

January-February 2020 retrofitmagazine.com

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2019 retrofit
TOP 50
PRODUCTS



Gritty Aesthetic:

An Abandoned, Graffiti-covered '70s Industrial Building Becomes an Office Full of Color, Light and Character

+ More Office and Warehouse Projects



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Latrobe Elementary School, Latrobe, PA Installing Contractor: Pennsylvania Roofing Systems Architect: Axis Architecture
 Distributor: Brock Associates Owner: Greater Latrobe School District Photographer: hortonphotoinc.com
 Profiles: Tite-Loc Plus, PAC-750 Soffit Color: Custom Marquis Orange



TITE-LOC PLUS
 METAL ROOFING SYSTEM
 Custom color: Marquis Orange

Bright Future

Petersen's Tite-Loc Plus metal roofing system in a distinctive Marquis Orange finish brightens the vision of the new Latrobe Elementary School. The 22-gauge panels complement the classic terra cotta-toned brick that clads the upper two-thirds of the school's façade.

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- Ford Rotunda Center, Dearborn, Mich.



← cover

COVER PHOTO: DROR BALDINGER

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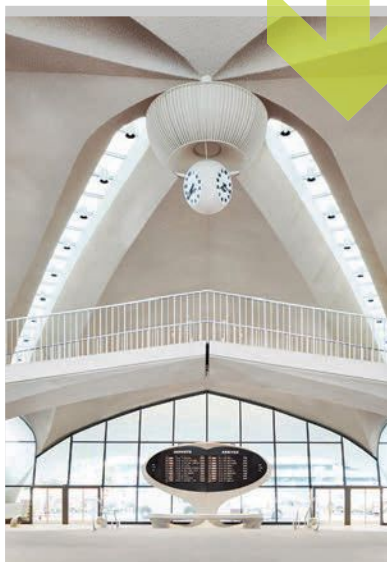
Architects create their dream home within a beloved Virginia barn.



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Transformation

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DPR Construction's team makes an abandoned building an office deserving of emulation.



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There's a massive shortage of skilled workers to fill construction-related jobs. Here's how it's impacting the building industry and what's being done about it.

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82 INSPIRATION // A downtown Chicago alley has been transformed from a dark, dingy passageway into an attractive, relaxing area with the help of some imagination and architectural lighting.

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10 POINT OF VIEW // It's up to us to discuss the benefits of technical school and provide information about the high-growth careers available in the construction industry to today's young people.

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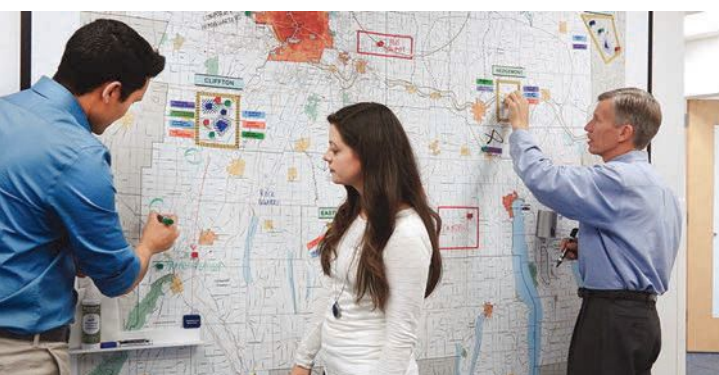
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FAILING A GENERATION

When I graduated from high school in the 1990s, I made predictions about my 23 classmates (yes, I went to a very small school), and I tucked those predictions into my senior-year scrapbook. As I prepared for my class reunion last summer, I read over my predictions and realized I was correct on about 90 percent of them. If 17-year-old me could guess what the future would hold for my classmates, I would think our school's guidance counselor, who also was a teacher and coach and interacted with our class and our other teachers every day, also could glimpse the future. However, looking back at the choices my classmates made after graduation, don't think everyone received the individual guidance they deserved. Fifteen out of 24 students went to college, including me; just one classmate went to trade school; and the remaining eight joined the workforce immediately.

While reading this issue's "Trend Alert" about our nation's skilled labor shortage—again expertly written by Contributing Editor Robert Nieminen—I couldn't help but call one of my high-school classmates, Pete.

Today, Pete, who chose the college route after graduation, is the third-generation owner of his family's trucking business in my hometown. I wanted to know if our guidance counselor—or any authority figure at our school—ever spoke to him about trade school rather than college. I always knew college was the path for me; I wanted to be a writer from the time I could spell words, so nobody ever spoke to me about anything but college. But had Pete's experience been different?

The answer is no. Pete recalls posters for nearby colleges and universities hung throughout the school and visits from college recruiters but none from trade schools. "I never heard I could survey land, build a house, fix a car," Pete told me during our phone conversation. "And knowing I would likely take over my dad's business, I should've been told to go to school to become a diesel mechanic so I could save money by fixing my own trucks."

Why wasn't Pete told about trade school, I wonder? According to Nieminen's article, page 74, one reason may be "cultural conditioning". Nieminen writes: "The effects of this cultural conditioning are far-reaching and date back to 1965 when the Higher Education Act was signed into law, which strengthened resources for colleges and universities and increased student access to financial aid. In the decades that followed, there's been a seemingly systemic emphasis on a four-year degree as the only viable path to success and stability."

Greg Sizemore, vice president of HSE and Workforce Development for the Washington, D.C.-based Associated Builders and Contractors, drives the point even further, "We've got a decades-old narrative we have to unwind in America today that says, for whatever reason, 'Unless you go to college, you're something less-than, or you're not employable, or you have less skill.'"

Fortunately, I think we've begun to unwind this negative narrative. In recent years, I've heard more often that not everyone is suited to college and going to college could still leave a person unemployed or underemployed (while carrying a lot of debt)—pronouncements I don't EVER remember hearing in the '90s. It's up to us to continue to discuss the benefits of vocational and technical school and provide information about the high-growth careers available in the construction industry to today's young people. It may take a generation to positively affect labor in our industry, just like it took failing an entire generation—my generation—to get us where we are today.

Christina Koch

CHRISTINA KOCH

Associate Publisher/Editorial Director
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Portland, Ore.-based freelance design journalist, critic and architectural photographer **Brian Libby** digs into the UPCycle project in Austin, Texas, in our "Cover Story", page 34. The 1972 former recycling plant sat vacant for more than a decade before developer Curt Kremer literally recycled a recycling center nobody loved—and surprised people with what was possible. Although intended for four to six small companies, UPCycle was leased entirely by a local grocery chain and its food-delivery subsidiary.



If world-renowned designer Eero Saarinen could walk into the TWA Flight Center at New York's John F. Kennedy International Airport today, he'd be pleasantly surprised, says **KJ Fields**, a Portland, Ore.-based **retrofit** contributor, in "Transformation", page 64. Much of the late architect's mid-century design remains, yet the space welcomes visitors in a way he didn't envision—as a hotel lobby that allowed his iconic monument to escape devastation.



Chris Gorthy, LEED AP BD+C, is a principal of DPR Construction, an international general contractor. Gorthy serves as a project executive in preconstruction, leading projects across multiple market sectors. His expertise in green building, cost benefit and life-cycle analyses has been instrumental in the planning and execution of numerous LEED and Net Zero Energy projects across the U.S., including DPR's own Washington, D.C., area office, which he writes about in "Transformation", page 69.

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Products are an integral part of any trade publication. As such, **retrofit** is celebrating the 50 products that received the most reader inquiries from our September-October 2018 through September-October 2019 issues.

“We consider **retrofit** a source book for our readers to find innovative solutions and products for their own retrofit projects,” says Publisher John Riester. “The Top 50 Products special in our January-February issue is a great resource to our readers, showcasing

the products readers’ peers thought were most interesting within the pages of **retrofit**.”

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

Enjoy **retrofit**’s seventh-annual Top 50 Products!



1 WINDOW IS OFFERED IN A HISTORIC PROFILE AND VARIOUS CONFIGURATIONS

Graham Architectural Products’ GT6700 commercial window system with an available historic profile in casement, projected and fixed configurations allows repurposed and renovated buildings to meet newer, more stringent energy codes. The GT6700 incorporates dual thermal strut technology for thermal efficiency and low U-values. It is AAMA-AW-rated in all configurations with impressive design pressures, high water resistance and minimal air leakage. The projected window system is available with a slim sightline or an equal sightline fixed option, depending on intended use and preferred aesthetics. The window incorporates a deeper-sloped glazing bevel for a more authentic historic look, and the strut framing allows for an optional dual finish. A euro groove frame design enables accessory attachment and a variety of multi-locking hardware. True and

applied grids are available, as well as optional roto operator or single-lever operator and limit devices.

www.grahamwindows.com // Circle No. 11



3 MASONRY VENEER RESEMBLES WOOD

Creative Mines has launched a line of masonry veneer products called Craft Weathered Planks. The handcrafted line, developed by master moldmakers, is evocative of weathered barn wood and fences that have acquired a patina over time. The collection celebrates the American countryside, demonstrating Creative Mines’ pride in its USA-made products. The line currently includes five products from which to select or mix: Barrelstave, Blueskye, Greenfield, Milkpaint and Redbarn. The colors in the line vary from vibrant and intense to burnished and weathered tones.

www.creativemines.us // Circle No. 13



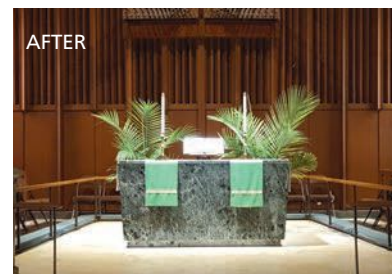
2 RETROFIT EXISTING CAN LIGHTS WITH LED

HyLite LED’s Lotus Lamps are an LED retrofit solution for PAR46, PAR56 and PAR64 can lights. Lotus Lamps feature optics for increased visibility and low power consumption, as well as lamp life of up to 60,000 hours. Available in 3000K and 5000K, the 20- and 30-watt options retrofit into PAR46 can lights, 40- and 60-watt options retrofit into PAR56 can lights, and 80- and 100-watt options retrofit into PAR64 can lights. The lamps, which are available in dimmable and non-dimming options, come in multiple beam angles: 15, 25, 40 and 120 degrees.

hyliteledlighting.com/led-products/par-retrofit // Circle No. 12

Representatives of Bel Air United Methodist Church, Bel Air, Md., replaced the church’s incandescent sealed beam PAR46 200-watt and PAR56 300-watt bulbs with 20-, 30- and 40-watt dimmable Lotus Lamps. The church utilized the multiple beam angles the Lotus Lamp offers to illuminate the altar and cross. Bel Air United Methodist Church utilizes the compatible Triac Dimming System to enhance the lighting setup.

Doug McCorkle, a member of the church’s board of trustees, notes: “Photos do not do it justice; the Bible on the altar just seems to glow. This creates a central focus at the altar that naturally draws your eye to the Bible when you enter the sanctuary from the rear. We could not do this before the new lights as the bulbs that had been placed in these positions were medium floods instead of a narrow spot, which is what they are now. The congregation has had a positive response to the lights. These new HyLite Lotus Lamps make reading the bulletin and hymnal a lot easier.”



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4 STONE COLORS LEAN TOWARD THE MODERN

Cultured Stone has unveiled two colors in Handmade Brick: Canvas and Titanium. Canvas presents an array of saturated white and off-white tones while Titanium includes hand-stained silvery grays. Two new colors have been added to Country Ledgerstone: Gunnison and Wheaton. Gunnison is charcoal and gunmetal punctuated with powdery light gray, and Wheaton is a mix of tawny silvers and cool neutral grays. The large-format Stanhope Textured Cast-Fit presents a weather-worn array of dusky grays. Carbon Cast-Fit features subtle shifts of light and dark tones present in morning fog. A panelized version of Drystack Ledgerstone is available in three color options: Rubicon, Melrose and High Plains. Rubicon is a blend of deep grays and carbon-inspired tones. Melrose incorporates light-gray hues, and High Plains showcases an earthy color with tan undertones.

www.culturedstone.com // Circle No. 15

5 SILICONE ROOF COATINGS RESIST NATURAL WEATHERING

Duro-Last Inc. has unveiled Duro-Shield Silicone Roof Coating and materials. The silicone-based roof coating is designed to resist natural weathering while providing long-lasting watertight protection on a variety of substrates. Its white finish offers reflectivity and energy savings for building owners. Five-, 10-, 15- and 20-year limited warranty options are available. Additional Duro-Shield Silicone materials include Duro-Shield Silicone Brush Grade Sealant, Polyester Reinforcement Scrim, Duro-Shield Silicone Roof Primer: Universal 2-Part Epoxy and Duro-Shield Silicone Roof Primer: TPO. The line expands the existing Duro-Shield coatings solutions, which feature Duro-Shield 20 and Duro-Shield 10 Acrylic Roof Coatings.

www.duro-last.com/duroshield // Circle No. 16



6 OPEN-CELL SPRAY FOAM DOES NOT REQUIRE MIXING

Icynene-Lapolla has debuted its Icynene OC No-Mix insulation, an open-cell spray foam solution for homes and commercial structures. The product is suited for application in critical insulation areas within the structure, including cavity walls, crawl spaces and attics (vented and unvented), as well as floor, ceiling and interior roof assemblies. The professionally installed spray-applied material seals the structure, providing a continuous air barrier and reducing unmanaged moisture. The insulation offers the added benefit of noise attenuation. Icynene OC No-Mix can be used across climate zones and may be spray-applied in a wide range of temperatures. The insulation firmly adheres to framing members and substrates and can be used to fill stud wall construction.

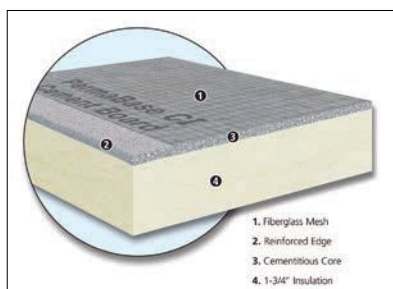
www.icynene-lapolla.com // Circle No. 17



7 CEMENT BOARD INCLUDES POLYISO INSULATION

National Gypsum's PermaBase CI Insulated Cement Board is a composite cement board that combines the strength of PermaBase with high-density polyiso insulation to create a substrate for exterior finishes. PermaBase CI meets or exceeds energy code requirements in all seven climate zones across the country with an R-Value of R-10. For use in residential, multifamily and low-rise commercial applications, PermaBase CI is lighter weight than using separate cement board and insulation products. The mold-resistant product, which was validated by UL Environment, has achieved NFPA 285 Approvals for Adhered Veneer Finishes and is GREENGUARD GOLD certified.

permaBase.com/permaBaseCI // Circle No. 18



8 ELECTRIFY EXISTING OPENINGS

ASSA ABLOY Electronic Security Hardware and ASSA ABLOY Group brand Adams Rite have released HES 9800 and Adams Rite 7800 Electric Strike. The HES 9800/Adams Rite 7800 Series is a low-profile, surface-mounted electric strike designed specifically to work with the Adams Rite 8800 and 8700 Series Narrow Stile Rim Exit Devices and the EX88 Interlocking Rim Exit Device. As the only electric strike compatible with the Adams Rite Starwheel and Interlocking latching mechanism, the HES 9800/Adams Rite 7800 electrifies openings on aluminum storefronts, commercial perimeter doors and high-occupancy commercial facilities, as well as provides an electrification option for the Adams Rite EX88.

assaabloyesh.com, adamsrite.com // Circle No. 19



9 CONTINUOUS INSULATION RAINSCREEN SYSTEM FEATURES STONE WOOL



Knight Wall Systems has collaborated with ROCKWOOL to market COMFORTBOARD 110, a continuous insulation (CI) rainscreen attachment system utilizing stone wool insulation. The product will now be marketed as a complete rainscreen solution alongside Knight Wall Systems' CI System and HCI System. Developed for use as an exterior continuous insulation in commercial applications, COMFORTBOARD 110 is thermally efficient, moisture-resistant, vapor permeable and creates high-performance wall assemblies. These assemblies are effective against fire, moisture and thermal bridging, as well as allow for drying potential. The CI System and HCI System are designed to properly disperse the façade loads over exterior stone wool board insulation with thermally isolated fasteners penetrating the thermal barrier, thus minimizing thermal bridging.

knightwallsystems.com // Circle No. 20

10 ABSORB NOISE IN SPACES WITH AN INDUSTRIAL AESTHETIC

To remedy acoustical problem in spaces with an industrial aesthetic, Armstrong Ceiling Solutions has debuted options for installing its InvisAcoustics Basics panels and Tectum Direct-Attach panels vertically onto trusses and I-beams. Because the panels virtually disappear into these structural elements, the solutions maintain the aesthetic of exposed-structure designs while providing noise absorption. Available in White, Black and Field Paintable, Armstrong Truss Fastening Kits are compatible with InvisAcoustics Basics panels and 1-inch-thick Tectum Direct-Attach panels up to 2 by 4 feet in size. Installation onto I-beams is accomplished using hat track and standard screws or fasteners. InvisAcoustics Basics panels have a Noise Reduction Coefficient (NRC) of 0.75, meaning they absorb 75 percent of the sound that strikes them. Tectum Direct-Attach panels have an NRC of 0.40. Both panels can be painted to match the deck while maintaining their acoustical properties.



armstrongceilings.com/invisacoustics, armstrongceilings.com/tectum // Circle No. 21

11 SEALING SOLUTIONS ARE EXPANDED AND ENHANCED

Huber Engineered Woods has expanded its line of ZIP System sealing solutions and enhanced its flashing tape performance. ZIP System sealing solutions now include five ZIP System stretch tape options and five ZIP System flashing (straight) tapes. While developing tape options for new widths and lengths, the company enhanced its tape formula to provide even stronger performance in a broader range of temperatures. ZIP System sealing solutions also include ZIP System liquid flash, a fluid-applied flashing alternative to ZIP System flashing and stretch tape. All ZIP System tapes are backed by a 180-day exposure guarantee and a 30-year limited warranty, feature a split-liner for easy application (on tapes 6 inches or wider), and can be applied between 0 and 120 F.



zipsystemsealingsolutions.com // Circle No. 22

12 WIRELESS IN-WALL SENSORS CAN REPLACE STANDARD WALLBOX CONTROLS

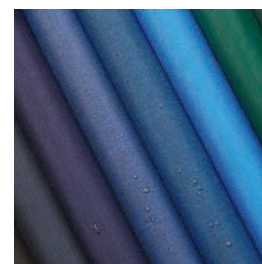
Lutron Electronics has released two Maestro Wireless in-wall sensors for its Vive solution. The 0- to 10-volt dimmer/sensor model combines automated, occupancy-based control of light, manual dimming control and wireless communication to other Vive system devices in a single piece of hardware. The sensor/switch model provides manual or automated, occupancy-based on/off control, as well as wireless communication to Vive devices. Both models can be direct replacements to existing controls in a standard wallbox. The sensors can communicate wirelessly to Lutron Pico remote controls or other Vive wireless sensors, making it easy to add additional wall controls without running new wire. Use the sensors as standalone devices or connect them to a Vive wireless hub at any time to deliver system features, such as timeclock control and energy reporting.



www.lutron.com/vive // Circle No. 23

13 MARINE-GRADE FABRIC NOW AVAILABLE FOR SHADING

Recognized in the marine market for its weather resistance and durability, Sunbrella SeaMark is entering the commercial shade market with a wide selection of colors. Sunbrella SeaMark is a marine-grade fabric that delivers protection from extreme precipitation and moisture without sacrificing style. Fabricated from durable Sunbrella performance fabric and 100 percent impervious waterproof backing, Sunbrella SeaMark is available for restaurant patio enclosures, office canopies and awnings. In addition, the Skin Cancer Foundation recommends Sunbrella fabrics in shading products as an aid in the prevention of sun-induced damage to the skin as part of a complete sun protection regimen.



sunbrella.com/seamark // Circle No. 24



14 STEEL CONNECTION ELIMINATES FIELD WELDING

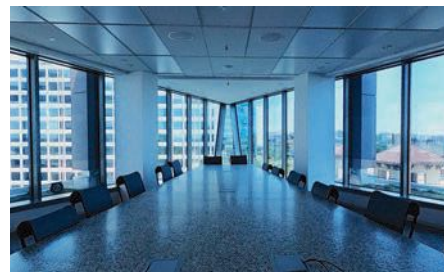
Simpson Strong-Tie's Yield-Link connection simplifies and streamlines structural-steel connections made in the field without compromising structural strength. The Yield-Link connection requires no field welding, resulting in reduced onsite labor costs, licensing fees and construction time. By eliminating field welding, the Yield-Link connection also removes the need for field weld inspections. And because beams can be designed without supplemental lateral bracing, fewer fabricated steel elements and field connections are required. With a smaller restricted zone, MEP coordination is eased. Yield-Link is designed to absorb forces in a seismic event and, as a bolted connection, it is easier to replace than welded beams and posts, which simplifies repairs following a natural disaster.

strongtie.com/yieldlink // Circle No. 25

15 GLASS PROVIDES GRADUAL TINT TRANSITION

Saint-Gobain has made available SageGlass Harmony, dynamic glass that offers daylight, heat and glare management while maintaining a connection to the outdoors. The product delivers a gradual in-pane tint transition from fully clear to fully tinted. Harmony can be integrated as an IoT device and managed to deliver an optimized indoor environment.

www.sageglass.com/harmony // Circle No. 26



In 2013, representatives from the American Geophysical Union (AGU) embarked on a journey to renovate their headquarters to become Washington, D.C.'s first commercial renovation to achieve Net Zero Energy status—producing as much energy as the building consumes during a year—and be a living representation of AGU's mission: science for the benefit of humanity.

