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Personal Spaces *in the* Workplace

Discover an Easy Solution to Uphold Privacy

In today's competitive labor market, where many companies are struggling to attract top talent, employers are not only getting creative with their program offerings, they are also looking more critically at the *types of spaces* they provide. Many are offering private spaces where employees can discover the proven benefits of some time alone.

Spaces for Mindfulness Practices

In recent years, mindfulness and meditation have gone mainstream. That's why leading companies like Google, Nike, Apple, Microsoft and Goldman Sachs have defined specific spaces for mindfulness and meditation and actively encourage workers to take time out of their daily work schedules to practice.

Nap Spaces

In addition to meditation spaces, many prominent organizations, including Google, Zappos and NASA now offer defined napping rooms so employees can rest and rejuvenate during the workday. Naps have been shown to improve performance, cognition and memory – and reduce frustration.

Gender Neutral Restrooms

Over the past few years, the push for all-gender restrooms has been making legal headway in the U.S. As a result, many businesses are reconfiguring building spaces to include gender-neutral restrooms to encourage acceptance of non-binary people, transgender people and those who choose not to conform to gender norms.

High Visibility Status Indicators Reveal Whether a Space is Occupied or Vacant

With ASSA ABLOY's patented status indicator for mortise locks, the status of spaces, whether they are occupied or vacant, locked or unlocked, can be clearly seen, either up close or from a distance.

Mortise lock status indicators have large viewing windows – up to 25% larger than the industry standard.



In addition, a patent-pending curved window design provides 180-degree, wide-angle visibility. Indicators can be customized using different colors, graphics and text in various languages.

Because high-visibility status indicators can be installed on either the inside or outside of doors, they are ideal for use on restroom doors and other spaces that require privacy.

The status of spaces can be clearly seen, either up close or from a distance with ASSA ABLOY's status indicators for mortise locks.

Retrofitting is Straightforward

Facilities can easily upgrade existing mortise locks to include enhanced status indicators.

For facilities with ASSA ABLOY mortise lock hardware installed, upgrade kits are available. The kit utilizes the existing door prep so there are no exposed holes.

And, mortise lock status indicator upgrade kits are entirely mechanical and require no electrical wiring, so installation is straightforward.

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Vibrance



The upper two-thirds of this Technical Education Center is clad with Petersen's Highline S1 panel in three shades of red, gray and white, as specified by Pfluger Architects. The mix of finishes and profiles adds a high-tech appeal, with vibrant colors that pop and installation detailing that creates unique shadow effects.

Career & Technical Education Center, TX Installing contr.: Texas Roofing Co. Architect: Pfluger Architects
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- Drop the H Brewing Co., Pittsburg, Kan.
- Thunder Valley Casino Resort, Lincoln, Calif.
- LemonTree Studios, Los Angeles
- Trillium Brewing Co., Boston
- The Fred Kavli Theatre, Thousand Oaks, Calif.
- CASBAR, SLS Las Vegas Hotel & Casino
- The Saint Paul Hotel, St. Paul, Minn.
- Seven Gables Inn, St. Louis
- San Ysidro Ranch, Montecito, Calif.



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COVER PHOTO: ALAN KARCHMER/OTTO

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RETROFIT // Vol. 11 // No. 3 is published bimonthly by Fisher Media LLC, 98 Booth Meadow Lane, Durham, NC 27713, (919) 641-6321. POSTMASTER: Send address changes to **retrofit**, 2409 High Point Drive, Lindenhurst, IL 60046.

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NO WORDS

What a month it has been! It is early April, just over a week from our press date, and I'm struggling for the words to put on this page.

The World Health Organization declared COVID-19 a pandemic on March 11. The daily news is difficult to watch/read—the loss of life, the strain on the economy; it's enough to cause anyone sleepless nights. We at **retrofit** are feeling the effects too as your businesses have shifted home and even contracted. There were moments in which I and the rest of the staff wondered whether this issue of the magazine would come together.

Most of us are living through the most difficult time in our lives right now. We miss our friends. We miss our extended families. We miss going out to the hospitality venues featured in this issue. We worry about our livelihoods. And there's no telling when things will get better. Will anything ever be "normal" again?

I've been trying to find things to do to ease my anxiety and refocus my mind. I have completed painting projects around our house and been voraciously reading. Yesterday, my two-year-old daughter and I took a livestream yoga class. Clare, my daughter, did one downward dog and then was more interested in tearing apart mommy and daddy's room!

Although I couldn't hear everything the instructor said because I had to keep an eye on Clare, I caught something that stuck with me. She said: "Consider this yoga practice as fertilizer that will help grow beautiful things. Ultimately, that's the situation we're in as a whole right now." It's true, though I'd prefer a stronger word than fertilizer to refer to COVID-19. It remains to be seen what the beautiful things to come out of this pandemic will be. I have to trust that there will be beauty and change for the better.

Stay safe. Stay healthy. Stay strong. There's no doubt we're in this together. I hope I will have more words to share with you in our July-August issue.

CHRISTINA KOCH

Associate Publisher/Editorial Director
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CORRECTION In our March-April issue, page 30, Materials list, millwork for Campus Crossroads at Notre Dame University should have been attributed to Imperial Woodworking, www.imperialwoodworking.com. We apologize for any confusion this error caused.

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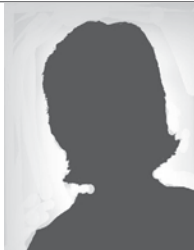
CONTRIBUTING WRITERS



Two 1860s-era buildings, which had been vacant for 30 years, have been rehabilitated as the Sazerac House, an interactive cocktail museum, active distillery, corporate headquarters for Sazerac Co. and event venue, in New Orleans' French Quarter. **KJ Fields**, a Portland, Ore.-based *retrofit* contributor, writes about this project in our "Cover Story", page 18, and underscores how today's design and construction technology can support the restoration of historic buildings.



Richa Yadav is a consultant and climate-mitigation specialist with Buro Happold's Cities practice. She is involved in developing urban and regional climate-action strategies, infrastructure and sustainability masterplans, as well as engineering models to inform sustainable policymaking and capital projects planning. Her experience with energy and buildings is spotlighted in this issue's "Energy" feature, page 44, in which she explains GeoMicroDistricts, a concept that brings renewable energy to neighborhoods.



An example of true modern high-rise construction techniques, the early 20th-century St. George Tower & Grill co-op residence in the Brooklyn Heights Historic District of New York City, recently underwent a meticulous façade restoration. **Meredith Morton**, who writes about architecture and design from her home office in Chicago, describes the work completed on this highly ornamented historic building in "Component", page 48.



There are more than 100 food halls scattered across the U.S., but only one can boast being housed in the nation's first commodities exchange. Located in Philadelphia near the city's top tourist attractions, the Bourse is a 125-year-old building whose beauty was masked by repeated renovations. **Robert Lubas**, AIA, an architect with BLT Architects, and **Diana Masterson**, marketing strategies and business development with the firm, explain in "Historic", page 54, how the design and construction team restored the 358,000-square-foot building to its former glory.



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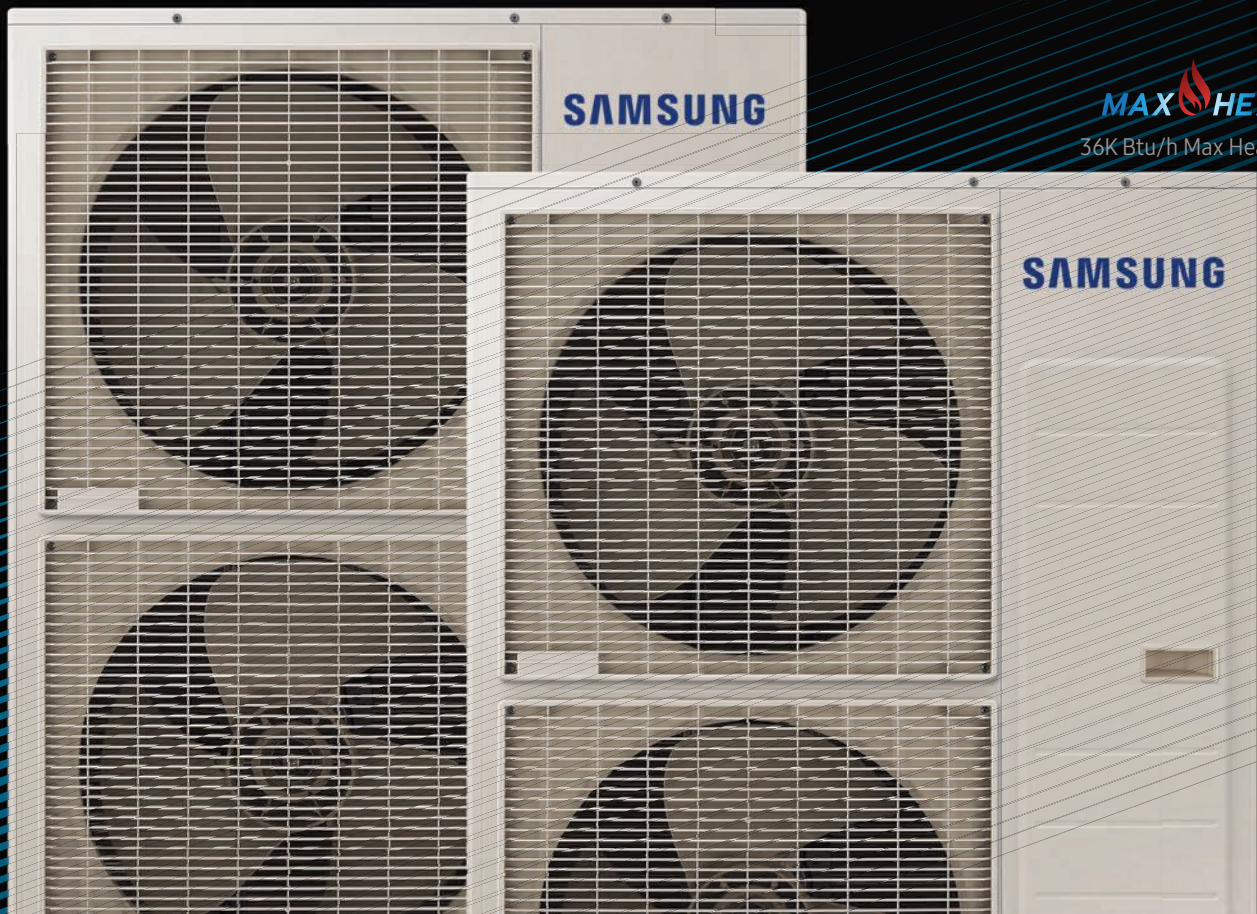
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RAISING *the* BAR

WRITTEN BY | KJ FIELDS

PHOTOS: ALAN KARCHMER/OTTO

A HISTORIC REHABILITATION MIXES PRESERVATION AND TECHNOLOGY WITH COCKTAIL CULTURE



New Orleans' French Quarter was bustling in the mid-1800s. Pharmacist Antoine Peychaud invented the Sazerac cocktail (the first mixed-spirits drink to be called a "cocktail") and—just blocks away—two new 5-story buildings rose in the neighborhood. Both the cocktail and the buildings still exist, but the 150-year-old buildings have been vacant for three decades. When the Sazerac Co. wanted to showcase its New Orleans presence, the abandoned properties were a natural fit from a historical, cultural and branding perspective.

Ambitious plans to revitalize the buildings and their prominent French Quarter locale challenged local firm Trapolin-Peer Architects to combine an operational distillery, interactive cocktail museum, rentable event

venue and corporate offices into one destination space.

"The complex program is a matrix of uses, all with their own special requirements," says Peter Trapolin, FAIA, founding principal of Trapolin-Peer Architects. "And the buildings are designated landmarks, so we had to preserve as many original aspects of the buildings as possible to meet the Secretary of the Interior's Standards for Historic Rehabilitation."

UNCONVENTIONAL BLEND

Over the years, the buildings endured numerous insensitive renovations and were eventually interconnected, serving most recently as one department store. Store representatives built ramps to provide customer access across the buildings, but those ramps posed ADA challenges. To address this issue, the team created a raised-access floor system

across the entire footprint of one building, effectively aligning the floorplates across both buildings.

Building settlement created conditions where floors were out of level by nearly 1 foot in many locations. To further complicate matters, former construction of an adjacent hotel modified one of the building's structural footings, causing it to slowly sink toward the hotel.

The team utilized cutting-edge technology to assess existing conditions. "One of the most compelling aspects of this project is how high-tech can support the restoration of a historic building," says Shea Trahan, associate at Trapolin-Peer Architects. "With the buildings' differential settlement, there were entire floors we couldn't walk on. Three-dimensional scanning gave us a level of detail we couldn't have gathered in field measuring."

The 3D scans also revealed the



walls were out of plumb, which complicated the placement of new steel beams at elevator shafts. When the team removed plaster, it also discovered the load-bearing masonry walls were structurally failing.

While the contractor performed low-pressure mortar injection to refortify the masonry walls and structurally reinforced some of the buildings' wood structures, designers turned to virtual reality (VR) technology to coordinate the complex mechanical systems for the distillery. The architects and mechanical fabricator examined layers of pipes in meticulous detail for aesthetics and functionality in the VR environment. Then, they created an extremely fine-tuned model that virtually showed the distillers where their valves would be, the length of the piping run, the water's entry point,

etc. This allowed the distillers to point out where they would need more clearance or different pipe locations.

"We knew that every pipe and pipe fitting had its proper place, even before the ceiling was put in," Trahan recalls. "Without VR, we would've spent countless weeks in the field in a reactionary mode rather than proactively designing it to meet our standards."

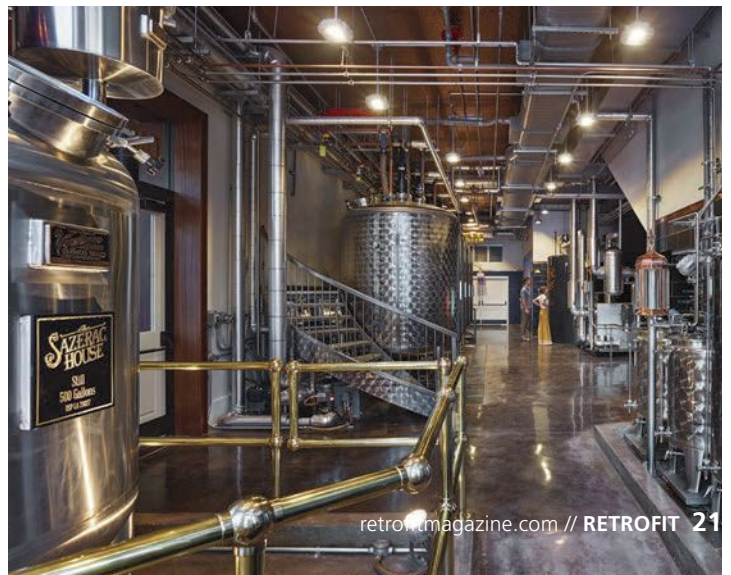
HIGH SPIRITS

The 52,000-square-foot project's first three floors now house the interactive museum, exhibit space and distillery. The fourth floor contains the event space and a catering kitchen. Sazerac offices and a new penthouse, which was set back from the façade to maintain the buildings' historic appearance, fill the fifth floor.

