1 800 PAC CLAD** | MD: 1 800 344 1400 | TX: 1 800 441 8661 | GA: 1 800 272 4482 | MN: 1 877 571 2025

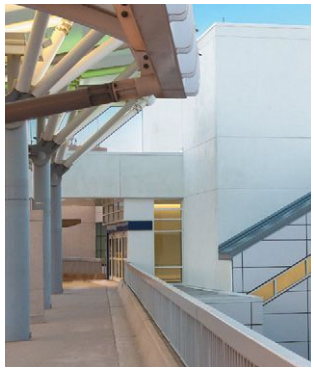
Circle No. 5

INSIDE THIS ISSUE

JULY-AUGUST 2017 // **VOL 8** // ISSUE 4





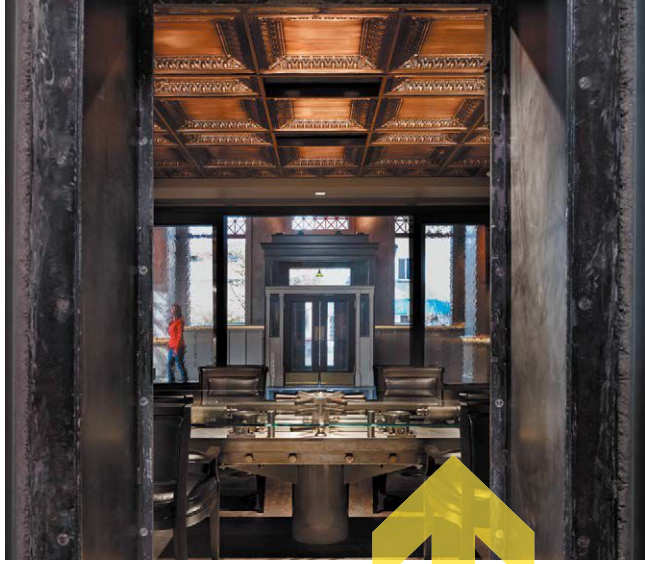


cover

COVER PHOTO: **LEGAT ARCHITECTS**

INSIDE THIS ISSUE

JULY-AUGUST 2017 // VOL 8 // ISSUE 4



DEPARTMENTS

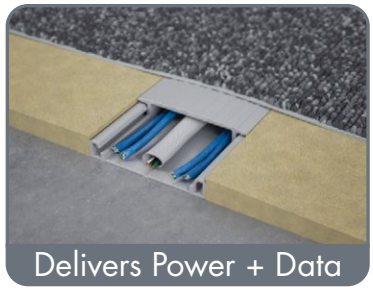
COLUMNS

It's so good at at disappearing you won't even know it's there.

Introducing Our New Under-Carpet Wireway

Shipping Now!

Connectrac® wireways provide a proven power and IT alternative to expensive and disruptive core drilling, trenching and unsightly power poles. Our ultra-low profile wireway is so discreet, it's barely noticeable as it elegantly blends in to any environment while accommodating power and data.



CONNECTRAC®

Connect without core drilling

Circle No. 6

connectrac.com

1.877.480.5637

Patent pending

retrofit

July-August 2017 // **VOL 8** // ISSUE 4

RETROFIT // Vol. 8 // No. 4 is published bimonthly by Fisher Media LLC, 98 Booth Meadow Lane, Durham, NC 27713, (919) 641-6321. POSTMASTER: Send address changes to ***retrofit***, 2409 High Point Drive, Lindenhurst, IL 60046.

TO SUBSCRIBE or make subscription changes, visit www.retrofitmagazine.com, and click on the "Subscribe" button, or email lyn@retrofitmagazine.com.

CARLISLE SYNTEC SYSTEMS

Experience the Difference of a **Quiet Roof**

Exterior noise can cause a lot of distractions within your building. Fortunately, there are three effective EPDM roofing system upgrades that reduce exterior noise by up to 47%. By "tacking on some mass" into a roofing system, you can produce a quieter, more peaceful atmosphere in your establishment.

To learn more, visit:
www.carlislesyntec.com/quietroof

Visit us at AIA in booth #2836

EXPERIENCE THE CARLISLE DIFFERENCE
800.479.6832 | www.carlislesyntec.com

Circle No. 9

pointofview

AN UNEXPECTED PATH

I qualified for work study while in college. Although the memory is 20-cough-some-years old, I vividly recall sitting in a crowded auditorium, learning about the work-study program at Cornell College in Mount Vernon, Iowa, and then being handed an envelope with my work-study assignment inside. When I read the words "Buildings and Grounds", 18-year-old me had to hold back tears. My brother was the one who mowed the lawn and shoveled snow at my parents' house. What would I be able to do in this department?

Little did I know the Buildings and Grounds department would become my home away from home. I was assigned to the office where I answered phones, filed work orders and, as I earned more responsibility, became a member of the parking committee. Karen Clifton and Gerry Decious, who were my supervisors, became family to me during that four years. I leaned on them for grown-up advice as I forged my path toward adulthood. I babysat the facilities director's kids. I joked with the maintenance guys in the office and on campus. If there was ever an issue in my dorm room, I had a direct line to the people who could help. Almost 20 years after graduation, I still am very close to Gerry (who now is retired) and Karen (who still expertly manages the facilities department office).

Therefore, you can imagine how excited I was when I recently was pitched a story about Cornell College's upgrade from central steam heating to standalone boilers connected to a building automation system. I immediately contacted Karen to determine whether I could interview Joel Miller, Cornell's current facilities director. I was thrilled Miller agreed, and I set up a time to visit campus so I could tour the buildings in which I had so many wonderful memories. In fact, one of my clearest recollections of campus living was related to the steam heating system. In the dead of winter, once my fellow students and I returned to our residence halls from class, we'd change into tank tops and shorts and run around barefoot with our windows open because our rooms were so hot. As you'll read in the article, "Component", page 44, it was virtually impossible to regulate the steam heating system.

Miller's tenure at Cornell began long after I graduated, but he's the type of no-nonsense facilities director who makes you very comfortable in his presence and, consequently, is a solid team leader. Miller believes in sustainability and saving every penny, so I realized quickly what an asset he has been to the college. He also taught me a few things while I was interviewing him. For example, today's maintenance staff is not the staff of my Cornell experience. These are men and women who grew up with technology and played Nintendo and PlayStation, which innately prepared them for today's Internet of Things era. I had never given video games that much credit before!

Miller also helped me realize that Cornell not only prepared me for my writing career via my majors, but it also inadvertently ignited my love of buildings by randomly assigning me to my work-study position all those years ago. The almost 60 buildings on campus— which qualified Cornell to be one of only two U.S. college campuses listed in their entirety on the National Register of Historic Places—were the first buildings with which I fell in love. I'm forever grateful to Cornell for setting me on an unexpectedly wonderful career path writing about buildings and grounds.

Christina Koch

CHRISTINA KOCH
Editor in Chief

THIS ISSUE IS INTERACTIVE!

Download the free Layar Augmented Reality app. (The QR code will help you find the app.) Then, hover over pages 48, 54, 56, 85, 90 and 92 with a smartphone or tablet and watch videos that bring the content to life.

layar INTERACTIVE PRINT | Download the free Layar App | Scan this page | Discover interactive content

follow us

retrofit **is now available on iTunes. Check it out at apple.co/1SODbx2.**

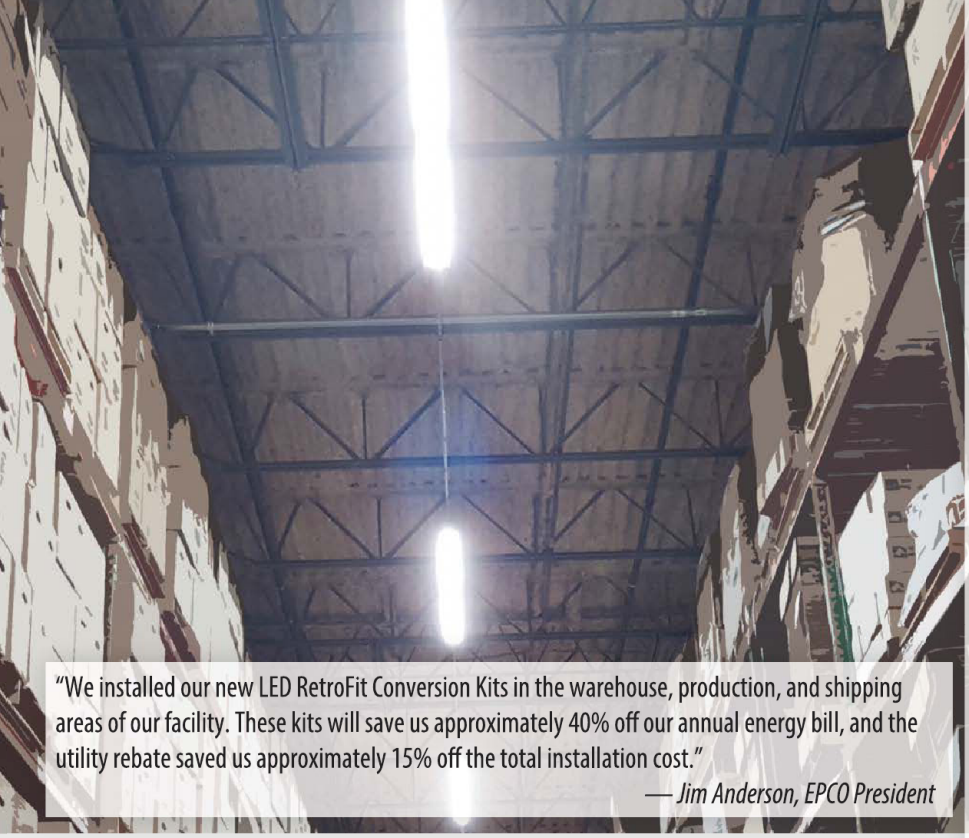
CONTRIBUTING WRITERS

Joe Mamayek, design principal with HDR's Boston office, writes about the Union Station Intermodal Transportation Center, Springfield, Mass., in "Business", page 20. Located in a blighted section of downtown Springfield, the once majestic train station had been dormant for more than 40 years. Today, it provides a state-of-the-art high-level Amtrak boarding platform and offers planned amenity spaces for restaurants, retail outlets and office space.

In the "Cover Story", page 26, **Doug Ogurek**, communications manager at Chicago-based Legat Architects, shares the story of the La Grange Stone Avenue Train Station in La Grange, Ill. Built in 1901 and serving more than 1,000 commuters per day, the community banded together to restore the station to its former glory.

Gary Nichols, IIDA, CID, LEED AP, is president and CEO of San Francisco-based Revel Architecture & Design (formerly NicholsBooth Architects). He creates 21st-century workplaces that celebrate the uniqueness of each client's brand, culture and workstyle. As such, he writes in "Transformation", page 62, about the new headquarters for Bently Enterprises, Minden, Nev., which is located within a former bank building.

In "Multifamily", page 72, **KJ Fields**, a Portland, Ore.-based ***retrofit*** contributor, writes about the rooftop space upon the Lofts at River East, Chicago. The unique area offers residents a range of relaxation and entertainment options, as well as landscaping that helps connect and differentiate spaces.



"We installed our new LED RetroFit Conversion Kits in the warehouse, production, and shipping areas of our facility. These kits will save us approximately 40% off our annual energy bill, and the utility rebate saved us approximately 15% off the total installation cost."

— Jim Anderson, EPCO President

EPCO LED RETROFIT CONVERSION KITS FOR STRIP-TYPE FIXTURES

Upgrades Old Fluorescent Fixtures Into Energy Efficient LED Lighting System

- A low cost LED lighting system upgrade solution.
- Improves energy consumption and energy management.
- Delivers high performance lumen output.
- Attractive "snap-on" frosted diffuser gives the retrofitted luminaire a complete finished look.
- No need to purchase a new lighting fixture.

LED RetroFit Strip Kit

T8 LED Tubes RetroFit Kit

EPCO Exclusive Features

- **Adjustable Bracket** — Expedites installation.
- **RFK Series Installation Tool** — Easy one-man installation; labor and time saving magnetic tool.

RFK ONE-MAN MAGNETIC INSTALLATION TOOL

Learn how EPCO's LED RetroFit Conversion Kits can help your building save money. Contact Mark Lindstrom, National Sales Manager, at 952.767.8756 or sales@engproducts.com.

Check with your local Electric Utility or Co-op for Rebate Programs and Compliance Requirements.

Meets the DLC 4.2 Standard Classification for Commercial Rebate Programs

Circle No. 12

ENGINEERED PRODUCTS CO.
www.engproducts.com
5401 SMETANA DRIVE | MINNETONKA, MN 55343
P 800.336.1976 | F 800.336.2801

ARTICLES ON www.retrofitmagazine.com

ATTRACT PEOPLE TO OUTDOOR SPACES WITH OUTDOOR POWER

The biggest innovations at many commercial properties are occurring outside. For example, Facebook's headquarters has a 9-acre green rooftop that has been described as more like a park and includes a walking trail and hammocks. A 40-year-old Houston mall reinvented itself with a large outdoor expansion that has an open-air section of stores and outdoor space for hosting movies, concerts and community events. The point is, companies and retailers are looking outside for ways to inspire and excite employees and customers. However, for facilities with outdoor space to reach their full potential, outdoor power is needed so people can charge their devices. Learn about some new options for bringing power to your outdoor spaces.

www.retrofitmagazine.com/outdoor-spaces-power

BLOGS ON www.retrofitmagazine.com

READ WHAT INDUSTRY EXPERTS HAVE TO SAY ABOUT RETROFITTING AND RELATED TOPICS.

Since ***retrofit*** was established, industry experts have been sharing their insight about energy efficiency, technology, codes, green-building programs, natural disasters, products and more via ***retrofit***'s blog. Click on "Online Exclusive" in our website's top navigation and select "Blog" in the drop-down menu. New blogs are posted every two weeks and shared via our e-newsletter. The latest blog topics include:

- Why You Should Consider LED Retrofit Kits
- Reduce HVAC Loads Now, Beat the Summer Heat and Reduce Energy Costs
- The Key to Building Safety Is Communication
- The Impact of Lighting Designers, Demonstrated at a Trade Show

www.retrofitmagazine.com/category/blog

NOW PLAYING ON retrofitTV.com

Bostik Bosti-Set Installation Demonstration

Manufacturer Guidance

Bostik's latest advancement in adhesive technology is Bosti-Set Thin Porcelain Tile Panel Adhesive & Sound Reduction Membrane. Bosti-Set is a one-component, easy-to-trowel adhesive for thin porcelain tile panels. Backed by Bostik's patent-pending Tenirex polymer technology, Bosti-Set provides instant grab and hold power in a single-coat application.

retrofit

Metal-Over-Metal and Metal-Over-Shingles

MCELROY METAL

THE RECOVER EXPERTS!

238T METAL-OVER-METAL RECOVER SYSTEM

138T SHINGLE RECOVER SYSTEM

Innovative Recover Solutions Featuring:

138T and 238T Symmetrical Standing Seam Panels
Economical • Easy to Install • Patented
Individual Panel Replaceability • Energy Efficient

Contact:
info@mcelroymetal.com • www.mcelroymetal.com/recover

Corporate Office:
1500 Hamilton Rd. • Bossier City, LA 71111

Circle No. 14

NEWS

REPORT: BIM Is Valuable to Infrastructure Projects

A new SmartMarket Report from Dodge Data & Analytics, New York, shows that the use of building information modeling is increasing in the horizontal construction market. **"The Business Value of BIM for Infrastructure 2017 SmartMarket Report"**—produced in partnership with San Rafael, Calif.-based Autodesk and with support from New York-based Deloitte—analyzes how engineers, contractors and owners are using BIM for transportation infrastructure projects in France, Germany, the United Kingdom and U.S. It shows that commitment to BIM is skyrocketing among firms who use it with 52 percent now reporting they deploy it on more than half their projects versus only 20 percent of them implementing it at that high level just two years ago. (Download the report free at bit.ly/2tqVk9q.) ¶ This information updates a previous SmartMarket Report from 2012 on the value of BIM for infrastructure in the U.S., which showed that its use on all types of infrastructure projects significantly lagged vertical building construction. However, the new study suggests that BIM is well on its way to becoming established for transportation in the U.S. and European markets. ¶ "Dodge has been closely tracking the growth of BIM for buildings globally since 2007," says Steve Jones, senior director of Industry Insights Research at Dodge Data & Analytics. "We have seen steady growth in both its usage and the tangible business benefits that its users receive. It is exciting to now see a similar pattern rapidly taking shape for transportation infrastructure and the dramatic global growth expected for that segment is certain to accelerate this trend."¶ The majority (87 percent) of BIM users in the study report they are receiving positive value from their use of BIM, and most believe that they have only begun to experience its full potential. Critical benefits reported by users include fewer errors, less rework and greater cost predictability, all of which improve project delivery for transportation infrastructure. ¶ In addition to improving project performance, most users report having BIM capability yields important internal benefits to their own businesses, which include: ■ **Increasing revenue** by expanding their ability to offer services (56 percent) and maintaining business with past clients (52 percent). ■ **Conducting their business more effectively** by improving the ability to teach younger staff about how projects go together (58 percent), establishing a consistent and repeatable project-delivery process (54 percent) and, for design professionals, spending less time documenting and more time designing (50 percent). ¶ Despite the fact that many of the respondents—especially those in France, Germany and the UK—are relatively new to the use of BIM, nearly two-thirds (65 percent) believe they experience a positive ROI from their BIM use, and more than one-quarter (28 percent) believe ROI is 25 percent or greater. ¶ In addition to these top findings, the report features projects that exemplify the value being gained from BIM, including for rail, airports and smart roadways. Other articles in the report explore how BIM is of particular value to infrastructure owners—from the ways it can support city planning efforts to asset management long after construction is complete, including a case study on an ambitious project to model Glen Canyon Dam. The SmartMarket Report also includes a summary of the use of BIM and the value it provides in the four countries included in the study.

BETTER BUILDINGS CHALLENGE PARTNERS MAKE ENERGY-EFFICIENCY PROGRESS

The U.S. Department of Energy (DOE) has announced the efforts made by the 345 leading public and private sector organizations in the Better Buildings Challenge have led to a combined 240 trillion Btus and an estimated $1.9 billion in cumulative energy and cost savings. These results are summarized in the "2017 Better Buildings Progress Report", which can be viewed at bit.ly/2sDTlly. The goal of this initiative is to make commercial, public, industrial, and residential buildings 20 percent more energy efficient during the next decade by focusing on overcoming market barriers and sharing partner-created solutions.

"Through the Better Buildings Initiative, hundreds of leaders from the public and private sectors are demonstrating innovative approaches and deepening American investments in critical building infrastructure," says U.S. Secretary of Energy Rick Perry. "By planning ahead and investing in cost-effective energy-efficiency strategies, partners are bringing better buildings to our communities and improving the everyday places Americans live and work while creating new and lasting jobs."

The organizations from diverse sectors that have stepped up to the challenge committed to improve the energy intensity across their entire building portfolio by at least 20 percent within a decade. These organizations represent more than 4.4 billion square feet of building space, include more than 1,000 industrial facilities and have committed $7 billion in financing. Partners have shared energy-performance results for nearly 38,000 properties. On average, partners are improving by more than 2 percent per year and are staying on track to meet their energy-savings goals of 20 percent during the next 10 years.

This year, 18 Better Buildings Challenge partners and allies met their energy, water or financing goals. Since the start of the program, 40 challenge partners have met their energy goals, six have met their water goals and 12 financial allies placed sufficient investments to meet their financing goals.

This year's 14 energy and water goal achievers are:

- Celanese International Corp.
- Chesapeake College
- CKE Restaurants Holdings Inc.
- Deustche Asset Management
- Digital Realty Trust
- General Motors (Water)
- Jewish Community Housing for the Elderly
- Johnson Controls
- Macy's
- Schneider Electric
- Shorenstein Properties LLC
- Staples (Water)
- The Tower Cos.
- Towson University

The four financial allies that have also met their goals this year are:

- Biostar Renewables
- CleanFund LLC
- LISC
- Renew Financial

More than 35 partners and financial allies joined the Better Buildings Challenge during the last year, committing 200 million square feet of building space, nearly 40 plants and $650 million for efficiency projects. These partners are contributing to the more than 1,000 proven solutions now available online in the Better Buildings Solution Center. When partners share their energy and water savings strategies and results, they demonstrate their collective leadership by making it easier for others to replicate their success. See the full list of new partners at bit.ly/2seWPIw. Read about how partners are increasingly working to catalyze change and investment in energy efficiency and their proven solutions in the Better Buildings Solution Center at betterbuildings solutioncenter.energy.gov.

retrofit Wins 2017 AZBEE Awards for Editorial and Design

retrofit is proud to announce it won a 2017 AZBEE Silver National Award and Bronze National Award, as well as two Gold Regional Awards and one Silver Regional Award (Southeast) from the American Society of Business Publication Editors.

retrofit won the Silver National Award (and a Gold Regional Award) in the Regular Contributed Column category for "Trend Alert", which is written by Robert Nieminen, contributing editor. The magazine won its Bronze National Award (and Silver Regional Award) for magazine design. ***retrofit***'s other Gold Regional Award was in the Case History category for "Rational Historic Preservation", an article about the Alaska State Capitol, which was written by Paul Lukes, owner of Seattle-based PAUL LUKES: Building Envelope Consulting Services LLC. The article appeared in the November-December 2016 issue. View ***retrofit***'s AZBEE entries at bit.ly/2tqFNqb.

Congratulations to Nieminen, Lukes and ***retrofit***'s Art Director Vilija Krajewski, as well as the entire retrofit team!

RENDERINGS: **COURTESY OF HDR**

The Springfield, Mass., Union Station site, with its abandoned buildings, was a constant reminder of the struggles American cities have been facing and is inextricably linked to the demise of rail—when the trucking industry increased its connectivity and America fell in love with the passenger car. Elected officials, local citizens and the Springfield Redevelopment Authority (our client), envisioned a different future. With that in mind, they charted a path forward to usher in not only a renaissance of Union Station, but also a catalyst for change in the city of Springfield and the surrounding region. The vision entailed a major investment in the infrastructure. Starting with a new high-speed rail between Hartford, Conn.; New Haven, Conn.; and Springfield, the project was rounded out by a plan to repurpose the Union Station Terminal and transform an underutilized site into a new multi-modal hub, incorporating intercity and intracity bus terminals.

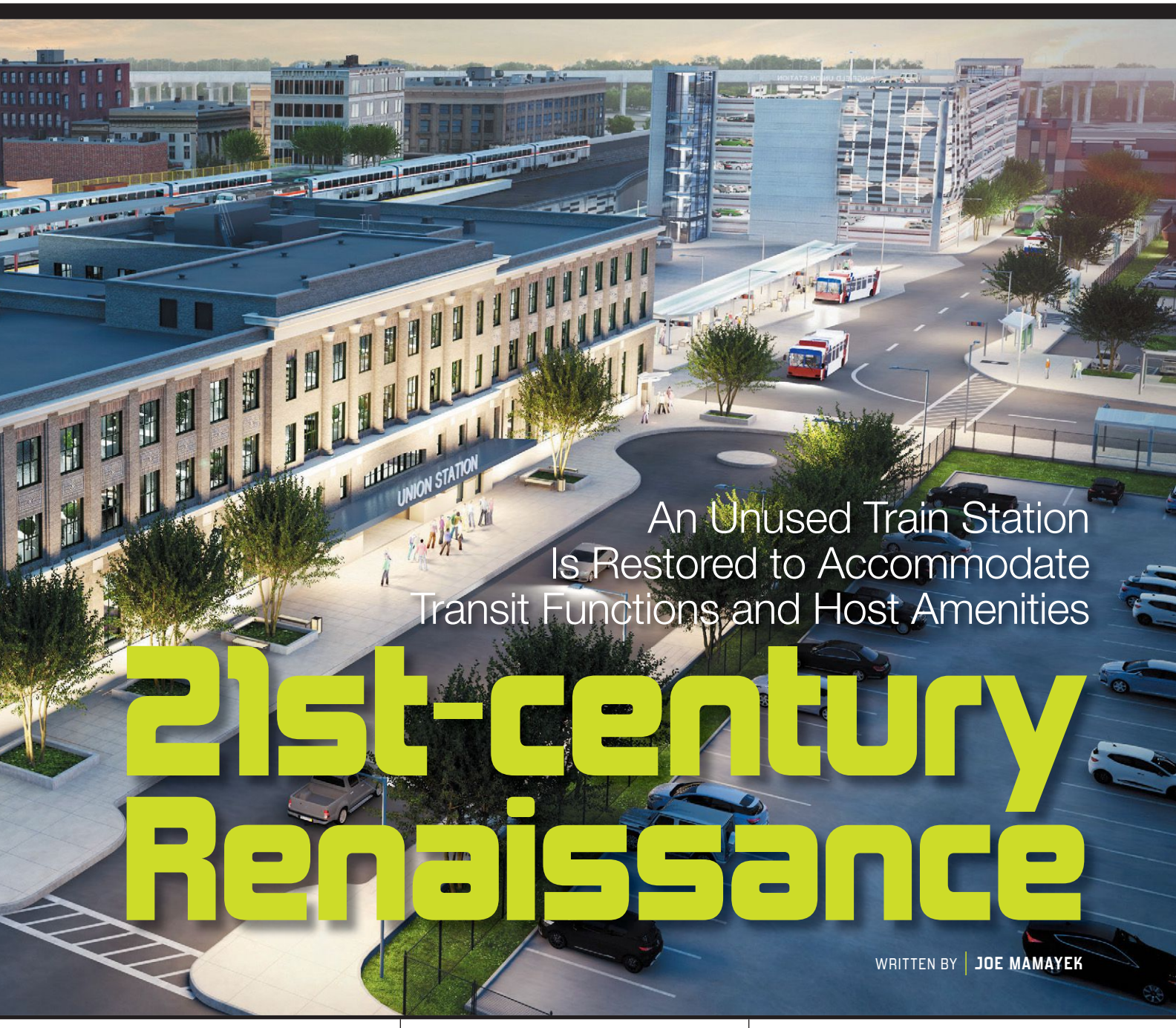
It was the unwavering commitment of Rep. Richard Neal, D-Mass., that propelled this vision. For nearly 40 years, his priority has been to renovate and reconnect Union Station, beginning when he announced his first candidacy for City Council at Union Station and continuing during his terms as mayor and then congressman.