AGU accomplished its goals by integrating leading technologies into the building, including 11,227 square feet of SageGlass in more than 900 windows. SageGlass provides tenants with the ability to create up to three tint zones within a single pane of glass to provide glare control and daylight management.

SageGlass helped AGU reach its sustainability goals, specifically through energy use. Incorporation of smart glass in the space limits the use of the building's heating and cooling system, resulting in a peak-load reduction of 35 percent. In fact, AGU was able to utilize chilled beams for all the building's space cooling needs. The smart glass is connected to the interior lights through the building management system; as the windows tint darker in response to the sun, the lights shine brighter, and vice versa, resulting in 5 percent electrical lighting savings. By tinting automatically in response to the sun and outdoor conditions, smart glass reduced window heat gain in the building by 29 percent, compared to static glass. This helps maintain a more comfortable work environment for staff and tenants, as well as a connection to the outdoors, which research shows improves wellbeing and productivity.

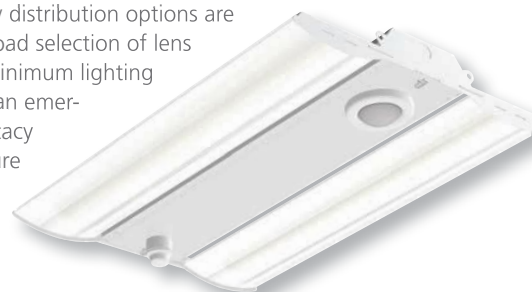
AGU representatives are collecting data on every system in the building to make available to the public so they can see the impact these strategies are having on energy usage and, ultimately, the climate and planet.

To read *retrofit's* coverage about the American Geophysical Union's headquarters, visit bit.ly/2KVyv98.

16 IMPROVE LIGHTING AND AESTHETICS IN SPACES WITH HIGH CEILINGS

Columbia Lighting's Peloton High Performance High Bay is designed for gymnasiums, warehouses and light-industrial working environments that require improved aesthetics. Peloton features an upright option from 1,000 to 4,000 lumens to eliminate the "cave effect" and alleviate contrast concerns that ultimately lead to decreased light uniformity. Wide and Narrow distribution options are available for open area and aisle applications, and visual comfort can be enhanced with a broad selection of lens options. Peloton has been certified to the UL 924 emergency lighting standard, which sets minimum lighting levels and overriding controls in emergency mode to light the path of egress in the event of an emergency. The DesignLights Consortium-qualified Peloton offers a 177 lumen per watt high-efficacy option and 8,000 to 60,000 lumen packages, enabling lighting specifiers to use a single fixture to achieve a unified look and feel in facilities with a range of ceiling heights.

bit.ly/2McQhqV // Circle No. 27



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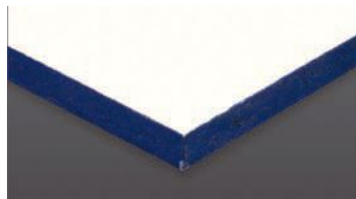


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17 COVER BOARD IS SOURCED FROM WASTE STREAMS

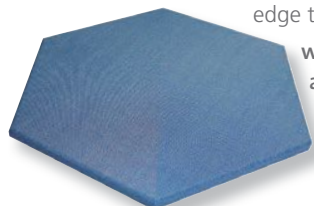
Carlisle SynTec Systems has introduced EcoStorm VSH Cover Board, an engineered composite building material made from a proprietary blend of plastic and cellulose fiber, sourced from postindustrial and post-consumer waste streams. EcoStorm VSH offers moisture and mold resistance, compressive strength of 3,990 psi, a coated glass facer on the top surface of the board and impact resilience.

www.carlislestntec.com // Circle No. 29

19 ACOUSTIC PANELS COME IN GEOMETRIC SHAPES

G&S Acoustics has created GeoDesign (GD) and GeoDesign Ridge (GDR) acoustical wall panels. Both panels are cut to standard geometric shapes—hexagon, trapezoid, rhombus and polygon—up to 4 by 4 feet across. They also can be cut to a custom shape that fits a specific design. The geometric pieces will fit together to create mosaic patterns across a wall. GD panels are flat and 1-inch thick while the GDR panels have a 1 7/8-inch raised ridge down the center, creating a 3-D surface. The ridge descends to level out at 1 inch at the edges, allowing the GD and GDR panels to be installed contiguously on a wall. The panels' fiberglass core offers an NRC sound absorption range of 0.55 to 0.85, based on standard acoustically transparent fabric. GD and GDR panels can be covered in a fabric of the client's choice in a variety of colors and edge treatments.

www.gsacoustics.com
// Circle No. 31



18 SCREEN ROLLS OUT OF SIGHT WHEN WINDOW IS CLOSED

Pella Corp. has gone back into its history to debut the Integrated Rolscreen, a concealed, retractable screen that moves seamlessly with the sash of double- and single-hung windows. The Rolscreen retractable screen, which was introduced when the company was founded nearly 100 years ago, automatically appears when the window is opened and rolls out of sight when closed. The design features high-strength magnets that keep the screen in place and a self-correcting feature that quickly re-threads the screen material if needed. Tested in extreme conditions to deliver performance, the Integrated Rolscreen is backed by Pella's 10-year transferrable limited warranty. The Integrated Rolscreen, which appears at both the lower sash and the upper sash of double-hung windows and appears at the lower sash of single-hung windows, is initially available on Pella Architect Series Reserve double- and single-hung windows with plans to expand into other product lines.

www.pro.pella.com // Circle No. 30



St. Regis Apartments, Berlin, N.H., is an 80-unit, 2-story building that offers affordable housing and living to low-income seniors. Built in 1905, the building originally was home to a Catholic high school and convent until 1972 when it was transitioned to affordable housing. Because of the building's significance as a center of education and for its architecture, the St. Regis Apartments building was listed on the National Register of Historic Places in 2015.

The historical architecture is what draws residents to the St. Regis Apartments: beautiful brick exterior, expansive banks of windows and original beadboard wainscoting. But the windows were old and heavy aluminum, and—in some areas—inoperable. When it came time to replace the windows, a critical aspect of the project was Pella Corp.'s ability to preserve the rich historical details and authentic design of the building while delivering a product that would be easy to open and close, as well as keep residents warm in the winter and cool in the summer.

The design team worked closely with the Washington, D.C.-based National Park Service to navigate the complex guidelines for a historic project and ultimately chose Pella Architect Series Reserve double-hung wood windows with Integrated Rolscreens. The historically authentic line of wood windows allowed the team to recreate the beauty of the building's original windows while increasing overall comfort and energy efficiency for residents. The addition of the Integrated Rolscreen, a concealed, retractable screen that appears when the window is open and then rolls out of sight when the window is closed, made the building look more historically accurate and allowed for more light streaming in and no seasonal screen storage.

20 EMERGENCY BALLAST OPERATES 4-PIN LEDS AFTER POWER LOSS

The new I-4PT-A Emergency Ballast is IOTA's first emergency ballast specifically tailored to operate 4-pin LED retrofit lamp designs. The I-4PT-A works in conjunction with the existing AC ballast technology to operate select 4-pin compact LED lamps for 90 minutes during a loss of normal power. The I-4PT-A is UL Listed as an emergency solution for a wide assortment of popular manufacturer LED lamp designs. The minimal dual-flex design makes the product IOTA's smallest California Title 20-certified solution for LED retrofit applications.

www.iotaengineering.com // Circle No. 32





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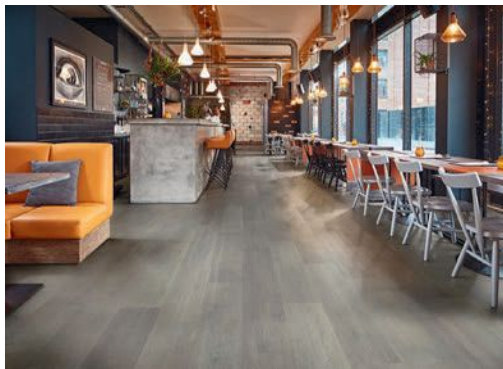
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Circle No. 33



21 LUXURY VINYL REPLICATES RARE WOODS

Karndean Designflooring has expanded its click-locking rigid core Korlok Select to include new visuals and a 24- by 6-inch herringbone plank. Replicated from rare and treasured American and European woods, the luxury vinyl is available in Hawaiian Koa, resembling a species of acacia that can no longer be harvested; three American Barnwood options in two sizes, allowing end users to have color continuity from room to room with different lay patterns in each space; English Oak, inspired by weathered stonework; Brushed Oak that offers an embossed texture; Baltic Oak, which appears as a mixing of wood grades; and European Oak that is reflective of the machine brushing and rapid dehydration that occurs within sawn boards. Korlok Select's waterproof, proprietary K-Core technology allows for installation over most existing hard floors and uneven subfloors. Korlok Select's pre-attached acoustic foam backing helps to reduce noise transfer to rooms below by 22dB.

www.karndean.com/korlokselect2019 // Circle No. 34

22 SAVE WATER WITH TOUCH-FREE FLUSH PLATES

The new Sigma10 flush plates from Geberit offer touch-free activation that is suited for private or semi-public restrooms, helping save water and reducing the spread of germs. The touch-free plates for in-wall toilet systems are activated with a wave of the hand or by simply walking away. Designers, architects and end-users will enjoy the hygienic and user-friendly hands-free actuation, as well as the wide range of finishes and the seven color options. The Sigma10 is available hard-wired or with battery power. Vandal-resistant stainless steel and manual flush override versions are offered. A matching urinal actuator also is available.

geberit.us // Circle No. 35



23 RESTORE VISIBLE ROOFS WITH COLORFUL COATINGS

Mule-Hide Products Co. has added seven finish coat colors—Brown, Charleston Green, Green, Safety Red, Safety Yellow, Terra Cotta and Tinnars Red—to its Silicone Roof Coating System for restoring roofs. Safety Red and Safety Yellow can be used to create "warning tracks" around roof perimeters, skylights and other areas where fall protection is required. The Silicone Roof Coating System can be applied to a wide array of roofing substrates, including metal, EPDM, TPO, aged PVC, aged acrylic coatings, concrete, asphalt built-up roofs, granulated modified bitumen roofs and new spray-applied polyurethane foam. The coating, which boasts low water absorption and a quick cure time, controls damage caused by ultraviolet radiation, reduces thermal shock and seals water entry points.

www.mulehide.com // Circle No. 36



24 COOL COMMERCIAL SPACES WITHOUT REFRIGERANTS

Cambridge Air Solutions has expanded its commercial cooling offerings with E-Series and ESC-Series evaporative cooling units. The Cambridge E- and ESC-Series lines help facilities efficiently meet IAQ and comfort standards without the use of refrigerants. E-Series provides direct evaporative cooling using up to 70 percent less energy than conventional mechanical cooling systems while the semi-custom-fabricated ESC-Series air handler uses 30 to 40 percent of the energy of mechanical systems through direct, indirect or a combination of both evaporative cooling techniques. In addition, Cambridge Air Solutions will make direct and indirect evaporative coils a regular option for its M-Series makeup air units.

www.cambridgeair.com // Circle No. 37



25 FOLDING GLASS WALL ACHIEVES EXTERNAL NOISE REDUCTION

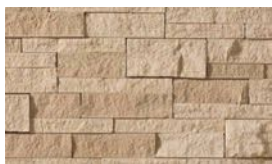
NanaWall Systems has introduced its NanaWall SL64 Acoustical, a first-floor-supported folding glass wall that is able to achieve up to STC 45 for educational settings and interior spaces. This system combines acoustically separated aluminum framing and gasketing with sound-enhanced glass to achieve external noise reduction while allowing natural daylight to flood interior spaces. The hinged panels are intuitive and convenient to operate, allowing staff to open or close the system when needed. The two-point contact Gothic-arch wheel-bearing design also provides an equal distribution of weight and permits the floor-supported system to glide with less friction.

www.nanawall.com/products/acoustifold // Circle No. 38

26 USE EXISTING WIRING TO CONNECT LED FIXTURES

LG Electronics' 480V step down transformer provides a solution for power conversion down to 277V, enabling building owners with three-phase power to use existing wiring to connect with any LG LED lighting fixture. Once commissioned, LG lighting solutions offer a selection of control options, such as light levels, time-out features, fade rates and scheduling. The lightweight design allows for easy installation and is suitable for large indoor spaces, such as warehouses, factories and gymnasiums. In addition, the next-generation LG Battery Scheduling Switch can be placed virtually anywhere and offers wireless control using ZigBee to configure and control fixtures, along with an energy-saving set scheduling feature.

www.lglightingus.com // Circle No. 39



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27 INTERIOR WALL PANELS INCLUDE A FIBERGLASS CORE

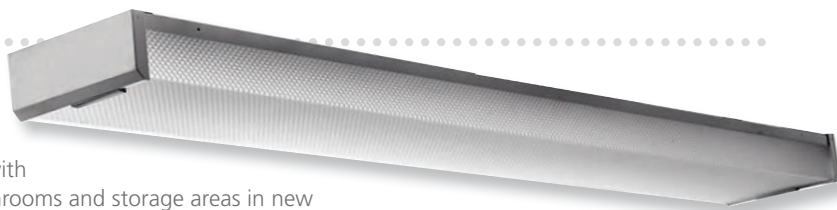
Formica Corp. has launched HardStop Decorative Protection Panels, a line of high-performance wall panels featuring a fiberglass core for durability, strength and fire resistance. HardStop panels are available in the full spectrum of Formica Brand colors, allowing for color coordination with other Formica Laminate products. HardStop Panels are designed to be applied directly to a variety of substrates, including drywall, bringing additional strength and style to vertical applications and settings. The panels may be installed using a selection of seam treatments. Formica offers a variety of anodized aluminum trims that come in five profiles for any application: inside corner, outside corner, division bar, end cap and corner guard. All trim profiles are available in five anodized colors, and color-coordinated 100 percent silicone or acrylic caulk also may be used as seam treatments.

www.formica.com/hardstop // Circle No. 41

28 WRAP FIXTURES PROVIDE 4410 LUMENS

Earthtronics has introduced its LED 4-foot Wrap Fixture Series with advanced lighting control capabilities for offices, stairways, bathrooms and storage areas in new construction and retrofit commercial projects. Available in 4000K and 5000K with an 80+ CRI, the LED 4-foot Wrap Fixtures provide 4410 lumens, operating at 120 to 277 volts. They are equipped with a 0- to 10-volt continuous dimming driver with a dimming range capability of 10 to 100 percent. Advanced control options include daylight harvesting, as well as motion detection. An optional emergency-light battery pack and driver are available. The LED Wrap Fixtures have a 50,000-hour performance life.

www.earthtronics.com // Circle No. 42



29 NEW BASIN OPTIONS FOR ALL-IN-ONE HANDWASHING SYSTEM

Zurn has added three basin designs within the Sundara Handwashing System portfolio: Tide, Surf, and Inlet include single, double and triple configurations. The new options join Sundara's established Reef and Drift basin designs. The Sundara system is available in seven basin colors across the five designs. Zurn offers five sets of curated sensor faucet and soap dispensers, available in multiple finishes.

Multiple manual faucets and soap dispensers also are available. Zurn's Sundara Handwashing System is an all-in-one-box solution: basin, faucet and soap dispenser. The system also can be specified with the manufacturer's in-wall carrier system.

zurn.com // Circle No. 43

30 HEAT PUMP OFFERS HIGH-EFFICIENCY PERFORMANCE IN COMPACT SIZE

The YORK LX Series High-Efficiency YHG single-stage Heat Pump offers up to 17 SEER cooling and 10.0 HSPF heating efficiency, allowing it to qualify for many regional efficiency incentives. The ENERGY STAR-qualifying product can be matched with high-efficiency standard ECM and constant CFM air handlers or matched with a gas furnace to create a dual-fuel comfort solution, providing year-round comfort and quiet operation. The compact heat pump fits into the footprint left by many of the older systems it can replace. Because the YHG system uses a conventional thermostat, in retrofit applications the existing thermostat often can be used. Those seeking more control and remote access can upgrade to the Alexa-compatible, Wi-Fi-enabled YORK Affinity Hx3 full-color touchscreen smart thermostat.

www.york.com // Circle No. 44





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31 STAINLESS-STEEL FITTINGS PROVIDE QUICK CONNECTIONS

Viega has made available MegaPress Stainless XL fittings for 2 1/2-, 3- and 4-inch pipe. The new fittings join the current MegaPress Stainless offerings of 1/2-, 3/4-, 1-, 1 1/2- and 2-inch sizes to create a comprehensive lineup for a broad variety of applications, including maintenance and repair. Designed for Iron Pipe Size stainless steel, the line of MegaPress Stainless XL fittings makes secure connections in seconds. The fittings are equipped with patented Viega Smart Connect technology, which allows installers to identify unpressed connections during pressure testing. MegaPress Stainless XL fittings are available in 304 and 316 stainless steel and are approved for use with Schedule 10 to Schedule 40 pipe.

www.viega.us/mpstainless // Circle No. 46

32 IMPROVE ACOUSTICS WITH BOARD PRODUCTS

Sound Seal has debuted Sound Quality Polyester Acoustical Board (PAB) and Theater Board. PAB offers flexibility in acoustical applications and installations, working as a sound-absorption product for wall, ceiling and duct applications. It is an environmentally friendly, polyester acoustical panel developed for building interiors and exteriors. The product works well for retrofit or new construction applications.