TRAPOLIN-PEER ARCHITECTS WAS CHALLENGED TO COMBINE AN OPERATIONAL DISTILLERY, INTERACTIVE COCKTAIL MUSEUM, RENTABLE EVENT VENUE AND CORPORATE OFFICES INTO ONE DESTINATION SPACE.

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THE ARCHITECTS CUT A **3-STORY ATRIUM** IN THE CENTER OF THE SPACE AND ADDED A MONUMENTAL STAIRCASE. DURING SELECTIVE DEMOLITION, THE TEAM SALVAGED THE ORIGINAL 3- BY 14-INCH FLOOR JOISTS, WHICH BECAME THE STAIR TREADS.

The architects cut a 3-story atrium in the center of the space and added a monumental staircase. During selective demolition, the team salvaged the original 3- by 14-inch floor joists and original brick flooring, long-hidden under topping slabs. “We reinstalled original brick floors in the atrium and transformed the floor joists into the stair treads of the contemporary staircase,” says Margitta Rogers, architect at Trapolin-Peer Architects.

The staircase rises next to an illuminated display wall of bottles from Sazerac-company brands that have connections to New Orleans, conveying the brand’s deeply rooted relevance to the town. The slender 3-story display wall casts a powerful glow within the public space. “Every element was thoughtfully designed to work in concert together,” Rogers affirms.

The building’s original 5-story cypress staircase stands on display as a historical artifact. Because the National Park Service wanted the staircase preserved, the contractor disassembled each piece with precision. Unfortunately, it was in such derelict shape that the full staircase was not salvageable. The team condensed the viable pieces and

(continues on page 24)

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BUILT IN THE 1860s, THE BUILDINGS RETROFITTED INTO SAZERAC HOUSE ENDURED NUMEROUS INSENSITIVE RENOVATIONS BEFORE BEING LEFT VACANT FOR THREE DECADES. THE STATE OF THE BUILDINGS CREATED NUMEROUS CHALLENGES FOR THE DESIGN AND CONSTRUCTION TEAM.

reconstructed a 3-story staircase instead, which remains visible in the museum but roped off for public safety.

Historic beadboard ceilings were discovered during the removal of the wood joists for the atrium, and the National Park Service requested the beadboard ceilings be restored. This presented a new challenge in providing the acoustic mitigation that a museum requires. The team added custom-milled micro-perforated acoustic beadboard ceilings that absorb 90 percent of the sound within the space and built a very dense flooring assembly from multiple layers of mass-loaded-vinyl and acoustic plywood. "The acoustic treatments are excellent," Trahan notes. "There can be a wedding with a DJ or a band happening in the event space without disturbing the museum space or the offices."

CRAFTED COMPONENTS

Distillers make Sazerac Rye whiskey on the first floor; blend and age custom rums from around the world on the second floor; and craft small-batch Peychaud's Bitters on the third floor, which is bottled and sold onsite.

When the team learned the amount of chilled water needed for the distilling process exceeded the entire building's chilled-water capacity, team members hired a company that makes thermal-energy tanks for hospitals to tailor a small one for the distillery. At night, when the electrical load demand is low, an antifreeze system runs through a 2,200-gallon tank to produce 14,000 pounds of ice for the next day's distillation. Because a flawed 1990s renovation demanded reconstruction of

(continues on page 26)

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“One of the most compelling aspects of this project is how high-tech can support the restoration of a historic building.”

—Shea Trahan, associate, Trapolin-Peer Architects

one portion of the façade, the team was able to slide the custom tank inside the structure between columns.

“It’s actually an energy-saving solution,” Trahan notes. “What started as an impossible constraint turned out to be a really cool design response, and it’s on display in the middle of the distillery space.”

The raised-access floor system is built of white oak (similar to whiskey barrels) and provides a drain directly to the sewer system to protect the museum in case a large tank spill occurs during production.

For fire safety, distillery operations were compartmentalized from other spaces with rated assemblies and active fire-protection systems. The project also includes enlarged fire egress stairs and a state-of-the-art fire detection system that constantly measures the air for particles known to appear minutes prior to combustion. Fire-safety specialists ran a series of egress scenarios and proved that the enlarged stairs and early detection system created a building safer than the code mandates.

CONTEXTUAL INFUSIONS

The clients wanted the project to exude the feel of the French Quarter, so Trapolin-Peer Architects distilled elements from the surrounding community. The original brick flooring in the atrium recalls the brick-paved sidewalks outside. Cast-iron detailing believed lost in prior renovations reappeared when an iron acanthus-leaf column capital was found

hidden behind a pipe, and the team used it as a mold to recreate the buildings’ acanthus leaf detailing.

Designers accentuated the authenticity of preserved historic elements with clearly modern touches. “We wanted to intentionally delineate between the new and old,” Rogers says. “Thoughtful detailing gave us opportunities to highlight contemporary techniques and materials in the project.”

For example, the staircase is reminiscent of the French Quarter’s wrought-iron balconies in a unique way. “The staircase’s 1/4-inch steel-panel, plasma-cut guardrail references historic New Orleans’ railings, embellished with elements from the Sazerac Company’s most iconic bottle labels,” Rogers explains. In addition to the iconic “S” from the Sazerac Rye bottle, the panels include the star anise flower—an essential ingredient in Peychaud’s Bitters and a mainstay of the Sazerac cocktail. At the perimeter of the opening, glass guardrail panels feature the recipe for the Sazerac cocktail, which is legible up close but the writing resolves into the background from a distance.

The exhibit space brings the bitters’ ingredients to life with old-apothecary-style drawers, containing the herbs, flowers and botanicals for visitors to smell.

“This project engages all the senses,” Trahan says. “It really manifests history and the Sazerac brand while blending the flavors and experience of a cocktail into physical form.” 



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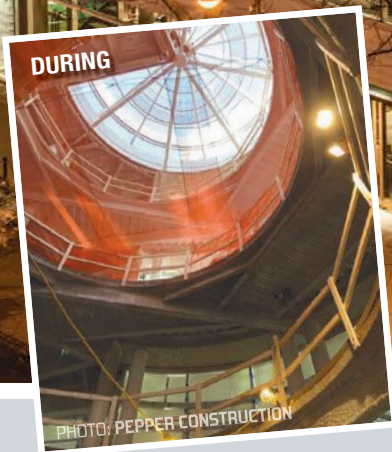
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STARBUCKS RESERVE ROASTERY | Chicago



PHOTOS: STARBUCKS unless otherwise noted



► RETROFIT TEAM

DESIGN: Starbucks, www.starbucks.com/coffeehouse/store-design, and Perkins & Will, perkinswill.com
GENERAL CONTRACTOR: Pepper Construction, www.pepperconstruction.com
ARCHITECTURAL MILLWORK: Parenti & Raffaelli Ltd., www.parentiwoodwork.com

► MATERIALS

The Roastery, which is seeking LEED Silver Certification, boasts LED lights and low-flow fixtures, as well as VRF units to supplement spaces that require additional cooling. It also captures and refeeds hot water instead of using additional electrical. The following is a sampling of materials used in the project:

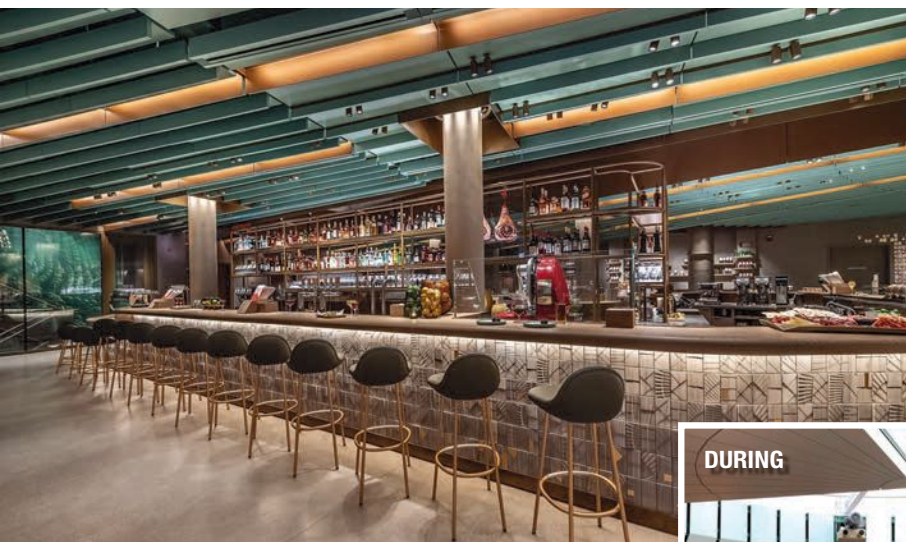
CURVED AND LINEAR ESCALATORS: Mitsubishi Electric, www.mitsubishielevator.com
CUSTOM LED LIGHT FIXTURES: Delta Light, www.deltalight.com/en
BATHROOM PENNY TILES: Ann Sacks, www.annsacks.com

► THE RETROFIT

Located on Chicago's Magnificent Mile, the 35,000-square-foot facility fills every inch of a former Crate & Barrel store built in 1990. The Starbucks Reserve Roastery Chicago takes cues from the original architecture of the largely glass and stone department store. In fact, Starbucks involved Crate & Barrel founder Gordon Segal in the design of the Chicago space. The roastery boasts plenty of natural light within the 5-story interior thanks to the building's existing rotunda and floor-to-ceiling windows. The exterior of the

building has been virtually untouched and the Starbucks stamp is minimal.

At the center of the space, spanning all five floors, is a towering coffee bean cask made of eight cylindrical chambers. It stretches 56-feet tall from the ground-floor upward and is surrounded by a spiraling escalator that guests can take to the second floor to watch conveyors drop roasted coffee beans in the cask to cool. One of the most unique features is the curved escalator, the first in the Midwest. The existing structure needed to be modified precisely to accept the curved escalator, which was planned as a showpiece in the finished space.



DROP THE H BREWING CO. | Pittsburg, Kan.



PHOTOS: AQUATHERM



►► RETROFIT TEAM

PIPE INSTALLER: Satterlee, satterleelumbing.com

PIPE SUPPLIER: Star Wholesale Supply,
www.star-mechanical.com/home

MANUFACTURER'S REPRESENTATIVE: Johnson & White Sales Co., www.jandwsales.com

►► MATERIALS

As a commercial airline pilot, brewery owner Mark McClain is meticulous and researched every aspect of brewery operations, including piping that would carry glycol from his brewery's process chiller to the facility's 16 fermentation and serving tanks.

"I knew I wanted a system that was reliable and I really liked Aquatherm's warranty and its ease of operation," McClain says. "Although I could

have gone cheaper upfront, I know that cheaper is not always what's best in the long run."

This project was pipe installer Satterlee's first experience with Aquatherm pipe, and the company's installers received training from Brandon LeMasters, outside sales rep for Star Wholesale Supply, and Ryan Epstein, an Aquatherm product specialist at Johnson & White Sales. LeMasters visited the job site regularly throughout the installation.

This project called for 400 feet of 2-inch and 450 feet of 3/4-inch Aquatherm Blue Pipe SDR 11, which was installed from June to September 2019. Satterlee's crew installed the pipe using two sets of McElroy socket fusion irons and one McElroy Spyder125 fusion machine. One installer worked on the 2-inch mains and another handled the 3/4-inch drops to each piece of equipment.

LeMasters says Satterlee's team was impressed with the ease and speed of installation, as well as Aquatherm's light weight. "A 20-foot section of 3/4-inch Aquatherm weighs about a quarter of what the same length of steel pipe weighs," LeMasters notes. "It's much easier for the installers to work with."

"When we did the pressure test, we found no leaks on that entire system with thousands of joints installed," adds Dale Benedict, a Satterlee project manager.

PIPE MANUFACTURER: Aquatherm, aquatherm.com

PIPE FUSION TOOL MANUFACTURER: McElroy,
www.mcelroy.com

►► THE RETROFIT

An appreciation for German beer inspired McClain to open his own brewery. The name "Drop the H" is a reminder about the brewery's location in Pittsburg, Kan., not Pittsburgh, Pa.

Beyond ease of installation, performance, warranty and all the other factors that McClain considered, there was another reason he insisted on Aquatherm: the look of the pipe.

"Mark McClain wanted the brewery to look like a showroom, and he loved the colored piping," Benedict says. "He didn't like the look of pipe insulation, so we didn't insulate any of this and we've had no problems with condensation even though we're running 42 F glycol though a 70 F ambient. Mark was very happy about that because it was important to him to show off the pipe's bright color."

McClain admits he loved the idea of the modern, blue piping in his 100-plus-year-old building. "We gutted and renovated the building, but we kept many of the rustic elements," he says. "I like the juxtaposition of the old and the new and the way they play off each other, and I'm happy to say that not only does the blue pipe work great, it looks amazing!"





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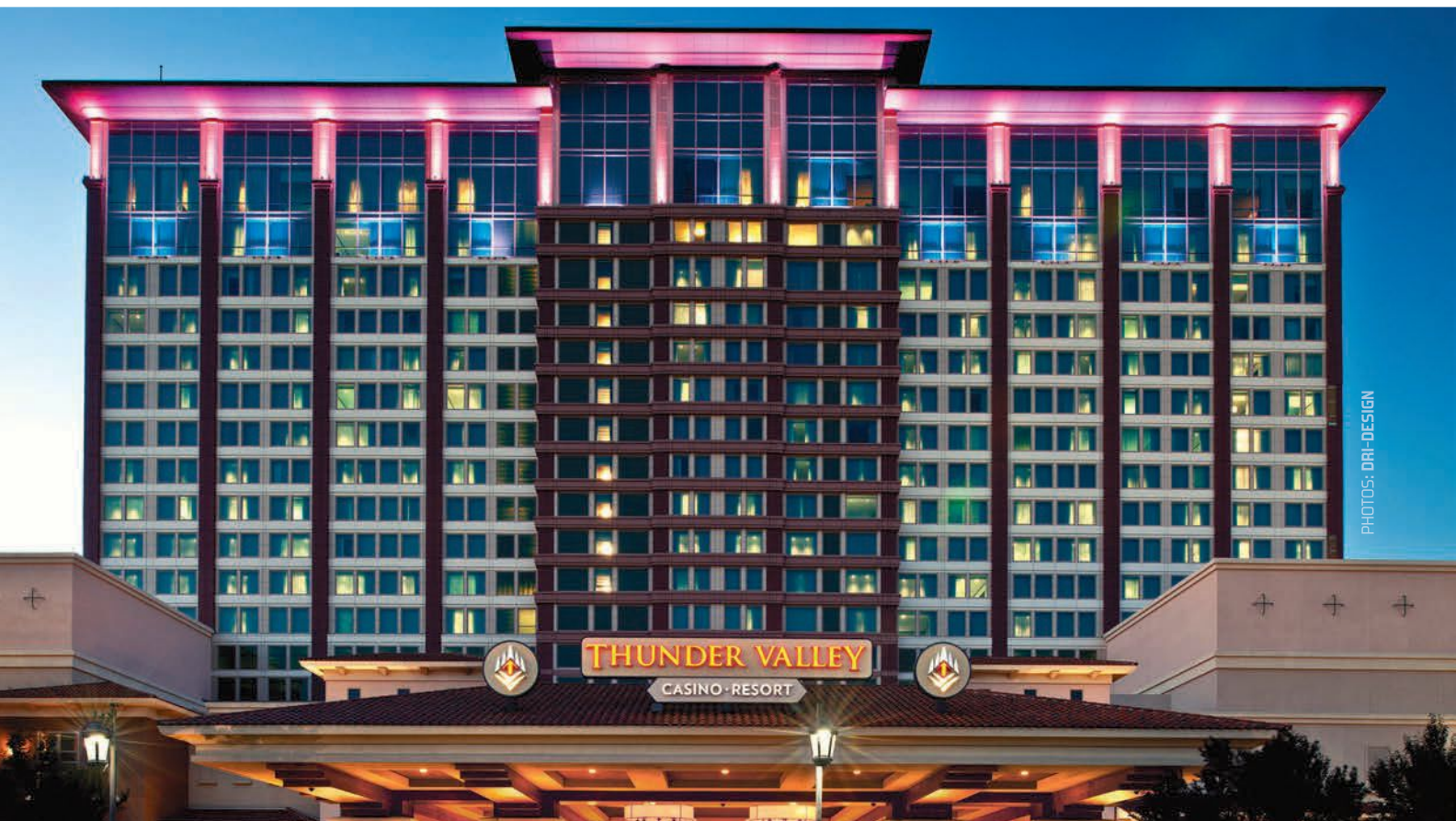


WAUSAU TILE

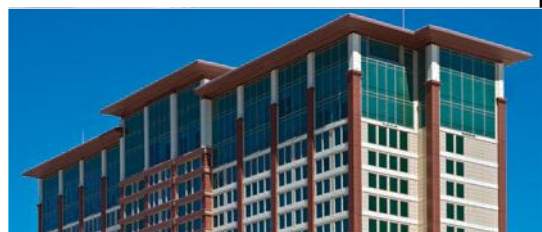
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PHOTOS: DRI-DESIGN



THUNDER VALLEY CASINO RESORT |

Lincoln, Calif.