Opportunities of this significance are rare and the design team felt an added obligation to meet the expectations of the citizens, city and region. With HDR's recognized, interdisciplinary design approach to problem solving, the Boston office was selected to lead this transformation. The collaboration consisted of a team of specialists, including Chadds Ford, Pa.-based John Milner Architects, the historic-preservation consultant. Our shared goal was to restore the station's historic integrity while modernizing its structure to provide a facility that would be safe, more accessible and environmentally friendly with amenity-rich options.

Our design team embraced the myriad of challenges and saw them not as deterrents, but rather opportunities. As a designer for the repurposing of Boston's Custom Tower, I am no stranger to historic-preservation challenges. I knew the equation for success must begin with a clear understanding of the context and program—to ensure we identified the right interventions. In this case, it was critical to understand the context of the building and the history of the city.

A City Defined by Innovation

Springfield is culturally rich with a legacy of big ideas and countless innovations. Like many early American settlements, strategic location was crucial. Springfield took advantage of trade routes to Albany, N.Y.; Boston; Montreal; and New York City, and was conveniently located at the convergence of four rivers. The city quickly emerged as a place of opportunity and the birthplace of remarkable inventions, including the first American musket and later the famous Springfield rifle, Merriam Webster's first American-English dictionary, the first use of interchangeable parts



An Unused Train Station Is Restored to Accommodate Transit Functions and Host Amenities

21st-century Renaissance

WRITTEN BY | **JOE MAMAYEK**

and the assembly line in manufacturing, the first American horseless car, the discovery and patent of vulcanized rubber (Charles Goodyear), the first American gasoline-powered car (Duryea Brothers) and the first successful motorcycle company (Indian). Springfield also is known for its Basketball Hall of Fame Museum and the literary creativity of Dr. Seuss. In addition, Springfield was home to Wason Car Works, once the largest makers of rail cars in the U.S. This company constructed an estimated 30,000 rail cars of every description, including the Pullman Sleeping Car, a renowned benchmark of comfort and style. Wason Car Works was just a few blocks away from Union Station and was linked to it by a number of rail lines.

Union Station was the central hub for transportation in western New England from the 1920s to the 1940s with 11 tracks used to handle the volume of travelers. In its early days, the station was a bustling terminal, able to handle the arrivals and departures of more than 90 trains per day. Designed and built in 1926 to handle the demands of early 20th-century train travel, the Terminal featured seating for 650 people, restaurants, several newsstands, a barber shop and travelers' aid station. It also included a parlor with a classic serpentine counter design, a place where you could imagine families with young children ordering hamburgers and ice-cream floats. With the decline in train use after WWII, the once active station gradually

THE REINCARNATION OF UNION STATION AS A MULTI-MODAL TRANSPORTATION HUB AND ITS TANGIBLE SYNERGIES WITH THE URBAN FABRIC OF SPRINGFIELD QUALIFIES IT AS A TRANSIT ORIENTED DEVELOPMENT... .

Highlights about Union Station Intermodal Transportation Center

- An unused Terminal building, approximately 120,000 square feet, is restored to accommodate transit functions.
- Incorporates 27 bus berths in an open-air environment.
- Includes a 377-space parking garage (approximately 136,000 square feet).
- Provides a state-of-the-art high-level Amtrak boarding platform with improved accessibility.
- Offers planned amenity spaces for restaurants, retail outlets and office space on the upper floors.
- Incorporates original artifacts and new wall murals that offer a historic perspective on rail travel in Springfield, Mass.
- Catalyzes renovation and reactivation of the Amtrak passenger tunnel, linking the terminal building to train platforms and the adjacent downtown area.
- Is LEED certifiable.

eliminated services, activities and amenities.

The adjacent Baggage Building also was a very active complex during the '20s to '40s with more than 30 trains a day delivering mail and freight of all kinds, including livestock. Like the Terminal, the Baggage Building was a victim of the decline of rail service, which led to the eventual closing of freight operations in 1967.

A Historic Station Reincarnated

Located in a blighted section of downtown Springfield, the once majestic train station had been dormant and forgotten for more than 40 years. Elected officials and the Springfield Redevelopment Authority saw its potential to serve as the catalyst for urban renewal in the area. HDR was tasked to create a 21st century transit-oriented facility (multi-modal hub) to maximize the intermodal transportation attributes of the station; adaptively reuse and revitalize a historic structure; and design improvements that would be feasible and sustainable, spurring long-term development. The goal centered on converting the station into an intermodal center, serving the city and the entire region. The center was to provide connections to enable continuation and expansion of transit services (local, regional and intercity buses; Amtrak, commuter and high-speed passenger rail) and other ground-transportation services, at a single location, with convenient pedestrian access and sufficient parking.

The reincarnation of Union Station as a multi-modal transportation hub and its tangible synergies with the urban fabric of Springfield qualifies it as a Transit Oriented Development (TOD), which will allow other developments to follow and become "good citizens." A TOD can be defined as any mixed-use development that offers housing, office, retail and amenities that are integrated in a walkable neighborhood, located within a half-mile of quality public transportation. Based on the location, further success will be measured by its inclusion of diversity while allowing convenient, affordable and active lifestyles for all generations.

Added benefits of TODs:

- Reduced driving with lowered congestion, air pollution and GHG emissions.
- Walkable communities that promote healthy/active lifestyles.
- Increased transit ridership and fare revenue.
- Potential for added value created

(continues on page 24)

MEET THE NEW CLASS IN FIBERGLASS.

WINDOWS • DOORS • STOREFRONTS • WINDOW WALLS

Single-Source Solutions at a Competitive Price. From Pella.

Envisioning a luxury, suburban-meets-urban experience, the development team looked to Pella's large combination Impervia® fiberglass windows. Their exceptional durability meets the rigorous performance requirements of the building while providing views that maximize daylight without compromising energy efficiency.

One Southdale Place • Edina, MN
Architect: BKV Group • General Contractor: Kraus Anderson • Owner: StuartCo

Pella COMMERCIAL

CHALLENGE US WITH YOUR NEXT PROJECT.

pro.pella.com/RM • 800.847.3552

[1] In testing performed in accordance with ASTM testing standards, Pella's Duracast® fiberglass composite has displayed superior performance in strength, ability to withstand extreme heat and cold, and resistance to dents and scratches.
[2] U-Factor of Duracast frame is 2.4 times greater than that of thermally broken aluminum when compared in thermal testing.

Circle No. 16

ANY NEW EXPRESSION WOULD BE DISTINCTLY DIFFERENT, YET RESPECTFUL OF THE EXISTING VERNACULAR.

through increased and/or sustained property values where transit investments have occurred.

- Improved access to jobs and economic opportunity for low-income people and working families.
- Expanded mobility choices that reduce dependence on cars, reduce transportation costs and make income available for other purposes.

With the assistance from John Milner Architects, the team was able to establish strategic interventions based on an evaluation of the exterior and interior of the entire site. An assessment was based on a tiered system, ranking the buildings on architectural and/or historical significance from the highest level of interest being "restoration" on through to "rehabilitation" and "renovation." Based on this evaluation system, we determined that the greatest character-defining features of the Union Station Terminal building are the exterior façades (a high degree of integrity); the train platforms and canopies; and sections of the interior spaces, primarily the main and outer concourse at the building's ground level.

The exterior façade is best categorized as an industrial design style, which incorporates Tudor-style column and cornice motifs. Originally, industrial steel window sashes were used and spaced in a rhythmic proportion with brick spandrels and pilasters. Because the exterior façades were considered to have a high level of architectural and historical significance, the design team approached the challenge by selecting energy-efficient windows with a style and proportions that were respectful of the original windows. The patterned brick was generally stabilized, repaired and then selected areas replaced while retaining all architectural stone features. Finally, exterior lighting was strategically placed to enhance the prominent architectural features of the façade, creating a majestic setting within Springfield's night skyline.

The main concourse area opens as a grand space featuring expansive, high ceilings and geometric-patterned terrazzo flooring. The space is defined by 12 plaster arches and columns from the outer concourse with natural lighting introduced at the center concourse by using upper clerestory windows. One of the more interesting spaces of the terminal building, it is redefined by the ever-changing levels of light and the resultant patterns of shade and shadows. The inner concourse, like the exterior façades, was considered to have a high level of architectural and historical significance. However, because of extensive water damage to the plaster arches, walls and ceiling, we determined the best course of action was to record and replicate the interiors, including the extensive plaster molding that delineates the arches, as well as the condition of the ceiling perimeter. Again lighting played a critical role. Original light fixtures were reclaimed, remodeled and relocated in the original locations to enhance the prominent architectural features of the interior spaces.

When the program required new architectural interventions, such as the integration of customer-service counters within the outer concourse, the design team selected a material palette composed of porcelain tile, metal and glass. This allowed for a contrast and achieved the desired outcome—that any new expression would be distinctly different, yet respectful of the existing vernacular.

A Move Forward While Preserving History

To enhance the visitor experience, the design team collaborated with the client and Springfield Museums to integrate a series of wall murals and artifacts from the

original Terminal: a baggage cart and barber chair, along with retrofitted benches from the waiting rooms and selected dining ware from the historic Charles Hotel. The interpretive display features vintage photographs and objects, as well as a timeline—all giving a nostalgic view into rail travel. The final stop concludes with a striking image of the renovated station. Purposely curated to signal a move forward to a new millennial Union Station, it represents a new era of rail travel that builds on the city's legacy of industrial achievement and innovation.

Union Station will not only be a prominent and vital multi-modal facility, it is poised to become Springfield's "civic piazza," connecting people through travel while celebrating life through sponsored events, ranging from exhibitions and gallery installations to political events and weddings.

It began as a vision and, through the dedication of Congressman Neal, it appears the transformation is well underway for Union Station, the city of Springfield and the surrounding region.

Retrofit Team

DESIGNER/ARCHITECT OF RECORD // HDR, Boston, www.hdrinc.com

CIVIL ENGINEER // Bryant Associates Inc., Boston, bryant-engrs.com

LANDSCAPE ARCHITECT // Shadley Associates PC, Lexington, Mass., www.shadleyassociates.com

MEP ENGINEERS // Fitzemeyer & Tocci Associates Inc., Woburn, Mass., www.f-t.com

STRUCTURAL ENGINEER // Souza, True & Partners Inc., Waltham, Mass., www.souzatrue.com

FIRE PROTECTION/CODE CONSULTANT // Fernandez & Associates, Byfield, Mass., fernandezassoc.com

HISTORIC-PRESERVATION CONSULTANT // John Milner Architects, Chadds Ford, Pa., johnmilnerarchitects.com

LIGHTING CONSULTANT // Domingo Gonzales Associates, New York, www.dgalight.com

ELEVATOR CONSULTANT // Van Deusen Associates, Boston, vdassoc.com

PARKING GARAGE CONSULTANT // Walker Parking Consultants, Boston, www.walkerparking.com

SIGNAGE AND WAYFINDING // DESIGN Inc., Cambridge, Mass., www.designinconline.com, and 96 Point, Cambridge, www.96pt.com

DOOR HARDWARE // Campbell McCabe, Maynard, Mass., campbell-mccabe.com

COST CONSULTANTS // VJ Associates, Needham, Mass., www.vjassociates.com

GEOTECHNICAL ENGINEERS // Haley and Aldrich, Burlington, Mass., www.haleyaldrich.com

WATERPROOFING CONSULTANT // Simpson Gumpertz & Heger, Boston, www.sgh.com

OWNER'S PROJECT MANAGER // Skanska USA Building Inc., New York, www.usa.skanska.com

CONSTRUCTION MANAGER // DOC, Holyoke, Mass., www.oconnells.com

[RETROFIT TEAM]

ARCHITECT // Legat Architects, Chicago, www.legat.com

GENERAL CONTRACTOR // Boller Construction Co. Inc., Waukegan, Ill., www.bollerconstruction.com

LANDSCAPE ARCHITECT // Hitchcock Design Group, Chicago, www.hitchcockdesigngroup.com

CIVIL ENGINEER // Baxter & Woodman, Chicago, www.baxterwoodman.com

[MATERIALS]

ROOF SHINGLES // Valoré Slate synthetic slate roof tiles from DaVinci Roofscapes, www.davinciroofscapes.com

INTERIOR CHANDELIERS // OCL Architectural Lighting, ocl.com

OUTSIDE LIGHTING // Sternberg Lighting, www.sternberglighting.com

STONE-CLEANING PRODUCTS // PROSOCO, www.prosoco.com

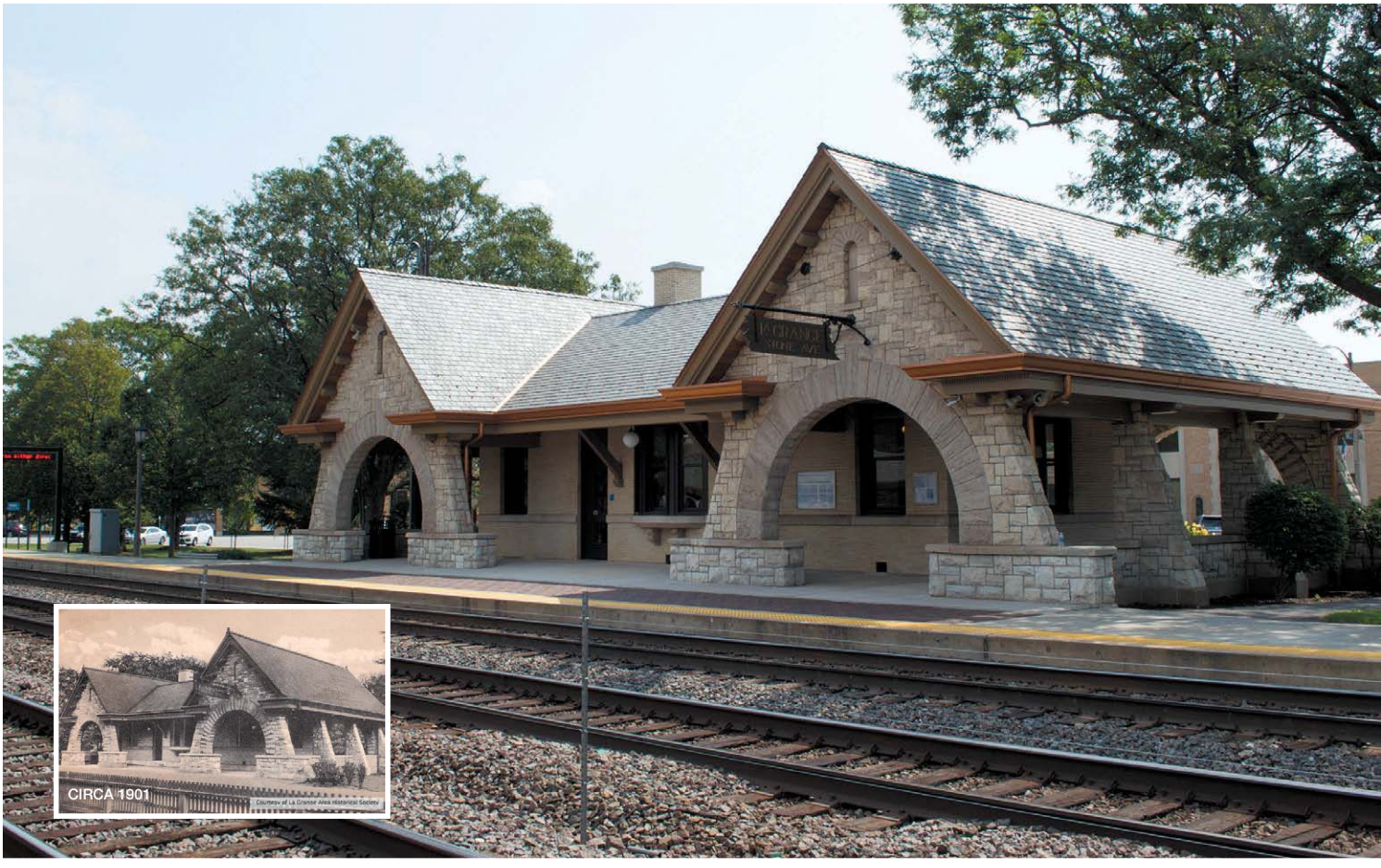
PHOTOS: **LEGAT ARCHITECTS**

HEYDAY RETURNED

Historic Rehabilitation Resurfaces Golden Age of Rail at Century-old La Grange Stone Avenue Train Station

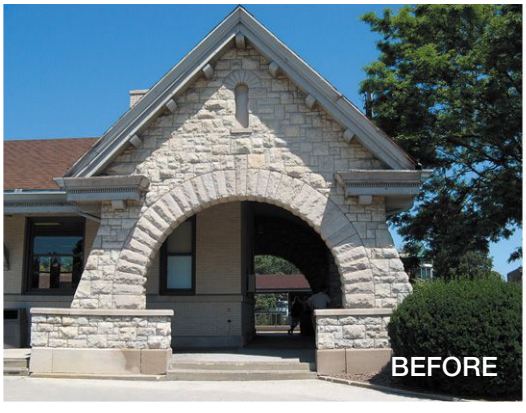
WRITTEN BY | **DOUG OGUREK**

During the last few decades, the nation has witnessed an ironic phenomenon when it comes to train stations. Communities bulldoze historically significant stations, then build new ones that look old. Despite the initial excitement that a new station brings, something gets lost when a beautiful station with a rich history is demolished.



The challenge was to revive some of the station's historic details and return it to its former glory without overspending.

—Marc Rohde, director of governmental architecture, Legat Architects



AMONG THE STONE AVENUE STATION'S **AILMENTS** WERE DAMAGED ROOFS, RUSTED GUTTERS, ROTTING WOOD AND PEELING PAINT.

The Village of LaGrange, just 15 miles southwest of downtown Chicago, has bucked this trend with its two stations, built in 1901 and 1916. The older structure, the Stone Avenue Train Station, is a much-beloved architectural gem that exemplifies the Classical and Richardsonian Romanesque styles and symbolizes the village's connection to rail. For more than a century, the station's twin arches and rustic materials have impressed residents and visitors alike.

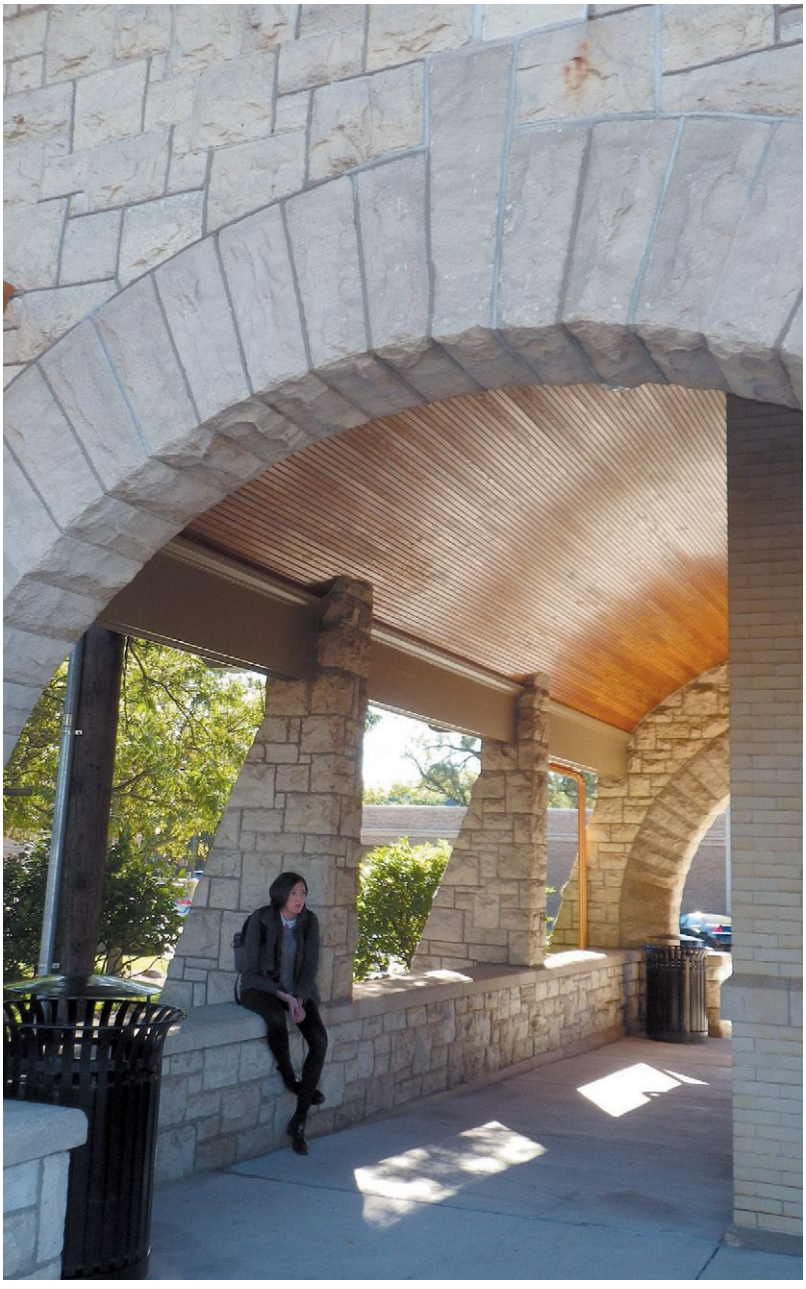
La Grange Village President Tom Livingston, whose father caught the train at the station for 40 years, called it "a real workhorse."

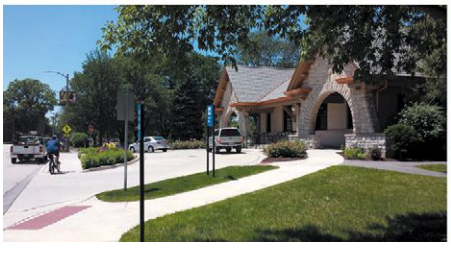
Unfortunately, years of foot traffic—the station serves more than 1,000 commuters a day—and harsh Chicago winters had taken a toll. Among the Stone Avenue station's ailments were damaged roofs, rusted gutters, rotting wood and peeling paint. To make matters worse, functional alterations in the 1970s and '80s ignored the station's strengths. For instance, new fluorescent ceiling lights and '60s-style globe lighting detracted from the historic appeal.

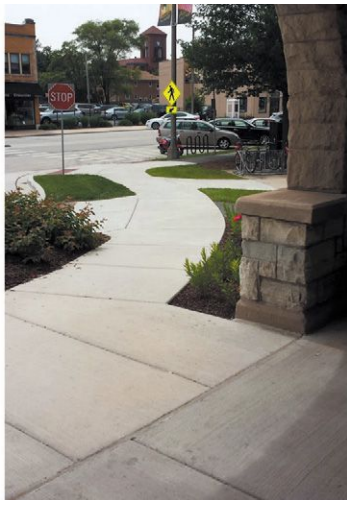
In 2005, the Village of La Grange kicked off a restoration effort that would unite village leaders, legislators, railroad partners and community organizations. Eventually, the village secured grants through the West Suburban Mass Transit District and U.S. Rep. Dan Lipinski, D.-Ill., then brought Chicago-based Legat Architects into the fold.

Marc Rohde, Legat's director of governmental architecture, says, "The challenge was to revive some of the station's historic details and return it to its former glory without overspending."

A decade after rehabilitation discussions







began, stakeholders gathered on a bright October morning to celebrate the completed project. Embedded in the restored station and its parklike surroundings was the input of community organizations, ranging from the La Grange Garden Club and the La Grange Area Historical Society to the Design Review Commission.

The work included tuckpointing (repair of the limestone mortar joints), new wood trim, new gutters and downspouts, new lighting and a new roof, as well as a refresh of the interior.

Andrea Barnish, chairman of the Design Review Commission, adds, "Everyone keeps saying how beautiful it is. It's nice to see it was restored and not replaced."

Archival Assistance

One of the key challenges of the project was finding historic documentation of the station.

Assistant Village Manager Andrianna M. Peterson says, "Working with the La Grange Area Historical Society, the village located plans, postcards and photographs of the original station to assist with the renovation design."

The documents inspired the selection of new lighting fixtures with brass stems that are more historically appropriate. Additionally, old photographs enabled the team to commission a custom-designed re-creation of the original carved wood and metal sign. The sign now hangs on the platform side.

Material Selection and Color Matching

Another obstacle was dealing with the budget limitations of the grant-funded project, along with modern-day pricing.

"We had to strike a careful balance between adhering to the budget and creating an authentic feel that was period-correct," Rohde notes.

The team turned to more affordable contemporary options that are aesthetically comparable alternatives to traditional materials. For instance, recyclable and durable polymeric slate roof tiles proved cost effective and low maintenance but achieved the required aesthetic.

Rohde adds, "When you look at the roof, you can see subtle color changes based on your position and the position of the sun."

Tuckpointing brought another difficulty—upgrades needed to match the station's mortar color and

TO MEET **MODERN ACCESSIBILITY STANDARDS**, THE TEAM REMOVED THE STEPS IN FRONT OF THE STATION AND REDESIGNED THE GRADES TO CREATE A SEAMLESS ROUTE LEADING TO THE FRONT DOOR.

joint style. The team created and inspected mock-ups on smaller wall sections before proceeding with the whole wall.

"We didn't replace any stone because we knew we wouldn't be able to find an exact match," Rohde notes. "The true focus was on joint repair. That's why the walls still appear weathered, which adds to the historic charm of the station."

Design-sensitive Accessibility

The village also tasked the team with meeting modern standards for accessibility without undermining the station's design.

The solution came in removing the steps in front of the station and redesigning the grades to create a seamless route leading to the front door. A gently sloping sidewalk (instead of a ramp) that rises toward the entry echoes the arches and follows suit with the station's symmetrical design.

WORKING WITH THE LA GRANGE AREA HISTORICAL SOCIETY, THE VILLAGE LOCATED PLANS, POSTCARDS AND PHOTOGRAPHS OF THE **ORIGINAL STATION** TO ASSIST WITH THE RENOVATION DESIGN.

Functional Art

The Village of La Grange, which has appeared in *Chicago* magazine's "Best Places to Live" and "Best Downtown" lists, thrives on community and tradition. This September, for instance, the 22nd annual West End Arts Festival brings together artists, ranging from musicians and dancers to woodworkers and jewelry makers. The facility that sets the backdrop for this always popular event is the Stone Avenue Train Station.

Last year, the station became one of only nine projects in Illinois to earn a Richard H. Driehaus Foundation Preservation Award from Landmarks Illinois, a nonprofit that supports preservation of historic places in Illinois.