Theater Board is a sound-absorptive board that provides acoustic performance by reducing reverberation. Theater Board tiles are made from lightweight, black-dyed acoustic fiberglass board and finished with a matte-black fiberglass fabric. Theater Board is an affordable solution to building acoustic ceilings in any residential or commercial space where reverberation or reflected noise is an issue.

www.soundseal.com // Circle No. 47



Black Theater Board

33 COMPOSITE DECKING OFFERS COOLDECK OPTION

MoistureShield Vision capped wood composite decking resembles interior hardwoods to provide a seamless transition to the outdoor deck. MoistureShield's latest colors—Mochaccino and Cathedral Stone—feature CoolDeck Technology, which reduces heat absorption by up to 35 percent. Other Vision colors include Smokey Gray, Spanish Leather and Sandstone. Vision also includes the Solid Core Difference throughout each board for strength and moisture resistance. Manufactured from 95 percent recycled content, MoistureShield is available in grooved and solid-edge profiles and is protected by a 50-year structural warranty and limited 50-year fade and stain warranty.

moistureshield.com // Circle No. 48



PHOTO: WADE WORKS CREATIVE



34 VINYL COMPOSITE WALLCOVERING LOOKS LIKE WOOD, STONE

Vercade Wall Fashion offers 3-D, textured wall products in the style of natural stone and hardwood for interior walls. Vercade, which is easy to clean and maintain, can be installed quickly. Available in 6- by 48-inch planks and 12- by 24-inch tiles, the vinyl composite material can be used in virtually any sprinklered interior (as referenced by the International Building Code). Myriad patterns can be achieved with Vercade in horizontal and vertical formats. A pillowed-edge lends a realistic look and feel to each product and helps minimize the effects of wall imperfections.

vercade.com // Circle No. 49

35 DURABLE DECKING, CLADDING PRODUCTS ARE REAL WOOD



Drift from Thermory offers the increasingly popular look and texture of reclaimed-wood decking and cladding. The product utilizes thermally modified spruce, pine or ash for consistent quality and stability and offers Class 1 durability (25-plus years) for resistance to rot and decay. Produced

in Estonia, the thermal-modification process uses only heat and steam to create real-wood products that combine durability and moisture resistance without sacrificing strength. Drift decking, which is available in dimensions of 5/4 by 6 inches and 1 by 6 inches in lengths of 6 to 16 feet, features solid and grooved profiles for installation via a proprietary hidden fastening system. Drift cladding, which comes in seven silver/gray color options and dimensions of 1 by 6 inches and 1 by 8 inches in lengths of 6 to 16 feet, is designed for a blind fastener installation.

www.thermoryusa.com // Circle No. 50



36 PANELS RESIST DAMAGE IN HIGH-TRAFFIC AREAS

EXTECH/Exterior Technologies Inc. offers its CLEANWALL porcelain wall panel system for safety, durability and easy cleaning in transportation centers, pedestrian walkways, parking structures, restrooms and high-traffic publicly accessible applications. The system resists graffiti, vandalism, scratching, chipping, gouging and environmental damage. Its smooth finish, rounded corners, enclosed edges and concealed fasteners provide for no-hassle maintenance. The panels' noncorrosive, heavy-gauge aluminum framing allows for quick installation and individual panel replacement. CLEANWALL's flexible design accommodates variable panel sizes, signs, lighting, and other fixtures and devices. EXTECH provides CLEANWALL in fully prefabricated sections ready-to-install over a wide variety of substrates and adaptable to uneven substrates and varying field conditions.

extechinc.com // Circle No. 51

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37 HARDWARE COMPLEMENTS WINDOWS AND DOORS

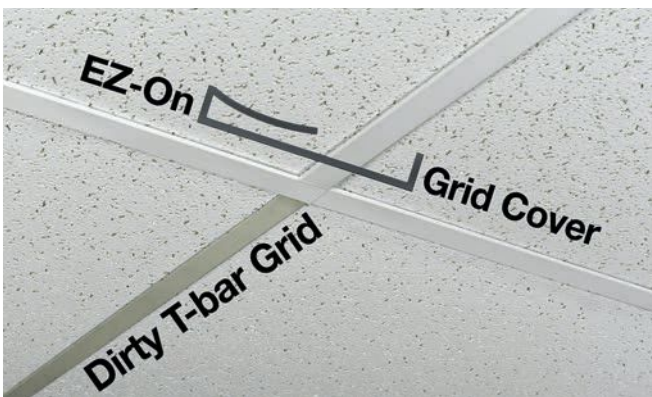
Kolbe Windows & Doors has introduced two hardware options designed to coordinate with its VistaLuxe Collection. Kolbe's Ashlar handle, which comes standard on VistaLuxe Collection casements and awnings, is available as an option for Ultra Series and Heritage Series. Constructed of metal, it has a square silhouette to complement the characteristics of the VistaLuxe product line. The crank-out

handle is available in white, satin nickel, rustic umber and matte black finishes. In addition, the two-toned matte black/brushed gold Dallas handle adds to any VistaLuxe Collection entrance or swinging patio door. The lever is brushed gold, and the escutcheon, turn knob and key cylinder are matte black. This finish option also is available for Kolbe's Ultra Series and Heritage Series inswing and outswing doors.

kolbewindows.com // Circle No. 53



Dallas



39 RETROFIT EXISTING CEILING T-BAR GRIDS IN SUSPENDED CEILINGS

EZ-On Grid Covers from Ceilume are a solution for suspended ceiling T-bar grids that have become stained, damaged or yellowed with age. The system has only two components: one to cover grid members, the other for perimeter angles. It installs on virtually all grids with 15/16-inch (1-inch nominal) flanges. The vinyl strips slide over the T-bar and snap into place. No pre-cleaning is needed; no adhesives are applied; and no tools or special training are needed. A 400-square-foot room could be completed by one person in about an hour without removing panels. Made from 100 percent recyclable rigid vinyl in a cool-white, semi-gloss surface, EZ-On grid covers require no maintenance and are easy to clean with soap and water. Impervious to moisture, they resist mold growth and are non-yellowing.

www.ceilume.com/ez-on // Circle No. 55

38 HVLS FANS INTEGRATE WITH BUILDING MANAGEMENT SYSTEMS

Greenheck has added two models to its line of AMCA-certified high-volume low-speed (HVLS) fans. Model DS-3, a three-blade HVLS fan for large commercial and industrial spaces, offers capacities up to 176,900 cfm and is available in 8- to 24-foot sizes. Model DC-5, a five-blade HVLS fan, featuring a lightweight design to complement office spaces, restaurants and more, offers capacities up to 55,800 cfm and is available in 8- to 14-foot sizes. Both models can be paired with a keypad control capable of operating up to 10 HVLS fans at the same speed setting with the same direction of rotation. A more advanced touchscreen control with BACnet capability is also available. The touchscreen control allows users to integrate their HVLS fans with a building management system, giving it full control over the fans and the ability to monitor fan status including fault histories. The touchscreen control also is available with temperature and humidity sensors for automatic fan operation based on changes in building conditions.

www.greenheck.com // Circle No. 54



Located in the historic Carnegie National Bank building, Citizen's Bank offers a wide range of financial services to residents of the Carnegie, Pa., community. Because of the age of the building (92 years), representatives of Citizen's Bank faced a variety of challenges caused by an outdated and inefficient HVAC system. In particular, the 25-foot ceiling height of the main bank lobby made it difficult to effectively distribute air and keep customers comfortable at ground level, leading to high energy bills each month.

Citizen's Bank representatives improved air distribution in their building by installing a high volume, low speed (HVLS) ceiling fan from Greenheck. By gently circulating air through the space, Greenheck's HVLS fan has improved the performance of the bank's HVAC system, allowing occupants to increase their thermostat setpoint by 6 degrees and maintain occupant comfort. The fan also was easy to install.

Branch Manager Sarah Peck says: "The design and placement of the fan adds a wow factor for our customers and is a great conversation starter. Overall, it is a quiet fan that has helped tremendously by making our customers and employees feel cool and comfortable."



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Circle No. 56

STARLINE



40 TEMPER VENTILATION AIR WHILE SAVING ENERGY

Daikin's Rebel DOAS with CORE pairs the high efficiency of Rebel's inverter compressor, which maintains consistent tempering of ventilation air, with energy savings of CORE's full enthalpy heat exchanger to provide clean, cool, dry air to an occupied space. From the moment the required volume of ventilation air enters Rebel DOAS with CORE, the air is pretreated with full enthalpy heat transfer in the CORE while having less than 0.5 percent exhaust air transfer ratio to maintain the air's purity. Traveling through the MERV 14 filters removes greater than 75 percent of airborne particulates as small as 0.3 to 1.0 microns, cleaning even smoke from the air. In cooling season, the air will be conditioned with the two-point independent



control of the evaporator and modulating hot gas reheat coil, allowing for control to specified dry and wet bulb leaving air temperatures.

www.daikinapplied.com // Circle No. 57

43 VRF SYSTEMS FEATURE UP TO 30 PERCENT SMALLER FOOTPRINT

Mitsubishi Electric Trane HVAC US LLC has introduced CITY MULTI N-Generation outdoor units that deliver better energy efficiency and personalized comfort control to commercial building applications. The N-Generation features a footprint up to 30 percent smaller than previous models and offers more design flexibility because of improvements in vertical piping limits, which have been increased from 164 feet to 295 feet. The units, which are available in 6- to 32-ton capacities, include a four-sided heat exchanger delivering increased heating capacity

within the reduced footprint. They also feature an improved compressor and fan design with five airflow settings that vary the units' noise output.

nextgenvrf.com // Circle No. 60



41 LIMESTONE VENEER IS ROUGHHEWN INTO ASHLAR PROFILE

Eldorado Stone has released its Grand Banks Limestone collection, which adds accents of rust and gray-green balanced with cream and silvery blue hues. The profile is hand-dressed to provide a chiseled, textured stone shape roughhewn into a rectangular ashlar profile. The architectural stone veneer ranges from 2 to 8 inches in height and 4 to 17 inches in length with an average stone size of 6 by 12 inches. In addition to Grand Banks, Limestone is available nationwide in San Marino, Savannah and York color palettes.

eldoradostone.com // Circle No. 58



42 UNDERLAYMENTS PROVIDE OPTIONS FOR VARIOUS ROOF SYSTEMS



HydraShell MAX, a standard synthetic underlayment, and HydraShell Supreme SA, a peel-and-stick underlayment, are McElroy Metal's new underlayment offerings.

HydraShell MAX's four-layer construction can be used under all types of finished roofing materials, including steel roofing. It can be used on roof slopes as low as 1/2:12 and requires fewer fasteners. HydraShell Supreme SA is a suitable option for high-temperature, self-adhering applications. The SBS modified asphalt offers pliability, and the cool gray surface reduces heat buildup.

www.mcelroymetal.com // Circle No. 59

Oak Run Middle School, New Braunfels, Texas, was in need of a new roof because the existing trapezoidal metal roofing panels were leaking. The Kovacs Group, Comfort, Texas, and Arkmo, Flower Mound, Texas, collaborated on an effective and efficient watertight roof re-cover that also met more demanding energy codes. America Roofing of San Antonio was the installer.



Sub-purlins from Roof Hugger were installed on top of the existing roofing. Three-inch-thick polyiso foam board was tapered on the edges to neatly fit in between the 24-inch, 24-gauge trapezoidal panels. Then another 1 1/2-inch layer of polyiso foam board was installed on top with an R-value of 19 to meet the energy code. Foam board insulation was chosen so the new roof would be walkable.

During roofing installation, HydraShell underlayment was rolled out to cover the foam board and provide a safe, dry and walkable surface for the roofers. HydraShell's SBS modified asphalt provides pliability, and the cool gray surface reduces heat build-up.

The 238T symmetrical standing-seam system from McElroy Metal was safely installed to complete the roof re-cover.

44 CONNECT PEX TO COPPER WITHOUT A FLAME

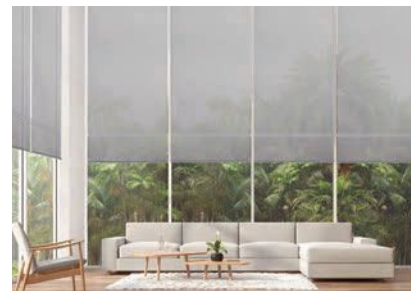
With plumbing professionals looking for flameless solutions that make hybrid PEX-to-copper connections quick and easy, Uponor North America has launched its ProPEX copper press adapters in sizes from 1/2 to 3 inches. Manufactured from lead-free brass to meet local and national potable-plumbing codes, the press adapters don't require new tools or processes and are backed by Uponor's 25-year transferable limited warranty. The adapters also incorporate a patented design for securely fastening the pipe and fitting together, eliminating the need for a stainless-steel ring.

uponorpro.com // Circle No. 61



45 WINDOW SHADES ARE NATURALLY RESISTANT TO FLAMES

Draper Inc. now offers window shades made with Mermet USA's GreenScreen Nature sustainable shade fabric. GreenScreen Nature, which is recyclable, is constructed of 100 percent natural fiberglass material. As such, GreenScreen Nature does not require additional FR additives to make it resilient to burn and flame. GreenScreen Nature is GREENGUARD and GREENGUARD Gold Indoor Air Quality Certified, RoHS Compliant (free of heavy metals), fire retardant (NFPA 701-10 TM#1, California U.S. Title 19, and CAN/ULC-S109 Small & Large Scale), fungal-resistant (ASTM G21) and bacterial-resistant (ASTM E2180). The fabric also is Red List-compliant and has a health product declaration.



www.draperinc.com // Circle No. 62



46 STONE VENEER IS 36-INCHES LONG

Oldcastle APG's Echelon brand has introduced Aria Slim Stone full-depth veneers, which deliver a linear profile with a modern aesthetic and versatile design. Available in five colors and four finishes, Aria Slim Stone's linear profile enables the application of the same veneer on façades and in corners. The 36-inch-long veneer design offers a solution to the labor shortage by reducing installation times while a full 3 5/8-inch bed depth enhances durability.

www.echelonmasonry.com // Circle No. 63

47 SPRAY FOAM IS APPROVED BY NATIONAL FLOOD INSURANCE PROGRAM

As storms continue to ravage coastal areas, communities are looking to build with stronger, more advanced materials designed to better withstand extreme weather events. The Demilec Heatlok Series Closed-Cell Spray Foam offers the newest technology advancements in medium-density, compact installations with products proven to be air, vapor and water resistant. In addition to being named a National Flood Insurance Program Class 5 building material, the Demilec Heatlok Series of closed-cell spray foam products is engineered to be eco-conscious and offers expedient installation options, as well as downstream energy return on investment.



Post flood, drywall is removed and Demilec insulation is intact.

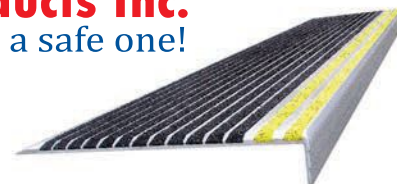
www.demilec.com // Circle No. 64

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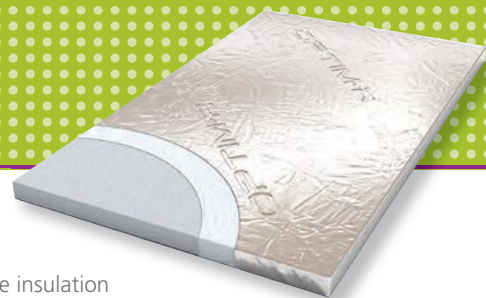
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Circle No. 65



48 THIN INSULATION PROVIDES HIGH R-VALUE

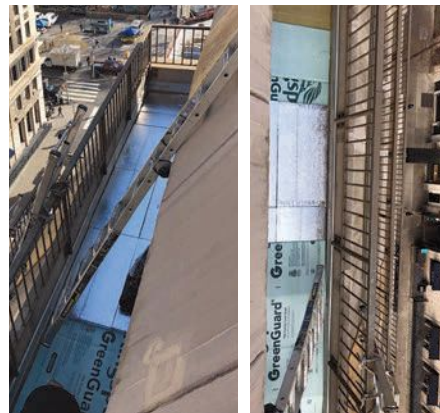
Kingspan Insulation has debuted OPTIM-R next-generation insulation for roof systems. The insulation comprises rigid vacuum insulation panels with a microporous core, which is evacuated, encased and sealed in a thin, gas-tight envelope. The high level of thermal efficiency—up to R-28 on 1 inch and R-57 on 2 inches using calculated edge thermal-resistance properties—combined with minimal thickness, provides a solution for applications where a lack of construction space or depth is an issue.

www.kingspaninsulation.us // Circle No. 66

When one of New York's largest and most prestigious universities needed to update perimeter conditions of one of its student housing buildings, the architect and engineers chose Kingspan OPTIM-R Vacuum Insulation Panels as the solution. The building's roof and terraces needed to be brought up to code and waterproofed for leaks because of issues with door thresholds and parapets, all within six to 10 days.

Between 1,500 and 1,800 square feet of Kingspan OPTIM-R Vacuum Insulation Panels were used in the retrofit project. In this particular building, the existing roof system's insulation

thickness was minimal, and the doors and through-wall air-conditioning units were very low. The distance from the top of the existing concrete deck to the bottom of the air-conditioning unit wall penetration was less than 8 inches. If traditional insulation had been used, the top of the new roof system would have been just at the level of the wall opening. Kingspan OPTIM-R is suitable for applications like this, where lack of construction space or depth is an issue. It also was a cost-effective and efficient solution, saving the client money and time without having to make costly modifications to the existing perimeter conditions.



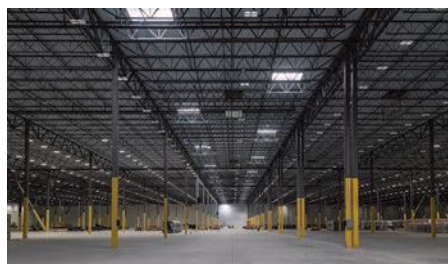
DYNAMIC DOME

49 SKYLIGHTS BRING DAYLIGHT INTO COMMERCIAL SPACES

VELUX America offers an expansive, customizable commercial skylight product line. The Dynamic Dome is engineered to capture more daylight in the early morning and late afternoon. The design promotes increased energy efficiency, allowing a building's lights to stay off nearly an extra hour per day. The VELUX Modular system is a prefabricated system that requires no onsite glazing to save time and allow for installation in nearly any weather condition.

It comes in six configurations and customizable designs with fixed and venting skylights designed to look identical whether open or closed. Structural skylight systems offer limitless design possibilities with sizes and shapes to fit any architectural vision. Many of the framing systems support spans of up to 40 feet with glazing options, including energy-efficient glass, hurricane-rated glass and polycarbonate. Structural skylights are available in Cluster and Extruded Gutter Systems, Continuous Vault Systems, Double Pitch, Extended Pyramid, Lean-To, Low Profile, Octagonal Pyramid, Single Pitch, Square Pitch and Structural Ridge.

www.veluxusa.com/professional/commercial // Circle No. 67



The Sparrows Point Terminal distribution center, Baltimore, underwent a renovation to transform it into a modern intermodal hub with warehouse/distribution centers, rail and marine access. At the center of the warehouse/distribution component is a 1.3-million-square-foot distribution center. The distribution center developers specified a single 20-year warranty for the skylights, roofing and lighting systems that could contribute points toward LEED Silver certification.

The 276 Dynamic Dome Commercial Skylights installed on the distribution center harvest sunlight earlier in the morning and later in the afternoon when the sun is low on the horizon. They work in tandem with

an automated LED lighting system, which gradually dims the LEDs as more sunlight illuminates the interior to help save on lighting costs.

Skylights and the white TPO roof membrane work together to boost the building's energy efficiency. The TPO roof reflects light and heat away from the building while the skylights provide natural light inside.

Installed at intervals to create overlapping light spill, the skylights create an evenly lit space for distribution center workers. On a sunny day, the level of light directly under the Dynamic Domes in the warehouse reaches 76 foot-candles, well above the 50-foot target for high visual task environments.

50 BARN DOORS TRANSMIT LIGHT

Hy-Lite has introduced the Barn-Lite sliding door system. Suitable for adding privacy options in residential and commercial locations, the doors are available in Wave and Glacier acrylic blocks. Each block is 9 by 9 inches with a depth of 1 1/2 inches. The doors measure 38 by 83 inches, and each door has a four-block-across by nine-block-down configuration. Architectural-grade vinyl frames surrounding the units are available in white and bronze. The Barn-Lite doors are supported by durable steel hardware overhead in a black satin color. The doors are backed by a 10-year limited warranty.

www.hy-lite.com // Circle No. 68



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General Shale

Artful RECYCLING

An Abandoned, Graffiti-covered
'70s Industrial Building in
Eclectic East Austin
Becomes an Office
Full of Color, Light
and Character

Industrial buildings from the
1970s and '80s are a difficult
retrofitting challenge, but
UPCycle proves it can be done.

before

before



Each year in the United States, hundreds of old warehouses are lovingly renovated and given new life: as offices, art galleries, restaurants. Often with steel-framed windows, skylights, thick masonry and concrete floors, old-school warehouse aesthetics are a big part of the appeal. But those buildings overwhelmingly tend to have been built in the early 20th century, before World War II.



A DECOMMISSIONED FREIGHT TRAIN CAR SIGNALS THE BUILDING'S PAST AS A SHIPPING FACILITY. SOURCED FROM SOUTH CAROLINA AND PLACED AT ONE OF THE BUILDING'S TWO ENTRANCES, IT NOW ACTS AS AN OUTDOOR LOUNGE.

BUILT ON SPEC AND INTENDED FOR A COMMUNITY OF FOUR TO SIX SMALL COMPANIES, **UPCYCLE** WAS INSTEAD LEASED ENTIRELY BY A LOCAL GROCERY CHAIN, HEB, AND ITS FOOD-DELIVERY SUBSIDIARY.