► RETROFIT TEAM

ARCHITECT: Jax Kneppers Associates Inc.,
www.jaxkneppers.com
WALL PANEL INSTALLER: B.T. Mancini Co.,
www.btmancini.com

► MATERIALS

The 17-story building has 408 hotel rooms over a main-floor casino. Jax Kneppers Associates' team set out to replace an existing EIFS façade. The firm considered composite metal wall panels, but team members could not recreate existing architectural detailing. Dri-Design's Shadow Series achieved the desired wall aesthetic. Each panel can be extended at varying depths, which creates texture, patterns and detailing. All of this is done

while keeping the substrate and weather barrier in the same plane.

Dri-Design also was selected for its interlocking system, which channels water and provides flexibility to accommodate subtle movements of a high-rise building.

"The bottom-up installation method allowed construction to occur on a floor-by-floor basis in correlation with interior renovations," says Jacob J. Welhouse, AIA, NCARB, LEED AP, an architect with Jax Kneppers Associates. "The installation method of attaching panels to girts allowed a seamless weathertight enclosure to be installed efficiently and independently of the finished metal panel system. Hotel management could regain occupancy of the guest rooms at a quicker pace."

B.T. Mancini Co. installed 78,364 square feet of 0.08-inch aluminum Shadow Series panels in Meadowlark, Clay Beige, Heartwood and Copper Nail colors. "The panels install at a very efficient rate and require no clips or hardware," says David Jacks, senior project manager for the Structural Products Division at B.T. Mancini.

"Metal panels have updated the building with a fresh new contemporary finish," Welhouse says. "The ... metal panels are consistent and color-stable for years to come. This significantly reduces the ongoing maintenance requirements for the exterior façade."

WALL PANEL MANUFACTURER: Dri-Design,
www.dri-design.com



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► RETROFIT TEAM

ARCHITECT: Wick Architecture & Design, www.wickarch.com
 GENERAL CONTRACTOR: Barling Construction,
www.barlingconstruction.com
 ACOUSTIC ENGINEER: JPM Acoustics Noise Vibration,
acousticalnoisevibration.com

► MATERIALS

The goal for owner Erik Nilsson's second BYOgear location was that it be acoustically designed and built with independent double-wall framing—with walls and ceiling not touching any other studio. Nilsson also wanted sound transfer between rooms to be practically nonexistent.

The studio walls and ceilings were built with 1 3/8-inch QuietRock 545, a multilayer gypsum panel engineered to provide maximum sound attenuation (STC-rated assemblies performing at the 60 to 80 STC level) across a broad frequency range. The product was installed on every wall and ceiling throughout the studios. The acoustical team from PABCO, QuietRock's manufacturer, reviewed the project and presented design options to guide the installation team.

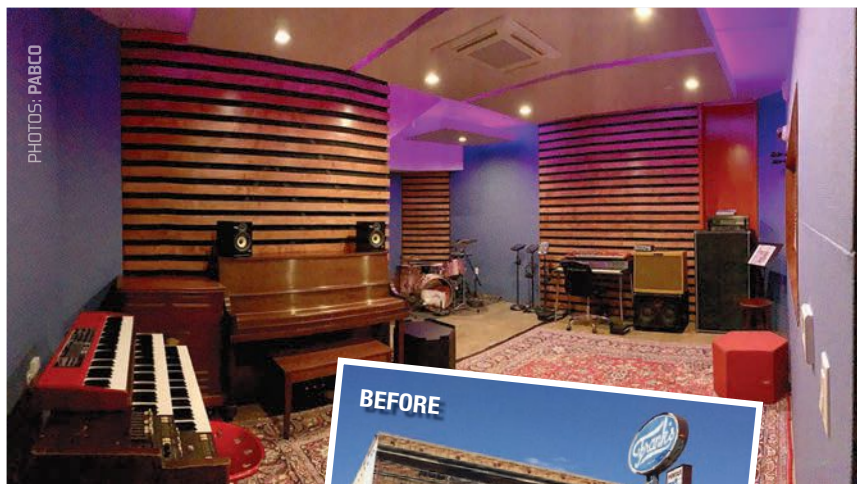
"Post-construction measurements and analysis of results indicated exceptional performance in relation to both sound isolation and interior acoustics," says John Matagos, senior acoustical engineer, JPM Acoustics Noise Vibration. "LemonTree Studios provides a high level of sound isolation between each room, as well as a design that allows for a community of collaborative music to flourish."

GYPSUM PANEL MANUFACTURER: PABCO, www.pabco-gypsum.com

► THE RETROFIT

LemonTree Studios was created to provide an affordable solution for musicians who have their own recording gear but need a professional recording space. The studio features 12 separate quiet rooms where musicians of all genres can work uninterrupted from sound by adjoining rooms.

Beyond achieving the recording space the owner expected, LemonTree Studios was selected by PMC to house its state-of-the-art Dolby Atmos studio, one of only a handful of such studios in the world. PMC, known for its speakers used by leading mastering houses, broadcasters and much of the professional world, selected LemonTree Studios because of the quality of construction and materials used.



TRILLIUM BREWING CO. | Boston

►► RETROFIT TEAM

PLUMBING CONTRACTOR: EH Marchant Co., ehmarchant.com
MECHANICAL ENGINEER: BLW Engineers, www.blwengineers.com
MANUFACTURER'S REPRESENTATIVE: David Gooding Inc., www.goodingd.com

►► MATERIALS

Trillium Brewing has two distinct areas at its Fort Point-neighborhood location related to hot water. "The restaurant and the brewery each have a standalone, instantaneous hot-water plant providing different supply temperatures," explains Michael Petrilli, president of EH Marchant. "Efficiency is of some importance on a job like this but it takes a back seat to the need for redundancy, satisfying peak demand and constant circulation."

EH Marchant worked with BLW Engineers to design the hot-water systems around Navien's NPE-240S condensing tankless water heaters. The two systems are nearly identical. Each includes five 199,900-Btu-per-hour gas-fired Navien tankless units with a 10:1 turndown. The system dedicated to the brewery provides 160 F water for vat cleaning, floor washdown, etc. The restaurant system supplies 140 F water for sinks and commercial dishwashers.

"We've standardized on cascaded tankless systems for restaurant applications for their redundancy," Petrilli says. "The fact that the systems are wall-mounted is a big advantage too from a space and sanitation perspective. We've had very good experiences with the Navien NPE line. Reliability, price point, and the support and training we get from the local rep are all big factors. Stainless-steel heat exchangers and 97 percent efficiency aren't hard to sell either."

The Fort Point building that houses Trillium Brewing is one of many warehouse-type structures in the old Boston Waterfront district. "Most are brick and built in the 1800s, so the option to common vent these systems is a big advantage," Petrilli adds. "One of our systems here is sidewall vented and the other penetrates the roof. We'd have preferred to vent both through the roof, but a large part of Trillium's roof space is occupied by a deck."

The units are piped in parallel to a 2-inch manifold and eventually a 1-inch recirculation line. Navien's cascade kit is used so the system is only firing at the needed input and there is always plenty of capacity available when peak demand occurs.

The brewery is equipped with washdown hoses, allowing brewers to spray down equipment and floors throughout the day. Water use is especially high when fermentation vessels are cleaned out, which occurs two or three times a week. The brewery can require as much as 30 gallons per minute. In the restaurant, demand for hot water is lower and steadier, never exceeding 20 gpm.

TANKLESS WATER HEATER MANUFACTURER: Navien,
www.navieninc.com

►► THE RETROFIT

The 10-barrel system at Trillium Brewing's Fort Point location isn't Trillium's largest production facility. Rather, it's a pilot system comprised of stainless-steel fermentation tanks and oak foeders for testing new recipes and ingredients. It also brews much of the beer for the location's gourmet restaurant that can seat 490 patrons when the roof deck and patio are open.



THE FRED KAVLI THEATRE | Thousand Oaks, Calif.



► RETROFIT TEAM

ARCHITECT: SVA Architects, sva-architects.com

- Robert Simons, AIA
- Robert Puleo
- Douglas Brown, NCARB

ENGINEER: TK1SC, www.tk1sc.com

LIGHTING DESIGNER: StudioK1, www.studiok1.com

GENERAL CONTRACTOR: Waisman Construction, (818) 716-6396

► MATERIALS

SVA Architects created a new color palette for the theater that would blend with the existing public lobby. All 2,000 seats were removed, refurbished and reupholstered to harmonize with the new color

scheme. All interior surfaces were refinished, and new wood trim and wall surfaces were added to enhance the durability and maintenance of the facility.

SVA Architects' team devised a new multicolored lighting system that would provide interest and unlimited lighting options for upcoming productions. Modifications to the lighting included the retrofit of flexible multicolored accent lighting, lighted steps and upgrades to existing lighting to meet current energy standards.

Additionally, the design team was tasked with renovating the behind-the-scenes areas, including the green room and VIP dressing rooms to provide an updated, quality environment for the visiting

stars. The team adapted the architecture to meet current ADA standards; installed upgraded finishes, cabinetry and lighting; as well as specified new furnishings. The following is a sampling of materials used in the project:

AUDITOREUM

CARPET: Tandus/Centiva, commercial.tarkett.com/en_US/brand/tandus-centiva

- The carpet features solution-dyed yarns that are colorfast and easily cleaned, as well as durable. The carpet is a large-scale, organic pattern that reflects the natural setting of the city of Thousand Oaks.

WALL PAINTS: Dunn-Edwards Paints, www.dunnedwards.com

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IMPACT-RESISTANT WALL PANELS: Korogard from Koroseal, koroseal.com/products/wall-protection
UPHOLSTERY: Palatine 2 from Arc-Com, arc-com.com, and Crypton, www.crypton.com

■ Upholstery was selected to provide multiple color interest in seating while creating surfaces that are impenetrable to spilled liquids.

COLOR-CHANGING LIGHTS: MaxiLED, www.maxiledlighting.com

AISLE AND CHAIR LIGHTS: Tivoli, www.tivolilighting.com

CUSTOM STEP LIGHTS: Hevi Lite, www.hevilite.com

LOUNGE AND DRESSING ROOMS

VINYL PLANK FLOORING: Karndean Designflooring, www.karndean.com

BEFORE

■ LooseLay Longboard in 10- by 60-inch planks creates a warm, hospitality ambiance.

CARPET: Net Effect from Interface, www.interface.com

WALL SURFACES: Arc-Com, arc-com.com; Koroseal, koroseal.com/products/wall-protection; Innovations, www.innovationsusa.com; Colour & Design, colouranddesign.com; and MDC, www.mdcwall.com

RESTROOM TILE: Avondale from Daltile, www.daltile.com

►► THE RETROFIT

The Fred Kavli Theatre at the Thousand Oaks

Civic Arts Plaza is a major performing-arts venue in Ventura County for live theatrical, concert, dance and comedy performances. The theater, which opened in 1994, required a cosmetic and technical upgrade to meet the increasing technical demands of contemporary performances and to rehabilitate the wear and tear that has occurred over years of constant use.

SVA Architects' team worked closely with city administrators to transform the look of the theater, focusing on new interior materials and lighting. All upgrades needed to be completed in eight weeks while the theater was closed between productions. The theater reopened in time for its 25th anniversary in October 2019.

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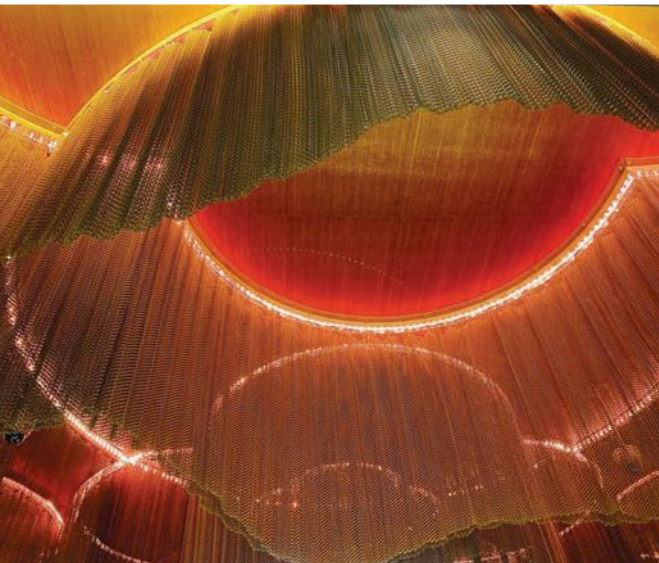


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PHOTOS: CASCADE ARCHITECTURAL



CASBAR, SLS LAS VEGAS HOTEL & CASINO

► RETROFIT TEAM

ARCHITECT: Innovativo Design,
www.innovativodesign.com

► MATERIALS

As part of a \$100 million transformation of the casino, the 24-hour CASBAR lounge showcases vibrant gold, orange and purple tones to create “a striking setting reminiscent of moody desert sunsets,” according to SLS Las Vegas Hotel & Casino. Above the bar hangs the main feature, a collection of coiled wire fabric systems by Cascade Architectural.