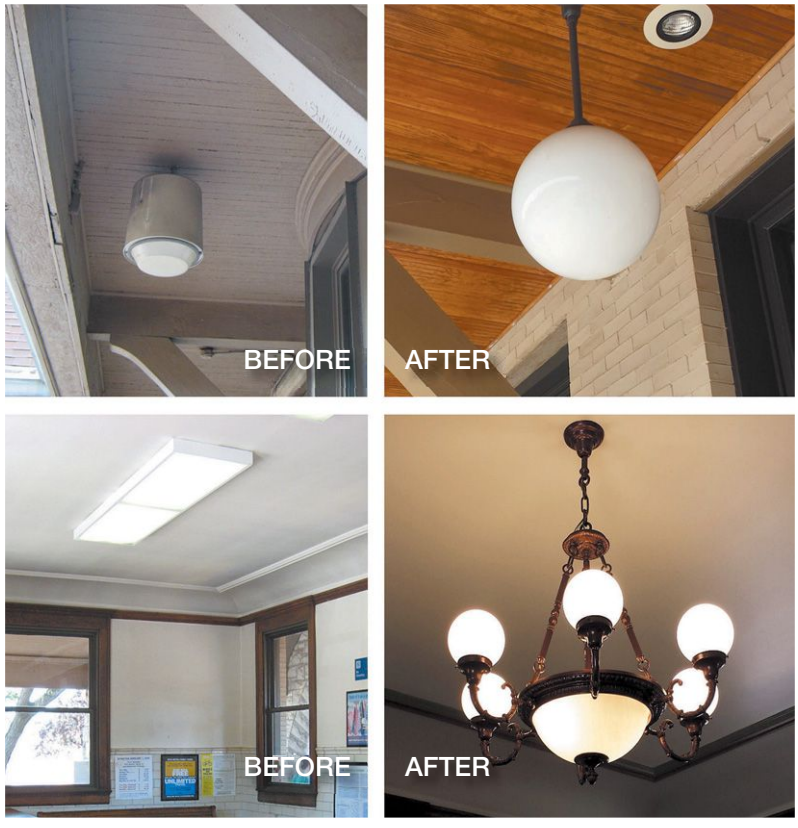
"The Stone Avenue Train Station's restoration is a model project demonstrating a community's value for its civic infrastructure," remarks Landmarks Illinois

OLD PHOTOGRAPHS ENABLED THE TEAM TO COMMISSION A **CUSTOM-DESIGNED RE-CREATION** OF THE ORIGINAL CARVED WOOD AND METAL STATION SIGN. THE SIGN NOW HANGS ON THE PLATFORM SIDE.

President and CEO Bonnie McDonald. "Unique and noteworthy is the pantheon of partners that coalesced around the importance of its reuse."

Jeannine McLaughlin, past president of the La Grange Area Historical Society, adds: "Many appreciate the station's history and its contribution to the growth of the village. Others appreciate the station's distinctive design, its dominating roofline, and the grace and beauty of the arches that beckon one to enter. But to most, the newly renovated station is, very simply, lovely to look at and, like a treasured piece of art, it enriches our lives while serving the transportation needs of thousands of commuters on a daily basis."

FUNCTIONAL ALTERATIONS IN THE 1970s AND '80s, LIKE FLUORESCENT CEILING LIGHTS AND '60s-STYLE LIGHTING, DETRACTED FROM THE HISTORIC APPEAL. TODAY'S LIGHTING FIXTURES WITH BRASS STEMS ARE MORE **HISTORICALLY APPROPRIATE**.



RUBEY PARK TRANSIT CENTER | Aspen, Colo.

» Retrofit Team

ARCHITECT: Studio B, Aspen, www.studiobarchitects.net

ROOFING AND CLADDING FABRICATOR AND CONTRACTOR: Douglass Colony Group, Commerce City, Colo., douglasscolony.com

» Materials

Built more than 30 years ago, Rubey Park Transit Center has been modernized with the incorporation of elZinc architectural zinc material, which was chosen to help maintain the historic form of the building. About 8,900 square feet of 0.8-millimeter elZinc Rainbow Green was fabricated into Double Lock Standing Seam Panels cladding the roof and façade of Rubey Park. Gilbert Sanchez, principal-in-charge and architect with Studio B, says the standing-seams panels were selected in part for their visual connection to the original roof, durability and low maintenance.

"The zinc panels reflect the original and familiar roof form while successfully integrating with the new additions and modern appearance of the rejuvenated facility," Sanchez says.

ZINC MATERIAL MANUFACTURER: elZinc America, www.elzinc.us.com

» The Retrofit

The primary goal of the renovation was to maintain the historic and familiar roof arrangement of the original 1980s transit center.

"There's an identity about Rubey Park that people have in their minds, so we wanted to build on and enhance that," Sanchez explains. "We've tried to retain some of the key elements of the existing building and update it so that it functions well, it's a safe place to be, and people like coming in and out."

To relieve overcrowded bus parking and increased number of bus riders, the restoration of Rubey Park Transit Center included the addition of two buildings on either side of the original center, improving passenger and pedestrian amenities, and enhancements to transit staging and operations.

PHOTOS: ELZINC AMERICA

Circle No. 22

CONFERENCE SPONSORS:

Armstrong CEILINGS Inspiring Great Spaces · CAMBRIDGE ENGINEERING INC · CONNECTRAC · CELEBRATING 45 YEARS · Flex Leader in Thermoplastic Single Ply Roof Systems · IEC International Environmental · Kingspan · METL SPAN INSULATED METAL PANELS · MITSUBISHI ELECTRIC COOLING & HEATING · PAC-CLAD PETERSEN · SIERRA PACIFIC WINDOWS · TerraLUX illumination

Contact John Riester, ***retrofit***'s publisher, at (919) 641-6321 or john@retrofitmagazine.com if you're interested in sponsorship opportunities.

DALLAS/FORT WORTH INTERNATIONAL AIRPORT, TERMINAL E

» Retrofit Team

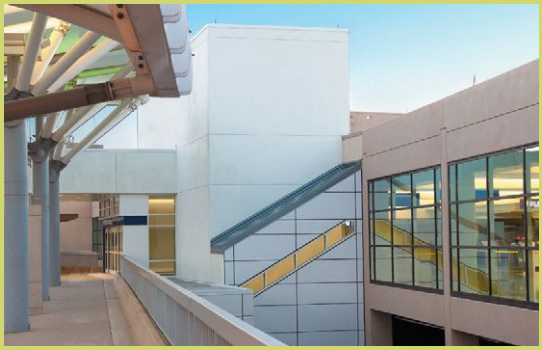
ARCHITECT:
Leo A Daly, Dallas,
www.leoadaly.com

APPLICATOR:
Pillar Construction Inc.,
Houston,
www.pillarconstruction.com

» Materials

Thermocromex was chosen as the exterior cladding at the Dallas/Fort Worth International Airport for the renovation of Terminal E for its cost effectiveness and 20-year performance warranty. The product was chosen in Scoria, Tandour and Ashler patterns and was custom-colored. Thermocromex was direct-applied to new CMU and existing precast concrete along with frame/sheathing wall assemblies. It offers scored joints up to 1-inch thick and achieves uniformity in texture and color.

CLADDING MANUFACTURER: Southwest Progressive Enterprises Inc., thermocromex.com



PHOTOS: SOUTHWEST PROGRESSIVE ENTERPRISES INC.

WHEN THEY ASK TO STAND, ASK FOR VARIDESK®

More and more employees are asking for the ability to sit and stand at work to increase their health and productivity. VARIDESK makes that easy by turning an existing desk into a height-adjustable standing desk solution, with no tools or installation required.

CALL TO TRY A VARIDESK IN YOUR OFFICE FOR FREE | (800) 207-2587

VARIDESK®.com
WORK ELEVATED®

Circle No. 23

MINSK NATIONAL AIRPORT | Republic of Belarus

» Retrofit Team

ARCHITECT: Minskproyekt Municipal Unitary Engineering Design Enterprise, Minsk, Republic of Belarus

» Materials

ROCKFON acoustic stone-wool ceiling panels add a modern look and performance to the historic Minsk National Airport. Chief Project Architect Oleg V. Sergeyev selected a combination of ROCKFON Tropic and ROCKFON Artic stone-wool panels to meet the modern aesthetic, as well as the performance requirements for fire safety and acoustics.

"Working on the airport project, we had to meet the international standards for passenger service and noise while creating a comfortable indoor environment," Sergeyev explains. "That is why we paid special attention to the selection of building materials. We chose the ROCKFON ceilings because they fully meet our standards for fire safety and acoustics. ROCKFON products are a contemporary and novel solution in our market that we were able to choose based on their value-to-quality ratio."

Sound-absorbent ROCKFON Tropic ceiling panels offer Noise Reduction Coefficients (NRCs) up to 0.90. With a high NRC, the ceiling panels help reduce the stressful din of noisy travelers and make it easier to hear important announcements in an international airport.

Non-combustible stone wool can withstand temperatures up to 2,150 F and resists melting and burning. It also won't create significant smoke, which improves overall fire safety and limits building damage. The panels are dimensionally stable at up to 100 percent relative humidity and factory painted, providing low maintenance and long-term durability.

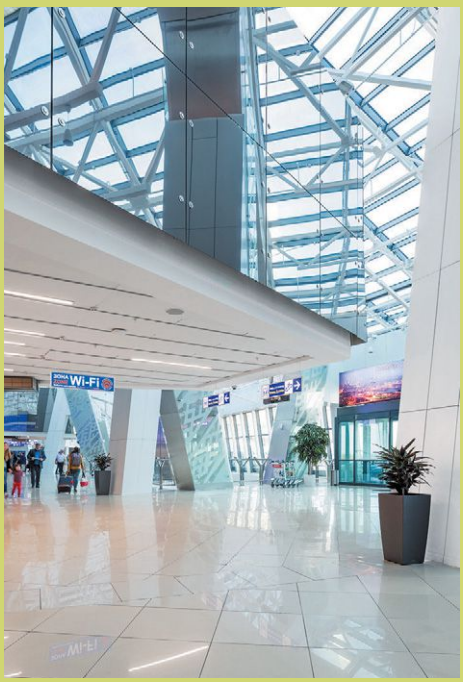
CEILING PANELS MANUFACTURER:
ROCKFON, www.rockfon.com

» The Retrofit

Constructed in the 1980s, the Minsk National Airport was built to serve approximately 5.2 million passengers per year. Initially, upward of 80 percent of airport traffic was carried within the Union of Soviet Socialist Republics. In the 1990s, the USSR dissolved and the Republic of Belarus formed. With the changing geopolitical situation, the airport became an increasingly important intersection connecting Western Europe and the Commonwealth of Independent States. However, airport capacity dramatically dropped around the change of the millennium and the existing building ceased to comply with international standards.

The airport's 2014 renovation and expansion brought the building up to current local standards, increased capacity for international airline traffic by up to 70 percent and improved the travel experience for passengers. "The objectives of a reconstruction and the construction of a new building differ greatly from each other," Sergeyev explains. "In this case, we had to work with the existing size and architecture of the building that was built in the former Soviet Union era. The idea of the project was to create an entirely new interior space with a modern, light and airy architecture within the boundaries of the existing building."

Sergeyev says he found inspiration in the spatial principles introduced by the legendary Swiss-French architect Le Corbusier: "We have dramatically changed the entire interior, streamlined the terminal area, created entirely new paths of passenger traffic, and rethought the location of check-in counters and waiting rooms to provide passengers with the necessary level of service."



PHOTOS: ROCKFON

www.sylvania.com

No. Frills, just Quality

Light is personal

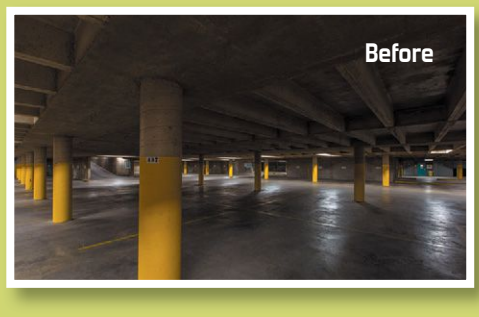
SYLVANIA LEDVANCE LED Luminaires and Retrofit Kits

Straightforward, efficient and easy-to-install products with proven quality and performance, perfectly matched to your everyday requirements. SYLVANIA LEDVANCE LED luminaires and retrofit kits are the ideal solution to fit your needs for everyday applications. The luminaires have all the necessary features and functions offering precisely what they have been developed for – no more and no less.

For more information, visit www.sylvania.com/luminaires

Circle No. 24

SYLVANIA



PHOTOS: CREE

U-HAUL CORPORATE HEADQUARTERS PARKING STRUCTURE | Phoenix

» Retrofit Team

MANUFACTURER'S REPRESENTATIVE:
Wild West Lighting Inc., Scottsdale, Ariz.,
www.wildwestlighting.com

» Materials

The existing lighting was inconsistent and not aesthetically pleasing. The lighting tended to yellow and could cast shadows that created a murky effect throughout the structure. The less than ideal lighting also was energy inefficient.

When U-Haul began its search for a new lighting solution, it was concerned about the high temperatures in Phoenix so it initially considered fluorescent and induction options because of the higher Kelvin temperatures available. However, since U-Haul's initial look, LED lighting technology has greatly improved and became the clear choice.

U-Haul requirements for its LED lighting solution included better light quality and performance, lower maintenance needs and costs, a product warranty and light-level control functionality. Cree LED lighting was able to deliver the energy reduction U-Haul was seeking with all the performance, quality and control features it demanded.

The lighting upgrade for U-Haul was comprehensive and provided an opportunity to maximize energy savings. "The scope of the project included replacing nearly 400 fluorescent lighting fixtures with LED luminaires," explains Michelle Sullivan, U-Haul manager of corporate sustainability. All the lighting in the parking garage was from 4-foot, 25-watt T8 lamps, and roughly 85 percent of all fixtures included four lamps. "With the new LED applications, we were able to eliminate more than 12 percent of our existing fixtures," Sullivan continues.

The T8 lamps were replaced with 324 Cree VG Series LED parking structure luminaires because of the light quality, output and lighting controls available. The 24/7 availability of the corporate office meant the parking structure lighting would be on 24/7. With the VG Series lighting control features, the new lights operate when needed—and time in use has been trimmed to approximately four hours per day.

Prior to the new lighting, maintenance was performed by U-Haul building technicians approximately every three weeks and was scheduled before or after normal business hours for minimal impact on the normal traffic flow. Material costs, time and labor added up to a costly monthly exercise. Now, the building technicians can focus on other areas of the facility as the costs of installation and replacement products are freed up for other expenses.

In addition to positive numbers surrounding maintenance and energy savings, feedback on the new lighting has been excellent. "There are no longer dimly lit areas in our parking structure that had previously raised safety concerns," Sullivan says. "With the increased amount and quality of light, visibility in the garage has improved overall."

More than 50 Cree LS Series surface ambient luminaires were installed for ramp and stairwell lighting, as well as OSQ Area Series and XSP Series Wall Pack outdoor luminaires. U-Haul is pleased Cree was able to accommodate the aged and uniquely shaped parking structure.

Along with improved light quality, U-Haul expects to realize more than 15 percent energy savings from the LED lighting upgrade. The new lighting has reduced the existing wattage by more than 17,000 watts to provide an estimated annual kilowatt-hour savings of more than 250,000 kWh. The expected lifetime savings is 3.7 million kWh. Additionally, U-Haul benefited from a generous rebate from Arizona Public Service, its local utility provider.

LED MANUFACTURER: Cree, www.cree.com

RTA CEDAR-UNIVERSITY STATION | Cleveland

» Retrofit Team

ARCHITECT: AECOM, Cleveland, www.aecom.com

INSTALLER: Advanced Roofing Systems, Cleveland, (440) 439-9820

CONTRACTOR: McTech Corp., Cleveland, www.mctech360.com

DEALER: Vulcan Metal Sales, Belle Vernon, Pa., www.vulcanmetalsales.com

» Materials

The station's steady flow of traffic called for an expansion in square footage of the entire facility. Not only was space for the large volume of visitors a concern for the architectural firm, but the architectural integrity and aesthetic aspects were considerations, as well. AECOM wanted to design the station with the convergence of different modes of transportation meeting in one location.

CENTRIA's Formawall Dimension Series horizontal panels were implemented to give the station a contemporary aesthetic. Panels were installed to rise from the ground on a curve and provide flowing sight lines and a seamless shelter for those awaiting bus transportation. Stainless-steel column covers Series 3000 were used to accentuate the Formawall Dimension Series panels and add to the modern aesthetic.

Architects also envisioned the station would speak the same urban language as its other transit-station counterparts and accentuate the neighboring scenery and locales. Thus, AECOM made sure the ground-rising Formawall Dimension Series panel roof acted as an extension to adjacent surroundings. For example, the dark-green finish of the panels matched the color scheme of the neighboring Ambler Park.

Transportation runs non-stop, regardless of weather. Cleveland is known for its brutal winters, so architects specified Duragard Plus coating for Formawall Dimension Series panels to ensure the material remains fade-resistant from rain and snow. The panels are pressure equalized along the length of the horizontal joinery, providing weather resistance. Additionally, the factory foamed-in-place core and a thermal break between the face and liner equates to minimum insulation gaps.

The following materials were used:

FORMAWALL DIMENSION SERIES 2-inch Horizontal; Square Feet: 8,445; Color: Orange; Coating: Duragard Plus; Finish: Smooth; Gauge: 22

FORMAWALL DIMENSION SERIES 2-inch Horizontal; Square Feet: 4,099; Color: Dark Green; Coating: Duragard Plus; Finish: Smooth; Gauge: 22

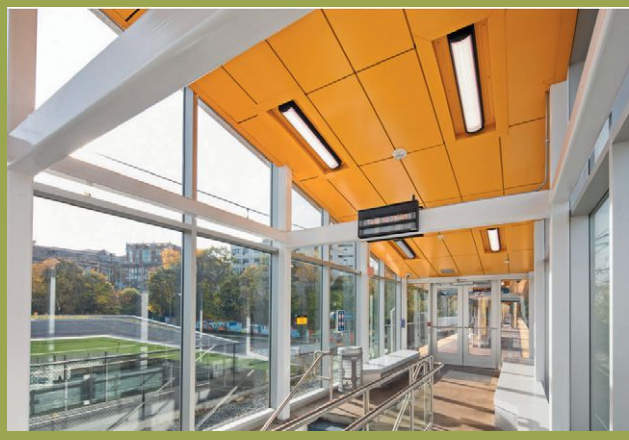
FORMAWALL DIMENSION SERIES 2-inch Horizontal; Square Feet: 500; Stainless Steel; Coating: None; Finish: Smooth; Gauge: 22

SERIES 3000 COLUMN COVERS: Stainless Steel

WALL-PANEL MANUFACTURER: CENTRIA, www.centriaperformance.com

» The Retrofit

Cedar-University Station, formerly known as the University Circle Rapid Station, is a part of the Greater Cleveland Regional Transit Authority (GCRTA) and was first opened to the public on March 15, 1955. The station is one of the most heavily used transfer points in the GCRTA network with traffic from the adjacent Case Western Reserve University accounting for much of the station's business. Commuters utilize it to take a bus to Cedar Hill, Cleveland Heights, Hopkins International Airport or downtown. However, after nearly 60 years in service, the station began to fall into disrepair. To meet the higher standards of the modern era, the transit authority secured $10.5 million to rebuild the facility.



PHOTOS: CENTRIA

MUNICIPAL AIRPORT | Florida

» Materials

Imagine walking out to your hangar to see its 74-foot door in a twisted heap, lying on the ground. Tom Vaughan, a manager at two Florida municipal airports, recently experienced this headache, discovering inferior hinges were the culprit. Even worse, the company that sold and installed the door went out of business.

Although it's possible for large doors to be damaged during tornado or hurricane conditions, weather conditions were not a factor in this failure, just inferior hinges.

"It looked like the top hinges broke off starting with a structural failure at one corner, which created a domino effect halfway across to the side of the building," Vaughan says. "There were several planes in the hangar at the time, but they thankfully weren't damaged. This calamity put the hangar out of operation for four months."

Vaughan started a search for a new door online, where he discovered Schweiss Doors. About the same time, a local tenant returned from an air show, where he saw the Schweiss Doors display and told Vaughan about them.

The hangar now has a 74-foot, 3-inch by 19-foot, 2-inch custom-made hydraulic door from Schwiess Doors. The door is engineered for a 175-mph wind load with a 12-volt back-up system and reinforced with a strong external truss and Schweiss' hydraulic frame with triple push tubes. It has a hydraulic two-speed valve that enables the door to slow down at the top and bottom cycle for smoother operation.

The new hydraulic door arrived in three weeks in good condition. "We asked our local aviation engineer to look at the Schweiss door from his engineering standpoint," Vaughan explains. "He took pictures and we gave him a brochure and he said he was going to take it back to his engineering firm to tell them if they have any future clients interested in putting up a door to direct them to Schweiss."

Vaughan knows where to turn if he ever needs another hydraulic door: "I can tell you one thing: If we ever have to replace any other doors, it will be with a Schweiss door and not any other brand. Getting a new Schweiss hydraulic door fixed this dilemma, but you can imagine, there are 69 more of these doors ... to worry about each day."

HYDRAULIC DOOR MANUFACTURER:
Schweiss Doors, www.bifold.com

PHOTOS: SCHWEISS DOORS

SAN BERNARDINO INTERNATIONAL AIRPORT | Calif.

» Retrofit Team

FENCE INSTALLER: Crown Fence Co., Santa Fe Springs, Calif., www.crownfence.com

» Materials

A large section of the airport perimeter fence was installed with Acoustiblok's Outdoor Noise Barrier, Acoustifence. The installation was done for GQ Aviation Engineering, which disassembles aircraft for parts and repairs them. The firm needed something to reduce the overall noise created in the process.

Luis Vasquez, the project manager for Crown Fence, along with Hector Vasquez, the foreman, headed up the team for the construction of the large section of fence. A double chain-linked fence was recommended by Acoustiblok. The black shade of Acoustifence outdoor barrier material was installed after the first fence was erected. With Acoustifence's grommets and stainless-steel ties, the task was relatively easy and went quickly. Once Acoustifence was in place, the second fence was put in position. The double fence provides extra security and can withstand high winds and keeps out blowing sand, dirt and dust.

"The client was very happy," Luis says. "The fence was easy to install and my Acoustiblok consultant was knowledgeable and helpful. We highly recommend Acoustifence for outdoor noise and are going to be installing more at the San Bernardino Airport for the second phase of the project."

FENCE MANUFACTURER: Acoustiblok Inc., www.acoustiblok.com

» The Retrofit

Located on the former site of Norton Air Force Base, which closed in 1995, San Bernardino International Airport is located about 2 miles east of downtown San Bernardino and 14 miles northeast of downtown Riverside. The airport has continued to grow over the years; airport tenants include aircraft-maintenance in the large hangars, a fueling operation, and the San Bernardino County Sheriff's Air Center that will include offices and facilities for fixed-wing and helicopter aircraft. In addition, two new state-of-the art terminals recently were constructed for domestic and international flights.

The area surrounding the airport has attracted new businesses, as well. There are now warehouses and fulfillment centers, such as Stater Bros., Kohl's, Amazon.com, Pep Boys, Pepsi and Mattel. With all the business and traffic comes additional noise and noise complaints. A noise-barrier fence helps the airport maintain good relations with the surrounding community of residential homes and businesses.

PHOTOS: ACOUSTIBLOK INC.

PHOTO: EXCEPTIONAL METALS

OST TRUCKING INC. | Baltimore

» Retrofit Team

ROOFING CONTRACTOR:
Moser Roofing Solutions, Lancaster, Pa., www.moserroofingsolutions.com

» Materials

About 68,000 square feet of Duro-Last membrane and EXCEPTIONAL Metals EM Retro-R metal roofing panel were installed on the busy trucking warehouse.

Because shutting down operations to install a new roof was not an option, Moser Roofing Solutions proposed installing this metal roofing panel because it is designed to go directly over an existing metal roof. The large project required a combination of the EM Retro-R panel in white and white 50-mil Duro-Last membrane. This solution allowed for very little disruption to OST Trucking's operations and avoided the costs of a tear-off.

"OST has a lot of traffic. It's very busy and it was crucial that we didn't disturb their operations," says Josh Moser, owner of Moser Roofing Solutions. "We were able to not only keep their operations running smoothly, but avoided any adverse consequences that come with having their roof opened up."

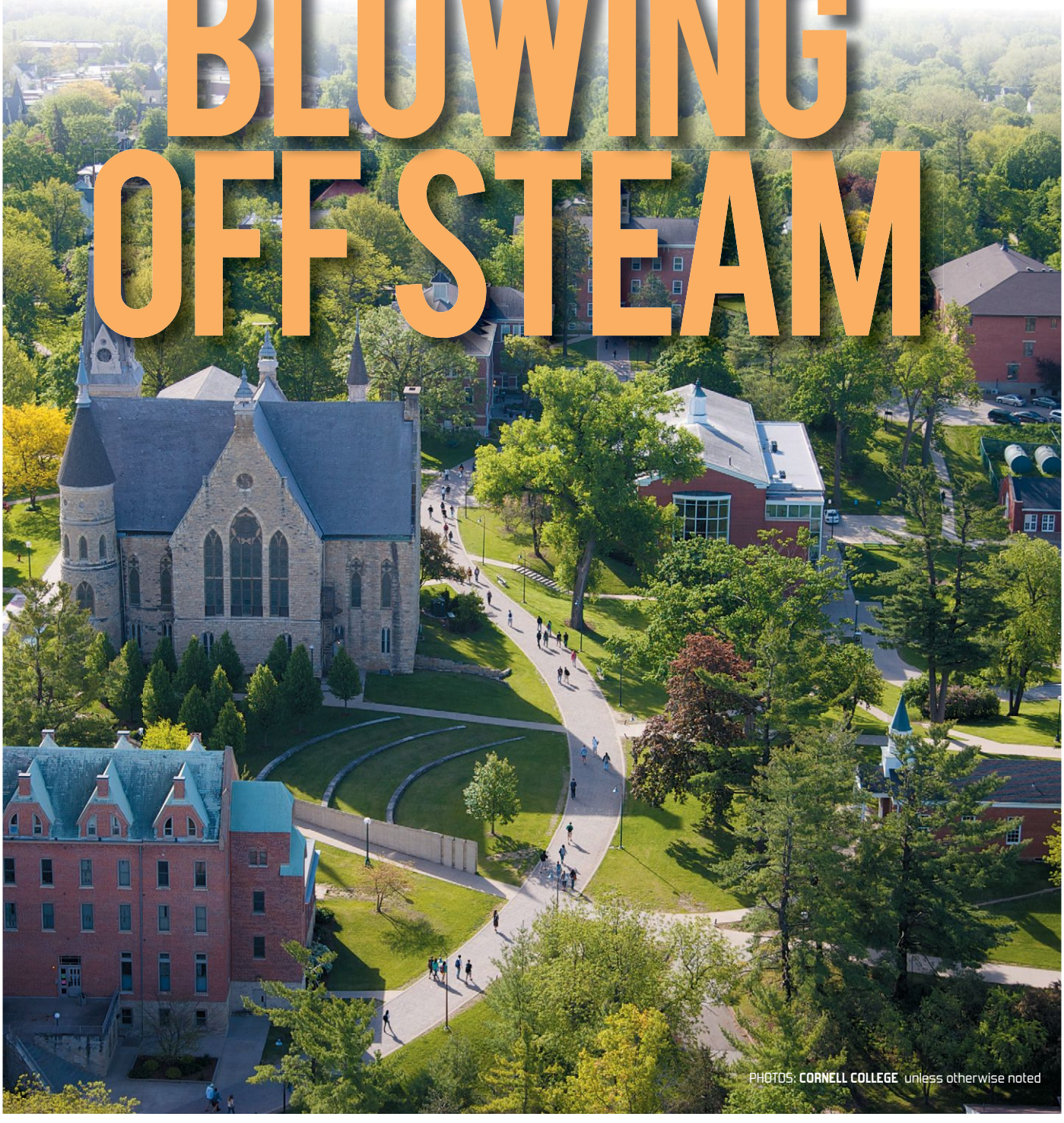
Being a large roof with a lot of detail work, Moser worked closely with the EXCEPTIONAL Metals and Duro-Last teams to make sure his crew had the right technical specifications to make the installation a success.