What happens when somebody decides to renovate a not-so-glamorous industrial building dating to 1972? What if it's a former recycling plant that has been vacant for a decade and has been referred to as a shed, not even attaining the "warehouse" status?

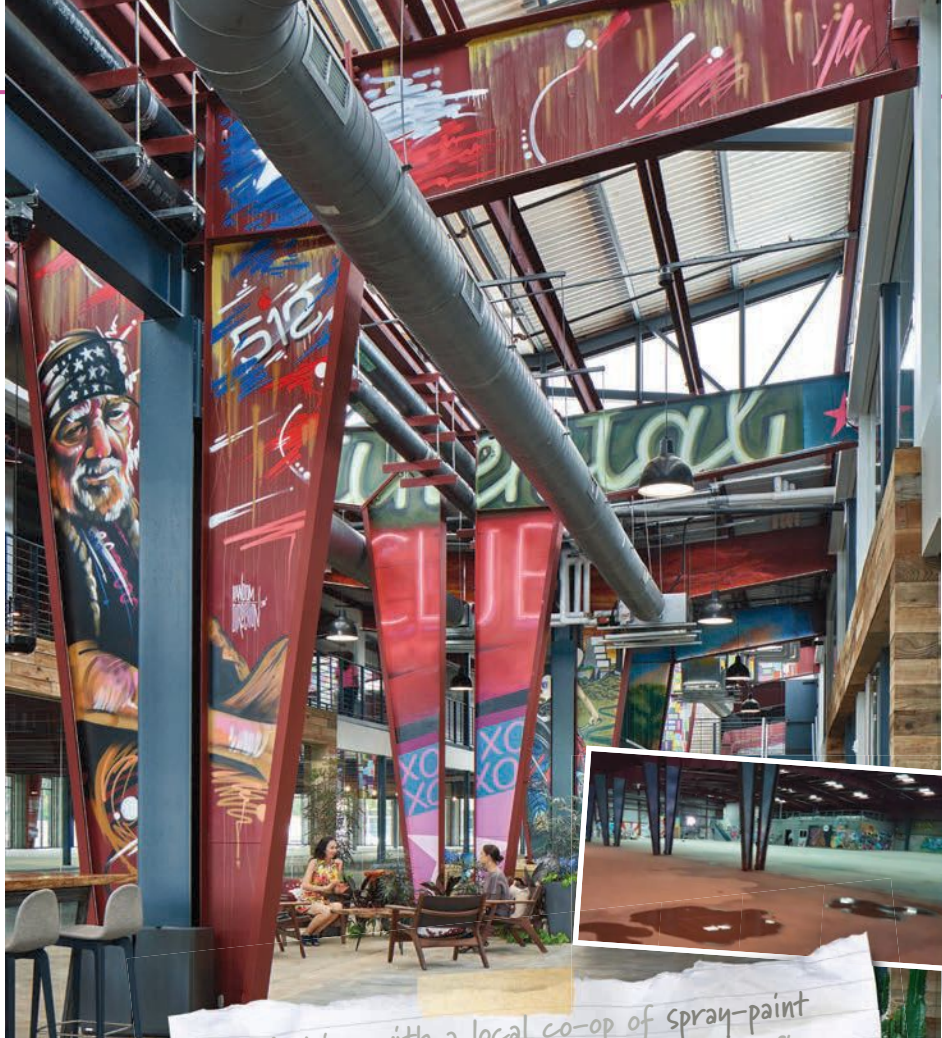
For the UPCycle project in Austin, Texas, and developer Curt Kremer of Denver-based EverWest Real Estate Investors, the decision to renovate instead of tear down and build new was still about authenticity, which meant recycling a recycling center that nobody loved—including a whopping 95 percent of its construction materials—and surprising people with what was possible.

"To me rehabbing an old brick warehouse is low-hanging fruit," Kremer says with a laugh. "They're expensive because the vision is easy to see." With less durable and beautiful materials, industrial buildings from the '70s and '80s are a more difficult challenge, but their authenticity can still come through. "We really loved the East Austin area and it was getting heavily gentrified. We wanted to do something that fit with the existing aesthetic," explains Kremer, now a managing partner with Scottsdale, Ariz.-based developer George Oliver Cos. "We didn't want to do something that just looked nice and pretty because the neighborhood didn't love that. We love it when people say 'we would have torn that building down'."

GRITTY AESTHETIC

The facility, with a floor plate of more than 60,000 square feet and comprised of two prefabricated steel-framed buildings side by side, was originally a manufacturing and shipping facility for drywall. It was later purchased by Balcones Recycling and converted into a recycling center. Yet after the recycling company changed locations, the building sat vacant for more than a decade. It became a kind of blank canvas for graffiti artists who tagged the building inside and out, especially its interior Y-shaped steel columns.

"I started to fall in love with some of the grittiness of the existing materials in the building: the big moment frames, the open spans," Kremer remembers. "We kind of wanted to just live inside this building with



Working with a local co-op of spray-paint artists, the building team commissioned five artists for the lobby and interior social areas.



Achieving 95 percent reuse meant creative solutions.



THE **STRUCTURAL-STEEL COLUMNS** DRAW ATTENTION WITH THEIR TAPERED SHAPES, A COST-SAVING MEASURE THAT BECAME UNINTENTIONALLY SCULPTURAL.

RETROFIT TEAM

ARCHITECT // Gensler, Austin, Texas, www.gensler.com

- TRAVIS ALBRECHT, project manager
- TODD RUNKLE, principal in charge
- CHRISTINA CLARK, designer
- CHRIS CURSON, architect
- MARK EPSTEIN, designer

LEAD DEVELOPERS // Curt Kremer, George Oliver Cos., Scottsdale, Ariz., georgeoliver.com, and Larry Lance, EverWest Real Estate Investors, Denver, everwest.com

GENERAL CONTRACTOR // The Burt Group, Austin, burtgroup.com

MEP ENGINEER // Integral Group, Austin, www.integralgroup.com

LANDSCAPE DESIGN BUILD // Big Red Sun, bigredsunaustin.com

CIVIL ENGINEER // Jones | Carter, Austin, www.jonescarter.com

STRUCTURAL ENGINEER // Cardno, Austin, www.cardno.com

the spray paint. We just had to figure out how to make it look like an office building on the interior and not lose the gritty aesthetic of it.”

To the architects in the Austin office of Gensler, which is best known for large-scale new-construction projects from airports and office towers to convention centers and hospitals, UPCycle was a blank canvas of its own: mostly just a row of steel columns in the middle and a corrugated metal roof. “It was a big column-free space with a nice high volume,” recalls Gensler Senior Associate Travis Albrecht, UPCycle’s project manager. “We wanted to maintain it as much as possible but transform into an office environment: perimeter windows and daylight in the middle.”

Albrecht and his Gensler team made the meeting point between the conjoined buildings a central public area, adding a bank of clerestory windows to the roof. “We realized that spine where the moment frames come together was going to become the most important part of the building,” Albrecht says. “That was our one big move that was additive to the overall structure and form. Because it sat in the valley of those gable roof forms coming together with the frame, it was a chance to bring the daylight into the middle,

which used to be the darkest point of the building.”

The structural-steel columns draw attention with their tapered shapes, a cost-saving measure that became unintentionally sculptural. The original spacing of the steel columns also enabled the architects to easily create a series of smaller rooms that now act as shared lobby space. “We didn’t have to add anything to them or around them to make them actually hold these different spaces as you march down the lobby,” Albrecht says. “It was great to really let the existing structure shine.”

The steel columns also provided an opportunity to connect the building’s future with its past artistically. Knowing the long-abandoned building had become a guerilla art-exhibition space, the team carefully removed several exterior plywood panels that had been covered in graffiti art and repurposed them as stall partitions in the restrooms. Working with a local co-op of spray-paint artists, the building team also commissioned five artists for the lobby and interior social areas. “We actually found a couple artists who had left art in the old building, whom we commissioned to create new work,” Albrecht says. “We

(continues on page 40)



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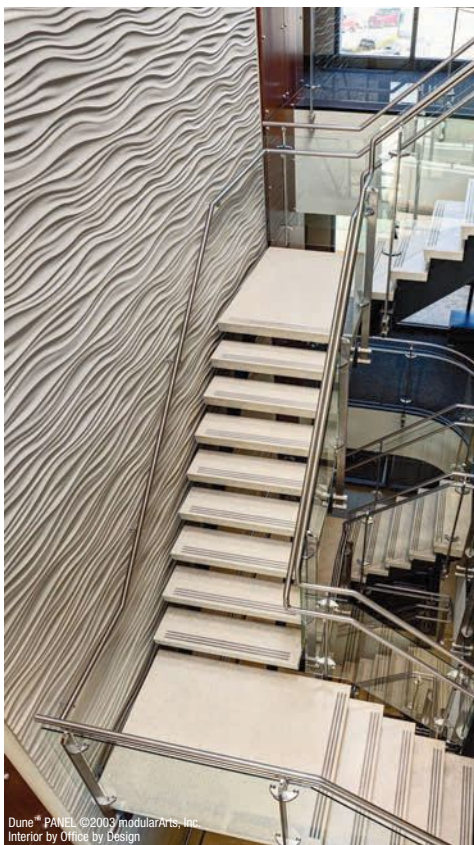


PHG LED High Bay



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really tied everything together, past and present.”

The project didn't stay empty for long, either. Built on spec and intended for a community of four to six small companies, UPCycle was instead leased entirely by a local grocery chain, HEB, and its food-delivery subsidiary.

95 PERCENT REUSE

To make the project pay for itself, the developers were determined to fit two floors into the existing volume. “Everybody said the clear heights weren't enough for a second floor,” Kremer recalls. But by investing in a high-efficiency chiller that takes up less space, large ductwork on the ceilings could be eliminated. “I think that's where we spent more [money] than people would expect: moving sprinklers, ductwork, lighting, allowing both the big areas and the small areas to feel big.”

Today's offices are all about creating a variety of spaces in which to work and socialize. Not only does the column-lined center lobby provide such space, but so too does an old decommissioned freight train car (signaling the building's past as a shipping facility). The developer sourced the car from South Carolina and placed it at one of the building's two entrances. “At first, we thought it would be a cool conference room,” Albrecht explains. “That became difficult because of having to air condition and insulate it. It doesn't look like a rail car anymore if you do that. Then it was going to be a bike locker room for the tenants. Eventually Curt said, ‘Why are we doing all this? We want people to experience this box car and celebrate it.’ Now it's more like an outdoor lounge.”

The architects also moved the north and south façades inward to create covered front porches for the building's north and south entrances, which are set back from Hidalgo Street (adjacent to an employees' surface parking lot) and busy Sixth Street. To enhance that sense of enclosure, permeable screens were added to the sides of the building, stretching to meet the awning. The new entry façades were clad in reclaimed wood—not from the building this time—a sourced

combination of cedar fence boards and shipping pallet material. The team also repurposed some of the many old exhaust fans left onsite, a must during the facility's days as an un-air-conditioned Texas warehouse. Welded in place for safety reasons, they no longer turn but are another decorative element mined from materials that, in less creative hands, would have been destined for the scrap heap.

Achieving 95 percent reuse meant creative solutions, like retaining the existing rusty metal façade panels by removing them, adding insulation, then reinstalling the panels inside-out, with half turned 90 degrees to create a checkerboard-like pattern. “They had still weathered a bit even on the inside,” Albrecht says, “but we used that to show the character and the history of the building.”

MATERIALS

INSULATED METAL PANELS // KarrierPanel from Kingspan, www.kingspan.com

PERFORATED ALUMINUM PANELS // Ecoscreen 3/4-inch Econolap from CENTRIA, www.centria.com

COMPOSITE DECK BOARDS // Symmetry Decking from Fiberon, www.fiberondecking.com

INTERIOR AND EXTERIOR WOOD CLADDING // Reclaimed Cedar Fence Boards and Shipping Pallet Material from Trestlewood, www.trestlewood.com

SKYLIGHTS // Skypro Skywave IR Dual Glazing from Skyco Skylights, www.skycoskylights.com

CURTAINWALL // 3250 Wall from U.S. Aluminum, www.crlaurence.com

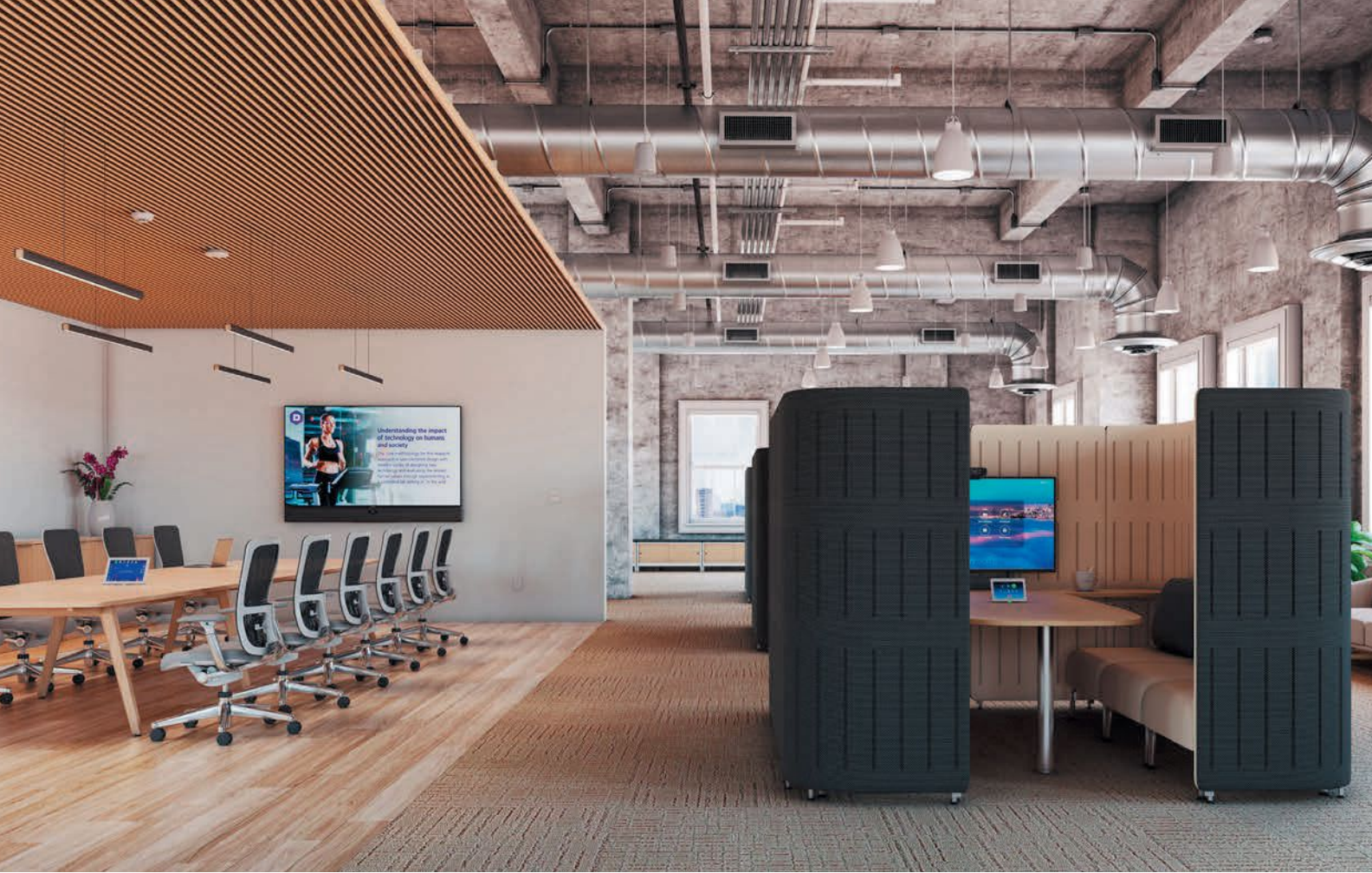
STOREFRONT // IT451 from U.S. Aluminum

TPO ROOF // Sure-Weld TPO from Carlisle Syntec, www.carlisesyntec.com

ROLLUP DOOR // Service Door Model ESD10 from Cookson, www.cooksondoor.com

GLAZED ROLLUP DOORS // 3295 Aluminum Full-View Doors from C.H.I. Overhead Doors, www.chiohd.com

CHILLER // Air-cooled Sinesis from Trane, www.trane.com

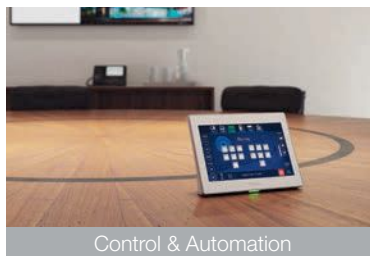


Technology That Blends with Your Design

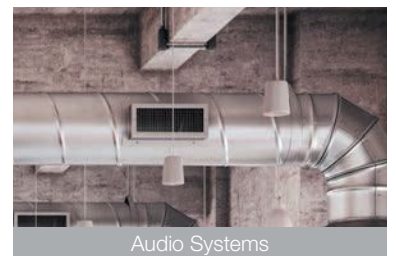
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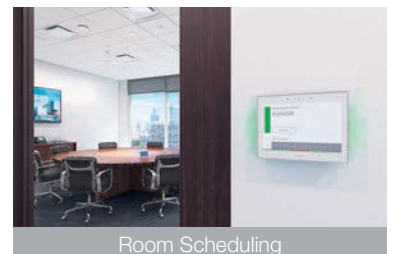
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» RETROFIT TEAM

ARCHITECT: ODA, New York, www.oda-architecture.com
 DEVELOPER: Triangle Assets, New York, www.triangleasset.com
 FAÇADE INSTALLER: KPA Façade Technology, Richmond Hill, N.Y., (347) 789-1212
 ENVELOPE CONSULTANT: Surface Design Group, New York, surfacedg.com

» MATERIALS

ODA dug into the site's history, drawing a series of skins that evoke sugar crystals, broken geodes and crystalline surfaces. The resulting curtainwall reflects the park and river sunsets that define the building's surroundings. The renovations restore the east, north and south original façades to their historical masonry condition, as well as the interior brick vault ceilings and columns. The façades and interior earned 15 permits from New York City's Landmarks Preservation Commission, which can hold jewel-box designs to intense scrutiny.

CUSTOM GLASS CURTAINWALL: KPA Façade Technology, (347) 789-1212, and Hankuk Glass Industries Inc., www.saint-gobain.com/en/hankuk-glass-industries-inc

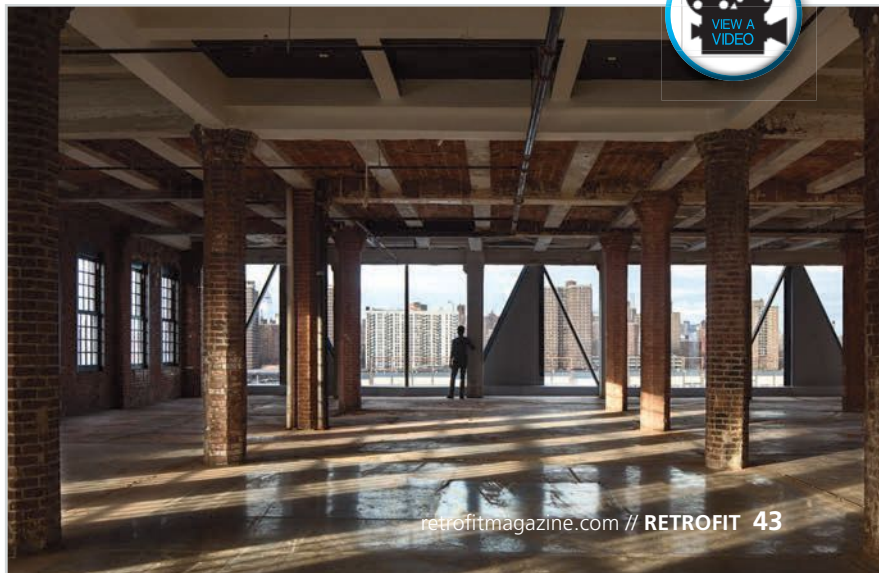
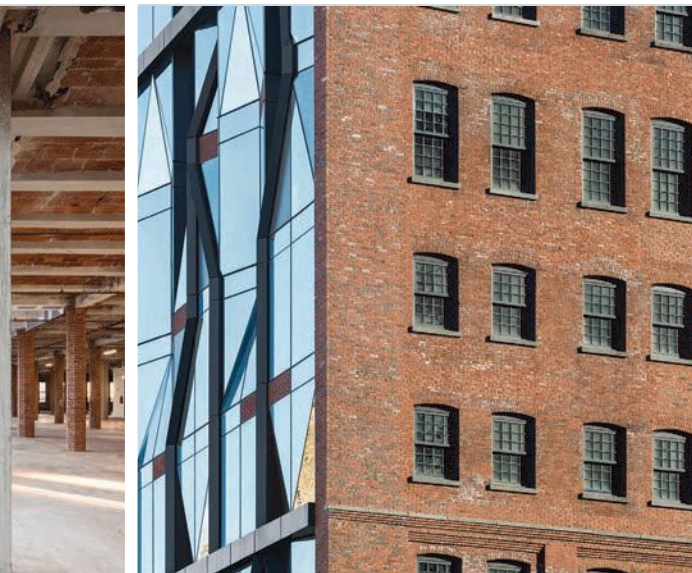
» THE RETROFIT

Formerly, the Arbuckle Brothers sugar refinery, which dates back to 1898, 10 Jay Street was a massive structure that reached all the way to the water, where boats could dock for deliveries and services. In 1925 it was converted into a winery and, later that decade, the front structure was torn off, leaving three of the original façades and an interior party wall exposed to the East River shore. For 50 years the building was vacant and fell into disrepair until purchased by family-owned Triangle Assets in 1991.