“Our team needed decorative architectural drapery that aligned with our design vision in terms of material type and color—both of which we were able to realize with Fabricoil,” says Nancy Paolino, founder and chief creative officer at Innovativo Design.

CASBAR’s above-bar feature was created using aluminum Fabricoil in two different weave sizes—3/8 and 1/2 inch—all with 15-gauge wire. The ceiling treatments are secured using Custom Curved Steel Angle with Hooks attachment systems offered by Cascade Architectural. Innovativo Design chose a Satin Gold

powder-coated finish, suitable for Las Vegas’ ambiance and the architects’ desired desert theme.

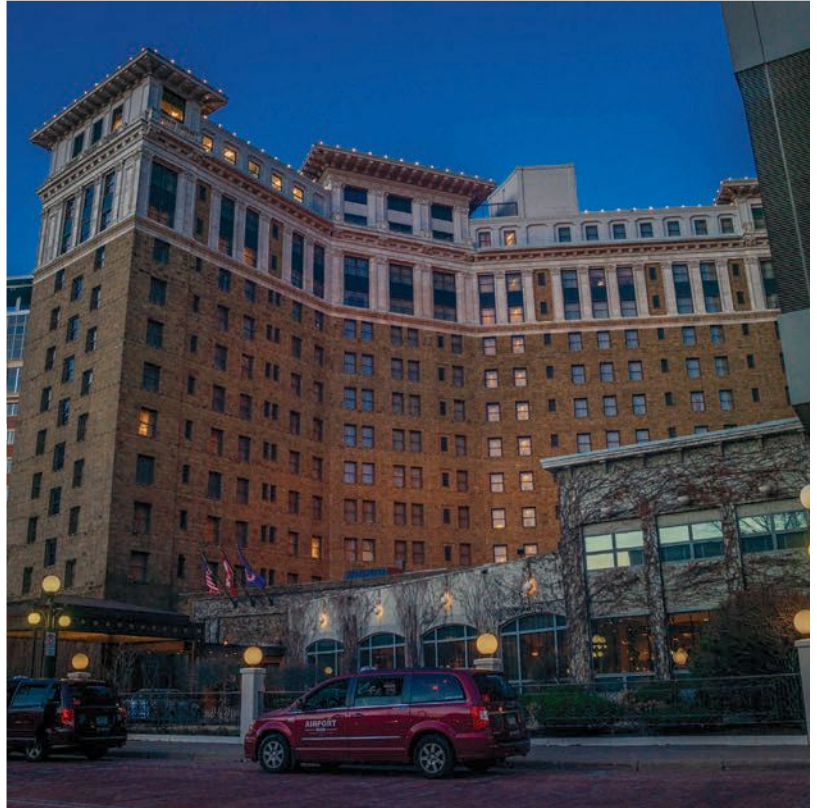
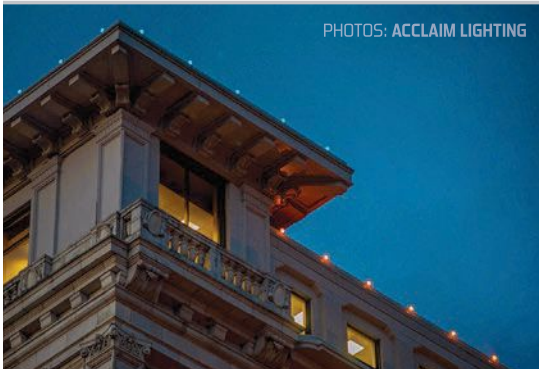
In addition to their decorative purpose, the coiled wire fabric intercepts light cast down from the ceiling to dim and diffuse throughout the bar area, creating a comfortable environment for guests below.

CASBAR Lounge at SLS Las Vegas Hotel & Casino was completed in May 2019.

WIRE FABRIC MANUFACTURER:

Cascade Architectural, www.cascadecoil.com

THE SAINT PAUL HOTEL | St. Paul, Minn.



» RETROFIT TEAM

LIGHTING INSTALLER: Aid Electric Corp.,
aidelectric.com

MANUFACTURER'S REPRESENTATIVE:
Mlazgar Associates, www.mlazgar.com

LIGHTING SUPPLIER: Viking Electric,
www.vikingelectric.com

» MATERIALS

Until recently, The Saint Paul Hotel's exterior lighting specification was not up to the standards of the trademark style and sophistication of the AAA 4-Diamond multiple award-winning hotel.

Ken Wieber, director of Property Operations at the Saint Paul Hotel, worked with Darren Strafelda, account manager with Mlazgar Associates, for the design development, specification, project management and system commissioning for a new lighting system. Wieber and Strafelda wanted the new lighting to produce a true white color, achieve appropriate brightness and be able to quickly change color.

Through a recommendation from Kathy Foldesi, account manager at Viking Electric, the team tested AL Dot AC RGBW fixtures, a direct view RDM/DMX node, developed and designed by Acclaim Lighting for low-resolution dots of color

and dynamic visual effects, for the entire top of the building. AL Dot AC features an internal DMX driver; 120-degree beam angle; and Acclaim's Spectrum Technology, which allows for true dedicated whites alongside color-changing options.

According to Wieber and Strafelda, the team liked AL Dot's RGBW color-changing ability with the option to be at 3000K, which will be the "standard" color used by the hotel on most days. The color-changing ability enables The Saint Paul Hotel to set and change scenes throughout the year.

One-hundred-sixty AL Dot AC RGBW nodes were installed around the top of the building. With two screw holes on each side of the fixture, the AL Dot nodes are easy to mount on any surface. The direct view, RDM/DMX node comes with a multipin with five connectors for DMX lead conductors. To maintain the façade's architectural integrity during installation, the team designed a mounting system that enables for single fixture replacement without disturbing any of the building's envelope with penetrating hardware.

The IP66-rated AL Dot AC has an aluminum housing that does not attract dust and provides protection in water. The fixtures operate in temperatures between -4 to 123 F and maintain

70 percent of their lumens at 150,000 hours.

"Everyone loves the results," Wieber says. "We reinforced our position as a showpiece in the city. It changed the look of our hotel by adding sparkle to our elegant building. We are now brighter and more vivid. For us, the building is a major part of our attraction. We are a beautiful historic property with this attractive lighting system on top."

LIGHTING SYSTEM MANUFACTURER: Acclaim Lighting, acclaimlighting.com

» THE RETROFIT

Opened and promoted as "St. Paul's million-dollar hotel" in 1910, the property has hosted dignitaries, leaders and colorful characters from presidents and royalty to movie stars and athletes, including President John F. Kennedy and Charles Lindbergh. The Saint Paul Hotel was designed by the architectural firm of Reed and Stern, best known for their design of New York's Grand Central Terminal.

Today, the historic hotel maintains its charm by combining early 20th-century elegance with the convenience of modern 21st-century amenities while offering views of Rice Park and downtown St. Paul.

SEVEN GABLES INN | St. Louis



PHOTO: BRYAR KEYES

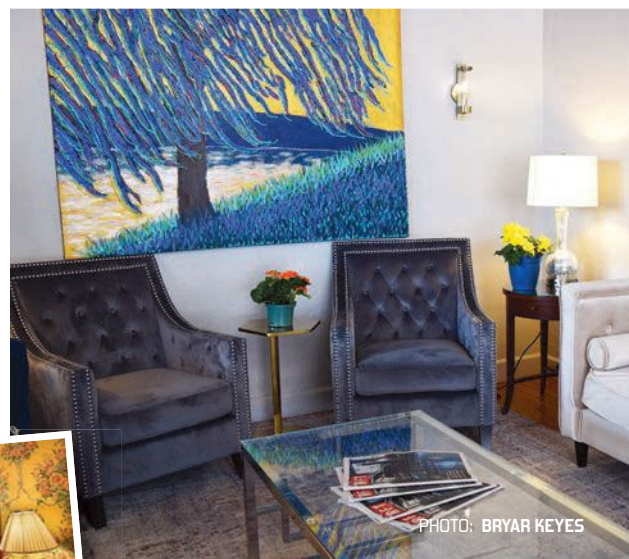


PHOTO: BRYAR KEYES

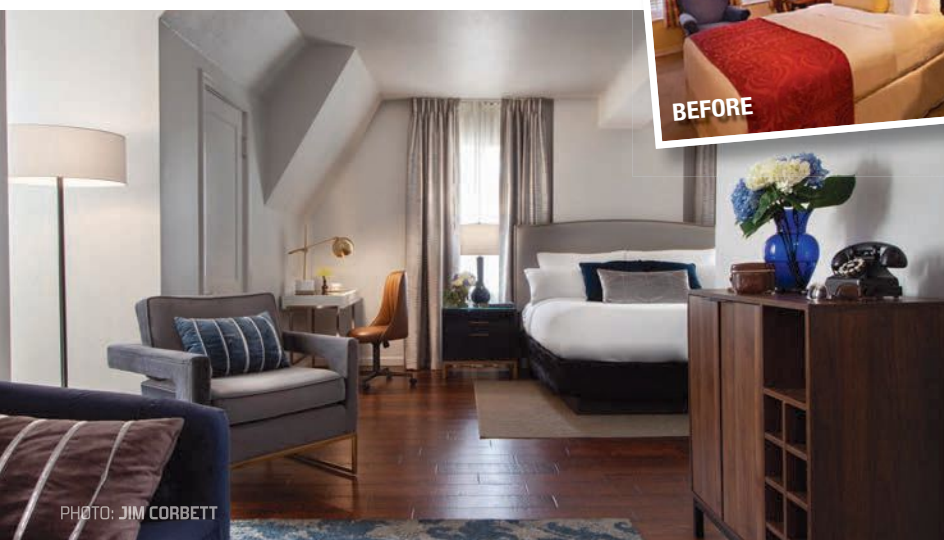


PHOTO: JIM CORBETT

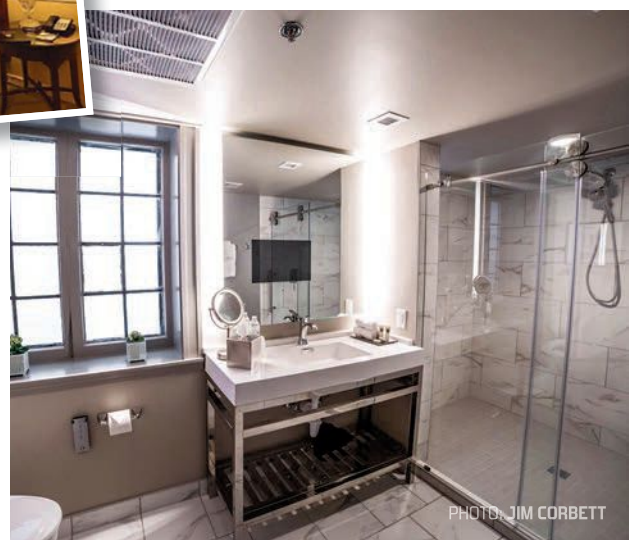


PHOTO: JIM CORBETT

► RETROFIT TEAM

ARCHITECT AND INTERIOR DESIGNER: Checkmate Design LLC, www.checkmatedesign.com
GENERAL CONTRACTOR: Poettker Construction, www.poettkerconstruction.com
STRUCTURAL ENGINEER: KPFF, www.kpff.com/location/st-louis-mo
MECHANICAL/PLUMBING ENGINEER: Jarrell Mechanical Contractors, jarrellcontracting.com
OWNER/DEVELOPER: Restoration St. Louis, www.restorationstl.com

► MATERIALS

The restoration updates included historic window replacement and interior finish upgrades. The accessibility portion of the project consisted of constructing a bridge between the second- and third-floor guest wings, adding an elevator,

removing extra unused staircases and adding more hallways for better guestroom access. The following is a sampling of materials used in the project:
CERAMIC FLOOR TILE IN SHOWERS: Daltile, www.daltile.com
GUESTROOM FLOORING: Exotic Brushed Mulberrywood Strand Wood Collection from Mazama, www.builddirect.com
CORRIDOR CARPET: Masland Contract, www.maslandcontract.com
SELF-FLUSHING BIDET TOILETS: Toto Washlet, www.totousa.com
SHOWERHEAD: Raindance from Hansgrohe, www.hansgrohe-usa.com
MIRROR: Seura, www.seura.com
PAINTS: Sherwin-Williams, www.sherwin-williams.com
GUESTROOM FABRIC WALLCOVERING: Genon Contract from MDC, www.mdcwall.com

CLOSET SYSTEM: Impressions, Chocolate, from ClosetMaid, homedepot.closetmaid.com
DOOR LOCKS: Safflok Quantum Electronic Lock from DormaKaba, www.dormakaba.com
EXTERIOR LIGHTING: Bistro Collection, E26 Architectural Suspended String from LightCraft Outdoor, lightcraftoutdoor.com

► THE RETROFIT

Because the Seven Gables Inn is listed on the National Register of Historic Places, the \$3.5 million project required historic-renovation expertise. Poettker Construction's hospitality experts were engaged by Restoration St. Louis for overall interior restoration updates and accessibility layout adjustments. The project was completed in summer 2019.

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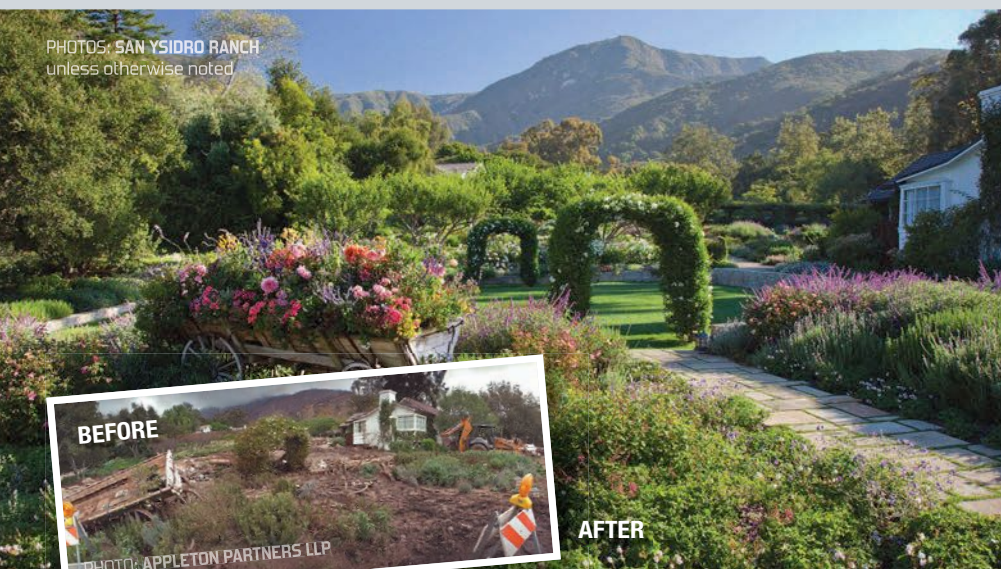


Feeney Makes it Easy.



SAN YSIDRO RANCH | Montecito, Calif.