"The customer is happy," Moser adds. "From the first handshake to the broom-swept condition of leaving a project, we were there for our customer and they knew it. They appreciate that."

MEMBRANE MANUFACTURER:
Duro-Last Inc., duro-last.com

METAL ROOF PANEL MANUFACTURER:
EXCEPTIONAL Metals, exceptionalmetals.com

BLOWING OFF STEAM



PHOTOS: **CORNELL COLLEGE** unless otherwise noted

A PRIVATE COLLEGE CONVERTS FROM STEAM CENTRAL HEATING TO INDIVIDUAL BOILERS WITH BAS

WRITTEN BY | **CHRISTINA KOCH**

Often confused with Cornell University in Ithaca, N.Y., Cornell College, which is located in Mount Vernon, Iowa, was established in 1853 (12 years before Cornell University). The college's hilltop campus is one of only two U.S. college campuses listed in their entirety on the National Register of Historic Places. About 60 buildings, some of which date back to the 1860s, contribute to the campus' beauty.

The school offers its 1,000 students a liberal-arts education, featuring more than 40 academic majors and pre-professional programs. Notably, Cornell follows a "One Course At A Time" curriculum, meaning students immerse themselves in one class for three and a half weeks before they take a four-day break and begin their next course. The "block plan", as it's known, results in a distinctive—albeit rigorous—learning environment.

Despite the college's success in innovating over the years, one area in which Cornell was lagging was heating. The campus' central heating plant was built in the late 1800s and provided steam heat (first powered by coal, then diesel and finally converted to natural gas in the 1960s) to the entire campus via underground piping.

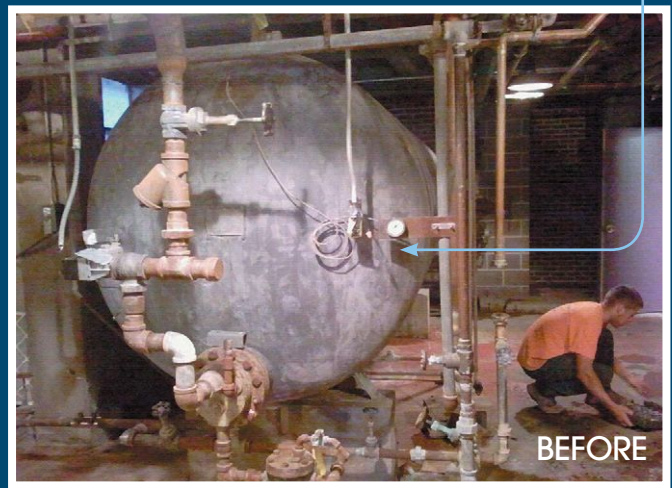
As the three boilers in the central heating plant aged, expensive repairs were common. Underground pipes also were deteriorating at a rapid pace, causing some buildings to be without heat for days while steam leaks were repaired. The inefficiency of the underground piping also was apparent to students; in the dead of winter the ground above pipes would be a summer oasis, clear of snow, nurturing grass and attracting wildlife. When Joel Miller was hired as facilities director in 2010, he knew the campus' heating solution had to change.

"When I started here, we came up with a saying: warm, safe and dry," Miller says. "These are the three things we must ensure our students and building occupants can expect at Cornell. Heat was just not consistent."

The Trouble with Steam

The 1960s boilers in the central heating plant were operating simultaneously when Miller began his tenure at Cornell. The school

THE **WIRE STEAM EXCHANGER** IN **OLIN HALL** (A 46,000-SQUARE-FOOT RESIDENCE HALL THAT HOUSES 200 STUDENTS) AND THE 250-GALLON **HOT WATER HEATER** HAVE BEEN REPLACED BY FIVE STANDALONE BOILERS FROM WEIL-MCLAIN. THE NEW BOILERS TAKE CARE OF OLIN'S DOMESTIC HOT WATER AND HEAT IN THE SAME FOOTPRINT.



ABOVE: Two of three 1960s-era boilers in the central heating plant **(CENTER)** provide heating and redundancy to the seven buildings on campus that have not yet been converted to standalone boilers.

BELOW: Five boilers that use the same footprint as the previous wire steam exchanger in Olin Hall take care of Olin's domestic hot water and heat.

PHOTOS: **WEIL-MCLAIN**

also was spending the money to inspect and clean all three 350-horsepower boilers. Miller opted to take one boiler offline; boilers two and three then provided the required heating and redundancy.

The antiquated heating solution is fairly straightforward. Water goes into the boilers and is converted to steam, which is pumped through underground lines to campus buildings. A condensate line carries the liquid from the steam away from the buildings and back to the boilers in the central heating plant. "This process is non-sustainable for a couple reasons," Miller notes. "One is the underground lines run through campus for miles and miles. The lines are typically anywhere from 3- to 4-feet wide and are insulated with drywall dust basically. Two, when we're converting from water to steam we have to chemically treat all this water to keep the lines that feed the buildings clean of residue created by the chemical composition of the water. We spend an enormous amount of money on chemicals just to treat the water."

In addition, the carbon footprint of the entire process is enormous, Miller notes: Pumping chemicals into the water requires electricity; facilities staff members watch the pumps to make sure the water is treated properly; once a month one staff member tests the chemicals in the water. "It's not just the fuel we use, it's the time and expense of it all," Miller points out. "Nobody ever thinks about the carbon footprint created every time you drive a vehicle to the central heating plant, the hours and cost and fuel for transporting that chemical from wherever it's made, the plastic barrels we have left behind, the pumps that go bad, the maintenance we do. There's a carbon footprint for all these things."

Not to mention, Miller adds, students were uncomfortable. "The only true thermostat a student in a residence hall had was a window," he says. "We couldn't really throttle a building down because the valves probably didn't work. When you cut that valve down it cuts down the pressure to the building, which lowers the temperature of the building and was just too hard to regulate."

21st Century Solution

Miller set forth his mission to move the campus' buildings off steam heat the year he came to Cornell. Three residence halls already were heated via individual gas-fired boilers rather than connected to the central heating plant. This solution was working well and Miller intended to replicate it throughout the buildings on

Retrofit Team

BOILER INSTALLER // Pipe Pro Inc., Cedar Rapids, Iowa, www.pipeproinc.com

Materials

BUILDING AUTOMATION SYSTEM // Niagara Framework by Schneider Electric, www.schneider-electric.com

STANDALONE BOILERS // Ultra 550 MBH high-efficiency condensing gas boilers and SlimFit 750 series by Weil-McLain, www.weil-mclain.com

TAKE A TOUR OF CORNELL COLLEGE'S CENTRAL HEATING PLANT AND VIEW THE NEW STANDALONE BOILERS IN ACTION AT OLIN HALL.

campus. However, when one of the individual boilers' heat exchangers went out, Miller learned it would take three months to receive a new part from the overseas manufacturer and that was only after the manufacturer confirmed the boiler still was under warranty, which could take days, even weeks.

"We had one boiler and no redundancy. If we lost that boiler, we would be without heat to the building," Miller recalls. "We were not willing to have a pipe freeze, burst and possibly hurt a student."

Miller began researching other natural gas-fired boiler systems for the campus-wide upgrade. One system, with which Miller was familiar from previous projects he had completed in his career, ended up being the solution he proposed to Cornell's president and board of trustees. Not only was pricing competitive, but the chosen boilers could be maintained by Cornell's facilities staff after some training by the Midwest-based manufacturer. In addition, Cornell staff could retrieve parts for the boilers from Cedar Rapids, Iowa, (17 miles northwest of Mount Vernon) and Iowa City (22 miles south). Finally, the small-footprint boilers are available in up to 1.5 million Btu in sizes that fit through a standard door, as well as into smaller spaces. This was very important to Miller as he tucked the boilers into locations that held old steam converters in the campus buildings.

"We now have five boilers where one wire steam exchanger was in Olin Hall [a 46,000-square-foot residence hall that houses 200 students]," Miller says. "Those five boilers take care of Olin's domestic hot water and heat in the same footprint."

Another benefit of the chosen boilers is they connect directly to the campus' new building automation system. Cornell has a fiber-optic connection to every building, which made implementation of the BAS easy. "Before we couldn't log in from home, but Jeff Mick [assistant director of Facilities Services] and I get all the alarms on our phones now," Miller states. "We know when a building, exhaust fan or air handler is down. We know when any building has a fire alarm. We can monitor everything."

If a student calls the maintenance department and says his or her room is 58 F,

THE BUSINESS CASE FOR ENERGY EFFICIENCY AT CORNELL COLLEGE

JOEL MILLER, facilities director at Cornell College, Mount Vernon, Iowa, has a mantra he follows on campus every day: "warm, safe and dry". To keep students warm in their residence halls and classrooms, he worked with Cornell's president and board of trustees to move from an antiquated central heating plant that produced steam heating for campus buildings to standalone gas-fired boilers for each building.

Olin Hall, a 46,000-square-foot residence hall that provides housing for 200 students, was among the farthest buildings from the central heating plant. Every time there was a steam leak to Olin, it was costly to repair.

"It's not very hard to convince the board of trustees that we can either dig this up six times and spend money to repair it each time or we can spend the money on putting a standalone boiler in Olin with standalone building controls and efficient water heaters."

Miller says it took his team a year and a half to figure out what building controls would work best for campus before they went back to the board with hard numbers for the boiler upgrades—and a few additional items. "To bring Olin into the 21st century, not only did it need new heat, but the residence hall also needed new windows that opened and were insulated. It was a perfect time to make these kinds of updates," he notes.

Miller contacted the local utility, Cedar Rapids, Iowa-based Alliant Energy, about rebates for the upgrades. "The rebate was enough to pay for another building's upgrade the next year," Miller recalls. "It was pretty easy. I think once the board knew how we accounted for every dollar, it wasn't hard to convince them this was the right thing to do."

This is just one piece of the overall effort to improve the energy efficiency of the Cornell College campus. In fact, energy savings is one of two chief goals for Cornell College's Facilities Services.

"As a result of our work, we have received Alliant Energy's highest award for energy-efficiency improvement," Miller says. "We expect to use 150,000 fewer kilowatt hours of electricity per year, which will save us about $45,000 per year. That money can now be reinvested in the college."

anyone in the department can look at the BAS and see the actual room temperature in real-time. Currently, Miller has set some buildings to global temperature settings and others are set globally per floor. He explains: "With Cornell's last renovations, we found out that nature plays a big part in the comfort of a building. For example, there's a north side of a building and a south side of a building. Both sides are relative to the sun and wind. It took fine-tuning to ensure students in all buildings are comfortable."

A Warm, Safe and Dry Legacy

It's a slow process to convert the heating systems of each building, especially when many buildings on campus didn't have gas lines running to them. Today, Cornell only has seven of about 60 buildings remaining on steam heat, which Miller anticipates will change in the near future. As the upgrades are made, Miller is focused on retrofitting each building for maximum energy efficiency. Four years ago, Miller and his team worked with the local utility, Alliant Energy in Cedar Rapids, to conduct an energy audit on every campus building.

"The audits told us what was happening with all of the buildings. The last two pages of the report told us what we could do to make the building more energy efficient. It was an easy decision to move forward with many of the recommendations," Miller explains. "In fact, the reports included paybacks. If it's five to eight years, OK. We'll go to the board of trustees and we'll work on our capital plan. If it's less than three years, we're going to do it in our budget because we're going to save that much money in three years in the facilities operation budget. The money we save buying LED light bulbs allows us to buy more LED bulbs or better insulation or better controls."

It's not all about the cost savings to Miller, however. He likes making students and their parents happy.

"These kids are the same age as my kids, and we want to be sure that mom and dad don't have to worry about the heating and cooling in their kids' residence hall along with everything else," Miller says.

"We want these kids to remember just as many good stories and memories in their room at Cornell College as they had in their room at home. We don't want them to ever remember being cold or water pipes breaking. Warm, safe and dry. I hope that's our legacy here."

Read a blog by JOEL MILLER, Cornell College's facilities director, about updating the college campus wisely at www.retrofitmagazine.com/campus-renovations-done-right.

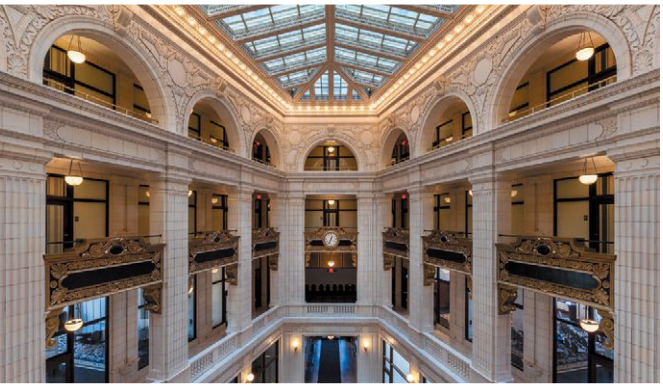
DAVID WHITNEY BUILDING | Detroit

Retrofit Team

HVAC CONTRACTOR: RW Mead & Sons Inc., Fraser, Mich., rwmead.com
ENGINEER: Strategic Energy Solutions, Berkley, Mich., sesnet.com
DISTRIBUTOR: Young Supply Co., Chesterfield, Mich., www.youngsupply.com
DEVELOPER: Roxbury Group, Detroit, www.roxburygroup.com

Materials

Vince Dattilo, vice president of construction and project management, Roxbury Group, knew his team had a big project ahead of it in bringing modern-day cooling and heating to the David Whitney. The building dates back to 1915 and sat vacant for 15 years before the renovation. The outdated mechanical systems needed updating but the sheer size and mass of the preexisting structure presented an immediate problem. "The floor is 22- to 28-inches thick. So right off, that made new HVAC challenging from a cost perspective. Forced air, which involves running tons of ductwork, would have meant high costs—if ductwork was even possible," Dattilo recalls.



PHOTOS: MITSUBISHI ELECTRIC US INC. COOLING AND HEATING DIVISION

Cue Don Nichols, P.E., LEED AP, senior mechanical engineer with Strategic Energy Solutions. Nichols was given two determining factors whether VRF (variable refrigerant flow) was the most viable HVAC system: cost and energy efficiency. He explains: "Cost was about first cost. We compared two types of systems: water-source heat pumps and VRF. The construction cost for the VRF came in less than water-source heat pumps."

Dattilo notes the VRF design used a pre-insulated line set distributed locally and manufactured in Italy. "We were looking at close to 5 miles of piping, so compare VRF to getting guys in here crawling through tight spaces to install insulation; that's a lot of money saved on that one piece alone," he adds.

Nichols' consideration of energy efficiency was about long-term utility cost. "We did energy modeling for the building, looking at the yearly energy cost compared to a baseline of typical HVAC," Nichols says. "Ultimately, VRF was a lower first-cost installation and lower utility operating costs."

The result was that the original estimate of $6.8 million with a forced-air system came down to $5 million with VRF. VRF also maintained the building's existing architecture. Contractor Rick Mead, president, RW Mead & Sons, says: "We could not disturb any of the historically significant elements of the building. For renovating the historic building, VRF with its small-diameter piping rather than large-diameter forced-air ductwork made sense."

Mead notes the installation went well. "Nichols' design split the condensers across three areas—on the roof, in an alley and in the basement-level areaways—to minimize the vertical travel distance of line sets, thereby staying within Mitsubishi Electric specification," he says.

Since installation, the VRF system has been keeping everyone comfortable while keeping costs down. Mead adds, "In January/February, the system was put to a test, and it provided the heat needed to make people happy and comfortable."

Some of those people are guests in the 136-room Aloft hotel that occupies floors one through 9 of the building. Aloft's Director of Engineering Scott Mondock describes the rooms as spacious with high ceilings. The vertical- and ceiling-concealed indoor units contribute to the rooms' clean look and Mondock appreciates the system's ability to cool and heat simultaneously. "The rooms are more evenly cooled/heated," he says. "The temperature stays consistent throughout the building with

the system getting pretty close to the set points. Older systems have at least a two- to five-degree differential. But with this VRF system you set it to 72 degrees and the system is usually within one degree of that, often right on the money."

Behind the scenes, the centralized controls system has been a boon to the entire building's management team. Dattilo mentions: "The BACnet controls allow you to look at the system remotely—every fan coil, every condenser. We can set alarms. We can see what folks are doing 24/7/365." Mondock uses the controls system to follow the system's operation, establish set points and troubleshoot. "This is all by the touch of a finger on my cell phone, which is very nice and convenient," he says. "I can access the system from my house or Colombia, and it responds quickly."

VRF MANUFACTURER: Mitsubishi Electric US Inc. Cooling and Heating Division, mehvac.com

The Retrofit

According to the U.S. Census Bureau, Detroit lost 60 percent of its population from 1950 to 2010. The decline meant bankruptcy, myriad abandoned homes and buildings, high crime rates, even thousands of stray dogs on the streets. In the last two years, though, something has shifted; downtown activity has greatly increased thanks to a focus on rehabilitating historic buildings. Several projects are credited with this revitalization—among them the $94.5 million renovation of the David Whitney Building, a Class A skyscraper. The building has been restored to its previous grandeur and now offers luxury residences, the Aloft Detroit at the David Whitney, a restaurant and bar.

Ultimately, Nichols says: "The David Whitney is a big player in the Detroit revitalization. It's been well-received and is in the heart of everything downtown. It's an iconic place, and now it's the hot spot in Detroit."

PHOTOS: SAVE ENERGY SYSTEMS

PLANET FITNESS | 52 locations

Retrofit Team

ENERGY-EFFICIENCY SERVICES COMPANY: Save Energy Systems, Westborough, Mass., www.saveenergysystems.com

Materials

Maintaining a perfect climate in any fitness center is difficult. The combination of highly active occupants, electrical equipment, bright lighting and rooms of differing temperature requirements (workout versus stretching versus locker rooms, for example) pose unique challenges for a traditional HVAC approach.

For each Planet Fitness location, Save Energy Systems upgraded the HVAC control system to include its patented demand-limiting controller (DLC), an intelligent networked system that automatically manages HVAC energy consumption, including demand, kWh use and overall HVAC load during peak hours.

More than just a programmable thermostat or a monitoring system, the DLC system precisely controls the operation of all HVAC units at any location. It prevents all units from running simultaneously while independently managing each unit's fan and compressor to maintain a comfortable temperature in each location's different zones.

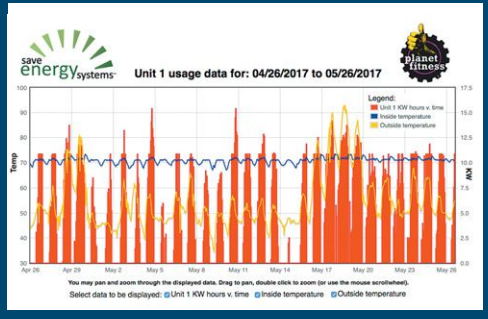
Save Energy Systems also networked each location into a central hub, providing an Internet of Things (IoT) approach that enables facilities managers at the franchise headquarters to monitor each location and receive alerts when any HVAC unit is operating outside of a defined range.

DLC DEVELOPER: Save Energy Systems, www.saveenergysystems.com

The Retrofit

By installing its patented DLC to control the HVAC system in each location, Save Energy Systems reduced the energy bill of each Planet Fitness location by an average of 18 percent, shaving $450,000 from the chain's energy bill.

Alan Buell, who oversees construction at Planet Fitness' head office, appreciates the benefits of centralized control and diagnostics that the DLC system offers: "What I'm hearing from our locations around the country is that the internal climate is now consistently precise with little variation from the set point. This is good for our members and good for our bottom line."



CJ AUTOMOTIVE | Butler, Ind.

Retrofit Team

HVAC INSTALLER: Freedom Heating & Plumbing, Auburn, Ind., www.freedomheatingandplumbing.com
MANUFACTURER'S REPRESENTATIVE: B&B Energy, Indianapolis, www.bbair.com

Materials

The owners of CJ Automotive knew their building's existing boiler was not only inefficient, but also was providing uneven temperatures, leaving their employees uncomfortable. However, management was concerned that retrofitting a new system would disrupt production in the factory.

The automotive parts manufacturer's leaders opted to replace the boiler with a trio of space heaters from Cambridge Engineering that are classified as HTHV (high temperature heating and ventilation) products.

Contractor Toby Jordan of Freedom Heating & Plumbing worked with B&B Energy's Mike Zipse, as well as Cambridge Engineering's in-house engineers, to specify the proper size and placement of three heating units for the 126,300-square-foot facility. The new units—SA 250, S800 and S2200—were mounted on walls rather than on ceilings, which minimized blocking sections of the factory for installation during production hours. The combination of these three units is enough to provide efficient and draft-free heat to the entire facility.

CJ Automotive's thermostat setting went from 55 F with the old system to 68 F using the Cambridge HTHV equipment. The workforce now has an environment in which they feel comfortable on the job. They also enjoy improved air temperature uniformity because of de-stratification with no need for supplemental fans and better indoor air quality with the use of 100 percent outside-air HTHV units.

The HTHV equipment also qualifies CJ Automotive for commercial rebates through the natural-gas utility provider, which helps the business with equipment costs and ROI.

HTHV MANUFACTURER: Cambridge Engineering, www.cambridge-eng.com

The Retrofit

Ron Lanning, plant manager at CJ Automotive, says that following installation employees are more comfortable and the air quality is improved. The cost savings are undeniable, as well, ranging up to 54 percent per month in winter. "We have saved approximately $2,500 each month in fuel costs, plus numerous man-hours in maintenance or repairs of the old boiler system and thousands of dollars in annual boiler inspection fees," Lanning says. "The heat is now regulated and comfortable throughout the building versus having spikes in temperature with the old boiler system. We also use the Cambridge units to bring in fresh outside air on warm and hot days."

Utility Cost Savings at CJ Automotive Before and After Space Heater Retrofit

Month	Therms used	Month	Therms used	Savings
January 2014	11,673	January 2016	5,314	54%
February 2014	9,880	February 2016	7,369	23%
March 2014	5,556	March 2016	2,781	50%

Note: January, February and March culminate in 80 percent of CJ Automotive's heating requirements.

PHOTOS: CAMBRIDGE ENGINEERING


TUNABILITY
AND
BEYOND
VISA LIGHTING
Featuring Symmetry Tunable Fixture, 1 of 3 new Symmetry models
· 1650K-8000K
· 90 CRI
· DMX | 0-10V
visalighting.com

PHOTOS: CARLISLE HVAC

View a video of Duke University Chapel's HVAC restoration.

DUKE UNIVERSITY CHAPEL

Durham, N.C.

Retrofit Team

HVAC CLEANING AND SERVICE: Pur-Vent, Cary, N.C., pur-vent.com

Materials

In May 2015, Duke University kicked off a year-long restoration project to rehabilitate the interior and exterior of the chapel. Pur-Vent was tasked with restoring the entire HVAC system, including 100 feet of underground ductwork.

Duke University was replacing the existing air-handling units, and Pur-Vent was responsible for cleaning all of the remaining ductwork and grilles. The project's scope was eventually expanded to include 100 feet of underground fresh-air ducts that had previously been taken out of service. "They decided to put it back in service, and they wanted to coat it, so we suggested using Carlisle Hardcast's RE-500," says Henry Baker, president of Pur-Vent.

A building's ductwork can be resurfaced—as opposed to being replaced—with RE-500, a high-performance, spray-applied insulation coating. Coating the fiberglass liner or duct board with RE-500 increases the equipment's service life at a fraction of the cost of replacement. RE-500 is a low-VOC product that can be used inside the HVAC ductwork.

Pur-Vent's technicians first cleaned the ductwork with vacuums; then they performed a more thorough cleaning using whips and air-washing. Duct cleaning is extremely important for a facility to have a healthy and efficient airflow system and, after cleaning, sealing and coating the duct system is essential to ensure that dirty, dusty air is not pulled into the ducts and recirculated throughout the building.

"Architects and engineers are starting to realize that you can't just replace an air-handling unit and not clean the existing ductwork and the air distribution, especially if you put new ductwork downstream. I've seen cases where dirt from old ductwork blew into the new ductwork, then the entire duct system has to be cleaned," Baker recalls.