When it came time to renovate, Triangle Assets' team wanted a design that would preserve the unique history of the building while integrating into the 21st century fabric of DUMBO, an acronym—Down Under the Manhattan Bridge Overpass—referring to the neighborhood. The 10-story building features 23,000-square-foot floorplates and interior terra-cotta arches, as well as interior detailing and characteristics of the industrial age.

Triangle Assets challenged ODA to reimagine the building for larger commercial businesses. "It was important to us that our building was hugged by the park. As the only privately owned building in all of Brooklyn Bridge Park [all other waterfront buildings hold 99-year leases], we wanted to make sure that we were making a statement that we could stand by for years to come. You can see this building from every direction, from land and sea, it's definitely the crown jewel of DUMBO," explains Benjamin Stavrach, director of Leasing and Property Management for Triangle Assets.

The building offers open floors for dynamic office arrangements to enjoy wide views of Manhattan and Williamsburg's waterfront. Vaulted ceilings and exposed brick meet the full-height glass curtainwall. "10 Jay Street is a great example of the guiding principles that should steer the development of our future cities," explains ODA Founder and Architect Eran Chen. "It's a fresh approach to preservation; the mixed-use program gives the building a new purpose, shifting business hubs from city centers to peripheral neighborhoods, making DUMBO a place to live, work and play. The outcome is intended to be both beautiful and provocative. I believe 10 Jay will stand as an example for growing cities around the world."



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corbinrusswin.com/ml2000indicator
or sargentlock.com/8200indicator.



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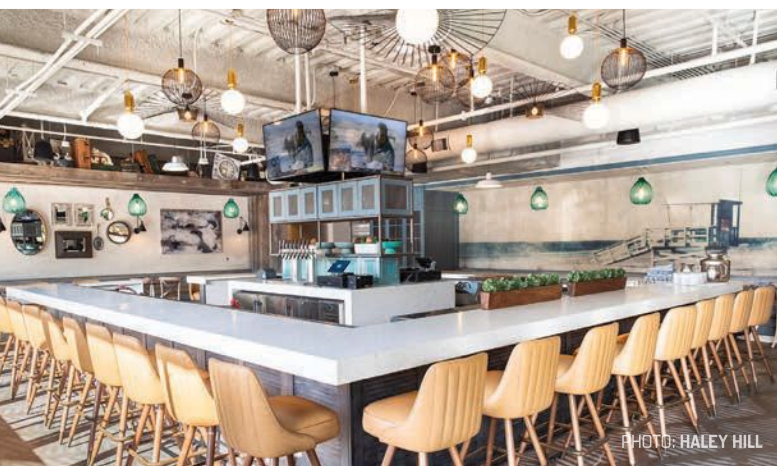


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KILROY SABRE SPRINGS | San Diego



►► RETROFIT TEAM

ARCHITECT AND INTERIOR DESIGNER: Ware Malcomb, San Diego, waremalcomb.com

GENERAL CONTRACTORS: DCT, San Diego, dct-sd.com; Burger Construction, San Diego, www.burgercon.com; and Bycor, San Diego, www.bycor.com

►► MATERIALS

The 450,000-square-foot campus includes three 6-story office towers. The project entailed the transformation of 30,000 square feet of lobbies, restrooms, and common areas to activate multiple indoor and outdoor amenity spaces and attract new tenants.

The following materials were used in the renovation:

LIGHTING

- The original 18-inch-diameter Sky Chief pendant and Exeter wall sconce in Old Bronze finish from Barn Light Electric Co., www.barnlight.com
- 16-inch-diameter Harper pendant in Surf Green finish and Gambit 19-light chandelier from Tech Lighting, www.techlighting.com
- Non Random pendant in white finish from Moooi Lighting, www.moooi.com
- Vertigo pendant in black finish from Petite Friture, us.petitefriture.com/en
- Custom metal rod fixture with globe shade from C.W. Cole & Co. Inc., www.colelighting.com
- Fili pendant in black finish from Scangift Inc., www.scangift.com
- Aballs T ME in gold finish from Parachilna, www.parachilna.eu/en
- Parallel cylinder by Jackson Schwartz and Joe Limpert in dark bronze/bronze finish from Hennepin Made, www.hennepinmade.com

FINISHES

- Arthur Slenk remixed wallpaper from NLXL, www.nlxl.com
- Orco Mac Misty in Glacier White finish from Endicott Tile LLC, endicott.com
- Oldker/S1FPEOLD tile from SomerTile, sometile.com
- NOA – L / NOW – R in Vancouver dark finish from Porcelanosa, www.porcelanosa-usa.com
- Kerlite metal/Corten from SpecCeramics, specceramics.com
- Signs in white texture from Stone Source, www.stonesource.com

►► THE RETROFIT

The heart of the Kilroy Sabre Springs campus is a culinary hub that offers an all-day dining experience. The new restaurant, The Florence by San Diego-based Legal Restaurants, is designed to provide a variety of eating and drinking options from grabbing a quick breakfast to sharing a cocktail after work. Named after the late San Diego swimming legend Florence Chadwick, the decor honors her accomplishments, which include being the first woman to swim both directions of the English Channel. With coastal influences and architectural references to decades past, the interior design evokes an escape from the traditional office setting once housed there. Layered textures, soft hues, and warm woods are complemented by operable windows at bar seating, inviting the summer breeze in, and connecting views with the outdoor seating and "Boat House" shade structure in the center courtyard.

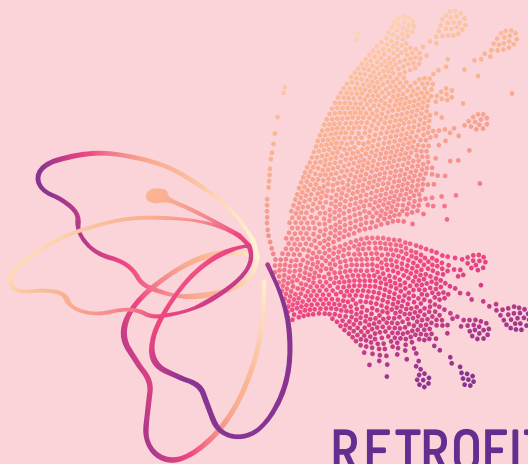
Other reimagined amenities include the REV fitness center, as well as the outdoor common areas, which now include fire pits and a regulation-sized bocce ball court.

"The Kilroy Sabre Springs campus has been completely reinvented as a highly desirable place to work and play for both new and existing tenants," says Tiffany English, principal of Ware Malcomb's San Diego offices. "By bringing world-class dining and other amenities to this busy office campus, Kilroy Sabre Springs has become a leading destination for San Diego businesses."

Kilroy Sabre Springs was recently named Best Redevelopment project at the *San Diego Business Journal's* 2019 Commercial Real Estate Awards.

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54 MIDDLESEX TURNPIKE

Bedford, Mass.



►► RETROFIT TEAM

ARCHITECT: Dacon Corp., Natick, Mass., www.dacon1.com

IMP INSTALLER: Controlled Environment Structures LLC, Mansfield, Mass., cesweb.com

►► MATERIALS

Because the owner wanted to bring this 1970s facility into the 21st century, insulated metal panels (IMPs) were specified for the 2-story office building. Approximately 16,000 square feet of 3-inch CF Architectural IMPs in 24- and 36-inch widths were installed. IMPs, with an exterior skin of 22 gauge and an interior skin of 26 gauge, were installed over the existing split-face masonry wall using a custom clip to metal studs.

"The original building was constructed in two phases," says Michael Frechette, AIA, of Dacon, noting the casual observer could notice the differences in the construction phases. "Insulated metal panels allowed us to pull it all together and provide the updated aesthetic the owner was seeking in an energy-saving system."

Horizontal IMPs were installed in widths consistent with windows and other design elements of the building. Frechette says the Middlesex Turnpike office building now boasts a clean, consistent look all around the building.

"It's a lot more difficult to do a horizontal renovation than a new vertical installation," says Dave McGrath, sales engineer, Controlled Environment Structures (CES). "We had to line up our seams with the mullions on the storefront windows. There is a lot of custom field work because we weren't working off a blueprint; these are field conditions."

Half the IMPs were Regal Gray and half were Polar White. "It was a dramatic transformation," Frechette adds. "The original concrete masonry unit was a very rough surface, but CES came up with a clever solution to attach the insulated metal panels to a sub-framing system. Now, you'd never know there was basically a concrete block building under there."

Another challenge was working with panels that have a smooth finish. "The quality of manufacturing has to be right on with smooth panels or it can become problematic," McGrath says. "Every imperfection shows up; you can't hide sins in a smooth panel, but the Metl-Span panels were perfect."

McGrath says the owner is extremely happy with the finished project and the building is attracting some attention. "They light it up with LED lights at night and it looks great," he says.

IMPS AND MANUFACTURER: CF Architectural from Metl-Span, www.metlspan.com





— | OFFICES & WAREHOUSES

STEELSCAPE LLC |

Kalama, Wash.

PHOTOS: ACUITY BRANDS



►► RETROFIT TEAM

LIGHTING INSTALLER: Steelscape maintenance and engineering staff, Kalama, www.steelscape.com

►► MATERIALS

A total of 355 light fixtures, as well as wireless controls, were used to upgrade the lighting at this 553,000-square-foot steel coating facility. The following were installed:

- American Electric Lighting Autobahn outdoor LED area luminaire
- Holophane Phuzion and Petrolux LED high-bay luminaires
- XPoint Wireless control system
- nLight
- SensorView monitoring system and software package

In addition to a lumen-maintenance strategy (where lumen output is initially set to 80 percent to balance the common loss of output over an initial period), lighting is modified even further utilizing a task tuning strategy throughout the facility to meet workers' needs while maximiz-

ing energy efficiency. For example, a scheduling strategy was implemented by dimming and/or raising light levels at different times of day and per work station according to specific needs. The storage area now runs at 50 percent of the power it used prior to the upgrade, and a new controls schedule means nighttime savings at the plant are about 80 percent.

LIGHTING MANUFACTURER: Acuity Brands, www.acuitybrands.com

►► THE RETROFIT

Steelscape uses megawatts of energy on machinery operations. Consequently, the company's leaders discovered the facility's indoor and outdoor lighting were accounting for far too great a percentage of maintenance costs and creating a disproportionate amount of headaches, such as downtime and security risks, on the plant floor and elsewhere.

For example, outside the facility, the company's maintenance crew would replace several burned-out fixtures at once because maintenance was time-consuming and replacing one at a time

was simply too much trouble. The process of waiting for multiple burnouts, however, was less than ideal for safety and security. Inside the plant, a burned-out bulb or failed ballast usually meant taping off the darkened area and then working around active machinery and other plant operations to change out the bad part of the luminaire. To avoid such situations, the company often spent one or two 12-hour days just checking lights, which amounted to more than \$10,000 annually on maintenance.

Managed internally, the lighting upgrade was completed in a year's time and was followed by two full days of software training for key members of the Steelscape electrical engineering team at the Acuity Brands facility in Chatsworth, Calif.

Critically important, lighting-maintenance calls were reduced to virtually zero, but Robert Torres, an automation engineer with Steelscape who served as the project champion, is especially pleased that the completed system performs how he anticipated. "As an electrical engineer, my vision is to have control of machinery," he says. "Why not be able to control the lights? It's among the most visual equipment out there on the floor."

OFFICES & WAREHOUSES

1000 SANSOME

San Francisco



PHOTOS: RIEN VAN RIJTHOVEN



► RETROFIT TEAM

ARCHITECT: Lundberg Design, San Francisco, www.lundbergdesign.com, and MacCracken Architects, San Francisco, www.macarchs.com
CHANNEL GLASS CUSTOM FRAMING SYSTEM
FABRICATOR: Chris French Metal Inc., Oakland, Calif., www.cfrenchmetal.com

► MATERIALS

Prior to the renovation, the structure was a dimly lit, low-ceiling building with a second floor entrance. To create a more contemporary design, the architects opened up the space and increased the ceiling height. Large pieces of interlocking glass were installed in the lobby, forming large

glass walls, which increase transparency and allow light to move throughout the different rooms.

For the glazing throughout the lobby, the architects chose channel glass. The linear, U-shaped, cast-glass channels are self-supporting and mounted in a custom framing system designed by MacCracken Architects.

"Not only does the channel glass act as a beautiful divide between rooms, it also offers the durability we needed in place of solid walls," explains Daniel Robinson, principal, MacCracken Architects. "We were happy to have found a product that helped us reach the desired aesthetic; the glass allows light to diffuse into each part of the building."

CHANNEL GLASS AND MANUFACTURER: Pilkington Profilit from Technical Glass Products, tgpamerica.com

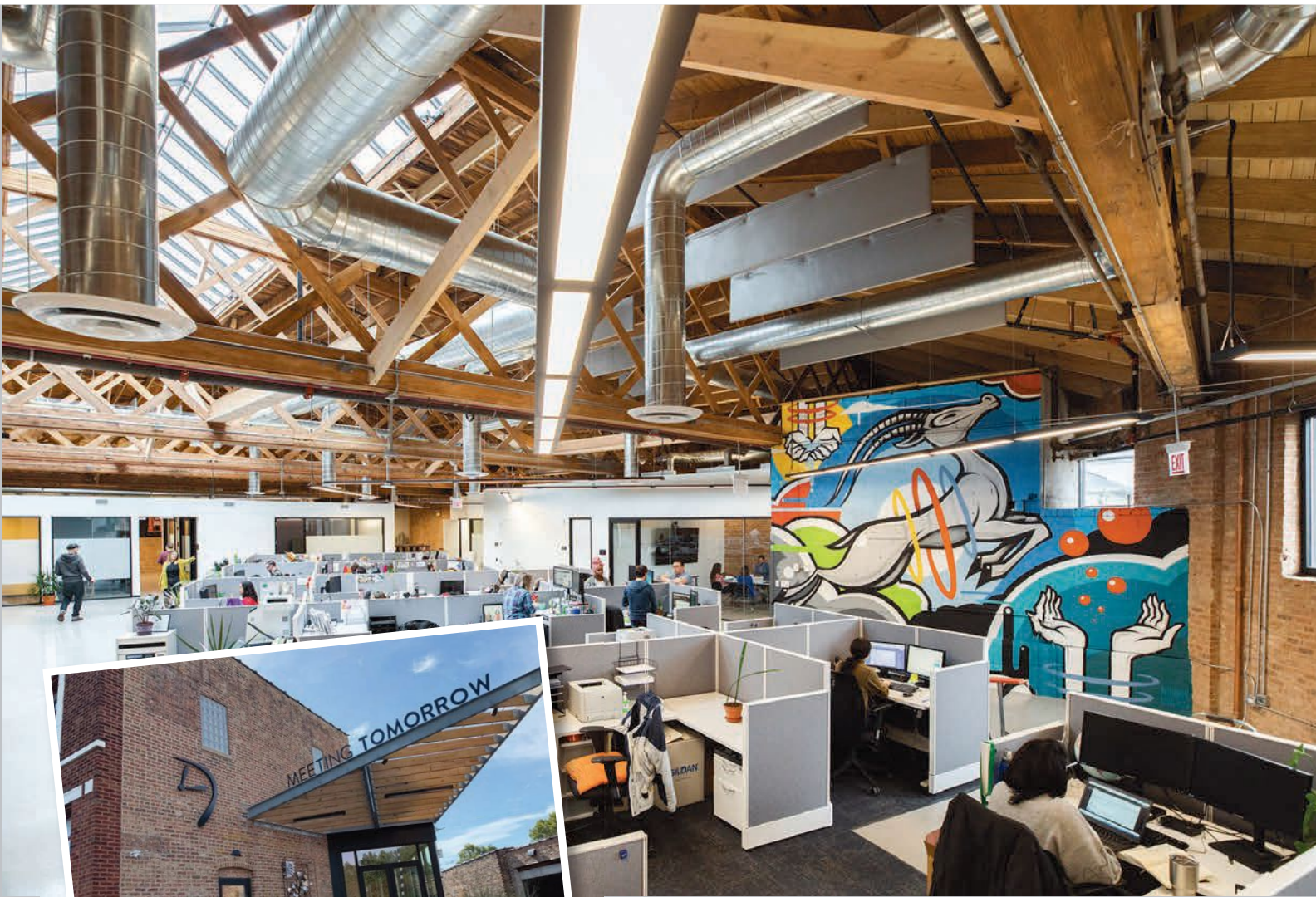
► THE RETROFIT

Located in the revitalized shipping district of San Francisco, this 4-story warehouse-turned-office space underwent a massive facelift.

At more than 60,000 square feet, the building was in stark contrast amidst the historic personality of homes and offices.

Lundberg Design and MacCracken Architects were tasked with updating the outdated space with a modern design and increased daylighting.

MEETING TOMORROW | Chicago



PHOTOS: MEETING TOMORROW

» RETROFIT TEAM

ARCHITECT: NELSON Worldwide, Chicago, nelsonworldwide.com
PROJECT MANAGER: RL Edward Partners LLC, Chicago, rlepartners.com

INTERIOR DESIGN: Meeting Tomorrow in collaboration with A. Delane Design, www.adelanedesign.com
GENERAL CONTRACTOR: Urban Innovations Ltd., Chicago, urbaninnovations.com

STRUCTURAL ENGINEER: Klein and Hoffman Inc., Chicago, www.kleinandhoffman.com

ACOUSTICAL ENGINEER: Shiner Acoustics LLC, Chicago, www.shineracoustics.com

» MATERIALS

CUSTOM TABLE MADE OF SALVAGED AMERICAN WHITE OAK: Crow Works, www.crowworks.com

CARPET UNDER WORKSTATIONS:

Interface, www.interface.com

LIGHTING SENSORS: Lutron, www.lutron.com

HVAC: York, www.york.com

FLOORING EPOXY: Sherwin-Williams, www.sherwin-williams.com

» THE RETROFIT

Built in the early 1920s for industrial uses, two buildings at the entry of Chicago's Albany Park neighborhood

have become the national headquarters for Meeting Tomorrow, a provider of technology, services and onsite support for nationwide corporate meetings and events.

By leveraging the natural features of the property—Chicago River setting, exposed brick, grand bowstring trusses, 30-foot-high ceilings, skylights and other architectural details—the team could take a minimalist approach to other building finishes.

All appliances are ENERGY STAR, and all lighting is connected to a sensor system that turns off lights when enough natural light is detected.



DEG | Cologne, Germany

PHOTOS: NANA WALL

►► RETROFIT TEAM

ARCHITECT: sop architects, Düsseldorf, Germany, www.sop-architekten.de

►► MATERIALS

The single-track sliding glass wall system, HSW60, enhances the "Cloud", flexible breakroom space on the ground floor. The HSW60 is a three-sided operable system that completely disappears when open. It creates an open corner design on two sides. With the vertical profile design of the HSW60, the system echoes the existing façade grid of the building's exterior shell and stylistically blends in as if it were part of the original building design.