PHOTOS: SAN YSIDRO RANCH
unless otherwise noted



» RETROFIT TEAM

ARCHITECT: Appleton Partners LLP,
www.appleton-architects.com

» MATERIALS

Just 15 months after destruction from mudslides after the nearby Thomas Fire, San Ysidro Ranch reopened to once again serve as an A-List hideaway. The 41 vine-covered, individually decorated cottages with gated entries, enclosed gardens and adjacent private cottage side parking, wind along San Ysidro's hillside creek and tree-lined paths. Each cottage features unique interiors with hand-selected antique furnishings, original artwork, Persian rugs, stone fireplaces and handmade four-poster canopy beds with Rivolta Italian linen. Bathrooms feature radiant-heated floors, stand-alone Parisian bathtubs and separate glass-enclosed showers with Frette bath linens and Bamford bath amenities from England. Cottages include a private outdoor patio with rain shower and candle-lit sunken hot tub; several include private plunge pools.

» THE RETROFIT

Appleton Partners, the commissioned architect that led the property's complete renovation back in 2008, oversaw a team of more than 200 construction workers to rebuild and restore the 500-acre property as quickly as possible following the damaging mudslides.

As part of its efforts, Appleton Partners strived to protect the property and the land from future natural disasters. The team planted mature trees, added boulder walls, strung wires across the valley and re-sited 17 cottages out of the path of rainflow from the Santa Ynez Mountains.

San Ysidro Ranch has been known as a home away from home to many notable figures over the decades: Vivien Leigh and Laurence Olivier were married at the ranch; John and Jackie Kennedy honeymooned there; John Huston completed the script for *African Queen* at the property; and the likes of Audrey Hepburn, Lucille Ball, Bing Crosby, Groucho Marx, W. Somerset Maugham and Sinclair Lewis frequented the property.

"San Ysidro Ranch is a special place where one can indulge the senses and invigorate the soul; it is a slice of heaven unlike anywhere else in the world. The ranch prides itself on the history, the beauty and the spirit of this special property. We all have worked diligently to restore it to be better than ever," says Ty Warner, owner of San Ysidro Ranch.

“

**It was really good
to have Graham as a
partner on this project.
Very easy to work with
and great team players.**

”

STEPHEN TORELL, PE, LEED AP
SENIOR PROJECT MANAGER,
PRISM CONSTRUCTION

**PROJECT: THE RESIDENCES AT EDISON LOFTS
OWNER: DGP URBAN RENEWAL LLC
ARCHITECT: MINNO & WASKO ARCHITECTS & PLANNERS**

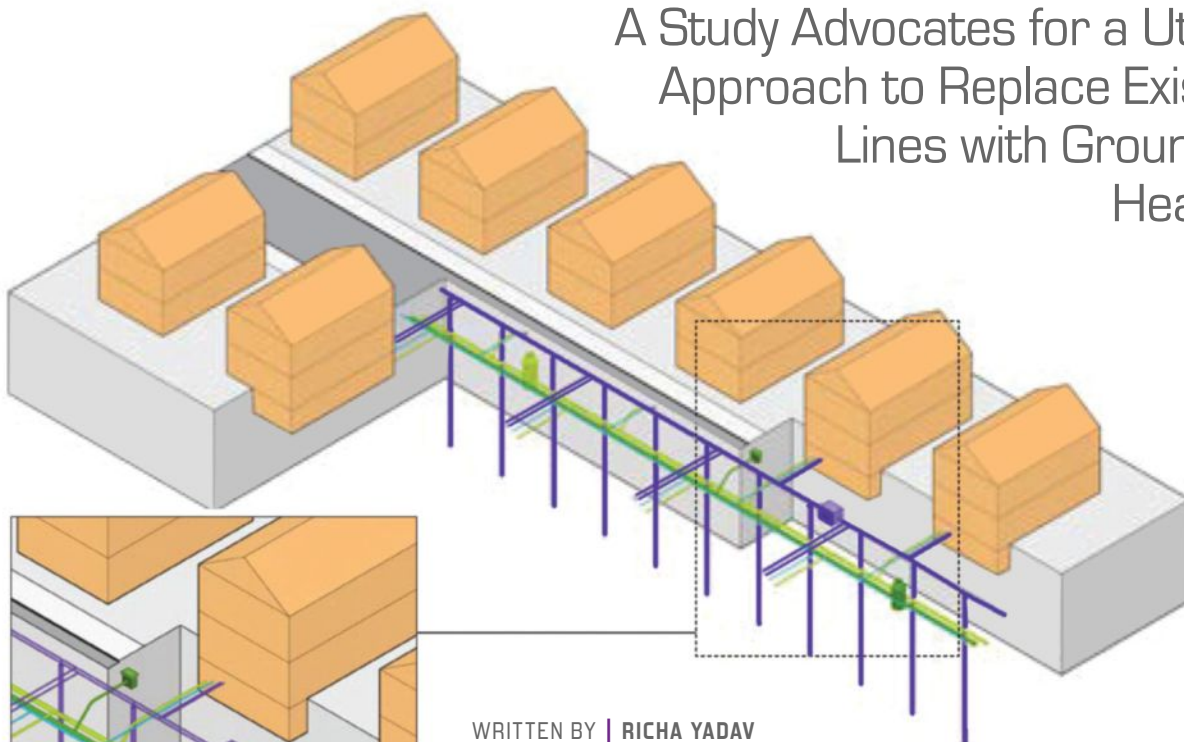
HISTORIC REPLICATION WINDOW EXPERTS

Necessity truly is the mother of invention, as Graham discovered in replicating the former Thomas Edison Battery Building's nearly 2,500 windows. The solution required nearly 40 new extrusion dies. But by extensively modifying its rugged S6800 Series window, Graham was able to replicate the original windows' look while also delivering high-end thermal and structural performance. Edison would be proud.

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GEOMICRODISTRICTS

A Study Advocates for a Utility-scale Approach to Replace Existing Gas Lines with Ground-source Heat Pumps



WRITTEN BY | RICHA YADAV

In 2019, about 97 percent of U.S. natural gas pipelines were made of plastic or steel. Cast- and wrought-iron pipes were the remaining few and among the oldest gas lines in the country, according to the U.S. Department of Transportation's Pipeline and Hazardous Safety Administration (read more at bit.ly/2UwHgdM). Nearly half of all iron pipes are concentrated in four states, including Massachusetts, New Jersey, New York and Pennsylvania. If cast-iron (and bare-steel pipelines) are left in the ground beyond their service life, utilities have to spend millions of dollars repairing leaks on old pipelines. When left unattended, leaking gas pipes release methane, which is a highly combustible gas that poses significant health, public safety and environmental risks.

In September 2018, a natural-gas leak resulted in 131 fires and three explosions in three communities in Merrimack Valley, Mass. Thousands of people from the city of Lawrence and towns of Andover and North Andover were forced to evacuate their homes. About 25 people were injured and one person died in the incident. In the winter months

that followed, more than 8,000 customers had no access to heat, hot water and gas. After a yearlong investigation, the National Safety Transportation Board determined there was inadequate planning and management by Columbia Gas of Massachusetts, which led to over pressurization in the valley's aging cast-iron gas pipes. (Read a synopsis of NTSB's report at bit.ly/3ajO59i.)

Massachusetts Rethinks Gas Infrastructure

Massachusetts has the second-oldest gas infrastructure system in the country with 6,000 miles of aging and leak-prone pipes, which make up 26 percent of the state's gas system. In recent years, natural-gas companies have faced a great deal of backlash caused by pipeline failures and methane leaks from aging pipelines. Gas companies are therefore actively replacing aging pipelines with corrosion-resistant high-density polyethylene plastic pipelines. It is estimated that repairing and replacing the state's leaking gas system can cost taxpayers more than \$9 billion during the next 20 years. This

GeoMicroDistrict: Ground-source heat pump closed vertical systems could be installed in a single row along an existing utility corridor. Vertical boreholes and service connections could be located between existing infrastructure.

does not include the price of lost gas that customers and businesses already pay in their monthly bills, which is estimated at \$90 million per year in the greater Boston area alone. (Learn more from a research article published by the Proceedings of the National Academy of Sciences of the United States of America, www.pnas.org/content/112/7/1941.)

Currently, nearly 70 percent of Massachusetts' electricity and 50 percent of heating energy loads are met by natural gas, all of which is imported from other regions in the U.S. and overseas. During peak winter season, the state faces massive gas shortages, increasing the wholesale price of gas, as well as the cost of power production. To address this energy-security problem and overarching climate issues, the state has required electric utilities to use more renewable energy each year and has heavily invested in energy-efficiency programs. At the current pace, clean-energy alternatives are poised to undercut gas prices in coming years, per Rocky Mountain Institute, rmi.org/insight/clean-energy-portfolios-pipelines-and-plants.

The decreasing cost of renewables will likely accelerate the pace of renewable deployment and building electrification, which will decrease gas consumption. If gas consumption declines, the utilization of gas pipelines will drop, inadvertently increasing the financial burden of maintaining the pipelines on a shrinking pool of gas customers. Although it is imperative to maintain gas lines for public safety, continually replacing leaking pipelines with new ones will not only cost taxpayers billions of dollars but also lock some gas customers into another 40 to 70 years of fossil-fuel dependency. The macroeconomics have forced Massachusetts policymakers and industry leaders to rethink future expansion of gas infrastructure.

Following the aftermath of Merrimack Valley, the Home Energy Efficiency Team (HEET), a local environmental non-profit, began exploring potential substitutes for gas infrastructure. Long known for its work on energy-efficiency retrofits and methane-leak studies in Massachusetts, HEET wanted to explore an alternative business model where customers could purchase renewable thermal energy, instead of natural gas. In early 2019, HEET selected Buro Happold to lead a feasibility study for replacing aging natural-gas infrastructure with a network of ground-source heat pumps (GSHPs). (For a quick lesson about GSHPs, see "Understanding GSHP Systems", page 46.)

Viability of GeoMicroDistricts

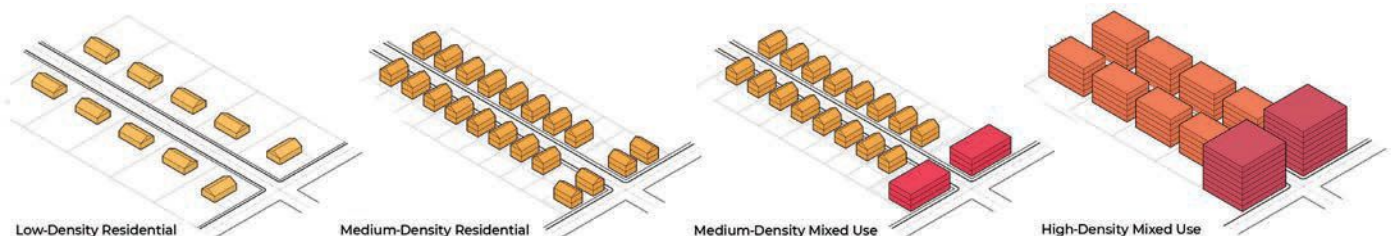
During the development of the study, the term "GeoMicroDistrict" was coined to refer to the GSHP network that serves a street segment—the length of street between two intersections or an intersection and a dead end. The GeoMicroDistrict would contain a shared loop running through an array of boreholes installed within public rights-of-way. The ambient water circulating in the shared loop would serve as the heat-exchanging medium between the ground and heating and/or cooling distribution systems housed within individual buildings. In theory, the concept is to incrementally replace leaking gas pipes with GeoMicroDistricts that are eventually interconnected to create a district-scale energy system.

District-scale GSHP systems are not a novel idea. In the U.S., universities like Colorado Mesa, Ball State and Furman, as well as many large-scale residential development projects have successfully installed and operated district-scale GSHP systems for years. However, strategic replacement of natural-gas pipelines with GSHP systems is certainly a unique proposition. For successful execution of this

A FUTURE FOR RENEWABLE ENERGY

Following the public release of the GeoMicroDistrict Feasibility Study, Home Energy Efficiency Team (HEET), a Massachusetts environmental non-profit, and its supporting partners filed an act for utility transition to using renewable energy. Known as the FUTURE Act, the act was developed with legislative leaders to pass laws to improve regulations for gas distribution systems and to accelerate the transition to renewable energy. The FUTURE Act will grant utilities the permission to bill customers for renewable thermal credits (or Btus) instead of gas and proposes a renewable thermal credit market for the gas industry. The act calls for flexible regulations, allowing municipalities to choose energy alternatives, and requests for funding and financial incentives to encourage gas companies to distribute thermal renewable energy instead of gas. The bill was supported by 13 municipalities at the Telecommunications, Utilities and Energy Committee hearing last November. (Learn more about the hearing at malegislature.gov/Bills/191/HD3719.) HEET is currently supporting Eversource Gas, a local utility, to pilot the GeoMicroDistrict concept in 2021.

PROTOTYPE STREET SEGMENTS



Layout of prototype street segments (PSS), representing common building and land-use characteristics across Massachusetts.



The Home Energy Efficiency Team (HEET) project aims to develop an innovative GeoMicroDistrict, which can potentially replace natural gas infrastructure with a network of neighborhood-scale district heating systems, supplying heat via a system of insulated pipes to homes, businesses, schools and more.

concept, various risks pertaining to site suitability, building compatibility, high upfront capital costs and operational reliability (energy load and capacity management) need to be mitigated.

To address these constraints, the GeoMicro-District Feasibility Study examined the engineering and economic viability of installing shared loops in four prototypical street segments (PSS). The PSS represent distinct building and land-use typologies prevalent in Massachusetts. Each PSS is composed of two contiguous lines of residential and/or commercial properties on either side of a 40-foot-wide, 500-foot-long public right-of-way.

To avoid site conflicts with underground infrastructure systems (potable water, telecom, data cables, sewer, stormwater systems and the like), borehole installation area is limited to the 2-foot-wide gas utility corridor. The engineering layout is informed by the state's geological and seasonal parameters and designed to operate in balanced condition so as to prevent ground overheating or overcooling. The heating and cooling demand profiles of each PSS are then compared with the ground's thermal capacity to assess annual thermal loads met by interconnected GeoMicroDistricts.

Buro Happold's study concluded that interconnected GeoMicroDistricts can provide nearly 100 percent of the annual thermal loads in low-to medium-density residential and mixed-use commercial areas. High-density neighborhoods would require supplemental heating and cooling energy. The study strongly advocates for a utility-scale approach wherein existing gas companies install, operate and maintain the GeoMicroDistricts. It is assumed that any costs associated with systems outside the building are borne by the gas company. As the customer base increases, the load diversity, efficiency and economies of scale would improve. Furthermore, the utility also would be responsible for scaling and managing system capacity while integrating thermal energy storage and backup energy systems, as needed.

At this conceptual stage, it is assumed that

UNDERSTANDING GSHP SYSTEMS

A ground-source heat pump (GSHP) is a heat-exchanging device that transfers heat to or from the ground, groundwater or surface water to provide space heating and cooling. These devices are some of the most energy-efficient and low-carbon space-conditioning technologies available today. The GeoMicroDistrict Feasibility Study discussed in this article focuses on a subset of GSHPs called vertical ground-coupled heat pumps that exchange heat with the ground.