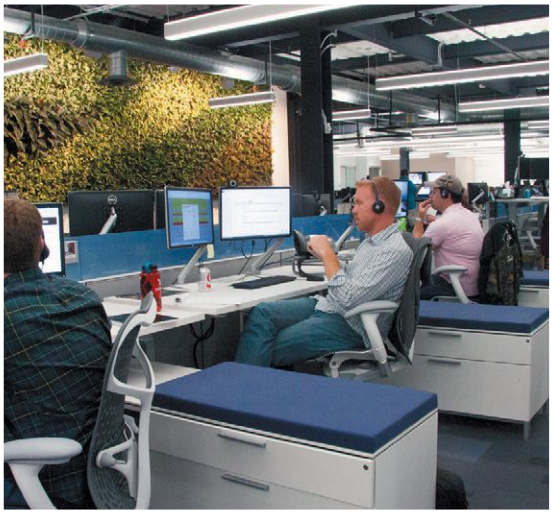
Because the Duke University Chapel is such a significant building, Pur-Vent's first priority was to preserve its historic elements, including the brass grilles, limestone walls and woodwork. "The air distribution was literally on top of the woodwork and the entire back of the seats were the air plenum, so we had to go down in back of that and clean that out," Baker explains. "Getting zoning and enough suction on that was tough."

After the clean-up phase of the project was complete, Pur-Vent technicians hand- applied RE-500 using an airless sprayer.

DUCTWORK RESURFACING: Carlisle Hardcast's RE-500 by Carlisle HVAC, www.carlislehvac.com

The Retrofit

Since the early 1930s, Duke University Chapel has stood on the highest ridge of Duke's West Campus. This iconic building has a rich history and is known for its architectural grandeur. During the past eight decades, Duke University Chapel has been the site of thousands of services, welcomed millions of guests and served as the preeminent icon for the distinguished university.



PHOTOS: CITRIX

PHOTO: DYNAMIC AIR QUALITY SOLUTIONS

CITRIX | Raleigh, N.C.

Retrofit Team

ARCHITECT: Alliance Architecture, Durham, N.C., alliancearchitecture.com
ENGINEER: Crenshaw Consulting Engineers Inc., Raleigh, www.crenshawconsulting.com
MECHANICAL CONTRACTOR: Newcomb & Co., Raleigh, newcombandcompany.com

Materials

Designers had three primary objectives with respect to ongoing sustainability and LEED certification:

1. Energy Savings.
2. Maintenance Cost Savings.
3. Superior Air Quality within the Space.

To meet these objectives, Dynamic V8 Air Cleaning systems were installed in Trane Performance Climate Changer air handlers. Air filtration is increasingly being recognized as an energy-conservation measure that may be second only to lighting upgrades in terms of financial benefits. With its low static pressure resistance, the Dynamic V8 reduces the amount of energy required to push air through the filtration system, requiring two-thirds less fan energy than MERV 14 passive filters while delivering MERV 15 filtration performance.

The Dynamic V8 also enjoys a high dust-holding capacity, which extends filter change-out intervals from every few months to every several years. These long maintenance intervals cut operating costs by saving time and labor, in addition to replacement filter costs and disposal costs.

Lastly, the Dynamic V8 delivers high-efficiency air-cleaning performance. The Dynamic V8 addresses all three types of airborne contaminants: particles; odors; and VOCs; as well as biological contaminants, like germs and other airborne pathogens.

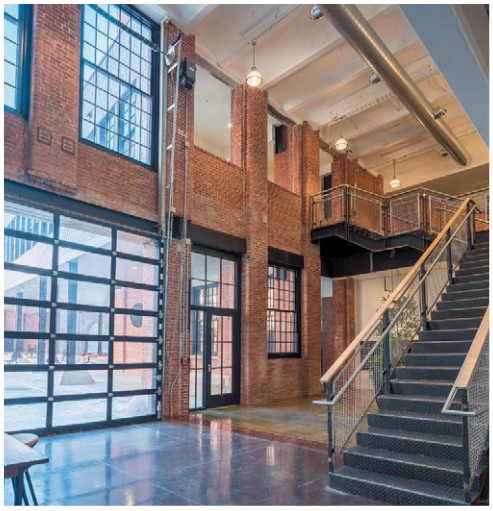
"These systems are a great fit in our facility given the variety of spaces that they need to service. From our fitness center to the café, these filters help us maintain excellent indoor air quality," says Drew Shaw, lead technical associate for Facilities.

AIR-CLEANING SYSTEM MANUFACTURER: Dynamic Air Quality Solutions, www.dynamicaqs.com
HVAC MANUFACTURER: Trane, www.trane.com

The Retrofit

Citrix recently transformed an abandoned warehouse into a new-generation 172,000-square-foot modern workplace designed to stimulate creativity, collaboration, productivity and employee engagement. The environmentally forward workplace design combines Citrix Mobile Workspace technologies and embodies the company's core vision of the mobility-transformed business that allows people to work better and live better.

The unique spaces in the building were designed to amplify collaborative, design-led thinking and support a culture of work-life balance and healthy lifestyles that enable greater employee engagement in the workplace. Spaces range from conference areas made out of retrofitted shipping containers to racquetball and basketball courts to a yoga studio and rooftop bocce court. The adaptive-reuse building is sustainable, including a 55-foot-long living wall covered in vegetation, a 2-story-high ceiling with shades that adjust to natural light and numerous other features supporting LEED Gold certification.



PHOTOS: LG

View a video about the HVAC system in the Sharpe Building at the Foundry.

SHARPE BUILDING AT THE FOUNDRY

Providence, R.I.

Retrofit Team

MECHANICAL CONTRACTOR: Peregrine Mechanical Inc., Rumford, R.I., www.peregrine-mech.com
MECHANICAL ENGINEERING: Trumbull Campbell Associates, Newbury, Mass., (978) 225-2045

Materials

The project team required an HVAC system that would retain the Sharpe Building's unique architectural character while appealing to young professionals migrating to Providence's urban center who expect modern comfort and conveniences. Therefore, the team looked for a system that was energy efficient, aesthetically pleasing and quiet.

Peregrine Mechanical Inc. turned to Trumbull Campbell Associates to help design a super-efficient solution that would allow for individually controlled heating and cooling in the building's mix of metro, studio, one- and two-bedroom units. After carefully reviewing the requirements, Trumbull Campbell Associates recommended installing the LG Multi V IV VRF heat recovery system. Using LG's VRF (variable refrigerant flow) systems would preserve the architectural integrity of the historic building while addressing space considerations by running small refrigerant lines throughout the building without using bulky ductwork.

In addition to the small refrigerant lines and compact equipment, the LG Multi V IV does not require a large mechanical room. In turn, the Sharpe Building was able to repurpose that space for amenities for the residents, including a gym and theater. On a large portion of the roof that would have been occupied by a conventional system, an outdoor space overlooking downtown Providence has been built for the residents.

To create a comfortable and appealing indoor environment, the Sharpe Building features a mix of indoor units including ceiling cassettes and wall-mounted units, depending on the location. Selected for their minimal noise level, the LG indoor units provide precise temperature control while operating as quietly as the noise level in a library. By using individual zones, the LG Multi V IV systems only engage when there is enough demand and then balance the load requirements across all spaces to use energy more efficiently. The system provides further energy efficiency through the heat-recovery feature as heated return air is redistributed to the zones that need it, rather than heating new air.

For nearly the same cost as a traditional system, the Sharpe Building now has a highly reliable, stable HVAC solution that provides energy-efficient comfort for residents.

VRF MANUFACTURER: LG, www.lghvac.com

The Retrofit

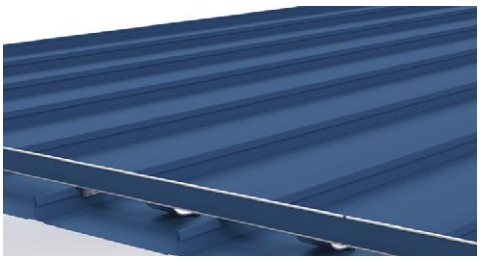
Originally built in 1872, The Foundry has a rich history dating back more than a century. Once the former manufacturing campus of industrial powerhouse Brown & Sharpe, the 13 brick buildings located on 26 acres have been meticulously restored into a mixed-use complex, which bridges the old and new.

In the middle of the sprawling complex is the Sharpe Building at the Foundry, which served as a mill during the building's manufacturing years. The goal for the renovation of the 157,500-square-foot, 6-story building was to develop 196 loft-style luxury residences. Placed on the National Register of Historic Places in 2003, the Sharpe Building required a renovation that upgraded the functionality of the building while maintaining the historic design.

THE UNDISPUTED LEADER IN SNOW RETENTION SOLUTIONS!

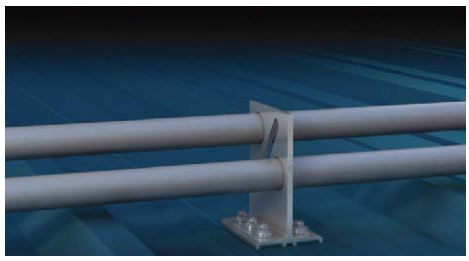
S-5!® prides itself in ingenuity, quality, and holding strength. Our innovative snow retention products are made in the U.S.A. to the highest quality standards. Lab testing and decades of heavy-duty applications prove that when it comes to preventing snow avalanches, S-5! is the best in the business, outperforming all other options on the market.

- **Proven**
- **Strong**
- **Safe**
- **Easy**
- **Versatile**
- **Warranted**
- **Engineered**



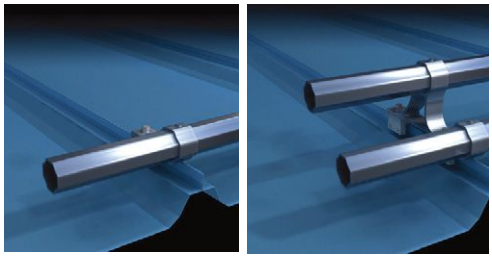
ColorGard®

Fitted with a strip of the roof material itself, ColorGard ensures a perfect color-match for the life of the roof.



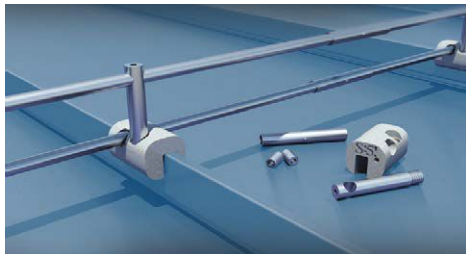
VersaGard

VersaGard™ is compatible with almost any trapezoidal, exposed-fastened profile. No messy sealants to apply! No chance for leaks!



X-Gard™

X-Gard can be designed as a one- or two-pipe system spanning up to 48". No other pipe snow retention system on the market has proven stronger than X-Gard.



SnoRail™ and SnoFence™

Up to six times the strength of adhesively-mounted devices, these systems offer a long-term, dependable solution for traditional standing seam and sheet copper roofing.

DualGard™

DualGard™ a complete, affordable system only S-5! can provide. DualGard also works with most face-attached roofs and VersaGard™.

S-5!®
The Right Way!

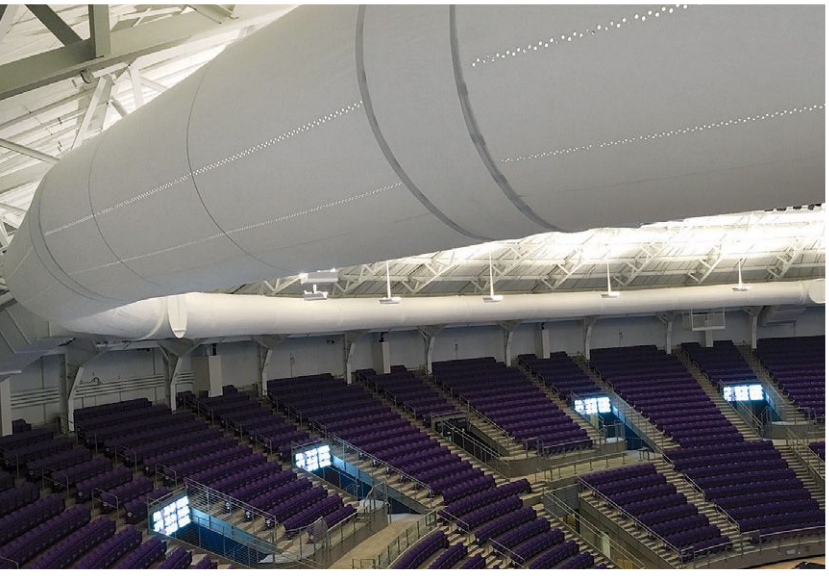
Call or visit www.S-5.com to find out more about S-5! Snow Retention Systems.

Circle No. 29

MADE IN THE USA

888-825-3432 | www.S-5.com

PHOTOS: DUCTSOX



ED AND RAE SCHOLLMAIER ARENA | Fort Worth, Texas

Retrofit Team

CONSULTING ENGINEER/ARCHITECT: Baird Hampton & Brown Inc., Fort Worth, www.bhbinc.com
MECHANICAL CONTRACTOR: SkiHi Enterprises, Fort Worth, www.skihi.com
DUCT INSTALLER: McCorvey Sheet Metal Works LP, Houston, mccorvey.com
DUCT MANUFACTURER'S REPRESENTATIVE: Bartos Industries, Fort Worth, www.bartosindustries.com

Materials

Baird Hampton & Brown (BHB) faced many challenges during the $72 million renovation. There were limited indoor areas available for new air handlers; design committee members discouraged roof placement on the renovation's new 1-story build-outs for aesthetic reasons. Hanging new spiral metal air-distribution duct from a bowl-shaped roof not originally intended for supporting the estimated 1,500 tons would require costly roof structural upgrades. Installing tons of 60-inch-diameter metal ductwork 47-feet high would be a job-site safety concern for HVAC contractors. Finally, strict year-round humidity and temperature tolerances were required to maintain the new wood basketball floor.

Fabric duct, which is 90-percent lighter than metal duct, was BHB's solution for these challenges. However, the architecture committee was concerned with the deflated appearance associated with older-style fabric duct during idle air-handler periods. Recent industry developments of in-duct tensioning systems convinced the committee to use the FTS (Fabric Tensioning System) Jumbo Series from the SkeleCore product line manufactured by DuctSox Corp. SkeleCore is an in-duct, cylindrical metal framework tensioning system that's field-adjustable with a wrench for taut, wrinkle-free and inflated-like aesthetics regardless of air-handler operation. The lightweight internal framework also has a minimal friction loss of 0.04 inches w.g. per 100 feet.

Unlike the original back-wall air-distribution positions, BHB's fabric duct ring hangs approximately 40 feet out from the back wall and disperses air more evenly throughout the seating and court areas. Air is dispersed through a linear array of laser vents that throw at three velocities. "The laser vents are capable of velocities that reach center court without the need of high-velocity nozzles," says Josh Schmidt, P.E., mechanical engineer and a member of BHB's design team that included Principal Ian Bost, P.E., LEED AP, and Ken Randall, P.E., electrical engineer.

The renovation included build-out areas for concessions and the circular corridor's widening. With no ground space available and the existing build-out structurally incapable of HVAC unit loads, the new build-out's roofs were the only solution for the placement of three 50,000-cfm air handlers. Although BHB would have preferred three symmetrical supply points at 3, 7 and 11 o'clock into the circular fabric supply duct for even airflow and low velocities, the build-out roofs' unsymmetrical positions around the arena permitted only air-handler supply radius entry points of 10, 8 and 4 o'clock in the circular duct design. Therefore, airflow is designed to flow right or left, but not both directions, once entering the fabric duct ring via metal duct tee connections from the air handlers. Bartos Industries assisted BHB in engineering the fabric duct's airflow, velocities and calculations of the 10-degree transitions between every 16-foot by 10-inch-long section to complete a 550-linear-foot circle of 60-inch-diameter duct.

BHB specified an additional 6-MBH condensing boiler manufactured by Aerco International to accommodate the building's added space requirements and to supplement three existing 2-MBH condensing boilers. All pumps were replaced because of age. BHB incorporated a new hydronic strategy of redundancy with two 50-horsepower chilled water pumps, two 25-horsepower hot-water pumps and two 10-horsepower general water pumps. Thanks to an ample-sized mechanical room and BHB's first use of Autodesk's Navisworks construction modeling software, the hydronic change-outs were seamless.

The lowering of the playing court 4 feet for better stadium seating views, plus adding locker rooms and other sublevel spaces, also allowed BHB to design more courtside return air, which feeds an existing concrete return-air shaft. The shaft feeds a plenum above the encircling concourse that supplies the York units, which mix it with outdoor air per data from the arena's CO_2 sensors and the BAS.

FABRIC DUCT MANUFACTURER: DuctSox, www.ductsox.com
AIR-HANDLER MANUFACTURER: York, www.york.com
BUILDING AUTOMATION SYSTEM: Metasys from Johnson Controls, www.johnsoncontrols.com
EXHAUST FANS: Loren Cook Co., www.lorencook.com
FANCOIL UNITS: Enviro-Tec, www.enviro-tec.com
CONDENSING BOILER: Aerco International, aerco.com

The Retrofit

The conversion of the 55-year-old, 70,000-square-foot Daniel-Meyer Coliseum into the new Ed and Rae Schollmaier Arena presented many HVAC engineering challenges. The $72 million renovation includes new locker rooms, expanded common areas and 140,000 square feet of building additions.

LAKESHORE PUBLIC SCHOOL DISTRICT | Stevensville, Mich.

Retrofit Team

ARCHITECT AND ENGINEER: Kingscott Associates, Kalamazoo, Mich., www.kingscott.com
MANUFACTURER'S REPRESENTATIVE: Bolhouse LLC, Jenison, Mich., www.bolhousellc.com

Materials

Scott Bolhouse of Bolhouse LLC took Nick White, director of operations for Lakeshore public schools, and Scott Morgenstern, senior mechanical engineer for Kingscott Associates, on a tour of nearby locations with unit ventilators already installed and running.

"We've found that it always helps to demonstrate equipment operation; there's nothing quite like a working demo in a setting not unlike the classrooms they needed to improve," Bolhouse notes. White and Morgenstern saw a variety of HVAC equipment that day. After further research into equipment capable of solving problems at the school district, they chose the Airedale Classmate DX Cooling and Heat Pump.

"One of the first things that stuck out to me at the demo was the noise—or better—the lack of it," White remembers. "We learned about the equipment's impressive sound lab performance, but it was most impressive to see and hear the equipment during our tour. We were certain that we'd found the right technology for our schools."

One-hundred thirty-two units were specified for the five schools in the district, and two Modine Varsity under-the-window units were chosen for the high-school football locker room. The classroom units have efficient electronically commutated motors and micro channel coils. Advanced blower and compressor technologies contribute to the decreased sound and power output. They also have a proprietary CF coil, offering improvements over existing parallel flow coil technology.

The all-aluminum counter flow (CF) coils provide condensing and evaporation. Inside the CF coil, refrigerant makes two-passes—once up and then back down—to create a uniformly conditioned air stream.

The vertical systems allow for ductwork and diffusers to be connected easily so sound from the fan and the moving air are distributed throughout the room, which more or less eliminates sound from the units.

"Kingscott has been designing with vertical style ventilators for years," Morgenstern adds. "These types of units have been our preferred solution since they came on the market. Being able to provide ducted supply systems to the classrooms allows for better temperature control throughout an entire room, which was a huge win for the Lakeshore schools."

COOLING AND HEAT PUMP AND UNDER-WINDOW UNITS MANUFACTURER: Modine Manufacturing Co., www.modine.com
ALL-IN-ONE BLOWER MOTOR IN MODINE MANUFACTURING'S HVAC SYSTEM: Genteq, www.genteqmotors.com

The Retrofit

White's attention and prudent management of improvements at Lakeshore Public School District's three elementary schools, a middle school and high school have included broad HVAC upgrades, which have improved student and teacher comfort, as well as energy efficiency. It had been about 20 years since any of the schools had new heating equipment installed, and none of them had any form of air conditioning.

"It was time to do something," White remembers. "We would get daily complaints from teachers about the inconsistency of room heating. Students seated by old, under-the-window unit ventilators were either sweating or shivering. In the mornings, the ventilators would be blasting heat and, later, as the thermostat was satisfied, outside air was brought in to improve indoor air quality and student health."

But the fresh air entering the rooms became a textbook lesson in thermal shock. Cold air immediately conditioned students and teachers; the discomfort was so routine that they knew to have their winter jackets nearby.

"The old systems were not only noisy, but they weren't providing sufficient air distribution," Morgenstern adds. "They were basically oversized fan coil units that sat under classroom windows with the sole purpose of making life miserable for students and teachers alike."

White says the teachers have nothing but praise at the lack of noise, the delivery of consistent temperatures and the conditioned fresh air in the classrooms since the new units have been installed.

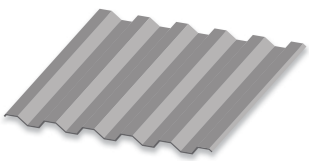
"The renovations have had a dramatic 'ladder' effect," White says. "The students are happy, not distracted and learning, which in turn makes the teachers happy, making it easier for them to inspire the student body, which in turn makes the school board happy."

PHOTOS: MODINE MANUFACTURING CO.

Advancing Frontier Technology

XCOR Aerospace Research and Development was built to inspire a high-tech space community in Midland, Texas. The exposed-fastened 7.2 Panel was used to provide a low-cost, high-performance suborbital space for this facility to test the Lynx spacecraft.

www.mbci.com/xcor



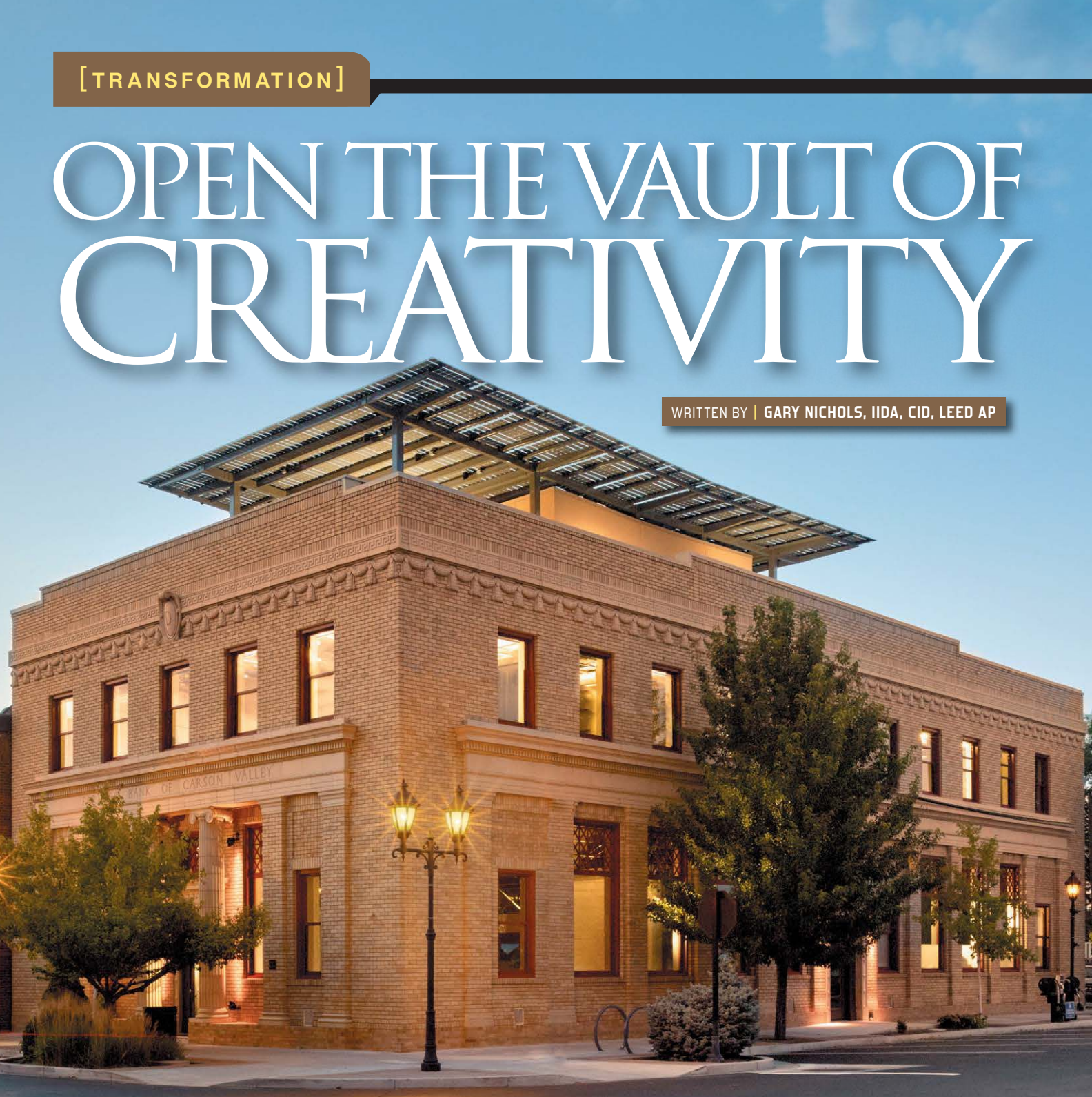
7.2 Panel

PROJECT: XCOR Aerospace
LOCATION: Midland, TX
ARCHITECT: NC Sturgeon LP
CONTRACTOR: NC Sturgeon LP
PANEL PROFILE: 7.2 Panel (Tundra)

[TRANSFORMATION]

OPEN THE VAULT OF CREATIVITY

WRITTEN BY | **GARY NICHOLS, IIDA, CID, LEED AP**



Historic Bank Building Is Transformed into a LEED Platinum Workplace

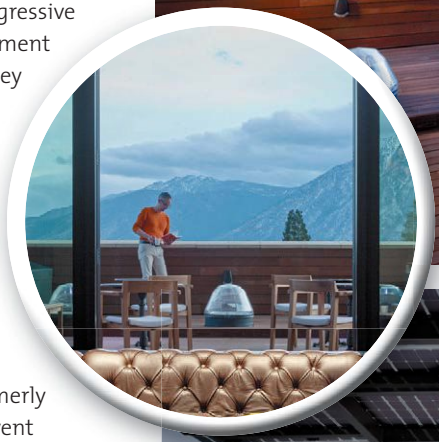
PHOTOS: **CESAR RUBIO PHOTOGRAPHY**

Christopher Bently, the CEO of Bently Enterprises, has a vision for his hometown of Minden, a small farming community in the Carson Valley of Nevada, not far from Lake Tahoe. Bently has taken on the revival of several of the town's abandoned and underutilized historic structures, enlivening them with new, contemporary uses for his socially and environmentally progressive companies—a property-management firm, sustainable farm and whiskey distillery, among others. "I see no sense in building new structures when we have beautiful historic properties left abandoned," Bently has said.