To open the ground-floor breakroom area, 36 panels were installed with a total linear run of 107 feet and a height of 9 feet 3 inches. The panels move centrally from the front and symmetrically to each side and stack conveniently outside the plane of the opening in custom-designed parking bays. These panel parking bays are installed remotely and out of the way of the seating and tables. Additionally, the system has a no floor track option that was used to create an uninterrupted floor expanse. This flowing, threshold-free transition between the breakroom and atrium accentuates the floating nature of the "Cloud". Small embedded floor sockets are used to lock

the panels securely into place when the system is closed.

When needed, the closed system's thermally broken panel design and insulated laminated glass provide not only a warm barrier, but also the acoustical buffering needed in this office environment—all while reinforcing the overall translucent design intended by the architects. For traffic flow and convenience, the system is outfitted with four integrated swing doors that glide out of the way with the rest of the panels when the system is open. The engineering of the self-guided wheel technology makes the panels easy to move with a single hand.

GLASS WALL SYSTEM MANUFACTURER: Solarlux, the German partner of NanaWall Systems, www.nanawall.com/sliding-glass-walls

►► THE RETROFIT

To expand usable space in DEG's headquarters building, Architect Jochen Solbach and the sop architects team created a kinetic-like sculptural pavilion within the convertible glass-roofed atrium. Completed in 2018, the redesigned space serves as an open or closed event and breakroom for DEG's employees. The convertible glass roof is open on a regular basis in pleasant weather and transforms the atrium into an airy courtyard. To

gain flexible sheltered space for the workforce, the architectural firm embraced a room-within-a-room concept to add the much-needed year-round functional space. "Our idea was to extend the existing cafeteria with another room in the atrium with a dividable conference room [built overhead]—all integrated into an object that looks like a sculpture in the surroundings," Solbach says.

To accomplish this, the 2-story floating "Cloud" is constructed of diamond-patterned white skin on three sides with the fourth side being attached to the office interior. This lamella design consists of a crisscrossing of parallelograms that are hinged together to form a connected web of movable fins. The operable fins not only give the "Cloud" its kinetic appearance, but they also provide natural light and transparency or closed-off privacy in the elevated conference room as needed. This cloud-like component protects the transparently glazed conference room from the outdoor elements when the glass roof is open.

To achieve the levitating appearance of the "Cloud", V-shaped structural supports are used, mitigating the need for structural columns at the corners. This recessed V-support system gives the illusion of flotation to the covered conference room as if it were a "Cloud".

FORD ROTUNDA CENTER | Dearborn, Mich.

▶▶ RETROFIT TEAM

ARCHITECT: Ghafari Associates, Dearborn, www.ghafari.com
PANEL INSTALLER: Curtis Glass Co., Troy, Mich., www.curtisglass.com
GENERAL CONTRACTOR: Devon Industrial Group, Detroit, www.devonindustrial.com

▶▶ MATERIALS

To achieve a high-tech look with energy-saving, insulating properties, Ghafari Associates chose Thermolite glazing panels for the glazing inserts. Thermolite panels are constructed with an insulating foam core sandwiched between two corrugated, stabilizers and finished aluminum sheets, making them lightweight and quick to install.

More than 32,000 square feet of bright silver metallic Thermolite panels (more than 1,200 cut-to-size panels) were installed.

THERMOLITE PANEL MANUFACTURER: Laminators Inc., laminatorsinc.com

▶▶ THE RETROFIT

Ford Motor Co. is undergoing a multi-year transformation of its Dearborn campus, including updating its buildings into modern, green and high-tech facilities.



PHOTOS: LAMINATORS INC.



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NO PLACE LIKE *Home*

Architects Create Their Dream Home Within a Beloved Virginia Barn

WRITTEN BY | CHRISTINA KOCH

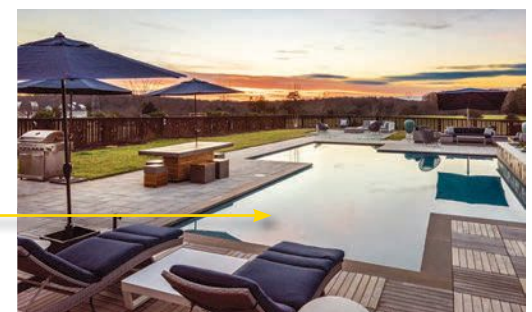
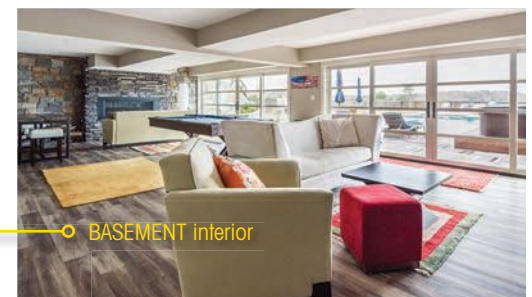
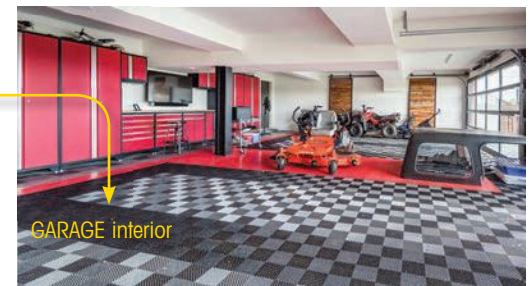
When making decisions, it typically is beneficial to follow our first instinct. Our intuition will lead us down the proper path—even if the outcome takes time to become apparent. Such was the case for Nea Poole, AIA, NCARB, principal of Midlothian, Va.-based Poole & Poole Architecture. She had a gut feeling her family's home could be created within a Dutch gambrel barn in the Richmond, Va., countryside the moment she saw the barn. Her husband

Mike Poole, AIA, NCARB, also an architect and a partner in Poole & Poole Architecture, was unconvinced.

"We drove down the little gravel drive and went around back and the land fell away," Nea recalls. "In the back, there was an entire basement level that was open; it had once been used to store equipment. Each of the four bays was 22-feet wide by 42-feet deep, so you could park 16 cars under the barn. With our urban house, my husband's biggest gripe had been our 'two-car' garage; it really just fits a car and a



PHOTOS: EASTMAN CREATIVE unless otherwise noted





lawnmower. When Mike saw the basement garage, he said, ‘OK, this might work.’

Thus began the four-year journey that would make the 1977 barn, known in the community as the Barn at Walnut Hill, into the Pooles’ dream home. “The amount of time it took was remarkable. If I had worked for another company, I would have been fired,” Nea laughs. “We knew the barn was very high profile, plus because we’re architects we really had to put our hearts into this because it was going to be a huge reflection of what we do for a living.”

A Structural Marvel

Although not technically historic, the Barn at Walnut Hill is

engrained in Richmond history. Louise and J. Harwood Cochrane—the couple who built the barn—are remembered fondly in Richmond. Harwood founded Overnite Transportation in 1935; he sold that business for more than \$1 billion in the 1980s. The Cochranes also owned tracts of land outside Richmond and had been cattle farming since the 1950s; they coined their farm Walnut Hill. When the Cochranes retired in their 90s, they donated the land, barn and their manor home to the Virginia Museum for Fine Arts in Richmond. Museum representatives and the Cochranes decided to create a neighborhood on the land, dividing it into 10- to 60-acre lots. The Barn at Walnut Hill is part of a 30-acre lot.

Before the Pooles bought the 42- by 82-foot barn, they invited

■ RETROFIT TEAM

ARCHITECT // Poole & Poole Architecture, Midlothian, Va.,
www.2pa.net

BUILDER // Portico Classic Homes, Richmond, Va.,
www.porticoclassichomes.com

INTERIOR DESIGN // Poole & Poole Architecture and Focus Design
Interiors, Atlanta, focusdesigninteriors.com

CUSTOM CABINETRY // Kitchen Design Inc., Newport News, Va.,
(757) 873-8887

STEELWORK FOR STAIRS/RAILS/SLIDING DOORS //
Ore and Fiber, Richmond, www.oreandfiber.com

■ MATERIALS

SIDING // LP SmartSide from LP Building Products, lpcorp.com

FLOOR FRAMING // Resolute I-joists from LP Building Products

SOLAR PANELS // Sigora Solar, www.sigorasolar.com

CUSTOM CONCRETE SINK // Creating Concrete, etsy.me/2P8elpz

ALL OTHER SINKS, TOILETS AND TUBS // Kohler,
www.us.kohler.com/us

FAUCETS, SHOWERHEADS, TUB FILLERS // Delta,
www.deltafaucet.com, and Brizo, www.brizo.com

KITCHEN APPLIANCES // Thermador, www.thermador.com/us

WINDOWS AND DOORS (Except Custom Front Door) //
Jeld-Wen, www.jeld-wen.com

AUTOMATED BLINDS // Bali, www.baliblinds.com

FANS // Big Ass Fans, www.bigassfans.com

MAJORITY OF LIGHT FIXTURES // Hubbardton Forge,
www.hubbardtonforge.com, and Big Ass Fans

RUGS // Chandra, www.shopchandra.com

GRANITE/QUARTZITE COUNTERTOPS // BBG, (804) 282-4707

TILE // Daltile, www.daltile.com

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

friends who are structural engineers to analyze it. "The barn was built like a bunker," Nea says. "There are 36-inch steel beams in the basement and 24-inch steel beams carrying the load of the gambrel roof. The floor joists are true 3- by 12-inch floor joists at 16-inches on center."

Nea made a joke to the engineers about Mike liking the barn because he can park 16 cars underneath it. "The engineers said 'Nea, you can park 16 cars inside the barn and you won't have a problem!'" she declares.

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The Pooles endeavored to maintain the structure that captured

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TREASURED *Sketch*



Louise and J. Harwood Cochrane built the Barn at Walnut Hill in 1977. Louise was an artist and actually drew the barn she wanted built. “She drew it as a Dutch gambrel because she felt like that was quintessential Americana,” explains Nea Poole, AIA, NCARB, principal of Midlothian, Va.-based Poole & Poole Architecture. Poole and her architect husband, Mike, transformed the barn into their dream home.

When Louise was 99 years old, she learned the Pooles bought the barn and she visited the site before work began. “She brought the original picture that the barn had been built from,” Nea recalls. “It was a little framed hand sketch. She was really lovely and just a very nice woman.”

After Louise passed away, about two years later, Louise’s daughter reached out to the Pooles and said she found the framed sketch in her basement. Nea was interested in a copy but Louise’s daughter gave her the original sketch. Today, Louise Cochrane’s sketch hangs proudly within the Pooles’ home as a reminder of the barn’s legacy.

their hearts. Original beams and posts are visible throughout. In fact, a name carved into one of the beams still is visible in the living room.

“We literally kept every single beam, every single column,” Nea explains. “Probably one of the most difficult design challenges was that—for reasons I truly don’t understand—the column and beam grid on the basement level doesn’t align with the column and beam grid on the next level; it’s shifted on the grid. If you have a beam in one place in the basement, it’s about 10 feet over on the next floor. The problem was getting vertical all the way through there, so the stairs were really tricky and, frankly, that’s why they’re not fully aligned.”

Framing also had to be done creatively. For example, in the basement, the team furred a wall out 2 feet in several places to run HVAC ductwork because the team could not work under the existing steel beams.

On the exterior, the Pooles wanted a covered entrance but attaching a porch to the barn didn’t look right, Mike says. Instead, they pulled the entry back 4 feet into the barn and left the original barn doors, which have been refurbished, to cover the new entryway if desired.

To avoid cutting new windows into the barn, the Pooles placed windows where vents already existed around the structure. This posed a challenge. “Now we had these big 4- by 7-foot windows

and had to design the house out around it,” Nea says. “One of the most difficult areas to design was actually the master bathroom because normally you get a pretty nice long run for vanities. We had two 4- by 7-foot windows in our bathroom so we put opaque glass on sliding barn hardware and it works great because when you’re in the shower, you can close the glass door and then when you get out and you want natural light, you just open it up.”

The Pooles also reused whatever they could from the minimal demolition that was done. For example, when the team cut the 12-inch floor joists to locate stairs going down to the basement, the Pooles reused what was cut out as the treads for those stairs.

Although the painted cedar siding on the barn was in poor condition, when the team pulled it off, they found the backside of the siding was unpainted and beautiful.

“We had them pile and store all the existing siding they took off,” Mike recalls. “We didn’t know exactly what we were going to do with it but once the powder-room walls were in place, for example, we realized this would be the perfect spot for it.”

The cedar siding also was used as the base of the kitchen bar and for wine closets in the living room.

(continues on page 62)

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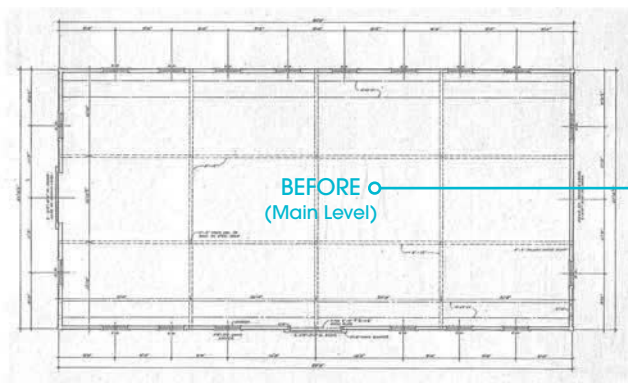
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Thinking about the Future

The Cochranes built the barn literally on a compass; the front doors are exactly due east, and the back of the barn is due west. Because there weren't any trees impeding the west-facing roof section, the Pooles specified solar panels, which encompass about 20 percent of the barn's roof. The pair installed metal roofing on the barn because it was the original roof when the barn was built; however, they found the existing roof was in great condition so they were able to maintain the existing roof under the solar panels.

"The barn facing due west, a tax credit and being able to use the existing roof under the panels economically put us pretty far ahead with the solar, so it's been a really good decision," Nea notes. "Our energy bills are running about what they did or less than the 4,000-square-foot suburban house we had prior to moving to the barn."

Mineral-wool insulation was specified throughout the barn, not only for its thermal properties but also because it offers good acoustical performance per Nea. The Pooles' children's rooms are on the second floor of the barn, above the master. Because

the Pooles love to entertain, they wanted to ensure their children wouldn't be awakened by any revelry. The Pooles specified the mineral wool in all four walls and the ceiling of the master under the kids' floors.

"We also put the mineral wool in their hallway walls for that sound barrier and it works better than I expected," Nea says. "In fact, I was in the bedroom the other day and I thought Mike was somewhere else in the house. I walked out and he was on the other side of the bedroom wall in the living room watching TV and I hadn't even heard the TV."

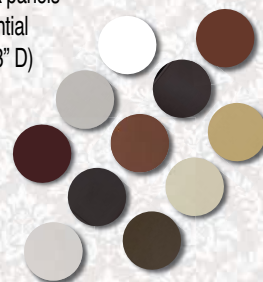
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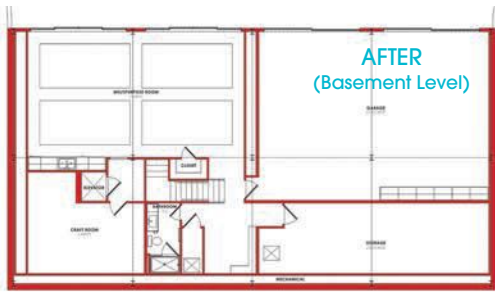


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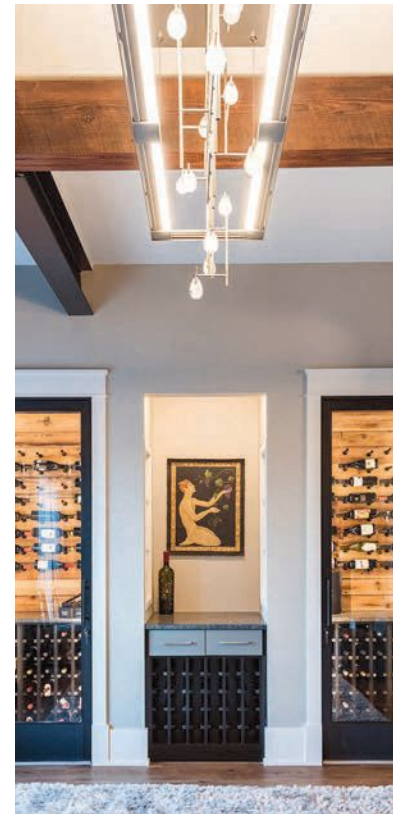
The Pooles bought the barn in October 2014 and moved in during June and July of 2018. “The biggest delay was at the beginning,” Nea says. “That was finding a bank that could get its head around the financing of a barn. Even the bank we do all of our business banking with and have a great relationship with, as soon as their underwriter was looking at it, he was just like, ‘Come back when it’s a house and we’ll give you a great loan, but we don’t understand this.’”

Despite the challenges, Nea says it was extremely gratifying to be the sole decision-

maker on this project and have others recognize the barn with local and national awards. “This was our vision,” she says. “We thought we had done a really good job, and the positive feedback has been great. It makes me smile every time I walk in. We went on a trip once and came back and walked in our home and were like, ‘ah, now this is special!’”



Listen to Nea Poole, AIA, NCARB, principal of Midlothian, Va.-based Poole & Poole Architecture, read this story—with additional details about the Barn at Walnut Hill—via our digital edition. Click on the digital edition in the top right corner of www.retrofitmagazine.com.



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TIME TRAVEL

WRITTEN BY | BY KJ FIELDS



If world-renowned designer Eero Saarinen could walk into the TWA Flight Center at New York's John F. Kennedy International Airport today, he'd be pleasantly surprised. Much of the late architect's mid-century design remains, yet the space welcomes visitors in a way he didn't envision—one that allowed his iconic monument to escape devastation.

Saarinen conceived the curved, soaring center as a takeoff on flight in the 1950s for Howard Hughes and Trans World Airlines (TWA) when propeller planes were common. It opened in 1962, and the arrival of much larger jet planes soon followed.

"The Flight Center was essentially obsolete 10 years after it was built," observes Richard Southwick, partner and director of historic preservation at New York's Beyer Blinder Belle (BBB) Architects & Planners. "It had no significant waiting room and not enough baggage capacity for modern uses. There was no way to take this beautiful sculpture and add onto it, and the building was too fragile to move."

The Port Authority of New York & New Jersey hired BBB as its historic preservation consultant in 1995 after the building was designated a New York City Landmark. TWA continued to minimally use the terminal until it went bankrupt for the third and final time in 2001. American Airlines purchased TWA's assets and closed the terminal less than a year later in early 2002.

Given its highly valuable corner location next to the International Arrivals Terminal,

the Port considered demolition to accommodate a new terminal. Southwick advised against it, and BBB ran concept plans to repurpose the center as office space, a conference center or museum, but a hotel was the airport's most pressing need. In 2005, the building was listed on the national and state registers of historic places.

Port representatives decided to create a JetBlue terminal behind the site, which was completed in 2008. To accommodate the new terminal, the Port tore down the TWA Flight Center's flight wings, which were its former access to the jetways.

Meanwhile, the Port went through three rounds of developer requests for proposal on the flight center. When developers responded that the cost of restoration was

Fast Fact

The TWA Flight Center was featured in the 2002 Leonardo DiCaprio movie, "Catch Me if You Can".

A FLIGHT CENTER'S RESTORATION TRANSPORTS VISITORS TO A VINTAGE ERA OF DESIGN AND AVIATION



PHOTOS: DAVID MITCHELL, COURTESY OF TWA HOTEL unless otherwise noted

too high, the Port tasked BBB with a Phase I restoration. Work was completed approximately six years later and a second RFP was issued, but the winning bidder eventually backed out.

Modern Ascent

In 2015, New York-based MCR/MORSE Development won the Port's third round of hotel development proposals, and BBB repositioned the 129,000-square-foot TWA Flight Center as a hotel lobby and function spaces. Design architect Lubrano Ciavarra Architects, New York, crafted two new hotel structures that flank the north and south sides of the center, providing 512 guest rooms across 216,000 square feet. The project also added a 46,000-square-foot conference center 30-feet below grade.

"The uses of an airline terminal and a hotel are very similar: There's entry, check-in, recession, food and beverage, and waiting," Southwick explains. "A hotel doesn't need a large baggage-claim area, and the baggage claim was one of the only large spaces in the flight center so it was transformed into a 250-person ballroom."