As compared to ambient air, the temperature of the ground remains relatively constant. Vertical ground-coupled systems utilize the temperature difference between the ground and interior spaces to transfer heat. The system consists of one or more heat pumps that are connected to a series of pipes, typically made of high-density polyethylene. These pipes form a closed loop that is buried in vertical boreholes. The boreholes can range from 4 to 6 inches in diameter and 100 to 500 feet in depth, though greater depths and larger diameters are possible.

A heat-transfer fluid, typically water or water with a non-toxic antifreeze solution, is circulated through the closed-loop to exchange thermal energy with the ground. The heat pumps regulate the fluid flow to transfer thermal energy to the building's

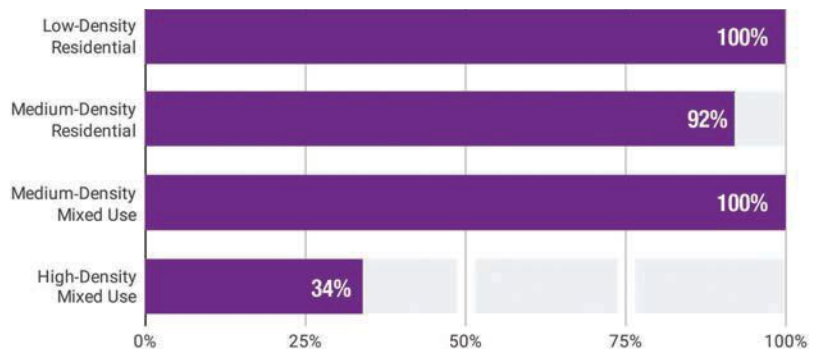
HVAC system. In winter months, the circulating fluid extracts heat from the ground to heat indoor spaces and, in summer, heat is transferred from indoor spaces and rejected to the ground to provide cooling.

Multiple factors must be considered prior to sizing a GSHP system, including building heating and cooling requirements, available land area, and the geological and hydrogeological characteristics of the ground. For optimal performance, it is very critical to maintain stable ground temperature over the long-term. This can be achieved by balancing heat extracted and rejected into the ground (maintaining thermal balance).

The ground can withstand a 10 to 15 percent difference between heating and cooling loads but beyond that the ground may become gradually warmer or colder, reducing the operating efficiency of the GSHP system. To design a GSHP system that meets 100 percent of a building's heating and cooling demands, the system must have enough capacity to perform during extreme winter and summer days. Because heating and cooling demands are rarely identical, supplemental heating or cooling may be needed to meet peak demands while maintaining thermal balance.

customers would pay for monthly thermal energy consumption and any additional costs associated with heat-pump installation or improvements needed inside the buildings with financial support from the state. The performance and cost for retrofitting existing buildings can therefore vary significantly based on their type, size, height, and age of the building and the original space-conditioning system. Installing heat pumps in new buildings is relatively easier than renovating existing buildings. GSHPs in existing buildings are generally more compatible with forced-air and hydronic systems because the distribution system can be reused with minor adjustments in the ducts, pipes and controls. However, buildings utilizing steam distribution systems and electrical baseboards are not well suited to GSHPs and may need a gut rehab. Furthermore, gas-powered appliances, like domestic hot-water heaters, stoves, ovens and clothes dryers, etc., would need to be replaced with electric appliances. It is also critical that existing buildings are made as efficient as possible prior to or during the conversion. This would allow for the installation of

TECHNICAL FEASIBILITY: GSHP Closed Vertical Annual Thermal Energy Loads Met (Interconnected)



smaller and less expensive systems, reducing upfront costs and energy bills for the customer.

Safety First

GeoMicroDistricts represent a viable “safety first” alternative to natural-gas heating along with a host of additional benefits, including climate-change mitigation, infrastructure resilience and air-quality improvements. The concept promotes equitable transition to a renewable thermal system that can be deployed in any

neighborhood, city or region. Allowing gas utilities to operate GeoMicroDistricts will help them retain their current organization purpose, structure and workforce. Installing GeoMicroDistricts will not be an easy or inexpensive feat and will require significant coordination with public utilities, policymakers and communities. It is safe to say that investing in heat pumps and building electrification is certainly a better utilization of billions of taxpayer dollars that are currently being used for funding an obsolete energy system. [\[E\]](#)

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EYE IN THE SKY

CTA Architects Restores the Brick and Terra-cotta Exterior of a Landmark Brooklyn Co-op Residence

WRITTEN BY | MEREDITH MORTON



PHOTOS: PERICLE GHEORGHIAS/CTA ARCHITECTS unless otherwise noted

In compliance with the requirements of the New York City Building Department's Façade Inspection and Safety Program (FISP), building owner St. George Tower & Grill hired CTA Architects P.C. for the inspection and subsequent remedial repair work for the historic 30-story St. George Tower & Grill co-op residence in the Brooklyn Heights Historic District in New York City. Having provided façade restoration and roof replacement design services for the property in 2008, CTA Architects, which was established in 1987 as an architectural restoration and design firm, already had extensive knowledge of the building.

“The restoration of the façade was an interesting historic-preservation challenge because this structure is a highly ornamented early 20th-century building and an example of true modern high-rise construction techniques,” says CTA Architects Principal Daniel J. Allen, AIA. “The \$2.8 million renovation included the replacement of approximately 13,000 square feet of brick, terra-cotta ashlar, copings and ornamental units, as well as new monumental steel-framed windows.”

Michael Vekassy, president of St. George Tower & Grill Co-op Board, explained that for a project of this complexity, it was very important to have a well-defined and realistic budget. “This had to include not only the contractor’s estimate, but also consulting fees, Department of Buildings fees, scaffolding charges, site safety oversight and restoration of historic materials. A budgeted contingency was essential to handle unforeseen items,” he says.

“The keys to success of this and any other extensive historic façade restoration of a residential property are communication with the construction team, residents, and building personnel; day-to-day coordination and distribution of information to all parties; and relying on professionals for advice on the best technical solutions,” notes Roseann Randazzo, management executive at Solstice Residential Group, the property’s building manager.

Work began in fall 2015 and was completed mid-year 2018. Punch-list items and additional repairs were completed in early 2019. The project was phased because of an expanded scope, weather challenges and un-

expected technical conditions discovered while the project was underway.

Building History

Notable architect Emery Roth designed the 315-foot-tall tower in the late 1920s as the final expansion of the St. George Hotel. The initial hotel building, named for an 18th-century inn located on the Brooklyn Heights site, was constructed on Clark Street in 1885 by businessman William Turnbridge. At 10 stories, it was one of the tallest buildings in Brooklyn and was an instant success.

Based on growing demand, Turnbridge purchased adjacent properties facing Pineapple, Hicks and Henry Streets to expand the site and, by 1890, a total of five additional buildings had been constructed and interconnected to create a hotel of more than 1,000 rooms. The original structures of the St. George were some of the first hotels to be lit by electricity and became a fashionable destination.

The completion of the Emery Roth-designed tower in 1929 made the St. George the largest hotel in New York City with more than 2,600 guest rooms; 1,000 employees; an enormous ballroom; palatial bar; and an indoor, 120-foot natural-saltwater swimming pool. The hotel was a popular venue for society events, and its accommodations were in demand to support the nearby Brooklyn Navy Yard through the 1950s. The tower and adjacent grill building were sold to St. George Tower & Grill Owners Corp. and converted to a co-op residence in the early 1980s. The building contains 275 units and provides unparalleled views of the Manhattan skyline

and harbor from its common 27th-floor roof deck.

Roth, famous for his ability to meld classical elements with the contemporary Art Deco style, incorporated Egyptian motifs into the design of the tower. The bulk of the building is 25-stories tall with the tower

CTA Architects has completed an extensive, \$2.8 million exterior restoration of the historic 30-story St. George Tower & Grill co-op residence in the Brooklyn Heights Historic District.



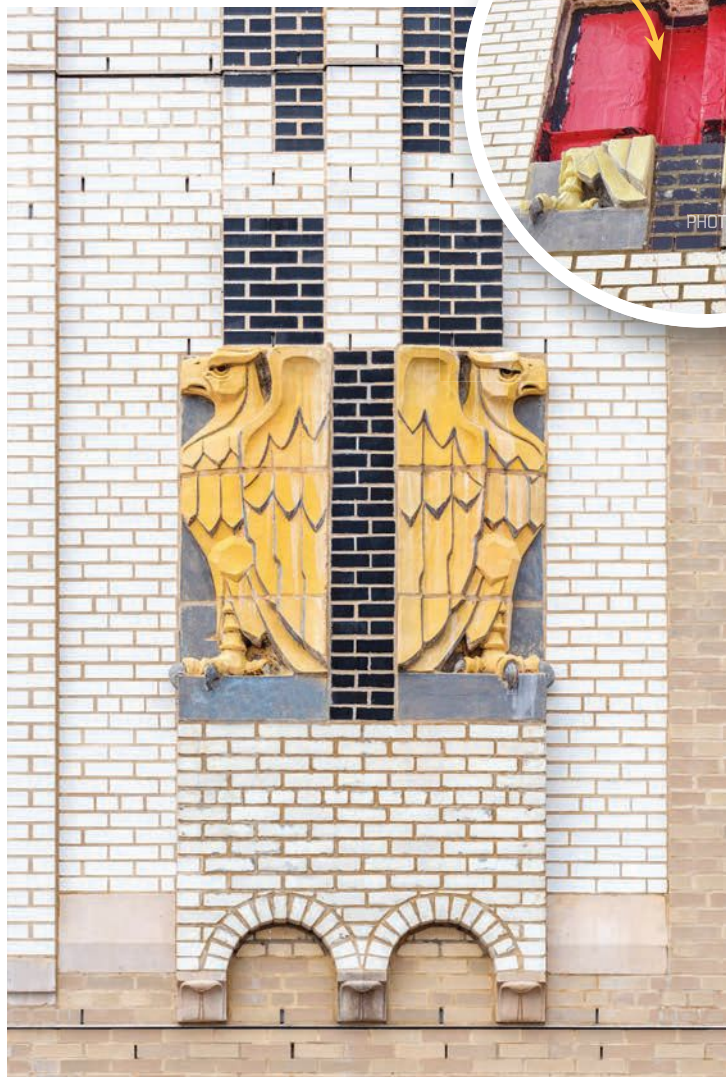
PHOTO: OLA WILK/WILK MARKETING COMMUNICATIONS

portion extending to 30 stories. The façade consists primarily of buff glazed brick at the lower levels in varying planes to define pilasters, corbels, arches and other decorative details.

Starting at the 25th floor, black and white glazed brick in contrasting bands at the parapet, window surrounds and upper pilasters were added to the composition. The façade

The renovation included the replacement of approximately 13,000 square feet of brick, terra-cotta ashlar, copings and ornamental units, as well as new monumental steel-framed windows.

Resetting of terra-cotta eagles over flashed steel in a rebuilt wall area.



Starting at the 25th floor, exterior elements include black and white glazed brick in contrasting bands at the parapet, window surrounds, and upper pilasters, as well as glazed beige and yellow terra-cotta decorative pieces with black highlights at cap pilasters, lintels, and copings. Multiple significant terra-cotta pieces project from the upper stories, including heads and eagles.

features glazed beige and yellow terra-cotta decorative elements with black highlights, cap pilasters, lintels and copings. Multiple significant terra-cotta pieces project from the upper stories. Monumental, arched windows are located at the 25th and 30th floors.

Façade Restoration and Challenges

NYC Building Code 1 Section RCNY 103-04 mandates the façade of any building over 6 stories is inspected every five years to determine the conditions and safety of the façade elements and that a restoration plan

is put in place to address any potential safety or deterioration issues. CTA Architects, which has been performing FISP inspections since the inception of the program in 1980, utilized photo equipment and telescopes to inspect the building's façade in detail to determine its condition. CTA Architects personnel also used suspended scaffolding to gain physical access to the façade. Although localized repairs were warranted based on the inspection results, the façade in general was structurally sound. However, building management reported continued issues of extensive water penetration at

the upper stories and decided to incorporate leak remediation into the project. CTA Architects with the structural engineer, GACE Consulting Engineers, developed design documents to address structural and water-proofing issues.

The original brick masonry walls are fully bonded and did not contain a cavity, flashing or other mechanism for water drainage. To effectively address the water-penetration issues, the design team directed the removal of the outer wythe of the brick façade at the upper four floors to reveal the underlying steel structure and brick lintels



and other supports, as well as the steel armatures for the projecting terra-cotta pieces. Because the structure was exposed, CTA Architects and GACE Consulting Engineers inspected the steel and directed restoration where required. The team designed a new brick cavity wall system to replace the original masonry. The new system improves drainage and protects against water infiltration.

Because the building is located in the Brooklyn Heights Historic District, all exterior changes fall under the jurisdiction of the New York City Landmarks Preservation

Commission (LPC). LPC regulations mandate any new masonry, mortar, and terra cotta must match the color, texture and bond pattern of the existing façade. As part of the previous façade renovation project in 2008, CTA Architects had submitted six different bricks to match and received LPC approval. These bricks were also utilized for the current project with LPC's approval. The mortar color was matched to the original mortar exposed during the removal of the face brick.

The building contains extensive terra-cotta ornaments. Six-foot tall Egyptian figures

flank windows at the 27th floor, and eagles project approximately 5-feet horizontally from the base of the monumental parapet wall.

"Each oversized terra-cotta element was removed from the façade and sound tested with a mason hammer to determine its structural condition," explains Frank Scanlon, AIA, an associate with CTA Architects. "All eagles and Egyptian figurines were salvaged, cleaned and reinstalled on newly fabricated steel armature. Other pieces, including several heads, could not be salvaged and required replacement."

General Contractor Adelphi Restoration's team removed more than 20 different terra-cotta component samples from the building so the terra-cotta manufacturer could create molds for replication. The manufacturer then produced color samples, which were reviewed and approved by the design team and LPC prior to manufacture. Likewise, Adelphi Restoration and its steel subcontractor custom-fabricated armatures as required to support the terra-cotta pieces after providing shop drawings for review by the design team.

The project included the

▲ RETROFIT TEAM

FAÇADE RESTORATION // CTA Architects P.C., www.ctaarchitects.com

- G. Douglas Cutsogeorge, AIA, principal (retired)
- Daniel J. Allen, AIA, principal
- Frank Scanlon, AIA, associate
- Emily Barr, lead technical designer

STRUCTURAL ENGINEER // GACE Consulting Engineers, www.gace.net

GENERAL CONTRACTOR // Adelphi Restoration, (212) 725-0011

OWNER'S REPRESENTATIVE // Building Conservation Associates, www.bcausa.com

BUILDING MANAGER // Solstice Residential Group, solstice.us.com

WINDOW SUPPLIER AND INSTALLER // Adler Windows, www.adlerwindows.com

▲ MATERIALS

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

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

MORTAR // SPEC MIX, www.specmix.com

PATCHING MORTARS // Jahn from Cathedral Stone Products, www.cathedralstone.com

WALL TIES // Hohmann and Barnard, www.h-b.com

BACKER SEAL // EMSEAL, www.emseal.com

BRICK VENTS // Williams Products, www.williamsproducts.net

BUILDING WRAP // Tyvek Stucco and Commercial Wrap, www.dupont.com

SEALANT // BASF NP 1, www.basf.com

FABRIC-COATED COPPER FLASHING // York Multi-Flash 500, www.yorkmfg.com

CUSTOM STEEL WINDOWS // Optimum Window, optimumwindow.com

PROPERTY-MANAGEMENT PORTAL // BuildingLink, www.buildinglink.com



The project included the replacement of 11 monumental, arched windows with new stainless-steel-framed windows in two profiles at the 25th and 30th floors. The new windows, approved by the New York City Landmarks Preservation Commission, were custom-manufactured to match the original profiles, frame material and frame color.

replacement of 11 monumental, arched, rolled-steel-framed windows with new stainless-steel-framed windows in two profiles at the 25th and 30th floors. Original windows were top-of-the-line at the time of construction but were deteriorated and no longer operable as intended. The new windows are thermally broken with insulated glass. One profile, 6.5-feet wide by 11-feet high, has a floating hopper vent; the second, 7-feet wide by 13-feet high, has a combination of fixed panels and operable casements.