When it came time to create his company's new Minden headquarters, Bently called upon our firm, San Francisco-based Revel Architecture & Design (formerly NicholsBooth Architects), to reinvent the historic Farmers Bank building as a LEED Platinum workplace. Our approach aimed for a seamless integration of modern technology, sustainable features and new additions, like a new mezzanine, into the building's historic fabric. We worked alongside a local team dedicated to the building's preservation and project's sustainability goals: architect of record J.P. Copoulos and general contractor Miles Construction, both of Carson City, Nev.

Merging Historic Grandeur and Modern Sustainability

Built in 1918, Farmers Bank is a 2-story, Neoclassical-style building designed by Nevada architect Frederick J. DeLongchamps. Commissioned by the locally prominent Dangberg family, early settlers in the Carson Valley, the structure has architectural and historic significance as only the second financial institution established in the



AN OPEN PENTHOUSE ON THE ROOF WITH VIEWS OF THE SIERRA NEVADA MOUNTAINS HAS BECOME A FAVORITE PLACE FOR EMPLOYEES TO WORK AND UNWIND. A PHOTOVOLTAIC ARRAY, WHICH COVERS 39 PERCENT OF THE BUILDING'S ENERGY NEEDS, DOUBLES AS THE SHADE STRUCTURE.

Materials

OXIDIZING PAINT FINISH ON COLUMN ENCLOSURES // Modern Masters Metal Effects, modernmasters.com

22-INCH SUN TUNNELS // VELUX, www.velux.com

SOLAR PANELS // LSX from Lumos, www.lumossolar.com

WHITE OAK WOOD FLOORING // Greyne, greyne.net

WHITE OAK FLOORING FINISH // Custom Colory by Rubio Monocoat, www.monocoat.us

CARPET // Karastan, www.karastan.com

573 NICOLETE GUEST SEATING CHAIRS // ISA International, havaseat.com/products/573-nicolette-arm

MARBLE-TOPPED CAST-IRON BASES ON ROOFDECK TABLES // West Coast Industries, westcoastindustries.com

HORIZON ARMCHAIRS // Westminster Teak (SVLK certified), www.westminsterteak.com

LED BULBS // Acculamp from Acuity Brands, acuitybrands.com

SURFACE-MOUNTED LED FIXTURES // Lumenbeam from Lumenpulse, www.lumenpulse.com

LINEAR PENDANTS // Delray Lighting Inc., delraylighting.com

LINEAR LED WALL WASHERS // Ecosense, ecosenselighting.com

FLOOR-STANDING LAMPS WITH SILK SHADES AND 0.5-WATT ORANGE CANDELABRA BULBS // Horchow, www.horchow.com

STANDARD METAL PARTS FOR CUSTOM METALWORK // Julius Blum & Co. Inc., www.juliusblum.com

GROUND-SOURCE HEAT PUMPS // Aaon (air), www.aaon.com, and Johnson Controls (water), www.johnsoncontrols.com

RADIANT COOLING // Krueger, www.krueger-hvac.com

INDIRECT EVAPORATIVE COOLING DEDICATED OUTDOOR AIR SYSTEM // Coolorado, www.coolerado.com

CHILLED-BEAM PUMPING SYSTEM // Taco, www.taco-hvac.com

area, and it was placed on the National Register of Historic Places in 1986. After the foreclosing of its last bank tenant in the late 1980s, this important visual anchor in the Minden commercial district has remained underutilized.

The building had lost its original layout and function long before Bently acquired it, and our team believed any remaining early 20th-century grandeur was too beautiful and important to lose. Bently dreamed of an environmentally sustainable headquarters that respected the dignity of the original banking hall while creating a relevant and inspiring workspace for his company headquarters. He envisioned a space that would welcome the local community and accommodate diverse daily work needs in casual meeting spaces and private offices. In addition, the team's ultimate goal was LEED Platinum certification.

In all our design decisions, we aimed to merge the building's remaining historic grandeur with modern sustainability in a cohesive space. We preserved some features in place, like the gold-leaf lobby ceiling, and reused the remaining classic bank elements in creative ways. On the ground floor, a former safe-deposit vault, open to the public, exhibits the history of the building and the story of its transformation. The second vault in the middle of the building was repurposed as a meeting room with the now glass-topped vault door featured as a dramatic conference table. The front half of the building is a double-height space that accommodates office and community gatherings with a large screen for projections and broadcasts. Teller windows were reused in the back half of the downstairs space, delineating private offices from shared spaces.

The heart of daily operations beats upstairs. Here, we designed a combination of private offices, open workspaces and casual meeting areas. Tall cabinets and map drawers from the original bank are reused, and the open staircases feel modern but give a

THE SAFE-DEPOSIT VAULT, OPEN TO THE PUBLIC, EXHIBITS THE HISTORY OF THE BUILDING. IN THE MIDDLE OF THE BUILDING, A SECOND VAULT NOW IS A COMPANY MEETING ROOM WITH THE GLASS-TOPPED VAULT DOOR ACTING AS A CONFERENCE TABLE.

nod to history with custom metal handrails and end returns with classic details. The lamp above the staircase originally hung in the entrance of the Farmers Bank building from 1918 until 1969, when it “disappeared.” It was later unearthed in Reno, Nev., and turned over to the Douglas County Historical Society, which returned the lamp to its original home for use in the renovation.

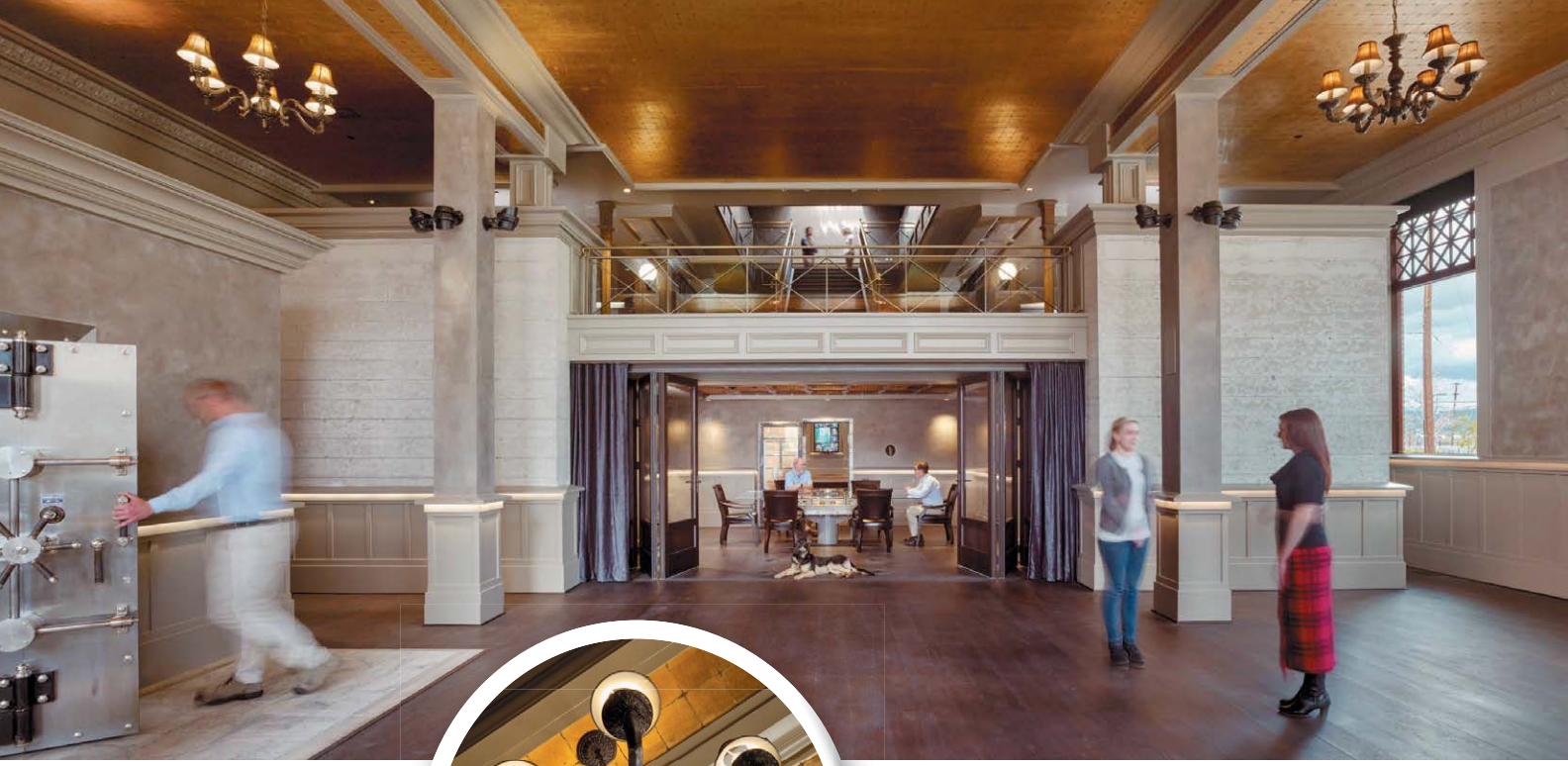
On the roof, we expanded a small, cramped room that was originally a lookout into a larger, open penthouse with comfortable furniture; drop-dead views of the Sierra Nevada mountains; and an outdoor terrace comfortably enclosed by sloping, bowl-shaped planting areas. The photovoltaic array on the roof doubles as a shade structure for the penthouse and roof patio. The patio has quickly become a favorite space for employees to work and unwind.

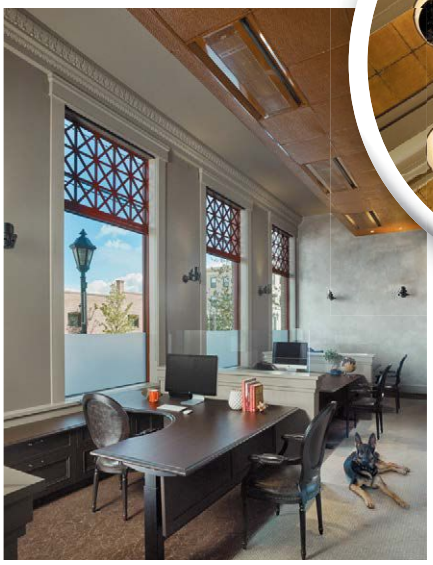
Unexpected Turns

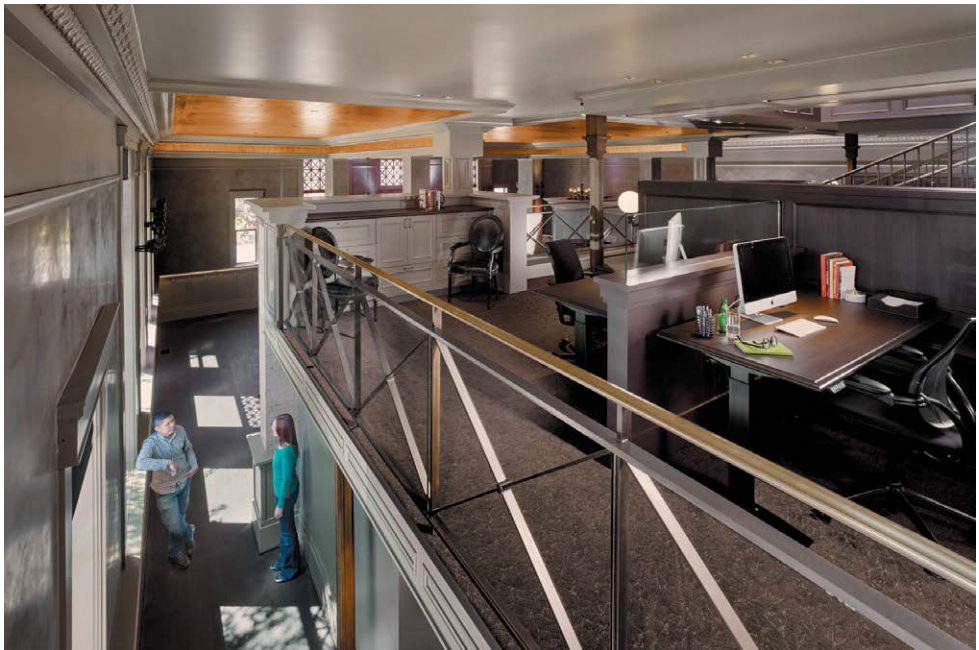
When renovating a historic building, demolition always brings surprises. Our initial structural design expected to rely on the building’s main vault for support for the new mezzanine with additional strengthening to meet contemporary building standards and seismic codes. However, once the existing vault walls were tested, our structural engineers, Ferrari Shields and Associates, Reno, discovered the vault’s concrete lacked any structural integrity. The original builders did not use rebar and instead laid wire belts horizontally into the walls that created weak spots in the concrete. New columns, ringing the first floor and mezzanine, were needed to support the building.

The team custom-designed many elements when off-the-shelf products would not blend seamlessly with the building’s character or would not meet sustainability requirements. The interior design of the project became a carefully calibrated selection of which historic elements to preserve

SOME HISTORIC FEATURES WERE PRESERVED IN PLACE, LIKE THE GOLD-LEAF LOBBY CEILING. NEW ELEMENTS AND MATERIALS THAT MAKE UP MOST OF THE BUILDING ARE FACED OR TREATED TO LOOK HISTORIC AND CREATE A PERFECT ILLUSION OF ORIGINATING IN HISTORY.







and which green products could fit seamlessly into the historic context—while coming together to create a contemporary workplace. The new elements and materials that make up most of the building are faced or treated to look historic and create a perfect illusion of originating in history. For the new columns, a typical approach to "historicizing" column details would be to buy new false column wraps, which would have allowed for limited design options and a less environmentally friendly solution. Instead, the design team clad the new 4 by 4 structural steel columns with wood molding top to bottom to recall ultra-narrow cast-iron posts. An oxidizing paint finish created the rust-color effect.

One historic element that remained was the original gold-leaf ceiling, which we wanted to preserve at all costs. This meant that while working on the roof's structure, the construction team had to support the second floor and roof without impacting the ceiling. For an additional challenge, old joists made of composite materials had been used to support the ceiling and about three-quarters of them had to be painstakingly channeled by hand with claw hammers and filled with modern steel joists. This laborious process enabled us to maintain the original character while greatly strengthening the building.

THE TEAM **CUSTOM-DESIGNED** MANY ELEMENTS WHEN OFF-THE-SHELF PRODUCTS WOULD NOT BLEND SEAMLESSLY WITH THE BUILDING'S CHARACTER OR WOULD NOT MEET SUSTAINABILITY REQUIREMENTS.

To achieve the LEED Platinum rating, we integrated passive and active environmental strategies. Ground-source heat pumps and wells drilled into the street use the differential in ground temperature to heat and cool the building and render a typical HVAC system unnecessary. Solar tubes circle the roof, illuminating the mezzanine's interior spaces with daylight. The design integrated new, environmentally responsible, healthy interior building products, finishes and fixtures that blend seamlessly with the preserved historic building elements.

To optimize energy performance, we incorporated an extensive energy and daylighting modeling strategy, which we used to make informed decisions regarding the building's system and assembly selections. The energy system combines direct and indirect evaporative cooling, building-mass utilization, natural ventilation, natural light with skylights, ground-source heat-pump technology, radiant cooling and heating, and chilled beams to use an expected 62 percent less energy than a baseline building of the same size and type. The ground-source heat wells contribute 37 percent of the building's overall energy savings while the latest solar panel calculations show they are covering 39 percent of the building's energy needs.

The resulting LEED Platinum building demonstrates that with creativity and a good team, a building's rehabilitation opens doors for historic preservation, sustainability and the meeting of the two in the most unlikely places. In marrying traditional design with modern features and sustainability, the adaptive reuse of Farmer's Bank illustrates green design transcends stylistic labels or single-track approaches—and serves as a model for celebrating history in a modern, sustainable workplace.

Retrofit Team >>

CLIENT / OWNER // Christopher and Camille Bently, Bently Enterprises, Minden, Nev., www.bentlyenterprises.com

DESIGN ARCHITECT // Revel Architecture & Design, San Francisco, revelers.com

ARCHITECT OF RECORD // J.P. Copoulos Architect, Carson City, Nev., jpcarchitect.com

GENERAL CONTRACTOR // Miles Construction, Carson City, milesconst.com

LANDSCAPE ARCHITECT // Moana Nursery, Reno, Nev., www.moananursery.com

STRUCTURAL ENGINEER // Ferrari Shields & Associates, Reno, www.shieldsengineering.com

ELECTRICAL ENGINEER // JP Engineering LLC, Reno, (775) 852-2337

MECHANICAL ENGINEER // SEED Inc., Incline Village, Nev., www.seedscca.com

CIVIL ENGINEER // RO Anderson Engineering, Minden, www.roanderson.com

FURNITURE VENDOR // KAHL Commercial Interiors Inc., Reno, www.kahlnv.com

CUSTOM SIT / STAND WORKSTATIONS (DESIGNED BY ARCHITECT) // Dependable Furniture Manufacturing, San Leandro, Calif., dependablefm.com

METALWORK // Paramount Iron & Handrail Inc., Moundhouse, Nev., paramountiron.net

MILLWORK // Complete Millwork Services, Carson City, www.cmsrno.com

METALCON

A FUTURE BUILT BY HAND

OCTOBER 18 - 20, 2017

LAS VEGAS / NEVADA / USA

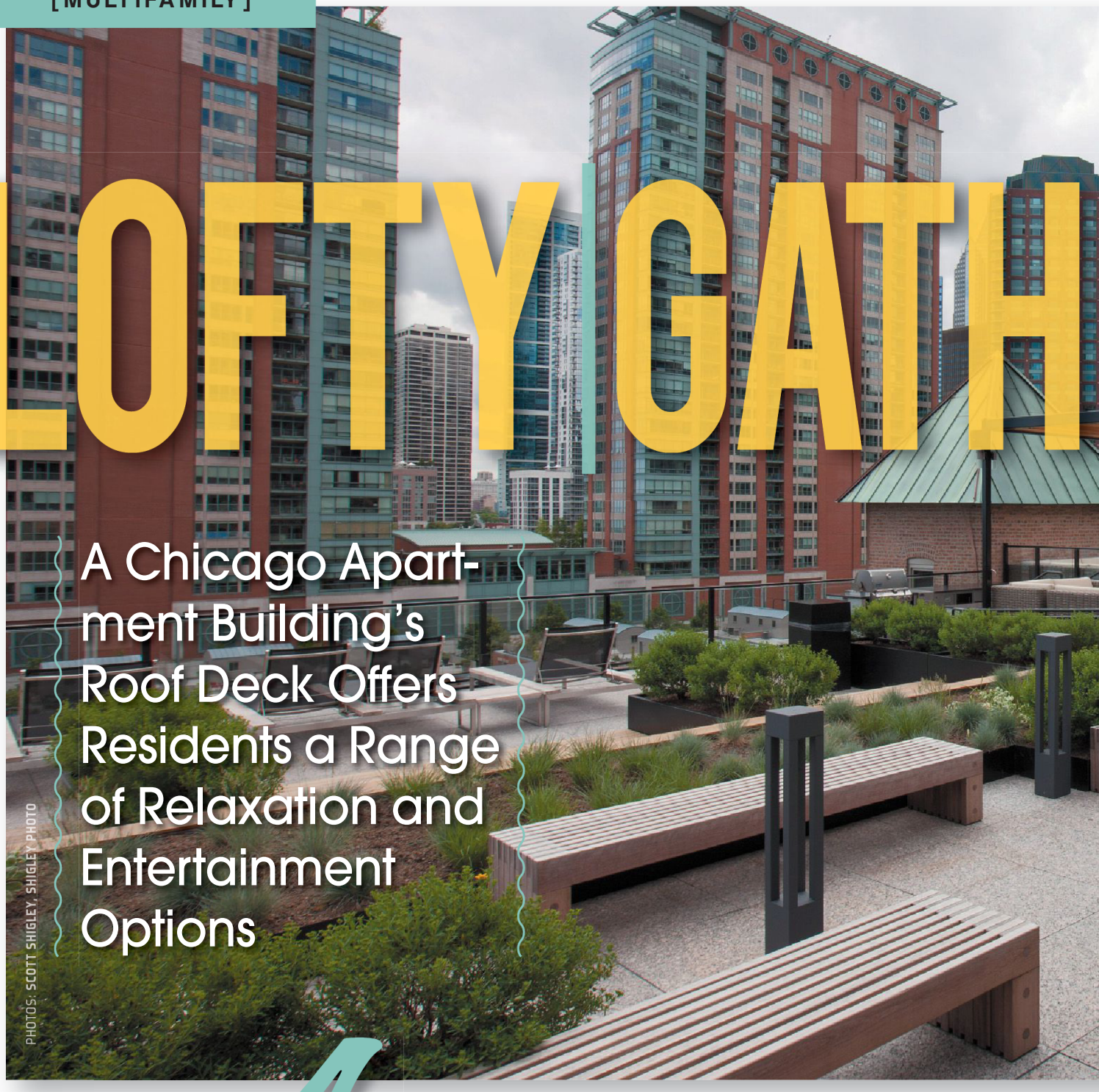
Las Vegas Convention Center

www.metalcon.com

Circle No. 34

LOFTY GATH

A Chicago Apartment Building's Roof Deck Offers Residents a Range of Relaxation and Entertainment Options



PHOTOS: SCOTT SHIGLEY, SHIGLEY PHOTO

Apartment building rooftops across Chicago are changing. Formerly white expanses dotted by HVAC equipment and the occasional pool area, developers are turning these spaces into goldmines of residential amenities. The Lofts at River East is a new downtown Chicago redevelopment that capitalized on this trend and its locale to create a spacious roof deck with enviable views.

"Chicago is a very industrial city, so it's helpful to have outdoor spaces where people can gather," remarks Hana Ishikawa, design principal at Chicago's site design group ltd., the firm that performed The Lofts at River East's rooftop landscape architecture. "Roof decks on apartment buildings are very popular in Chicago and they're becoming increasingly elaborate. This renovation has beautiful loft units and it really needed a nice roof deck to complement them."

ERING SPOT

WRITTEN BY | KJ FIELDS

Retrofit Team

OWNER/CLIENT(S) // AH River East LLC / Group Fox, Chicago, www.groupfox.com

LANDSCAPE ARCHITECT // site design group ltd., Chicago, www.site-design.com

ARCHITECT(S) // Fitzgerald Associates Architects, Chicago, www.fitzgerald associates.net, and Ghafari Associates, Chicago,www.ghafari.com

ENGINEER(S) // Stearn-Joglekar Ltd., Chicago, www.stearnjoglekar.com; Klaucens & Associates Inc., Northbrook, Ill., www.klaucens.com; and Shiner + Associates Inc., Chicago, www.shineracoustics.com

ROOFING CONTRACTOR // A-1 Roofing Co., Elk Grove Village, Ill., www.a1roofing.com

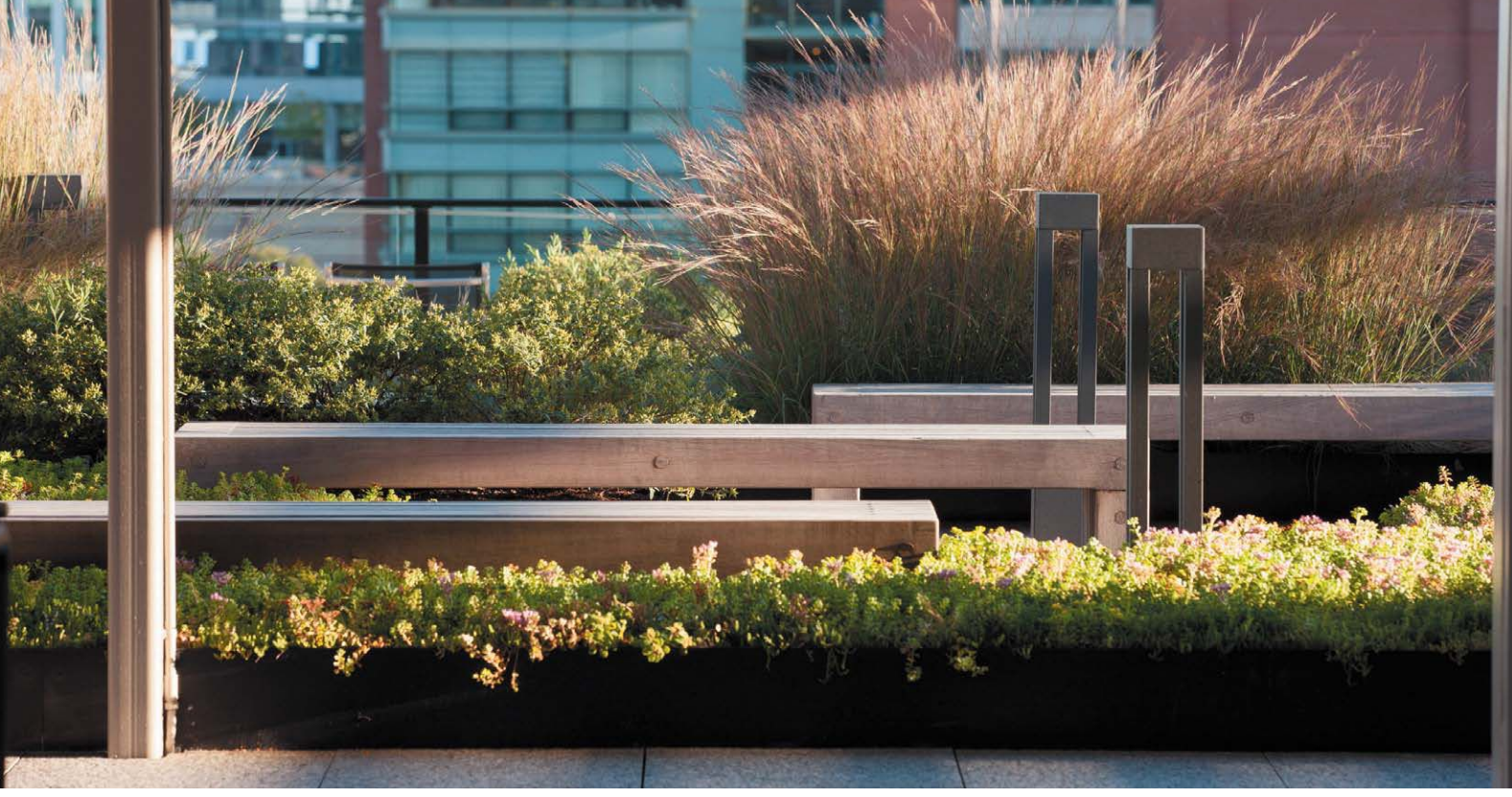
LANDSCAPE CONTRACTOR // Intrinsic Landscaping Inc., Glenview, Ill., www.intrinsiclandscaping.com

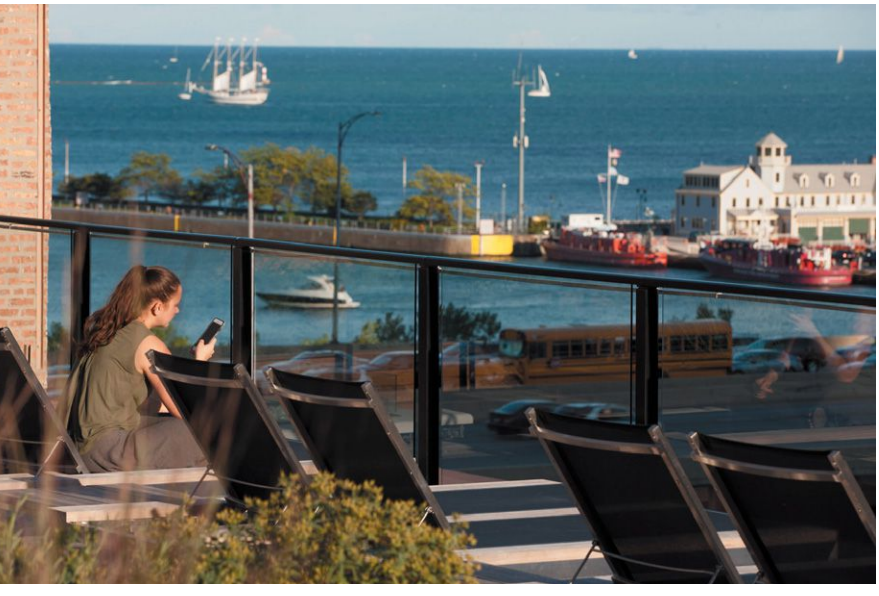
Unusual Dimensions

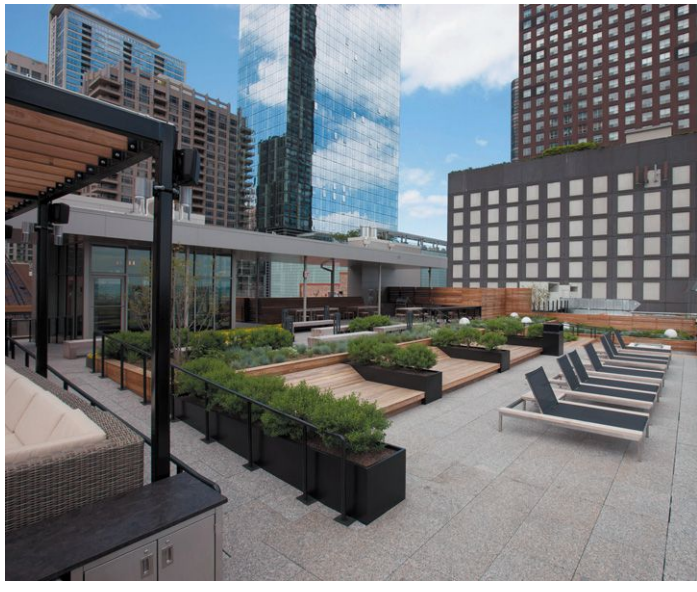
The Lofts at River East is a 6-story, 547,000-square-foot mixed-use redevelopment originally constructed a century ago as part of the Pugh Terminal Warehouse, a wholesale product exhibition center that was relegated to a warehouse space after construction of the Chicago Merchandise Mart. It was converted into offices and remained commercial space for decades, but its rich history gives the structure a unique feature: It is 625-feet long and 120-feet wide.