The center's international check-in became the hotel's reception area. A baggage conveyor belt was installed to transport guests' luggage to a storage area for day guests or for early arrival/late departure times when guestrooms are not currently available. Domestic check-in became a food hall for local vendors. On the historic mezzanines, the London Bar, Lisbon Lounge and Paris Café—bistros that carry the names of the flight center's 1960s establishments—returned to their famed locales.

The departure-arrival passenger tubes remained and were restored as circulation corridors to the hotel buildings. Set outboard of the circulation tubes, the new hotel buildings were constructed flanking the center (similar to the original TWA flight wings) and recreate the center's historic scene when viewed from the front. In addition, the buildings serve as a solid curtainwall to block out the JetBlue terminal.

A Clear Path

BBB's restoration followed the Secretary of the Interior's Standards for the Treatment of Historic Properties, and designers leveraged as-built record drawings dating back to 1964. "We always begin historic projects with

Retrofit Team

DEVELOPER // MCR/MORSE Development, New York, www.mcrhotels.com

PROJECT AND PRESERVATION

ARCHITECT // Beyer Blinder Belle Architects & Planners, New York, www.beyerblinderbelle.com

DESIGN CONSULTANT AND DESIGN ARCHITECT FOR THE HOTEL BUILDINGS

// Lubrano Ciavarra Architects, New York, lcnyc.com

CONFERENCE AND EVENT SPACE

INTERIOR DESIGN // INC Architecture & Design, New York, inc.nyc

INTERIOR DESIGN FOR HOTEL ROOMS, SELECT PUBLIC AREAS AND CONNIE

// Stonehill Taylor, New York, stonehilltaylor.com

LANDSCAPE ARCHITECTURE // Mathews Nielsen Landscape Architects, New York, www.mnlandscape.com

CONSTRUCTION MANAGER

// Turner Construction Co., New York, www.turnerconstruction.com

CURTAINWALL FABRICATOR // Fabricca, fabbbricausa.com



ABOVE LEFT: From the London Club area, guests can view the famous Flight Bridge and get a peek at the hotel's 1958 Lockheed Constellation, now a cocktail lounge known as Connie. **ABOVE RIGHT:** The Pope's Room was restored within the Ambassador Club, TWA's first-class lounge located on the mezzanine. **BELOW:** The Saarinen Wing of the TWA Hotel is named for the Flight Center's architect, Eero Saarinen.



Fast Fact

Completed posthumously in 1962, the TWA Flight Center was the last building designed by Eero Saarinen.

preservation mapping to identify three classifications of the space: restoration, rehabilitation and reinvention,” Southwick explains. “The center had three very significant spaces that were critical to restore to Saarinen’s original design intent—the upper lobby; lower lobby; and the Ambassador Club, TWA’s first-class lounge located on the mezzanine.”

An original sunken lounge had been previously removed to make way for a series of check-in areas. “The sunken lounge was a character-defining feature of the space so we restored it back to its original plan, reconstructing everything but the ashtrays,” Southwick says.

Interior elements also tell stories from the center’s past. “Saarinen was friends with notable artists and designers who became involved in the project,” Southwick says. “Charles Eames designed much of the built-in furniture, which was still mostly intact but in poor condition. We had the furniture restored and recreated one of the missing seating groups in the Ambassador Lounge.”

Florence Knoll was a good friend of Saarinen’s and she custom-designed many of the center’s fabrics, so BBB had Knoll redesign the fabrics. “Isamu Noguchi’s sculptural water fountain was the centerpiece of the Ambassador Club, and I believe it was still operational until the center closed in 2002,” Southwick adds. “We had the fountain fully restored.”

The team recreated the center’s characteristic chili-pepper red carpet and upholstery. Ceramic penny tiles that cover the curved floor and wall surfaces were restored, and 20 million new tiles that resemble the original were manufactured for repair or replacement where needed.

New Horizons

Constructed to the NYC 1938 building code, the center had contemporary compliance issues. BBB modified the building to meet current code using areas that had no architectural integrity, either because they had been changed in the past or were back-of-house.

For example, there was a strong push from the reviewing agency to add fire system sprinklers but noticeable piping would destroy the space’s historic visual integrity. As a result, an exhaustive two-year process ultimately produced many safety plans that mitigate potential life-safety issues.

Typical of mid-century architecture, the



ABOVE: Eero Saarinen’s soaring terminal with its restored Vulcain clock serves as the heart of the TWA Hotel. **BELOW:** The Sunken Lounge was a character-defining feature of the space so it was restored to its original plan, reconstructing everything but the ashtrays.





Four rows of Spectrum Lighting's custom Deep Regressed Cylinder fixtures line the skylight area over the lobby, and clusters of Louvered Eyeball Fixtures light the seating areas throughout the space. The fixtures are controlled via Xicato GalaXi Bluetooth and connected to a master dimming system.

Spectrum Lighting recreated the 1962 vintage eyeball, cylinder and spotlight fixtures, and updated them with modern functions and lifespan. The lights were made to fit in the exact places of the original 1960s fixtures, which had been lost or sat idle during the years of the center's disuse. The fixtures match the original lumens and beam patterns of a 500 W PAR56 lamp with a modernized 5000 Lumen LED system and special optics.



PHOTOS: SPECTRUM LIGHTING

Materials

LIGHTING UNDER CONNIE // Ground Spotlight from Color Kinetics, www.colorkinetics.com

CURTAINWALL // Solexia from Vitro Architectural Glass (formerly PPG Glass), www.vitroglazings.com, with Stanlock GRM neoprene snap lock glazing gasket system from Griffith Rubber Mills, www.griffithrubber.com/stanlock

CUSTOM ILLUMINATED SIGNAGE BASED ON SAARINEN ARCHITECTS' 1962 DESIGN // Crown Sign Systems Inc., www.crownsigns.com

LIGHTING // Spectrum Lighting, www.speclight.com, and Axis Lighting, www.axislighting.com/CMS

LED BOARDS // Nanometer Lighting, nanoltg.com, and HB Lighting, www.hblightinginc.com

ENTRANCE DOORS // Model 20D narrow stile entrance doors in clear anodized aluminum finish from YKK AP, www.ykkap.com

SLIDING FIRE DOORS // Won-Door, www.wondoer.com

ROOFING // JM PVC-60mil from Johns Manville, www.jm.com

ELASTOMERIC COATING // Ultra Spec Masonry Low Lustre (0360) from Benjamin Moore, www.benjaminmoore.com

FABRIC // Knoll, knoll.com

PENNY TILE // Design & Direct Source, www.designanddirectsource.com

INFORMATION SPLIT FLAP BOARDS // Solari of Udine, www.solari.it

building is composed of concrete and glass. Kitchens and food service required proper exhaust and services. Through extensive field surveying, the team verified construction was a thin concrete slab with 17-inch-deep concrete ribs placed 1 foot on-center. Mechanical ducts were precisely sized to ensure they fit carefully within the ribs.

The center is a split-level building that contained a full cascading stair from one end of the lobby to the other. Unfortunately, the steps were not ADA-compliant. BBB carved through some of the "reinvention"-classified spaces to create two large ramps for universal access to the upper lobby.

Given its distinctive architecture and angled walls, the windows in the center are uniquely shaped glass panes—some spanning 5 by 7 feet. Made of green-tinted, polished plate glass, some windows had failed over time. Glazing replacements include 486 lites made from green-tinted, tempered glass for safety. The team also replaced the center's failed skylights.

To hold the windows in place, Saarinen used zipper gaskets, just like those on an automobile. The team returned to the same company that produced the gaskets for Saarinen and procured new extrusions for the restoration.

But the new hotel buildings' windows are a world away by comparison. "We designed a very special curtainwall for sound protection," Southwick says. "It's a 4 1/2-inch-thick, triple-insulated assembly

with seven layers of glass. Planes taking off on nearby runways are almost perfectly inaudible in the guestrooms. It's one of the most soundproof installations in the world."

Plane-spotting

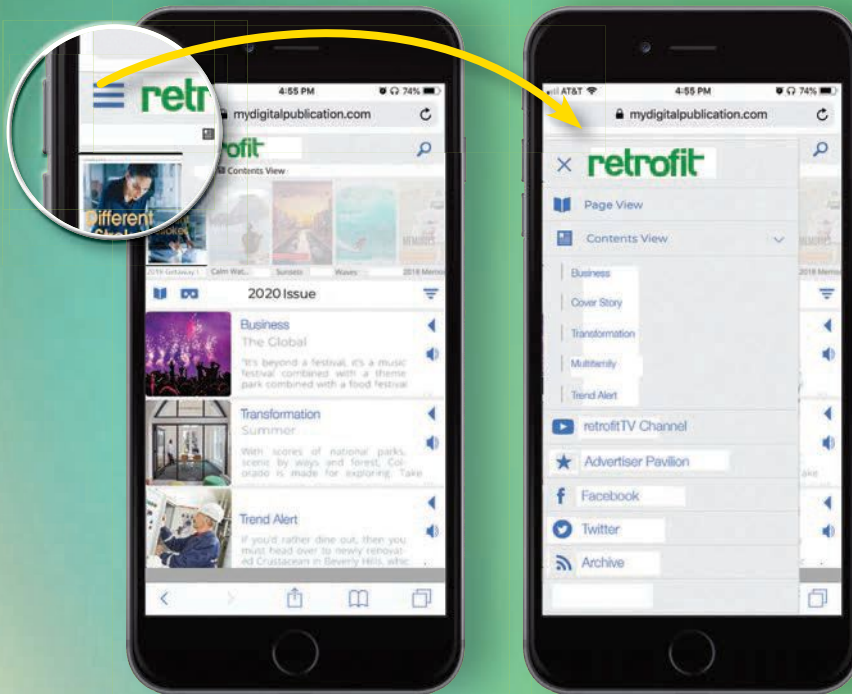
The design takes full advantage of its site. On top of the south hotel building's roof, an infinity pool looks out to the alley between the international terminal (T4) and JetBlue's terminal (T5). Some hotel suites directly face the taxiway. "Aviation aficionados can watch takeoff and landing and get up close to the A-380 jumbo jets on the roof. And those in the suites come nose-to-nose with the pilots. It's a wonderful plane-spotting location," Southwick says.

Outside the center, a 1958 Lockheed Constellation—Howard Hughes' plane of choice and one of the last in existence—sits on the tarmac between the two passenger circulation tubes. An interior cabin renovation turned the aircraft into a cocktail lounge, known as Connie.

"We created a painted runway with taxiway lights beneath the Constellation, so when you look out the sunken lounge windows at the plane, you see an evocative image as one would see in the 1960s looking out on the tarmac," Southwick notes. "This space is so much more than a hotel, it's a destination in its own right that attracts people from all over to come and experience it—whether they're taking a flight or not." 

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The Power of Collaboration

DPR CONSTRUCTION'S TEAM MAKES AN ABANDONED BUILDING AN OFFICE DESERVING OF EMULATION

WRITTEN BY | CHRIS GORTHY, LEED AP BD+C



PHOTOS: HOACHLANDER DAVIS PHOTOGRAPHY

When international builder DPR Construction outgrew its existing Washington, D.C., regional office, it was an opportunity to think about the space differently. The DPR team wanted to do so much more than just build a cool-looking office. It desired to incorporate sustainability and wellness while also creating a truly 21st-century workplace.

DPR set some lofty goals for its new office space, all linked together by the idea that a collaborative team really could achieve it all. For example, the team wanted to achieve Net Zero Energy (NZE) certification and a bevy of other items that, if not handled creatively, could conflict with one another. Articulating DPR's culture and supporting productive, enjoyable work had to balance with cost effectiveness,

functionality and other factors. Specific goals and objectives were developed and condensed into a living, 10-page document that summarized vital information about project goals, as well as expectations and performance criteria for owner, design team, construction team, operations and maintenance staff. This document defined the four goals that were established for the new office:

- **SUSTAINABILITY:** Incorporate strategies that contribute to the health and wellbeing of the environment and staff.

- **WORKPLACE OF THE FUTURE:** Create a 21st-century workplace that invigorates and encourages the staff.

- **DATA-DRIVEN DECISIONS:** Make decisions based on cost-analysis, payback studies and team expertise.

- **LIVING LABORATORY:** Build a living lab where technologies, products and systems could be showcased for customers, designers and the community.

Serving as owner and builder allowed DPR the opportunity to see things from the customer perspective and take on the complexities involved in making hard decisions to achieve its goals.

Sustainability

Rather than building new, DPR intentionally chose the more sustainable route of reuse. By renovating a 20,000-square-foot space, which had been vacant for more than seven years, literally tons of embodied carbon were conserved when compared to a new build.

DPR utilized materials that minimize



■ Retrofit Team

OWNER // DPR Construction, Reston, Va., www.dpr.com/view/path-to-net-zero-energy

ARCHITECT // SmithGroup, Washington, D.C., www.smithgroup.com

LEED CONSULTANT // Sustainable Building Partners, Fairfax, Va., www.sustainblbgs.com

MEP ENGINEER // Southland, Dulles, Va., www.southlandind.com

ELECTRICAL AND SYSTEMS INTEGRATION // M.C. Dean, Tysons, Va., www.mcdean.com

AIR-QUALITY CONSULTANT // Healthy Buildings, Fairfax, healthybuildings.com



VOCs in indoor air and provided a garage door that opens to a patio for outside air when weather permits. Natural daylight from perimeter windows is augmented by 24 tubular daylighting devices that bring daylight to the core of the building. A wellness room, workout room, kitchen featuring healthy snacks, and bicycles made available for nearby errands are some of the features that assist workers to make healthier decisions without the need for formal policies or programs. Additionally, these aspects have helped the building achieve WELL Gold certification.

With a goal of achieving NZE as a crucial element of the project, installation of an appropriate energy-generation system was essential. The team started with passive and active strategies, then installed a 141-kilowatt rooftop photovoltaic system, which was the best choice for the individual building.

Initial costs from the steel fabricator for roof reinforcements for the PV system came in at \$950,000 for



■ Materials

FURNITURE // Living Office from Herman Miller, www.hermanmiller.com

CUSTOM PRODUCTS // Gutierrez Studios, gutierrezstudios.com

RECLAIMED LUMBER PRODUCTS // Old Wood DE LLC, www.oldwoodde.com

LAVATORY // AER-DEC from Sloan, www.sloan.com

LIGHTING CONTROLS // WattStopper by Legrand, www.legrand.us

TUBULAR DAYLIGHTING DEVICES // Solatube, www.solatube.com

BUILDING MANAGEMENT SYSTEM // Honeywell, buildingsolutions.honeywell.com

SENSORS // Senseware, www.senseware.co

SMART GLASS // RavenWindow, (303) 984-7490

PHOTOVOLTAICS // Helix from SunPower, us.sunpower.com

PLUG-LOAD MONITORING // Enmetric Systems Inc., (650) 489-4441

WIRELESS COMPUTER CONNECTION // Barco ClickShare, www.barco.com/en/clickshare

WIRELESS AUDIOVISUAL // Sonos, www.sonos.com

DASHBOARD DISPLAY OF ENERGY AND WATER CONSUMPTION // BuildingOS from Lucid, lucidconnects.com

HVAC CONTROLS // Honeywell, www.honeywell.com

DOAS // Ingenia, www.ingeniatechnologies.com/en

EXPANSION TANK // John Wood Co., www.johnwood.com

BOILER // Lochinvar, www.lochinvar.com

COOLING TOWER // SPX, www.spxcooling.com

CARPET // Shaw, www.shawfloors.com

TILE // Mosa, www.mosa.com, and Johnsonite, commercial.tarkett.com/en_US/brand/johnsonite

WALLCOVERING // Filzfelt, www.filzfelt.com

WINDOW SHADES // Mechoshade, www.mechoshade.com

■ **BASED ON THE EMPLOYEE SURVEY** conducted using the Leesman Index, employee engagement increased 29 percent from the baseline scores observed in DPR's previous Washington, D.C., area office.

a \$500,000 PV system, which was untenable. "It almost destroyed our NZE goals before we even got started," recalls Chris Hoffman, project manager with DPR. "Instead of giving up, the team worked hard to find a way. We were relentless and just kept asking questions." It was discovered initial calculations for the dead load of the panels were higher than necessary. Laser scanning the existing building provided the engineer and fabricator with exact dimensions and armed with that information, the need to design to worst-case scenario was avoided. This type of collaborative effort reduced the reinforcement costs to less than \$220,000.

DPR used that same mentality with all the building systems—asking questions, determining what the worst-case scenario was and realizing that scenario would never happen. As the team overcame each of these obstacles, it got even more buy-in to the goals and mission of the project.

Workplace of the Future

Using DPR's own needs for substantial collaboration in tandem with guidelines from the New York-based International WELL Building Institute; Leesman+, an international firm that provides tools to benchmark how workplaces support employee and organizational performance; Washington-based U.S. Green Building Council's LEED; and the Seattle-based International Living Future Institute, DPR created a program that includes a variety of activity zones geared to facilitate interaction, collaboration and connection.

Marc Schneiderman, principal with project designer SmithGroup, Washington, encountered a space-planning challenge. "We wanted the space to be warm and inviting but also challenging and thought-provoking as it flows with the way DPR works," he explains. "It was actually more

about the negative space rather than the functional areas. Copious circulation allows the space to work for large-scale events while it still retains a lot of energy for daily use."

The office creates a sense of community. People have places to spend time together beyond meetings or daily desk activities. The large kitchen,

community dining area, lounge and workout room create organic opportunities for employees to interact and from which creative project problem-solving is inevitable. The space is adaptable for a variety of uses and work styles and is perceived by employees as simply being an attractive, enjoyable space. One of the unintended consequences of the super flexible environment is that people can and do act naturally.

These efforts enabled the project to achieve Leesman+ accreditation, placing it among the top 4 percent of workplaces surveyed by Leesman worldwide at the time of the survey. In fact, DPR was able to increase its Leesman Index by 16 points, illustrating that it has created a workplace that consistently measures high levels of employee pride, productivity and a sense of community.

Data-driven Decisions

The DPR team wanted to tie design and construction decisions to actual data. With three recent NZE DPR office renovations already under its belt, the team had an existing benchmarking database at its fingertips. The team did a total cost analysis of rent, construction costs, energy savings, systems, components, finishes and even people's commutes.

One item for which data analysis caused a different outcome than expected was the installation of insulation. It's easy to assume that an early 1980s building would need additional insulation. The first estimate of the cost was \$130,000. However, deeper examination and a subsequent comparison of energy models with and without insulation demonstrated only a \$460 per year savings with insulation. Instead of a costly upgrade for a negligible return, DPR made a better investment by buying another solar panel for that cost and more than offset the minimal insulation loss.

Another heavily data-driven decision was the selection of the mechanical system. The team wanted an efficient system that was able to maintain thermal comfort consistently throughout the office. Four different systems were analyzed for energy-use intensity, cost, temperature and humidity control, and flexibility. The selected four-pipe system features a high-efficiency heat recovery chiller, cooling tower and a

dedicated outdoor air system. Although meant for a larger space, and slightly more expensive, Hoffman says, “The system is an example of what DPR thinks the future of mechanical systems will be: more efficient and yielding healthier air.”

Data is generated and monitored through a controls system and sensors that measure energy usage from the cooling tower, chiller, electric boiler and DOAS (air-handling unit) individually, as well as other energy users in the office, such as lighting and receptacles. The controls system and sensors provide real-time analysis and monitoring.

Living Laboratory

Knowing the mechanical system would generate a lot of interest as a showcase, the DPR team installed it behind a glass window wall. Color-coded piping helps visitors more easily understand the functionality of the four-pipe system. The team also introduced radiant sails in a few of the meeting rooms. The ceiling-hung system transforms the centuries-old technology of radiant heating and cooling into a modern architectural element, providing alternative thermal comfort to occupants.

From ceiling to floor, learning opportunities were leveraged. At floor level, four different concrete finish options were installed throughout the common areas to showcase and educate potential clients about the different options available, costs, aesthetics and how they wear over time.