The windows are historically true, matching the original profiles, frame material and frame color, as well as comply with the requirements of the LPC master plan. LPC approval was required prior to the start of fabrication. “There were many challenges associated with the window in-

stallation,” notes Hugo Ramirez, director, Adler Windows. “Every opening size was unique, and precise field measurements were required before shop drawings could be produced.”

Adler Windows’ team carefully planned the installation of these oversized windows at a height of close to 300 feet, often in cold and windy conditions. Each unit was hoisted from the street along the exterior of the building. Sidewalk closures were enforced during hoisting operations.

During construction, the discovery of a deteriorated load-bearing beam within one of the exterior walls presented a significant challenge, which could have adversely impacted the work schedule. The project and ownership team worked together to analyze repair and replacement options. Following

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photo by Alex Upton

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GACE Consulting Engineers' recommendation, the board and property manager expeditiously replaced the beam so the schedule was not delayed.

The building was fully occupied throughout the project. In addition, several other unrelated construction projects were simultaneously taking place in other areas of the building. Solstice Residential Group's team carefully preplanned, scheduled, and coordinated multiple construction operations, storage needs, crew access and vertical transportation access to ensure residents were not inconvenienced by the work. Solstice Residential Group used a property-management portal to communicate with residents and shareholders about ongoing and planned work, potential foot traffic and noise, as well as schedule construction crews' access to apartments when needed.

"To minimize impact on the residents, work was performed only between 8:30 a.m. and 5 p.m., and crews were restricted to using the service entrance and service elevators," recalls Damian Sherlock, the building superintendent. "A space within the building was provided to the crews for use as a break and changing room."

"We reviewed the project plan regularly to maintain oversight of issues that could potentially impact residents, and regular communications between the project team successfully minimized disruptions," Vekassy adds.

The project team conducted restoration work on a phased schedule with winter shutdowns. Because significant winds buffet the 315-foot elevation, Adelphi Restoration implemented extensive safety precautions to protect workers on the suspended scaffolding, as well as residents and the general public below.

Allen says, "It was truly satisfying to watch such an important part of Brooklyn Height's history come together and shine again."

"Completing this long and difficult project so successfully was very gratifying," Scanlon adds. "Despite complex technical and logistical challenges, we maintained a positive relationship with a great client, who was thrilled with the end result." 

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| HISTORIC |

RESTORING

WRITTEN BY | ROBERT LUBAS, AIA, AND DIANA MASTERSON

*T*he Bourse is a 125-year-old building located in the heart of historic Philadelphia. Built in 1895, it is one of the first steel-framed buildings in Philadelphia and was designed by George Watson Hewitt and William Dempster Hewitt in the Victorian and Renaissance styles popular at the time.

The Bourse was the first purpose-built commodities exchange building in the U.S. The 8-story building's grand design is befitting of its original use and prominent location. Although it thrived for years as a commodities exchange, it eventually became neglected and suffered repeated renovations that masked its beauty.

Recently, BLT Architects was given the opportunity to undo the damage done to the building and restore its former glory. The team recrafted the original entrances, created a top-tier food hall, revitalized the building's office spaces and added new amenities while restoring historic elements. This recent renovation has been celebrated by the community and has adopted the motto "Restoring the Glory."

Building History

Philadelphia grain and commodities exporter George E. Bartol returned from Europe in the summer of 1890 with the grand notion of creating a building where merchants could meet, exchange ideas and conduct business. Impressed with the Hamburg Bourse, the stock exchange building in Hamburg, Germany, Bartol introduced his concept to prestigious and influential businessmen in Philadelphia. These men embraced Bartol's idea and commissioned Hewitt and Hewitt as architects.

The Bourse was built with an open trading floor at the ground level and seven levels of office space above that wrapped a central lightwell open to the sky. The building occupies an entire city block spanning Fifth to Fourth Streets and Ludlow to Ransstead Streets, a prime location for commerce then and attracting tourists visiting Independence Hall and the Liberty Bell today.

When the Great Depression hit, the grandiosity of the Bourse began to fade. By the 1950s and '60s, the building showed signs of neglect and, in 1971, the stockholders sold the property. New owners capitalized on the building's proximity to Philadelphia's tourist attractions and converted the main space to a retail, food and beverage destination. These successive renovations buried the grandeur of the interior, eroding the beauty of the building to suit the new tourist-focused uses. The skylight above the trading floor was moved to roof level, darkening the entirety of inward-facing



PHOTOS: JEFFERY TOTARO

THE GLORY



**The Nation's First
Commodities Exchange
Now Is a Top-tier Food Hall**



A highlight of the office renovations is the Exchange, communal space within the office floors where smaller-office tenants can meet, dine and share ideas. The Exchange features floor-to-ceiling windows that overlook the atrium, providing tables and stadium seating for working or relaxing.



offices. A mezzanine level was added between the ground floor and the first level of offices, corrupting the original 2-story entrances. The ground floor was converted to a second-rate food court. Large openings to the basement with interconnecting escalators were added to allow access to overflow seating for tourists.

By the time of the Bourse's recent purchase by MRP Realty, the 358,000-square-foot building was stale, partially occupied and the remaining office spaces were undesirable. The food court served as a buffet for bus-based tour groups and school trips visiting Philadelphia from out of town. Beautiful architectural details were obscured, muddled by dim, surface-mounted incandescent globe lights and a nearly monochrome beige paint.

MRP Realty approached BLT Architects to develop a design vision for the Bourse to use in conjunction with a competitive bid to purchase the building. The design team recognized the opportunity to restore the interiors to their original splendor and create a space with great social impact, engaging the community in a meaningful and productive way. The design vision for the Bourse centered around the restoration of its signature elements, creation of a top-tier food hall, revitalizing its office spaces and adding new amenities.

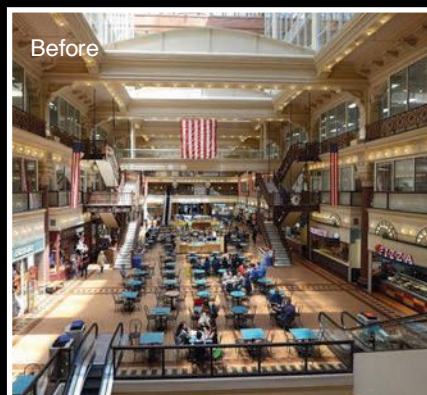
A Welcoming Space

The team began renovations at the primary entrance fronting Independence Mall on Fifth Street. Removing a portion of the inserted mezzanine level restored the

original double-height grand entrance and uncovered architectural details, including portions of the original archway and trim covered by the new mezzanine floor and crown molding covered by office drop ceilings. These discoveries were retained and restored. BLT Architects worked closely with Daniel J. Keating Co., the general contractor, to ensure the renovations were sensitive to the original detailing and new details were in keeping with the earliest design, complementing the historic ornament.

The lobby design relocated the security desk to better serve the office tenants and visitors to the food hall. Previously, the desk was built from dark-stained wood that fully engaged the walls and had a heavy appearance, making it a prominent feature in the lobby. The new desk is made of light marble

✧ DURING THE RENOVATIONS, MANY HISTORIC DETAILS WERE UNCOVERED, EMBRACED AND INCLUDED IN THE FINAL DESIGN OF THE FOOD HALL AND LOBBIES.



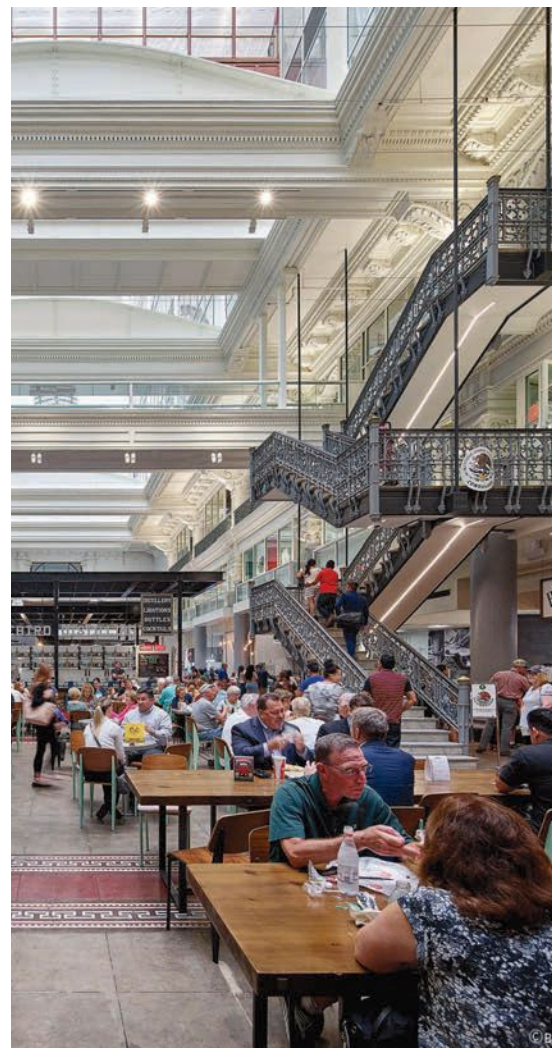
and glass panels that stand free from the wall and allows visitors to first notice the double-height space. The renovated lobby is a dramatic announcement of the restored glory of the building.

With the restoration of the primary entrance complete, focus turned to the central atrium that housed the ill-fated food court. Mammoth openings in the floor that contained escalators to direct visitors to overflow seating were filled, resulting in greater programmable area and flexibility for the food hall. (With the removal of the overflow space, the building owner currently is seeking a permanent tenant for the basement.) Vendors with cooking-intensive needs were located along the perimeter of the food hall where exhaust and other service demands could be more easily met with upgraded

building systems.

An extremely lightweight armature, designed within the bearing capacity of the existing structure—and aesthetically pleasing when viewed from within the food hall and from the offices above—was built to define the space for the center stalls. Crafted of wood sections designed to resemble wide-flange steel, the structure provides the lighting, services and code-required coverages required by the central tenants. The smaller grid within the wood frame connects an integral lighting system that allows vendors flexibility in placing lights and adding code-required ceiling tiles in areas of food preparation.

The atrium space's lighting was a major consideration. The food court's previous lighting resembled that of a riverboat



Retrofit Team

OWNER // MRP Realty,
www.mrprealty.com

ARCHITECT // BLT Architects,
www.blta.com

STRUCTURAL ENGINEER //
O'Donnell & Naccarato Structural
Engineers, www.o-n.com

MEP / FP ENGINEER //
Concord Engineering,
concord-engineering.com

GENERAL CONTRACTOR // Daniel
J. Keating Co., djkeating.com

LIGHTING DESIGN //
Lighting Design Collaborative,
lightingdesigncollaborative.com

Materials

PORCELAIN TILE // Tabula
Wood-look Tile from Garden State
Tile, www.gstile.com

MINI BLINDS // Bali Customiser
1-inch Aluminum Blinds by
SWFcontract, www.swfcontract.com

EXCHANGE STOREFRONT // Bliss
Noram, www.blissnoram.com/EN

LINEAR DIFFUSER // Architectural
Linear Diffuser by Titus,
www.titus-hvac.com

LOBBY PENDANT LIGHT //
Litecontrol Inde-Pendant by Hubbell
Lighting, www.hubbell.com

FLEXIBLE LINEAR LED LIGHTS //
Solara Flexible Lighting System by
Apogee Lighting,
www.apogee-lighting.com

LED ARCHITECTURAL LIGHTING //
Lumenfacade by Lumen Pulse,
www.lumenpulse.com

LIGHTING GRID // Global Trac Pro
by Nordic Aluminium, www.nordic-aluminium.fi/global-trac-pro/

EXHAUST HOOD // Captiveaire,
www.captiveaire.com

COMMERCIAL SINKS //
Hand Sink and Three Compartment
Sink by Eagle Group,
www.eaglegrp.com

WATER HEATER // Lowboy Electric
Water Heater by Bradford White,
www.bradfordwhite.com

**AUTOMATIC GREASE
INTERCEPTOR //** GreaseStopper
Automatic by Highland Tank,
www.highlandtank.com



casino. Surface-mounted incandescent bulbs created a dim glow that left the original architectural details in shadows. A neutral beige paint compounded the problem, giving the space a nondescript feel. By removing all surface-mounted lights and introducing concealed LED lighting, the original architectural ornamentation is celebrated. A cool, bright color palette highlights the ornament throughout the space. The original wrought-iron rails of the stair and balconies are painted a cool gray to provide contrast against the white walls. The whiteness of the space and the brightness of skylights enhance the space, bringing it back to life.

During the renovations, many historic details were uncovered, embraced and included in the final design of the food hall and lobbies. One of the previous food court renovations added a quarry tile floor throughout the space. Once removed, large areas of the original floor were found to be intact and in good condition, including brass stall numbers and bands of intricate hand-laid mosaic tile from the Bourse's time as a commodities exchange. The tile and mosaic, which were used to demarcate the trading stalls, were preserved and the major areas of infill were hand-stained with a simplified pattern to complement the original tiles.

The office entrance on Fourth Street could not be restored to its original 2-story height because of an existing long-term lease tenant on the mezzanine level above. This secondary lobby was renovated to be consistent with the Fifth Street lobby, however, allowing the double-height space to be restored in the future.

The last major focus of the renovation was the office component. Overall efficiency was improved by 10 percent with plans for rolling occupancy-based ADA compliance improvements. Serpentine corridors were simplified to provide logical egress, and small, disjointed office spaces were combined to provide improved spaces with higher lease potentials. A highlight of the office renovations is the Exchange, communal space within the office floors where smaller-office tenants can meet, dine and share ideas. The concept exists on just one level currently but was designed to serve the adjacent floors above and below, where the building owner was specifically looking to attract multiple smaller tenants. The Exchange features floor-to-ceiling windows that overlook the atrium, providing tables and stadium seating for working or relaxing.

Construction was phased to minimize impact on the office tenants. Work began in January 2017 with the Exchange and the main entrance from Fifth Street. At about the same time, the tenants of the food court began to leave as their leases terminated. In some cases, tenants with longer leases had to negotiate termination, which created some delay. Construction on the main food hall began in September 2017. The grand opening was held in November 2018.