To create luxury loft apartments, the architect wanted to move the 6-story building's main ductwork and air-handling units to the roof. The decking for the rooftop's 10,000 square feet of amenity space had to span over the mechanical and electrical systems, and the building's wood timbers and planks could not carry the additional load. The structure had massive wooden columns, however, so the team extended the columns and installed aluminum decking framed on a steel structure.

"The roof deck has varying elevations dictated by the height of the systems below. With the weight of the gardens and amenity spaces, it would have been structurally problematic and expensive to make them







The landscape and project architects decided the roof's grade changes would create different outdoor "rooms". Rather than having one space simply drop down into another, landscaping blurs the lines.

all the same height," Ishikawa explains. "It's a pretty unusual circumstance to have a range of grade changes, so that was difficult at times, as well as coordinating elements to line up with existing features, like doorways."

Site Lines

Ishikawa's team and the project architect decided to use the grade changes to their advantage and delineated the varying planes as outdoor "rooms". "The changing levels make the spaces interesting but we didn't want the design to feel forced," Ishikawa recalls. "Rather than having one space simply drop down into another, we used the landscaping to blur the lines." For example, between the Central Passive Garden and the sundeck that lies 1 1/2-feet below it, the team extended a large planter bed and used the increased soil depths to add taller plant life with a deeper root structure. This makes the two separate rooms appear more contiguous.

From the roof deck, views to the south include Lake Michigan, the Ogden Slip canal and dock, and Lake Shore Drive. A 3-acre park lies to the north, and gleaming downtown towers are visible on the north, east and west sides. The owner, who enjoys outdoor entertaining, had an ambitious list of amenities he wanted the deck to

contain. The roof deck includes gardens, seating and dining areas, a sundeck, two fire pits, grilling stations and an outdoor movie theater.

As site design group and the architect collaborated on a layout to accommodate the owner's wish list, they made clearly conscious choices based on the available views. The bigger amenity spaces, like the Central Passive Garden, sundeck, larger fire pit and outdoor theater's expansive grassy area, all open to southern views of the water. The north side feels more intimate with two wet bars, seating areas and a smaller fire pit.

Social Considerations

Sloped walkways ensure the entire roof deck is ADA accessible. Knowing that the outdoor space was meant to enhance the residents' quality of life, the designers carved out the deck to offer versatile experiences for groups and individuals.

"We really liked the idea of diverse spaces and even partitioned some areas off with different characteristics conducive to small or communal gatherings, as well as places for people to be alone," Ishikawa says.

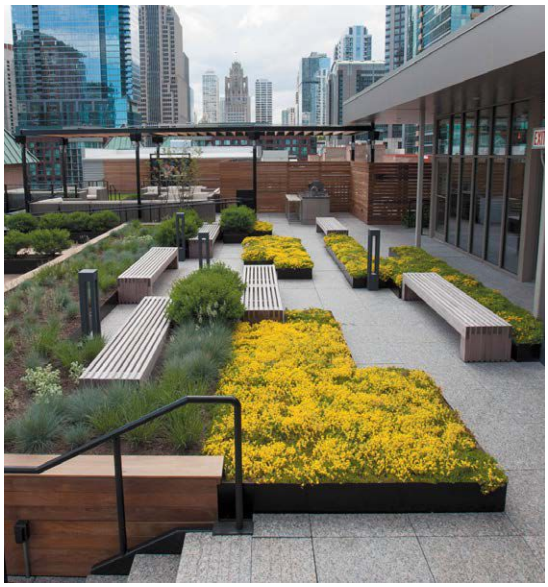
As residents exit the elevator and its glass-enclosed foyer, they first encounter the Central Passive Garden and main dining area. Ishikawa shaped spots for individuals through furnishings, like single seats in the central garden that look over the sundeck toward water views. Long stretches of tables with seating all on the same side allow singles to feel comfortable having lunch or making a phone call.

Just below the central garden, residents can recline on the sundeck in individual lounge chairs or together on wide wooden day beds and gaze out onto the lake beyond.

Grouped seating around the roof deck's grilling stations, fire pits, wet bars and tables provides a range of social entertainment options.

The furthest western "room" on the roof deck is the outdoor theater. A large lawn in front of

The owner, who enjoys outdoor entertaining, had an ambitious list of amenities he wanted the deck to contain. The roof deck includes gardens, seating and dining areas, a sundeck, two fire pits, grilling stations and an outdoor movie theater.



the big-screen monitor provides relaxed seating and serves as a picnic area, outdoor yoga studio and casual stage for a musical group. People can rent the theater and other areas on the roof deck for parties and special events.

Although the generous views to the water and Chicago skyline are expansive, the designers kept the scale human with the outdoor rooms, diverse-sized furniture groupings and plant selections.

Plants and Materials

Ishikawa says the landscaping choices help connect and differentiate spaces. "We capitalized on the opportunity to do something with different plant life and selected plants in various colors," she recalls. "The plants are laid out in a drift-like pattern, recalling a river or stream, to make the textures and colors feel more natural and create a constant changing landscape throughout the seasons."

Because rooftop conditions with limited soil volumes can be tough on plants, site design group chose native, drought-tolerant, tried-and-tested species, including allium, bluestem, coneflower, fescue, hypericum and junipers.

Natural materials, like stone, give the spaces a sense of warmth and make them more inviting. The main gas fire pit's base is filled with stones and the sides of the fire pit are gabion basket—stones held in with metal mesh. Granite accents throughout the deck were specified in a blue/charcoal color. In the northern section, site design group added a rectangular rock garden internally sculpted by a decoratively shaped sedum mat.

The use of wood in benches, day beds, partitions, wall accents, and a wood and steel trellis also generates warmth. Most of the wood is Ipe, an extremely dense Brazilian hardwood that is rot-resistant and durable enough to stand up to Chicago's brutal winter weather. Some furniture is built-in and custom-made for the deck. Metals in the project are mostly stainless steel or black-painted steel.

Lighting takes several forms, such as down lighting at the canopy area, strip lighting near the fire pit, and round white balls throughout the deck that provide soft light and sculptural interest.

As a landscape designer, Ishikawa brings a unique perspective to the urban project. "We wanted to make the deck inspiring and functional today, but one of the most interesting things about landscape architecture is that we have to visualize how it will look tomorrow," she says. "The roof deck is a living space that will change as the plants grow and we need to ensure that it remains inviting long into the future."

Materials

ADHERED ENERGYSMART ROOF USING 60-MIL SARNAFIL G 410 MEMBRANE IN WHITE // Sika Corp., usa.sarnafil.sika.com

WILSHIRE PLANTER // Tournesol Siteworks, tournesolsiteworks.com

PALISADE BENCH // Landscape Forms, www.landscapeforms.com

FIREPIT // Ore, orecontainers.com

CUSTOM GABION BASKET // Intrinsic Landscaping, www.intrinsiclandscaping.com

BOLLARD, SQUARE // Bega, www.bega-us.com

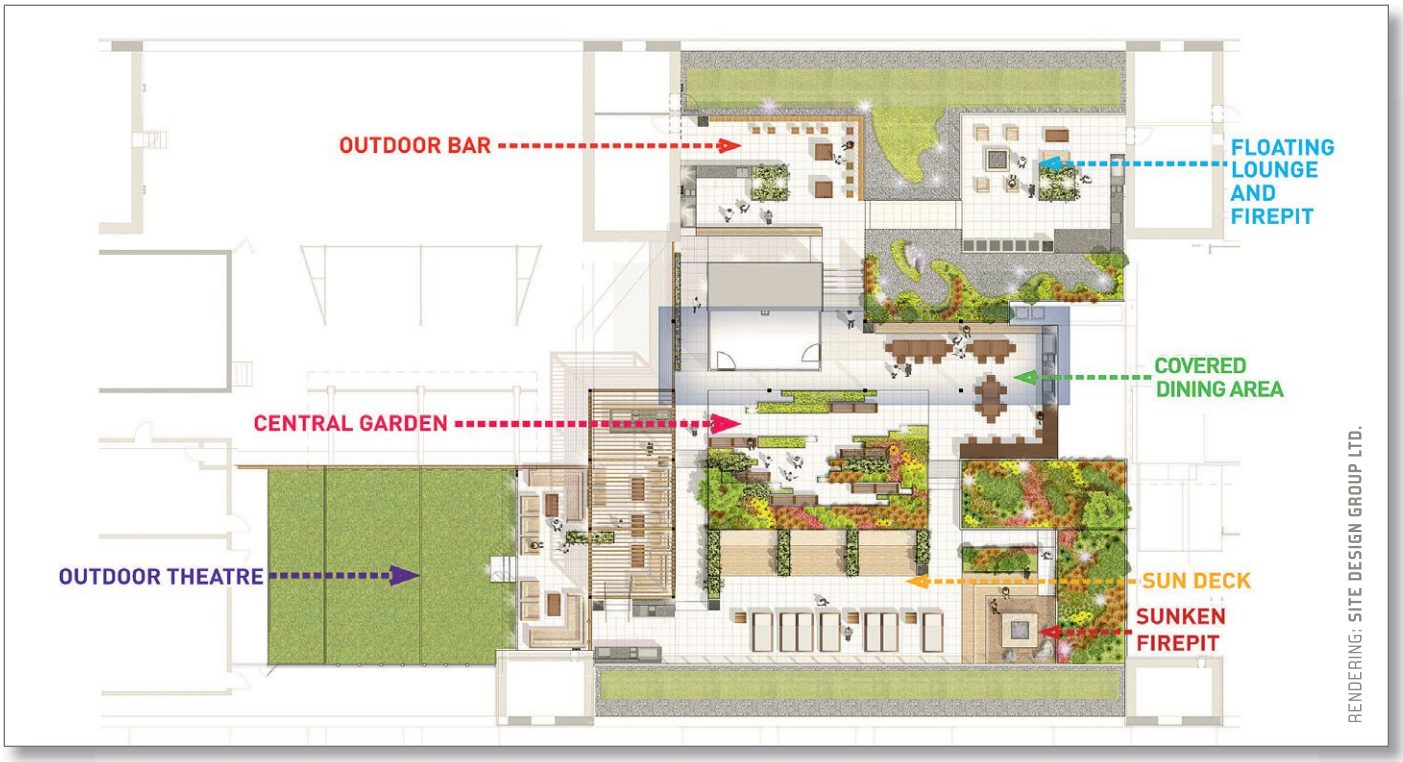
BOGARD TWO-SEATER, ARMCHAIR AND COFFEE TABLE // Mamagreen, www.askmamagreen.com

ZUDU OTTOMAN AND HAVANA MUDLAR SOFA // Mamagreen

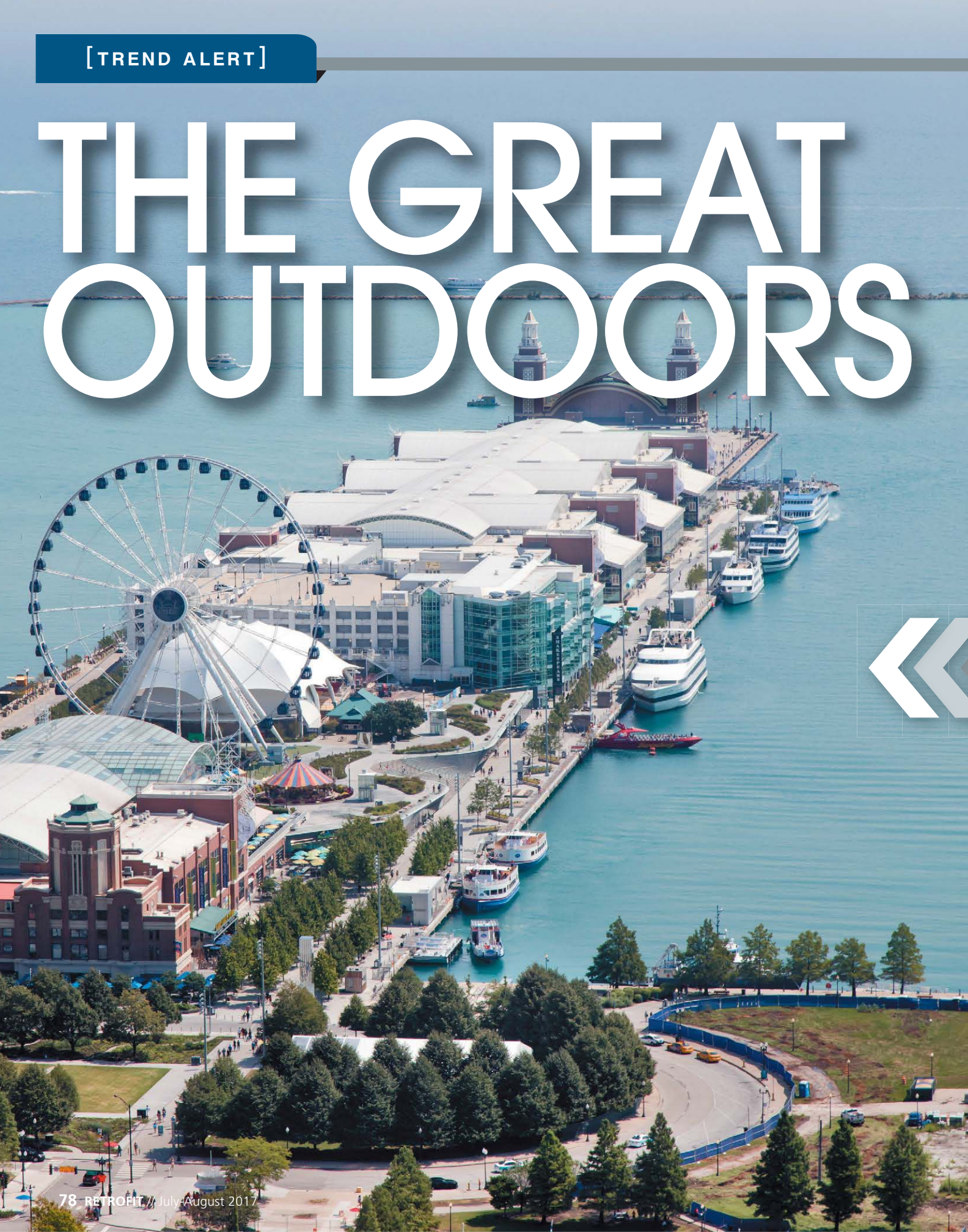
OKO BISTRO STOOL AND LOUNGER BATYLINE // Mamagreen

SPARTA DINING TABLE // Mamagreen

WOOD TRELLIS, WOOD-CLAD BENCH WITH STORAGE AND WOOD-CLAD PLANTER // Custom



THE GREAT OUTDOORS



What LEED Did for Buildings, Sustainable SITES Will Do for Landscapes—and Not a Moment Too Soon

As a new administration took residence at 1600 Pennsylvania Avenue earlier this year, environmental scientists frantically moved U.S. climate data onto private servers amid fears the data might vanish under the Trump presidency. Noting his appointment of Cabinet members who have questioned the overwhelming scientific consensus around climate change, *The Washington Post* reported Trump "could try to alter or dismantle parts of the federal government's repository of data on everything from rising sea levels to the number of wildfires in the country."

The POTUS fanned the flames of controversy by issuing gag orders against federal agencies, including the Washington, D.C.-based U.S. Environmental Protection Agency, U.S. Department of Energy and National Park Service, in an apparent attempt to silence them from communicating with the press about climate change. The plan backfired, however, and South Dakota's Badlands National Park began tweeting out climate-change facts in direct opposition to the executive orders, inciting further debate.

WRITTEN BY | **ROBERT NIEMINEN**

Amid the political and media firestorm, however, the building industry has quietly continued its persistent march on the path to sustainable market transformation. Although the U.S. Green Building Council, Washington, has made incredible strides toward that end with its LEED Rating System (certified buildings are said to produce 34 percent lower carbon emissions, consume 25 percent less energy and 11 percent less water than traditional structures), energy-efficient buildings can't fight the battle against climate change alone. Thankfully, landscape architecture professionals are joining the effort to enact mitigation strategies that will help reduce GHG emissions by 50 to 85 percent by 2050 and limit temperature rise to 2 degrees Celsius if deployed at a mass scale, according to the American Society of Landscape Architects (ASLA), Washington.

At the forefront of this movement toward "greening" our landscapes is the Sustainable SITES Initiative (SITES), a program based on the understanding that land is a crucial component of the built environment and can be planned, designed, developed, and maintained to avoid, mitigate, and even reverse the detrimental impacts of urbanization and development.

CASE STUDY: NAVY PIER

In 2012, Chicago's historic Navy Pier held an international design competition to reimagine the site in anticipation of its centennial celebration. The design team at James Corner Field Operations (JCFO), Philadelphia, won the bid and set out to restore the landmark to its status as "The People's Pier," as originally envisioned by Daniel Burnham in his 1909 plan for the Windy City, rather than simply a kitschy tourist destination.

"One of the early ideas about the project ... linked to the idea of restoring its existence for the people and being a much more authentic place, was the idea of making it much greener, a sustainable place and much more of a park space than a commercial space," explains Sarah Weidner Astheimer, principal at JCFO. "It was discussed early on to pursue LEED certification and then we introduced the idea of pursuing SITES certification, as well."

Navy Pier Phase 1 is the first project to achieve GOLD certification under the Sustainable SITES Initiative v2 rating system and is a leading-edge international model for sustainable design and management practices. The project considers sustainability in its broadest sense; the goal is not only to conserve natural resources but also to promote human health, fitness, social equity, mobility and synergy with adjacent neighborhoods for the 9 million people who visit the pier each year.

NAVY PIER PHOTOS: **SAHAR COSTON-HARDY FOR NAVY PIER INC. AND JAMES CORNER FIELD OPERATIONS**

UNLIKE BUILDINGS, BUILT LANDSCAPES AND GREEN INFRASTRUCTURE HAVE THE CAPACITY TO PROTECT AND EVEN REGENERATE NATURAL SYSTEMS, THEREBY INCREASING THE ECOSYSTEM SERVICES THEY PROVIDE, SUCH AS SEQUESTERING CARBON, FILTERING AIR AND WATER, AND REGULATING CLIMATE.

'LEED for Landscapes'

"Just like LEED transformed the built environment and the buildings market, SITES is intended to do the same thing for the landscapes and open spaces of the world we live in, in terms of driving sustainability in the design and development process," explains Jamie Statter, vice president, Strategic Relationships at USGBC.

SITES was developed, in part, because of the disconnect that sometimes exists between LEED-certified buildings and the properties on which they are situated.

"We would see LEED platinum buildings with landscapes that really didn't reflect the sustainability principles of the buildings themselves, so SITES is intended to address that," Statter says. "It creates a sense of true sustainability in any project, and it does that by prioritizing ecosystem services and resource management at the land level."

Unlike buildings, built landscapes and green infrastructure have the capacity to protect and even regenerate natural systems, thereby increasing the ecosystem services they provide, such as sequestering carbon, filtering air and water, and regulating climate, according to the Washington-based Green Building Certification Inc. (GBCI), which owns and manages SITES. Further, sustainable landscapes create ecologically resilient communities better able to withstand and recover from episodic floods, droughts, wildfires and other catastrophic events.

Rather than compete with one another, however, SITES and LEED—also owned and managed by GBCI—are designed to cooperate in creating greater opportunities to transform properties and strengthen the vitality of communities and ecosystems as a whole.

"The SITES and LEED [rating systems] are now officially interacting and are able to overlap," Statter notes. "So projects pursuing SITES and LEED can take advantage of credit equivalencies. What that means is if they get a credit in LEED, they can also automatically get that accredited in SITES, and the same is true in the reverse direction."

How It Works

Now in its second iteration (better known as v2), SITES is quite similar to LEED in that

(continues on page 82)

CASE STUDY: NAVY PIER

Best exemplifying Navy Pier's commitment to sustainability is its new "green spine," the South Dock Promenade. With approximately 200 native and appropriately adapted trees, the redesign includes forward-thinking adaptation of aging infrastructure to create a series of gigantic "tree tubs" that redirect, clean and facilitate stormwater use for 100 percent of plant irrigation, new permeable pavements and strategic use of products with recycled content that are sourced from the region.

A few of the project's other sustainable features include:

- Hundreds of species of native and appropriately adapted plants.
- A highly efficient drip irrigation system that utilizes sensors and metering to know when irrigation is necessary and how much water is being consumed.
- Designed to manage the 95 percent storm event to reduce related Combined Sewer Overflow events and improve Lake Michigan water quality.
- Sixty percent reduction in energy consumption through the incorporation of energy-efficient lighting, pumps, aerator and transformer components.
- Nearly 30 percent of materials used were made from recycled content.
- Low-maintenance materials and vegetation result in low maintenance costs.

"I can say that SITES, as a tool, was excellent for us during the design process because, like many other projects, we had to go through a series of significant value-engineering exercises, and budgets changed a little bit midway through because they weren't exactly able to raise all of the funds we had imagined originally," Weidner Astheimer recalls. "SITES was a great tool for us to preserve a lot of the sustainable features I think are often some of the first to be value engineered from a project."

LEED: A LEGACY

Leaders across the globe have made LEED the most widely used green building program in the world. Leave your legacy today.

#LEEDlegacy

usgbc.org/LEED

Circle No. 35

Photo Credit: offset.com/photos/322195

it is based on a points system. The number of credits a project earns determines its level of certification—Certified, Silver, Gold or Platinum (see table for a breakdown of points).

SITES CERTIFICATION BREAKDOWN

Certification Level	Points
SITES Certified	70-84 points earned
SITES Silver	85-99 points earned
SITES Gold	100-134 points earned
SITES Platinum	135+ points earned

Source: www.sustainablesites.org/certification

Any physical location or land on which a project is developed can be considered for SITES. This applies to new construction projects and existing sites that include major renovations. While there is no maximum size requirement for a project to participate in SITES, a 2,000-square-foot minimum prerequisite must be met to be eligible.

To determine if a site qualifies, Statter says anywhere a major retrofit is taking place where the land is being completely redeveloped, the SITES program is applicable. However, early engagement with the program is crucial, she says, because there are prerequisites centered in the pre-design and site-assessment areas that are best addressed by an integrated design team at the onset of the process.

"Right now, SITES actually is only available for new construction or major redevelopment because the program itself looks at the design and construction areas," Statter notes. "That's where the credits are focused—around design considerations and the construction practices, as well as some of the pre-design work."

The SITES v2 rating system accommodates regional differences and various types of sites from urban to rural and previously developed or undeveloped, including open spaces (local, state and national parks; botanic gardens; arboretums); streetscapes and plazas; commercial (retail and office areas, corporate campuses); residential (neighborhoods or individual yards); educational/institutional (public and private campuses, museums, hospitals); infrastructure; government; military; and industrial.