DPR representatives wanted to utilize a multitude of finish types to show customers how they look and work. All meet LEED material credit requirements and many are Cradle to Cradle Certified, including carpet, wallcovering, tile and window shades. The most notable architectural element throughout the space is reclaimed wood, which was taken from barns in Connecticut and the eastern shore of Maryland and installed by DPR’s carpenters. This sustainable finish, used in the entryway of the space and above the wine bar, connects the office with the history of the Mid-Atlantic region while providing acoustical benefits.

As in all of the newer DPR offices, the office utilizes a project dashboard display that provides real-time information related to energy and water consumption, as well as energy produced by the photovoltaic array.



Remarkable Results

A key difference on this project from DPR’s other offices—and something the DPR team could replicate for customer projects—is a dedicated ownership team that made decisions and kept attacking and driving things forward.

These leaders learned to balance the different elements of the project. For example, providing a demand-controlled ventilation system pushed against the goal for NZE. Natural daylight didn’t always work with the varied schedules of staff, so task-adjustable lighting was provided to individuals. The biggest lesson was you don’t have to choose between cost, wellness, sustainability and creating an incredible workplace. With the right team, engaged early, you can maximize the benefits. [▶](#)



Achieved **WELL Gold Certification** with the WELL Building New and Existing Buildings standard.



Achieved **LEED v4.0 Platinum** certification.

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Zero Energy Certification from the International Living Future Institute is expected by the end of 2020.



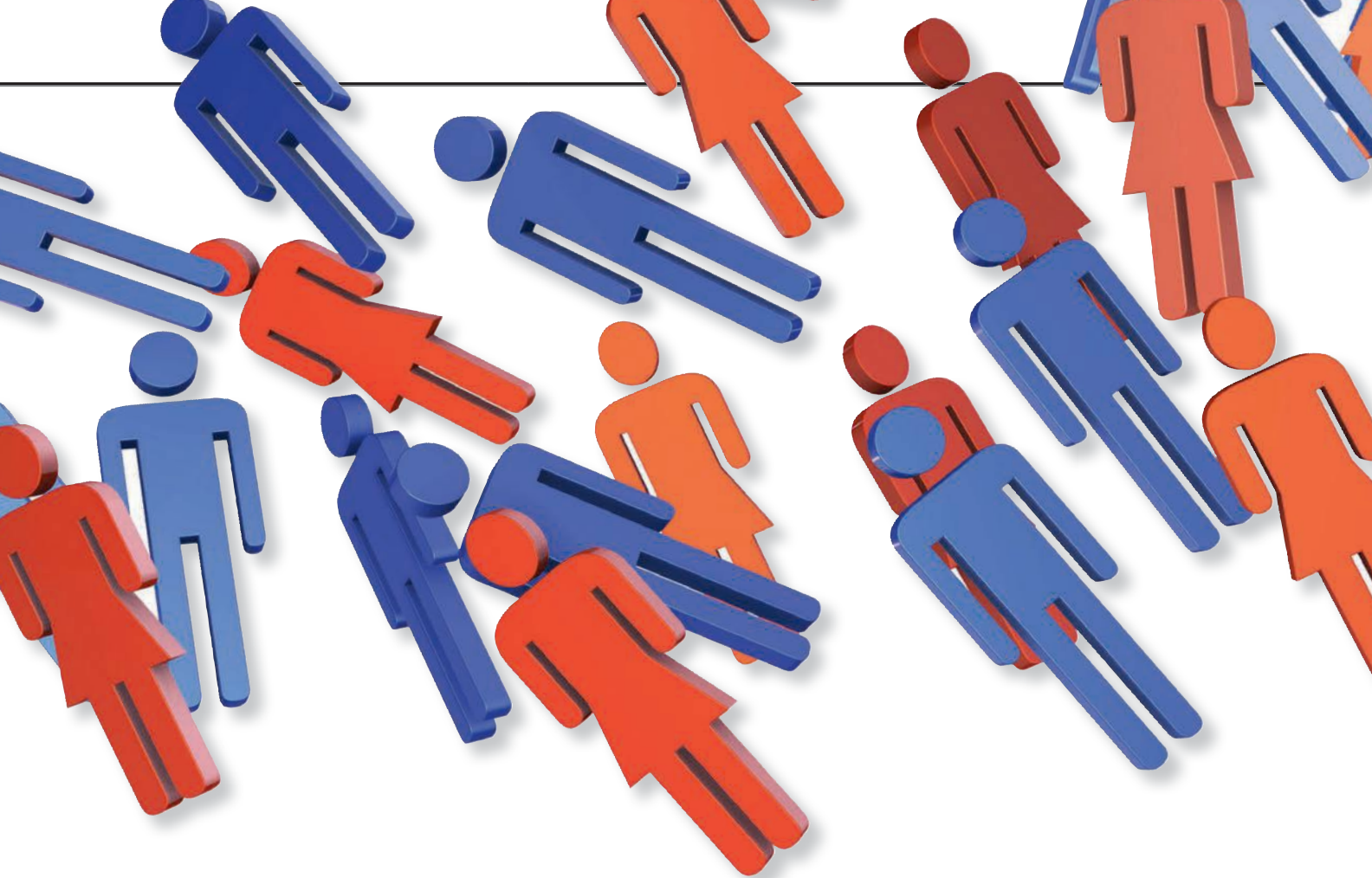
LOOKING for LABOR

There's a Massive Shortage of Skilled Workers to Fill Construction-related Jobs; Here's How It's Impacting the Building Industry and What's Being Done About It

WRITTEN BY | ROBERT NIEMINEN

At the midpoint of 2019, the Washington, D.C.-based American Institute of Architects released an update from its Consensus Construction Forecast Panel that projected a 4 percent increase in nonresidential building for the remainder of the year, dropping slightly to 2.4 percent for 2020. Other indicators were positive, as well; the Washington-based Associated Builders and Contractors' (ABC's) Construction Backlog Indicator (CBI), a marker that reflects the amount of work that will be performed by commercial and industrial construction contractors in the months ahead, was holding at 8 1/2 months. Although the number was slightly lower (0.3 percent) than the previous month, the report was consistent with healthy construction activity across the country overall.

Despite the minor decline in the amount of work ahead coupled with speculation of a softening economy, most contractors surveyed by ABC still project higher sales and plan to hire more staff in the short term. Although the projections appear positive, there's a major problem: There's just not enough skilled laborers to fill available jobs.



"Looking at the [CBI] data, we can actually tell we are at a significant shortage just to do the work that is under contract yet to be performed in the next 12 to 18 months," says Greg Sizemore, vice president of HSE and Workforce Development for ABC. "When you look at it mathematically, right now we can tell you we need an additional 400,000 craft workers—the young men and women, the seasoned professionals who are out there at the end of a wrench, hammering the nails, pulling the wire—and we are at a significant shortage that is impacting all aspects of the construction industry and what it takes to make a project occur."

The labor shortage isn't just short term, however. It is a growing concern among many industry experts because the lack of available skilled workers will continue to hinder the construction industry.

But there's a movement underfoot to address the educational deficiency that may usher in a new era of employment and prosperity in America.

How Did We Get Here?

Before we answer the question of how, let's talk first about where we are as it relates to the contemporary view of education and employment. Television Host Mike Rowe of the Discovery Channel show "Dirty Jobs" characterizes the dilemma this way on his Mike Rowe Works Foundation website:

According to the Bureau of Labor Statistics, there are more than 7 million jobs available across the country, the majority of which don't require a four-year degree. And still, we talk about millions of "shovel ready" jobs for a society that doesn't encourage people to pick up a shovel. We keep lending money we don't have to people who can't pay it back for jobs that don't exist. Bit by bit, our culture reaffirms the misguided belief that a career in the skilled trades shouldn't be desired.

The effects of this cultural conditioning are far-reaching and date back to 1965 when the Higher Education Act was signed into law; it strengthened resources for colleges and universities and increased stu-

dent access to financial aid. In the decades that followed, there's been a seemingly systemic emphasis on a four-year degree as the only viable path to success and stability.

In an effort to better understand the scarcity in qualified labor, Mooresville, N.C.-based home-improvement giant Lowe's conducted research to help determine attitudes about skilled trades. "We understood [the problem] from a historical perspective, so we wanted to know if it was real when people were being asked in current day about opportunities in the skilled trades," explains Mike Mitchell, senior director of Trade Skills and Learning for Lowe's. The retailer surveyed a wide cross-section of people between the ages of 18 and 50 across the U.S. and concluded the most common reason people don't pursue careers in the skilled trades isn't about money; rather, it's considered a threat to their identity, Mitchell says.

"We think there's a deep cultural stigma we are trying to disrupt and reshape because it isn't true," he says. "These are high-growth careers. We went back and

LOWE'S HOSTS BUILD OUT TO RAISE AWARENESS FOR SKILLED TRADES

Mooresville, N.C.-based **LOWE'S HOME IMPROVEMENT** believes the skilled trades are an essential part of America's future and is committed to building the next generation of skilled workers. That's why the retailer partnered with SkillsUSA, Leesburg, Va., in April 2019 to host a regional skilled trades community service event at the iconic Rose Bowl Stadium in Pasadena, Calif. The build out featured 300 high-school students from around Southern California in the first-ever Generation T Bunk Build.

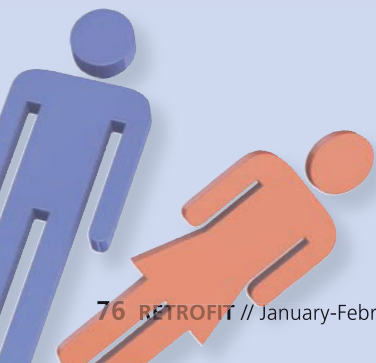
Located in the stadium's Court of Champions, the event showcased SkillsUSA students showing off their carpentry skills for a great cause—building 100 bunk beds that were donated to Sleep in Heavenly Peace, a non-profit organization dedicated to building, assembling and delivering beds to children and families in need. Generation T partners, including Timberland PRO, PeopleReady and Samsung, donated funds and volunteers to help with the event. Additionally, Serta and Tuft & Needle donated mattresses and bedding for the completed bunk beds.

More than 60 organizations led by Lowe's launched the Generation T movement in 2018 to help fill the skilled trades gap. The goal of Generation T is to shift the perception of the trades by demonstrating the economic mobility and career opportunities skilled trades provide, a change the organization believes starts with today's high schoolers. The Rose Bowl event helped these decision-making youths see firsthand how achievable and meaningful skilled trades can be.

For more information, visit wearegenerationt.com.



PHOTOS: LOWE'S GENERATION T



looked at the research and started to see current-day perception has been shaped a lot by the American economy, our education system and even pop culture for that matter.”

Sizemore agrees and says we’re facing a deficit in knowledge of skilled work because people simply don’t view technical education as a viable alternative. “It’s a lack of focus, a lack of emphasis, a lack of priority, and a lack of importance put on career technical education in our high schools and community colleges across America today.”

Complicating matters is the downturn in the economy that forced skilled laborers out of construction work, many of whom have not returned. “Through 2008 and 2010, you had a very slow economy construction-wise, and a lot of the craftsmen who were here in this marketplace actually had to move on and a lot of them went to oil-related jobs, which were what was available back then,” recalls Bob Moss, founder, chairman and CEO of Moss & Associates/Moss Construction Management, Fort Lauderdale, Fla. “So, we’ve lost some of the craftsmen that had to move on to other areas to be able to make a living.”

Impact on the Industry

Given the current deficit of workers, the problem gets magnified whenever more investments in infrastructure are made. Sizemore notes every billion dollars in overall construction spending creates 6,300 additional construction jobs on average. “All we’re going to do is exacerbate the problem,” he says. “If we don’t do something, the impact, as we’re sitting here having this conversation, is a year from now we’ll need 1.2 to 1.3 million people to do the work that’s out there, and you can imagine the economic impact.” (Note: Lowe’s estimates the number at 3 million jobs by 2028.)

Mitchell points out many builders struggle to turn a profit. A 2017 U.S. Census survey of construction-industry entrepreneurs reveals almost 20 percent of those businesses reported losses while 19 percent broke even. Almost one-third (27 percent) of respondents reported finding qualified labor as a reason for the negative impact on profit.

“You’re seeing noticeable pressure on

builders and remodelers throughout the country, and we hear it firsthand at the store level,” Mitchell says, noting contractors come in on a regular basis looking for laborers and leave their business cards at the store for potential leads.

The ripple effect of the labor shortage in construction extends into every industry; buildings are needed for virtually any type of business or activity. “Whether it’s a new build, whether it’s a greenfield facility, whether it’s public money, private money, whether it’s an upgrade or retrofit or remodel, all of these things have to happen but won’t happen in our industry today unless we really attack this full front,” Sizemore suggests.

Moss notes the severity of the impact on projects often depends on their size. Mid-sized projects with less aggressive schedules aren’t as pressing of a concern as a massive sports complex, for example, which requires an extremely short schedule and where manpower is a very high

priority. In those cases, people need to work longer hours and more days to get the work completed. More importantly, he says site superintendents “need to pay a higher level of attention to the quality of work, safety and all the important things that go on during a job each and every day supervising a less-skilled workforce, which is a challenge.”

Changing the Narrative

The current conversation in the U.S. about college and technical education needs to change not only because of economic factors, but because doing so can open up a pathway to success too many have felt isn’t available to them.

“We’ve got a decades-old narrative we have to unwind in America today that says, for whatever reason, ‘Unless you go to college, you’re something less-than, or you’re not employable, or you have less skill.’ I’m telling you that’s wrong,” Sizemore says.

It’s not enough to suggest technical



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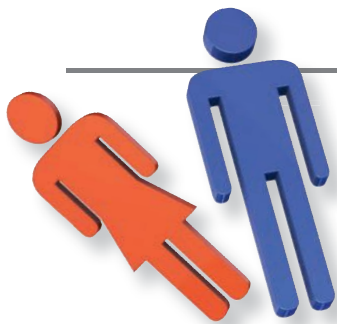




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It's not enough to suggest technical education and apprenticeships are simply an alternative to college. Younger generations need to see them as equal opportunities to success, and education at a national and grassroots level is essential in altering the narrative.

education and apprenticeships are simply an alternative to college. Younger generations need to see them as equal opportunities to success, and education at a national and grassroots level is essential in altering the narrative.

"It's one thing for us to go and rally the call on a national level, but where it's really going to take hold is when the local communities begin to put pressure on their school districts, their school boards, their community colleges and the contractors in those communities to get engaged in these programs and processes," Sizemore points out. "Where it's going to make a difference is in the backyards of

America and the very communities where this work is going to occur."

Moss notes with the rising costs of a four-year education and as students graduate with large amounts of debt, those who pursue technical education, on the other hand, "can advance pretty significantly into some high-paying construction jobs" in the same amount of time with little or no debt. He adds a number of organizations are working with the public-school system to educate high-school students about the opportunities of becoming a craftsman.

Case in point: Lowe's launched Generation T, an initiative designed to shift the perception of the trades by demonstrat-

ing the economic mobility and the career opportunities skilled trades provide (see "Lowe's Hosts Build Out to Raise Awareness for Skilled Trades", page 76, for more about Generation T in action). In addition to working with schools and non-profits, Lowe's, along with more than 60 national partners, is getting the message out through social-media campaigns, localized outreach, and by donating thousands of dollars in tools and materials to bring shop class back into schools. Additionally, it is offering scholarships and small business grants to transitioning military members, as well as to assist them in finding jobs requiring skilled labor. "It's sort of a portfolio



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of community-relations activities, leveraging Lowe's and its partners to start to reintroduce the trades locally and digitally so we have a truly nationalized movement," Mitchell says.

Likewise, the Washington-based International Code Council (ICC) has developed a program called Safety 2.0 to create awareness about careers in building safety for students, young professionals and military members alike. "We've identified through discussions with organizations and people within the industry that there is significant interest among the trade organizations to educate their members and industry representatives on building-code issues to provide opportunities for people in the trades to get involved in building safety," says Ron Piester, AIA, ICC's vice president of Membership/Certification. Through high school and college training programs and discussions

with military groups, ICC is getting the message out to help the next generation consider a career in global safety—and the need has never been greater.

"We knew there's a shortage of people to fill these jobs, and so we're trying to meet all these different groups where they are and introduce them to the industry and show them how it can fit into their life," explains Madison Dominescy, ICC's executive project manager.

The building safety industry is relatively obscure but is no less a viable career than an architect or contractor, Piester points out.

A New Reality

The construction industry is operating under a new set of rules, according to Sizemore. Whereas once the mantra "He who has the people hopes he gets the work" was once the norm, now it's "He who

has the work hopes he gets the people." Nevertheless, he suggests it's an exciting time to be in this industry, which is at a nearly all-time high in terms of the volume of work available.

The upside to this challenge is "it translates into huge opportunities for Americans to achieve their dreams," he says. For that to happen, however, the industry needs to continue raising awareness about the value of careers in the skilled trades, not just as an alternative to college but as a viable, dignified, lifelong career path. And the effort needs to extend across the spectrum of geographies and demographics—not just in rural America but also in the inner cities.

The labor deficit won't fix itself. "If we sit in a corner and hope they're going to come, it's not going to happen," Sizemore says. "This is not 'Field of Dreams.' This is the real world." 

Whereas once the mantra "He who has the people hopes he gets the work" was once the norm, now it's "He who has the work hopes he gets the people."

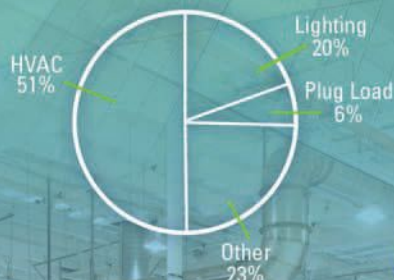
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Building owner, Accesso, purchased the two properties from separate owners and rebranded the space as Monroe Plaza to unify the complex. Accesso representatives then turned their efforts to the outdoor space between the buildings.

"It was a dark, dingy alley, populated with bicycle racks and trash cans and a popular spot for smokers," recalls Paul Gaines, managing director Asset Management at Accesso. "We recognized the potential to transform it into an inviting public space for building employees, nearby restaurant customers and passersby."

The architects at Shive-Hattery Chicago worked with the buildings' property managers to bring the concept to life. Natural light within the space was nonexistent so it was crucial to provide welcoming, comfortable and safe amounts of illumination for visitors.

The architects collaborated with KSA Lighting and the lighting manufacturer's Design Assist team to create the lighting scheme. The final design includes a combination of Accoiled5 (ACL5) and Accoiled3 (ACL3) linear lighting. ACL5, a recessed luminaire, is installed in a custom criss-cross pattern on the underside of a wood-like canopy that spans the length of the pocket park. ACL3, a surface-mount luminaire, is mounted along an open, zig-zag concrete frame that runs parallel to the wooden canopy. Each "X" in the project's pattern is formed with one long linear fixture and two short fixtures, welded together.

"The lighting provides a dynamic visual in the park," explains Mark Matuska, architect at Shive-Hattery. "The angled layout is intentional, to provide a juxtaposition to the rigid lines of the surrounding buildings. We were drawn to these particular products because of [the manufacturer's] ability to meet our design requirements. The Design Assist team was able to provide continuous-looking linear fixtures with custom-angled connections."

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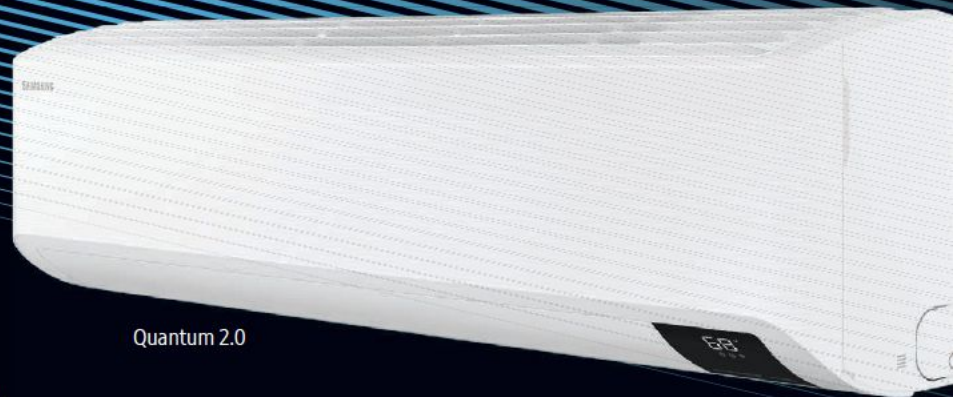
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