Counting the Costs

Beyond its environmental impact, the SITES rating system encourages practices that have been shown to save building owners and facility managers money over time in terms of reducing energy costs from urban heat-island effect, water usage, and maintenance and operational costs. Additionally, Statter says GBCI has seen evidence the number of hours a landscaping team needs to maintain a site are much fewer in sustainable versus traditional landscapes.

In fact, a number of studies have demonstrated building sites where sustainable landscaping strategies have been

CASE STUDY: UNIVERSITY OF TEXAS AT EL PASO

In celebration of its centennial anniversary, The University of Texas at El Paso (UTEP) commissioned the design team at Ten Eyck Landscape Architects Inc., Austin, Texas, to design and oversee the transformation of the heart of its campus from an automobile-centric environment dominated by asphalt into an inviting community landscape that reflects the beauty of the Chihuahuan desert by increasing the vegetative area of the site by 60 percent.

"The project integrates the city, the campus, and the land by introducing a complementary network of walkways, native planted ephemeral rainwater arroyos, and green spaces that promote connectivity, inspire outdoor exploration and support natural processes within the urban fabric of the campus," says Christine Ten Eyck, president, Ten Eyck Landscape Architects.

The core of UTEP's Campus Transformation Project (CTP) includes Centennial Plaza and Centennial Green, richly detailed outdoor gathering spaces that feature a performance lawn and amphitheater. A diverse array of native plants and local stone create campus malls, a courtyard, promontories, and desert gardens that invite students and the community to embrace and enjoy nature.

In July 2016, CTP received SITES Silver and became the first project certified under v2 of the SITES Rating System. Sustainable landscape practices include vegetated

implemented result in quantifiable savings over time. Consider the following:

- Adoption of widespread green infrastructure practices could save more than 1.2 million megawatt-hours of electricity per year in California, according to the National Resources Defense Council, New York.
- A Washington-based U.S. Forest Service report found trees properly placed around buildings can reduce air-conditioning needs by 30 percent and can save 20 to 50 percent in energy used for heating.
- Using cool roofs, urban shade trees and high-albedo pavements to mitigate urban heat islands can potentially reduce U.S. energy use for air conditioning by 20 percent, saving more than $4 billion per year in energy use, according to a study published in *Solar Energy*.
- A study conducted at the University of Central Florida, Orlando, found the maximum average day temperatures for a conventional roof surface was 130 F while the maximum average for a green roof was 91 F, directly translating into lower energy bills for interior heating and cooling.

Of course, there are costs associated with pursuing SITES certification, including registration and certification fees, which can be bundled or paid separately. For USGBC and ASLA members, the registration fee is $2,500 ($3,000 for non-members) and $6,500 for certification ($9,000 for non-members). Given the value sustainable landscapes bring to existing properties—and the fact that the fees can be recouped from the savings—the decision to pursue SITES may be much easier for buildings executives.

At the end of the day, it's important to remember that, unlike buildings, sustainable landscapes appreciate over time. As Statter points out: "As plants and trees grow, soils improve and then habitats develop and land management can significantly improve the value of a building or the entire property as a whole."

arroyo and acequia bioswales that mimic the function of natural desert riparian corridors and the replacement of asphalt with a diverse native plant palette, including 571 trees, 1,831 shrubs and 4,089 perennials.

Through this project, UTEP is helping its community be more successful and deal with life challenges by providing a sustainable landscape that can improve cognitive function, reduce stress and offer opportunities for physical exercise.

"The campus is extremely proud of the SITES certification," Ten Eyck notes. "The results of connecting the campus back to its place in the Chihuahuan Desert with comfortable malls and paths interlaced with new water-harvesting arroyos and desert gardens helps to instill pride in students and staff and community of their campus and heritage. The project is an example to the city of El Paso of low-impact development and hopefully will influence future projects."

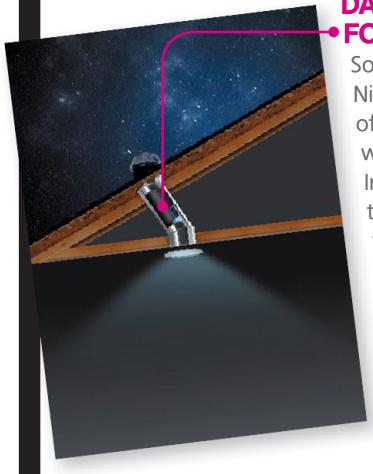
PHOTOS: ADAM BARBE

DOAS CAN BE USED AS BUNDLED SOLUTION

A new line of dedicated outside air systems (DOAS) from the YORK brand of Johnson Controls includes a range of 100 percent outside air units and mixed air units that provide users with more options and greater application flexibility. With heat-pump operation and water-source operation, as well as a hot-water heat option, the new line of air systems feature an internal energy-recovery wheel that pre-conditions outside air and reduces heating and cooling loads by transferring energy between the exhaust airstreams. A YORK DOAS can operate in combination with a separate sensible cooling system for a bundled solution.

www.york.com // Circle No. 37

DAYLIGHTING DEVICE STORES ENERGY FOR NIGHTLIGHT



Solatube International Inc. has made available its Integrated Solar NightLight, or ISn. During daylight hours, the solar panel inside of the Tubular Daylighting Device harvests and stores power so when the sun goes down it's illuminated as a nightlight. The Integrated Solar NightLight is available for all Solatube residential daylighting systems. ISn models are eligible for a 30 percent tax credit on the entire system and installation. Using patented technology, a Solatube Daylighting System harvests daylight at the rooftop, transfers it down a highly reflective tube (which bends up to 90 degrees and can be up to 70 feet or more long) and distributes it evenly into an interior space through a diffuser at the ceiling.

www.solatube.com // Circle No. 38

THIN-CLAD PRODUCTS OFFER RETURN CORNER UNITS

Arriscraft has introduced two thin-clad products in response to growing demand for veneer stone. The Midtown product, with two slim face rises, in long lengths, delivers a modern look similar to linear brick. Unlike many Arriscraft products, which combine sizes in a bond pattern, Midtown can be laid separately (one size, continuously) or the two sizes can be combined. Designers can choose to install Midtown with or without mortar. The linear Coastal Series is suitable for a sleek look with a mortar joint. The Coastal Series and Midtown offer return corner units for a seamless, natural finish and are available in five colors.

www.arriscraft.com // Circle No. 39

PREVENT DUST FROM TRACKING BEYOND WORK AREA

ZipWall has introduced the ZipWall Mat, its latest addition to the comprehensive ZipWall Dust Barrier System. The ZipWall Mat prevents the tracking of dust in and out of a work area. Its adhesive surface captures dust from shoe soles on contact and is strong enough to remove dust from casters and wheels. Each ZipWall Mat Starter Kit features a durable, reusable, non-skid base that prevents shifting and sliding and a pad of 30 adhesive sheets. Also new from ZipWall is a 4-Pack tacky mat refill that includes four pads of clear adhesive sheets for use with the ZipWall Mat base.

zipwall.com // Circle No. 40

STONE CLADDING FEATURES TONGUE AND GROOVE PANELS

Glen-Gery has unveiled StoneFit with DryFit Technology, a stone cladding solution with patented tongue and groove panels that interlock the stone pieces together without the use of mortar. The panels are mechanically secured with attachment brackets that can be drilled directly into structural sheathing, regardless of stud location. The attachment brackets assist in creating a water-management system and result in high wind-load resistance. The tongue and groove system also eliminates wall vibration. The panels are part of a larger wall system, the StoneFit Wall System, which is a complete stone drainage wall system that includes a custom-engineered starter angle and Glen-Gery-branded Weather-Resistive Barrier and Drainage Mat.

www.glengery.com // Circle No. 41

VINTAGE LAMPS REDUCE ENERGY CONSUMPTION

LEDVANCE is expanding its SYLVANIA ULTRA LED Filament and Vintage portfolios with Twisted and Frosted versions for downlights, pendant fixtures, table lamps, wall sconces and chandeliers. The lamps, which cover 95 percent of traditional shapes, have a full glass body design. The company is also adding dimming capability to its Vintage portfolio. With a long-rated life of up to 15,000 hours and a color rendering index of 80, Filament and Vintage Lamps can be used in a variety of commercial and residential applications. They reduce energy consumption up to 90 percent and last up to 15 times longer than incandescent lamps but provide a retro look that is becoming increasingly popular.

www.sylvania.com // Circle No. 42

FRAMELESS GLASS SLIDING SYSTEM PROTECTS AGAINST WEATHER

NanaWall Systems has created the NanaWall ClimaCLEAR, a frameless all-glass individual panel sliding system specifically engineered for transparent weather protection. Available for residential and commercial use, transparent vertical weather seals between the panels protect the wall against wind-driven rain and reduce air infiltration. When the system is closed, the seals virtually disappear from sight, allowing for maximum transparency with no vertical stiles, providing natural daylight, open views and a clean, modern appearance. ClimaCLEAR configurations come standard with a single action swing panel and are available in a clear anodized finish with additional brushed, dark bronze and black anodized finishes available to accommodate varying interior designs.

Learn more about ClimaCLEAR via short video.

nanawall.com // Circle No. 43

CEILING PANELS' PATTERNS EVOKE A ROOM'S PROGRAM

Hunter Douglas Architectural has made available Techstyle Graphic Customizable Acoustical Ceilings, which were designed in collaboration with HOK and Guillaume Martin from French design firm iwoodlove. Techstyle Graphic panels offer a selection of organic, abstract and geometric patterns that can be recolored to fit the design of any room. When integrated into a creative room environment, Techstyle Graphics can induce calmness in a doctor's office, produce excitement in retail settings or add subtle directionality in a complex transportation hub. The panels feature a honeycomb design that absorbs high and low frequencies to deliver acoustical performance across the spectrum.

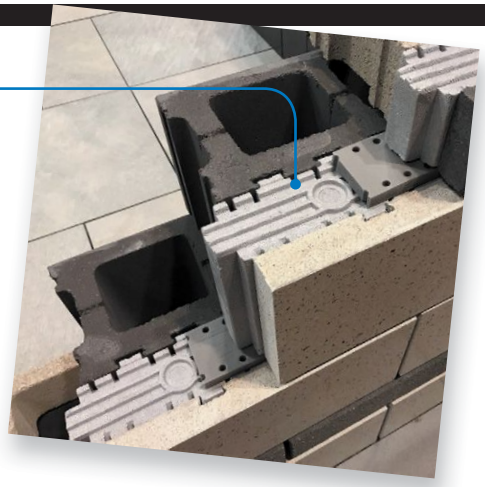
www.HDarchitectural.com // Circle No. 44

CANOPIES AND OTHER EXTERIOR APPLICATIONS AVAILABLE IN TURNKEY SOLUTION

Duo-Gard Industries Inc. and 3form LLC provide complete turnkey systems and solutions for canopies, shelters, building façades and other exterior applications. Fusion is a new line marketed by Duo-Gard and integrates 3form translucent polycarbonate glazing panels with Duo-Gard's engineered structural systems to create advanced aesthetic possibilities in 92 color options, three finishes and three thicknesses. 3form's polycarbonate panels combine design flexibility with aesthetics and strength. Duo-Gard's engineered systems provide structural support. The turnkey package offers complete cost-effective solutions.

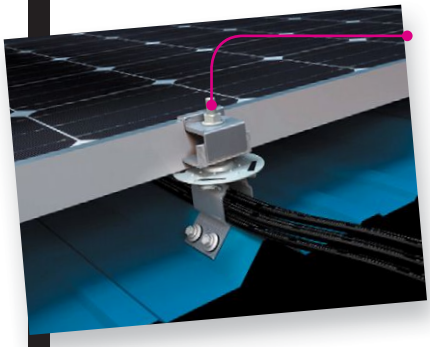
www.duo-gard.com // Circle No. 45

CONCRETE MASONRY SYSTEM MEETS IECC ENERGY CODES



Oldcastle Architectural's Echelon brand announces the InsulTech Concrete Masonry System's Half-High product line as an extension to the full-high product. InsulTech's Half-High products feature 12 profiles in finished nominal dimensions of 12 1/4-inch wide by 4-inches high by 16-inches long, offering more flexibility and design options for architects designing hospitals, schools and other institutions while meeting building codes. The products make up a complete, thermally broken insulated masonry system with a molded Neopor EPS insulation insert and thin veneer face to provide a 16.2 R-Value at 75 F. The system meets 2012/2015 IECC energy codes from Zones 1 through 7. InsulTech is available in standard finishes and Trenwyth Stone Veneer's variety of colors and textures.

www.echelonmasonry.com // Circle No. 46



ATTACH ANCILLARY EQUIPMENT TO TRAPEZOIDAL METAL ROOFING

S-5! has released the RibBracket I-IV products, four different shapes designed to properly fit the vast majority of trapezoid profiles found globally. Thoroughly tested for strength, RibBracket I-IV has no moving parts and is flexible enough to fit varying trapezoidal widths. A higher profile ensures more space between the roof and any devices attached to the roof while the four attachment points offer greater holding strength. RibBracket I-IV is designed for convenient wire management and ease of installation for a solar system. RibBracket I-IV and the accompanying fasteners come with a factory-applied EPDM rubber gasket seal attached. The S-5! reservoir conceals the bracket EPDM from UV exposure, preventing drying and cracking.

www.s-5.com // Circle No. 47

WATERPROOF SURFACES WITH NANOTECHNOLOGY

Arisfor LLC has introduced its next-generation Multi-Surface Waterproofer (MSW). Using nanotechnology, MSW forms a moisture barrier that integrates with the surface material, providing protection against the damaging effects of water intrusion, acids and deicing salts. Arisfor MSW is the result of an association with Integricote, the first nanotechnology spin-off company from the University of Houston. The product is equally suited to residential and commercial use, including home and commercial building façades, parking lots and decks, driveways and curbs, loading docks and ramps, and concrete sidewalks and stairs. Other applications include tile, limestone, granite, marble, slate and even gravestones. Arisfor MSW is currently marketed in 1-and 5-gallon pails and is applied with a standard sprayer.

www.arisfor.com // Circle No. 48

INTERIOR WALL PANELS RESIST DAMAGE

Inpro Corp. has released its Palladium Wall Panels, which are engineered with rigid sheet wall protection to endure abuse in commercial interiors. Designed for lobbies, elevator interiors, headwalls and more, Palladium Full Wrap Panels feature Edge Protectant Technology for durability.

www.inprocorp.com // Circle No. 49

CHILLED-BEAM CASSETTE CAN PINPOINT TEMPERATURE AND HUMIDITY

SEMCO LLC has introduced the LYRA II, a 2- by 2-foot active chilled-beam cassette capable of personalized pinpoint temperature and humidity via a digital controller. The LYRA II is a quiet, cooling/heating chilled beam capable of precise airflow patterns and velocities for spaces under 300 square feet in new construction and retrofit applications. It features digital field-adjustment capability of one-, two-, three- or four-way air directionality to accommodate any room shape or configuration. It also digitally controls discharge velocities, ranging from 11- to 150-feet per minute. Its 8 1/2-inch-deep enclosure is designed to suppress turbulence and operational airflow noise to below 20-dB levels.

www.semcohvac.com // Circle No. 50

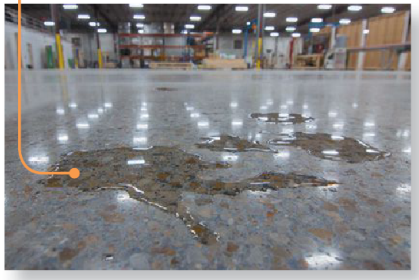
LED RETROFIT KIT MIMICS SUN CHANGES THROUGH THE DAY

Above All Lighting has unveiled its Human Centric LED retrofit kit, which utilizes a 38-watt LED source to mimic the natural Kelvin changes of the sun throughout the day in a typical 2- by 2-foot troffer. The fixture can be set to run automatically or allows users to change the lighting with one of several presets, such as sunrise/sunset, best lighting for reading (4100K) or best for working (5000K). With the wireless adjustable color temperature driver, the retrofit kit can be controlled by a remote control, smartphone or tablet using an available app. The LED lamp also can be controlled by a wall switch. The adjustable color temperature ranges are 2700 to 6500K and the LED has a CRI of more than 80. The retrofit kit has a 50,000-hour L70 life and comes with a five-year limited warranty.

www.abovealllighting.com // Circle No. 51

PROTECT CONCRETE SURFACES FROM WATER, OIL AND STAINS

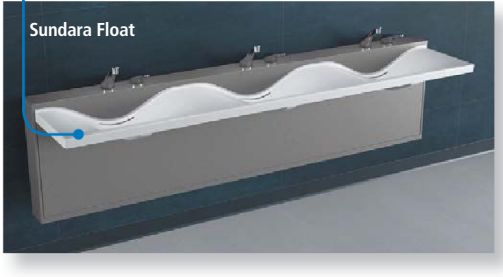
Concrete Protector SB is a solvent-based alternative to PROSOCO's Concrete Protector. Formulated based on contractors' feedback, Concrete Protector SB offers improved performance in repelling water, oil and stains and it can be burnished. Surfaces treated with Concrete Protector SB retain their natural appearance, texture and breathability and are easier to maintain. The product is ideal for high-traffic or wheeled-traffic areas where surface film-forming sealers may prematurely wear off. The low-odor, VOC-compliant product is applied with pump-up sprayers and can also be applied to surfaces previously treated with Consolideck guards, like LSGuard and PolishGuard. The product previously known as Concrete Protector remains available as Concrete Protector WB for customers who desire a water-based formulation.



www.prosoco.com // Circle No. 52

ARCHITECTS' INPUT HELPS CREATE HANDWASHING STATION

Zurn has released its Sundara Handwashing System, a modern, architecturally inspired approach to handwashing in the commercial restroom. The system combines a seamless countertop and basin design with curated faucets and soap dispensers to match. It features durable solid-surface construction, made from a proprietary mix of materials that are easy to maintain and scratch- and stain-resistant. Sundara has a 300-pound load rating to ensure vandal prevention. In developing the system, Zurn interviewed 150 architects and designers, completed 10,000-plus hours of research and created 26 prototypes. Through further testing and validation, Zurn finalized the concepts to three designs: Sundara Reef, Drift and Float.


Sundara Float

www.zurn.com // Circle No. 54

FAUCETS ACHIEVE 30 PERCENT WATER-USAGE REDUCTION

Sloan's 0.35 gpm flow-rate faucets allow architects and designers to achieve LEEDv4 compliance without sacrificing a sleek aesthetic. Sloan's full offering of 0.35 gpm faucets include the Optima and Sloan family of sensor products, each specifically designed to serve any commercial restroom environment with intelligent and touch-free applications. Sloan's latest product offerings can deliver a significant decrease in water usage when used, instead of the industry standard 0.5 gpm. These new faucet models are now equipped with lower flow rates and shorter time outs, achieving 30 percent or more in water-usage reduction.

sloan.com // Circle No. 53

AD INDEX

RETROFIT // July-August 2017

PHOTO: ASLA 2016 PROFESSIONAL GENERAL DESIGN AWARD OF EXCELLENCE. UNDERPASS PARK/TOM ARBAN

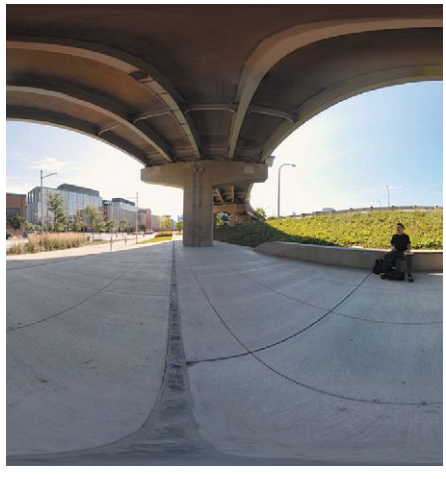
VIRTUAL REALITY: UNDERPASS PARK, WINNER OF AN ASLA PROFESSIONAL AWARD OF EXCELLENCE

The Washington, D.C.-based American Society of Landscape Architects selected Toronto's Underpass Park as the ASLA 2016 Professional Award of Excellence winner.

Underpass Park is located beneath several existing highway overpasses in Toronto's downtown. The otherwise forgotten and derelict space has been transformed into an active public park, providing diverse recreational and social opportunities while connecting new and existing local neighborhoods and nearby parks. This unique public space is part of Waterfront Toronto's revitalization efforts of the celebrated new West Don Lands neighborhood. At a time when urban open-space resources continue to dwindle and city populations and densities increase, taking advantage of unexpected opportunities, such as the underbelly of an overpass, has proven to be visionary and essential for the overall health and vibrancy of this area of the city. This award says that even underpasses can become great parks. It's ASLA's hope other cities will follow suit.

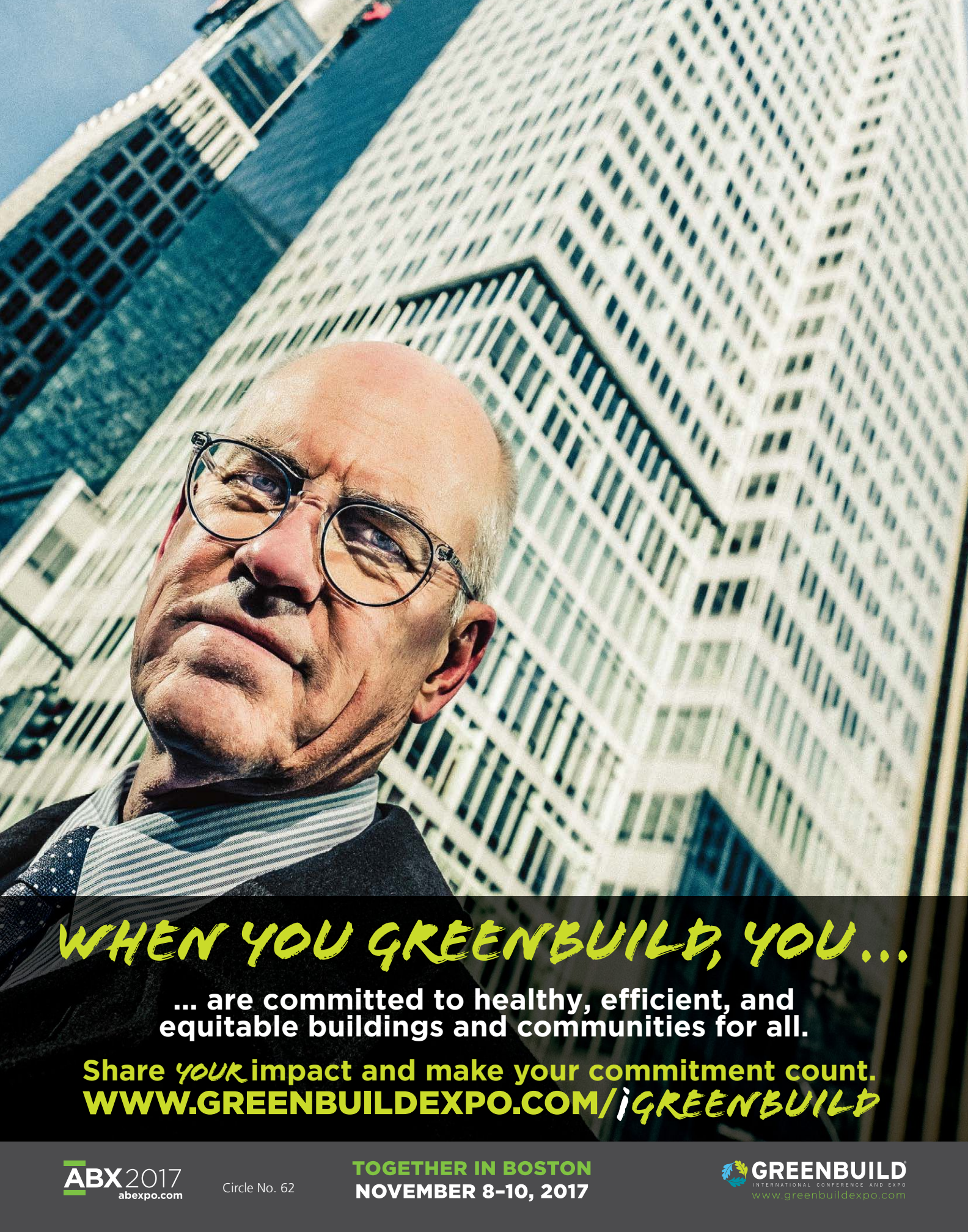
As such, ASLA has released its first virtual reality (VR) viewing experience to the public, featuring exclusive footage of Underpass Park. The ASLA VR video takes viewers on an exciting journey through this unique park, guided by the park's designer Greg Smallenberg, FASLA, principal at PFS Studio, Vancouver, British Columbia, Canada. If you own a Samsung Gear VR headset and compatible Samsung phone, go to Samsung Gear via the Oculus App and search for "Underpass Park" or "ASLA" to find the video.

PHOTOS: AMERICAN SOCIETY OF LANDSCAPE ARCHITECTS



Virtual reality takes video to the next level: As you move your phone or VR headset, you control your experience in the landscape. It more closely mimics the experience of exploring a place in person. In part, it recreates that sense of discovery one gets in real life. In the example of Underpass Park, many will never have the opportunity to visit the park in person but, with ASLA's video, viewers can get a good sense of what's it like to be there.

Tour Underpass Park via 360-degree video.



SARNAFIL NOW COMES IN PEEL & STICK.

INTRODUCING SARNAFIL G 410 SELF-ADHERED ROOF MEMBRANE. THAT'S RIGHT, YOU'RE NO LONGER STUCK WITH TPO OR EPDM.

Now, there's an easier, safer and faster way to install a quality Sarnafil roof. With the industry's first and only self-adhered PVC membrane, you simply peel back the liner and bond the membrane to your substrate. This self-adhered membrane eliminates solvents, VOCs and odors while improving installation productivity. Sarnafil G 410 SA is ideal for any project but especially for those buildings sensitive to adhesive odors and fumes, such as schools, hospitals, retail, food manufacturing and office buildings. To learn more, visit usa.sarnafil.sika.com/self-adhered or to request a sample, call 800-576-2358.

OUR LINE OF INNOVATIVE NEW PRODUCTS

SARNAFIL SELF-ADHERED MEMBRANE | SIKA SOLAROOF® SYSTEM | SARNAFIL® TEXTURED MEMBRANE | SIKA® ROOFING LIQUID FLASHING

SIKA CORPORATION – ROOFING
Phone: 800-576-2358
usa.sarnafil.sika.com

Circle No. 63

Sarnafil®

BUILDING TRUST

Sika®