George E. Bartol would be proud of the Bourse as it stands today. His vision for a building where individuals meet, exchange ideas and conduct business stands true once more. The Bourse is again a hub of activity with the amazing architecture of 1895 embraced and shown in its true beauty. 

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March 2019 | Today | Tuesday, March 19, 2019 | Day View | Month View

Schedule	Event	Location	Time	Audio	Status
Regular Day Schedule	1st Period End	Band/Choir/Drama and 5 more...	8:05 AM	Short Bell	Archived
Regular Day Schedule	2nd Period Start	Band/Choir/Drama and 5 more...	8:10 AM	Short Bell	Archived
Regular Day Schedule	3rd Period End	Band/Choir/Drama and 5 more...	10:15 AM	Short Bell	Enabled
Regular Day Schedule	4th Period Start	Band/Choir/Drama and 5 more...	10:20 AM	Short Bell	Enabled
Regular Day Schedule	4th Period End / Start Lunch	Band/Choir/Drama and 5 more...	11:20 AM	Long Beep	Enabled

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IS CUSTOMIZATION THE NEW STANDARD?

Clients Want to Differentiate Their Properties
and Are Looking to Custom Solutions to Do It

WRITTEN BY | ROBERT NIEMINEN

Harundo™

PHOTOS: ROBIN HILL

In our March-April issue's "Trend Alert", page 68 or bit.ly/2WqB5dV, we explored the growing trend toward local geographic and cultural influences in place of standardized design approaches not only for hotels and restaurants, but also corporate offices and retail locations. This movement is largely driven by a desire to create unique spaces that set companies apart from the competition in the search to find and retain customers, talent and tenants.

To create these one-of-a-kind spaces, design professionals in the commercial interiors sector are tasked with delivering unique designs, often using bespoke products and furnishings rather than off-the-shelf merchandise to achieve the desired aesthetic. As such, the demand for suppliers who make it effortless to specify custom furniture, fixtures and finishes is growing.

In fact, many manufacturers believe as much as 90 percent of the products they ship will be customized in some way in the not-so-distant future, according to Cliff Brown in *Digital Pattern-ing*. "The demand for custom furniture is on the rise, and the ability to deliver made-to-order pieces is becoming a major point of differentiation between brands," he notes.

There are several key factors driving the need for customization, as well as benefits and drawbacks to one-off solutions that design and building professionals ought to consider when

specifying tailor-made products for an interiors project.

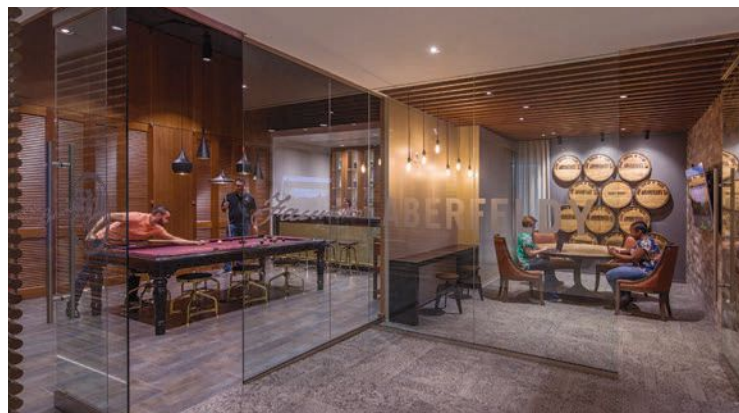
Three Factors Driving More Customization

To be clear: Customization is not a new concept. Manufacturers have historically offered customers the ability to modify standard products, but large minimums and higher costs made it somewhat prohibitive. Today, advances in technology and manufacturing, a desire for personalization and authenticity, as well as competitive advantage, are driving customization of products—from consumer goods to interior furnishings and finishes.

■ TECHNOLOGY

Thanks to web-based applications, digital printing and 3D configuration tools, suppliers can now manufacture products on-demand while housing less inventory and putting the power of choice in customers' hands. According to a report from McKinsey, "Online configuration technologies that can easily and cost-effectively assemble customers' preferences and 3D digital modeling that lets shoppers envision the final product are becoming increasingly affordable and scalable. In manufacturing, dynamically programmable robotic systems can switch between models and variants with little loss of efficiency."

These technology solutions have made it easier than ever for designers to introduce distinctive products tailored to their clients' needs. Whether it's changing



BACARDI'S NORTH AMERICAN HEADQUARTERS OFFICE IN MIAMI FEATURES A CUSTOM POOL TABLE THE DESIGN TEAM ENVISIONED, WHICH FEATURES THE BRAND LOGO AND SIGNATURE COLOR IN THE FABRIC. THE SPACE ALSO INCLUDES A DISPLAY CASE COMPLETELY CUSTOM-MADE BY A MILLWORKER.



"CLIENTS NOWADAYS ARE MUCH MORE INTERESTED IN HOW THEIR INTERIOR SPACES LOOK, SO I THINK UNIQUE SOLUTIONS OR ANYTHING CUSTOM REALLY HELPS THEM CREATE THAT ONE-OF-A-KIND LOOK THAT NO ONE ELSE HAS IS KEY."

—Gisselle Amador, senior interior designer, IA Interior Architects

basic elements, such as the size and dimensions of furniture, different materials or color, companies are giving specifiers the ability to co-create products to achieve a unique solution and aesthetic.

■ AUTHENTICITY

"Expert designers begin to feel that if they're not customizing aspects of their designs, the overall effect is somehow less authentic," writes textile designer Stacy Garcia in a recent article. With mass-produced objects, she says there is a greater chance multiple designers will be using the same products in their work. As a result, Garcia notes there has been retaliation against that "because as designers, it is always important to have our own stamp on things. Our unique voice and vision is ultimately what we are selling to our clients," she explains.

"Clients nowadays are much more interested in how their interior spaces look, so I think unique solutions or anything custom that really helps them create a one-of-a-kind look that no one else has is key," observes Gisselle Amador, senior interior designer at IA Interior Architects. "It's also a way to express their brand and their culture authentically."

For example, IA Interior Architects worked on a project for its client Virgin Voyages with no visual reference of what the cruise line's new ship would ultimately look like. Taking cues from the cruise industry, the design team custom-fabricated a reception desk that mimicked the forms and shapes one would find in ship and yacht design, Amador recalls.

"Clients really want you to feel who they are when you walk into their space," she says. "Those custom elements and products—it can be in the flooring or in the carpet or any material basically—can really help achieve that."

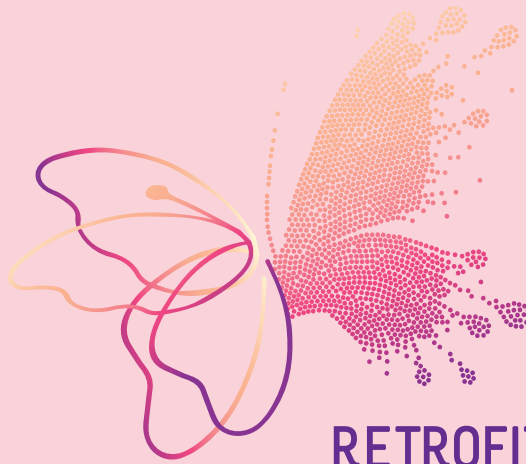
■ COMPETITION

Callie Reid, associate at CallisonRTKL, suggests clients may not always think to ask for custom solutions directly, but they are definitely looking for unique spaces to help recruit and retain new hires in a very competitive market. "They really want

(continues on page 64)

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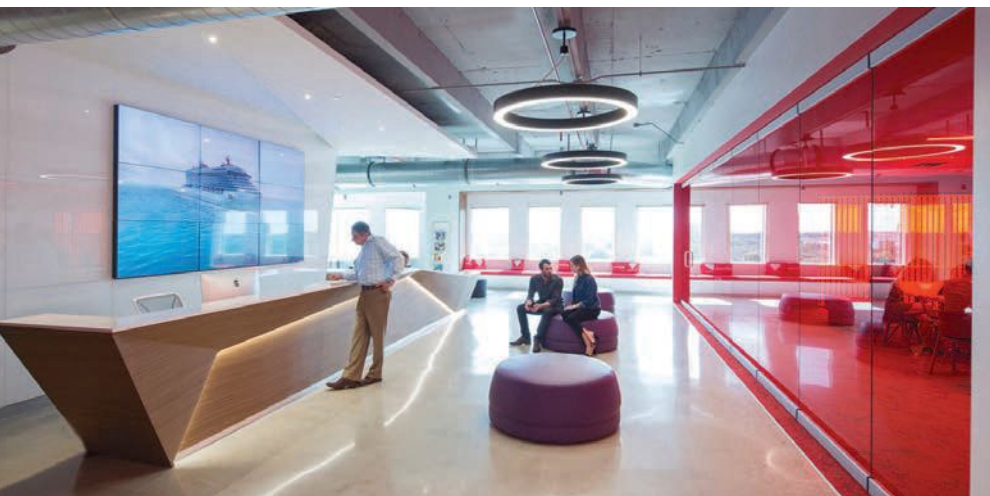
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A LONG, SLEEK RECEPTION DESK WAS INSPIRED BY THE FORMS OF CRUISE SHIPS AND CUSTOM-BUILT FOR **VIRGIN VOYAGES** BY THE DESIGN TEAM AT IA INTERIOR ARCHITECTS.



their workspace to look fun and unique and keep their employees happy, so their workspace needs to be top notch, and it needs to have all the amenities the other companies have,” she says. “I think that in itself warrants the need for these custom-designed elements.”

Benefits and Drawbacks

As noted earlier, companies need to set themselves apart from the competition and, as such, custom design solutions are a benefit unto themselves as a point of differentiation to attract customers and employees.

“I think that’s one of the benefits of definitely making that statement and making that impact with a space,” Reid says. “If you’re a company that has a lot of guests in your space, you want to impress them,” and custom-designed products are an effective way to do it.

Even for companies that don’t entertain guests, the need to make a statement with unique space design is equally important given that employees can now choose to work from home rather than come into the office. “You have that temptation to work from home every day, but you really want to get your employees back into the office and give them a sense of community,” Reid explains. “There are a lot of benefits to being in the office and collaborating with your coworkers and learning from people. If you’re giving them a nice place to work, then they’re going to come into the office rather than work from home.”

Amador agrees a distinctive space that speaks to a client’s brand and culture is a huge benefit of doing custom work that can’t always be achieved with off-the-shelf products. “When it’s custom, it’s tailored to that client,” Amador points out.

While bespoke furniture, products, and



designs are attractive and create one-of-a-kind looks, they often do come with a bigger price tag.

"It definitely impacts budget," Amador says, noting custom products are typically more expensive to manufacture than standard ones. As a result, she says it's important to offset custom solutions with standard products to stay within budget. "If done correctly, you can still get the high impact [of custom work] and balance the budget, which is very important."

To reduce costs, designers often choose off-the-shelf products but work with manufacturers to change certain details to give them a custom feel. Reid recalls one project in which she chose a stock carpet but asked the manufacturer to create a custom-colored yarn for the client. "Since the pattern was standard, it didn't increase the cost of the carpet at all. That was something the client was very excited about," she recalls.

Another potential challenge with custom work is longer lead times, depending on the type, size and number of products ordered. "You definitely have to be mindful of schedule," Reid notes. "But if you make sure to incorporate those custom pieces early on in the design process and you're making sure you're on top of those pieces on a weekly basis with the company, then it shouldn't be an issue."

Lastly, Amador says the biggest drawback to custom work is client expectations. "Drawings and 3D renderings can often be very different than the final product," she says. While it's easy for designers to envision how a concept will look installed, clients may not fully understand what they're getting or how it will look, so communication is essential. "It's really important to set expectations with your client and let them know this is a render-

ing," Amador explains. "It's important to point out how colors and other details may vary so when they are onsite, they're happy with the end results."

Other Factors to Consider

For a custom design solution to be successful, Amador says finding a good partner is key. Manufacturers who can help designers arrive at a design that's as close to their vision as possible, as well as provide solutions when problems arise, are invaluable.

"I've had wonderful partners I've worked with where sometimes the end result isn't what we wanted, but they'll work with you instead of saying 'bye' and leaving you with the product. They'll try to fix it and try to come up with a solution," Amador explains.

Reid suggests requesting multiple shop drawings from suppliers and holding regular review meetings with clients to ensure everyone knows what to expect with the end product and that it meets their needs. "Because it's custom, you never know what you're going to get unless you're requesting to see multiple drawings and renderings and elevations of the product," she says. "And because the client is spending money and time on this item, it's important they feel it's authentic to the company's brand, and it's really representing what they were expecting so in the end they're going to be happy with the final product."

Ultimately, the more product manufacturers can give designers the ability to customize, the more likely designers are to reach out to these manufacturers as a source, Reid says, because it gives the ability to put more creative flair on their designs. "It gives us the flexibility to put a little bit more creativity into the project," she concludes. 

MANUFACTURERS WHO CAN HELP DESIGNERS ARRIVE AT A DESIGN THAT'S AS CLOSE TO THEIR VISION AS POSSIBLE, AS WELL AS PROVIDE SOLUTIONS WHEN PROBLEMS ARISE, ARE INVALUABLE.



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→ SUBWAY TILES FEATURE HANDMADE APPEARANCE

Ege Seramik's Samos and Mirandela Lines add texture and a handmade appearance to 4- by 12-inch porcelain subway tiles. The Mirandela Line is available in 11 modern colors with a glossy finish and can be used as an accent piece or to cover large areas. Colors include Anthracite, Black, Burgundy, Coral, Cream, Deep Blue, Lilac, Olive, Silver, Turquoise and White. The Samos line is available in five neutral colors and includes deco pieces that add a unique aura to any installation.

www.egeseramik-usa.com // Circle No. 29



↑ INSULATION BOARD CREATES DARK AESTHETIC IN OPEN-JOINT FAÇADES

ROCKWOOL has released Cavityrock Black, a dual-density insulation board designed to mask the insulation layer with a bonded fleece facing to create a dark aesthetic in open-joint façades. Cavityrock Black offers the same thermal performance, fire resistance and moisture control of ROCKWOOL Cavityrock insulation. The fleece material on Cavityrock Black has been designed for exposure to the elements (weather, heat, UV) and is bonded to the insulation as part of the manufacturing process. As with ROCKWOOL Cavityrock, Cavityrock Black features a high-density top layer and lower density bottom layer. In a rainscreen application, the hard, outer layer acts as a resilient surface to weather exposure while the lower density layer reduces the overall weight of the board, making it easier to handle.

www.rockwool.com // Circle No. 30

↓ POWER STRIP MONITORS LOAD

Leviton has launched a medical-grade power strip with load-monitoring Inform technology. The product addresses a major concern of health-care facilities—compliance with the National Fire Protection Association 99: Health Care Facilities Code—and is part of the growing portfolio of Leviton products embedded with Inform, a technology platform that provides real-time data to the end-user to improve safety, efficiency and productivity. The power strips feature a line-of-sight, real-time LED that will only turn on if the NFPA 99 limit

of 75 percent or more of the cord's load has been reached. This feature is an indication only; reaching the 75 percent limit will not shut off power to the outlets. Instead of having to manually calculate the total load plugged into the strip to determine compliance, users can simply look at the LED indication.

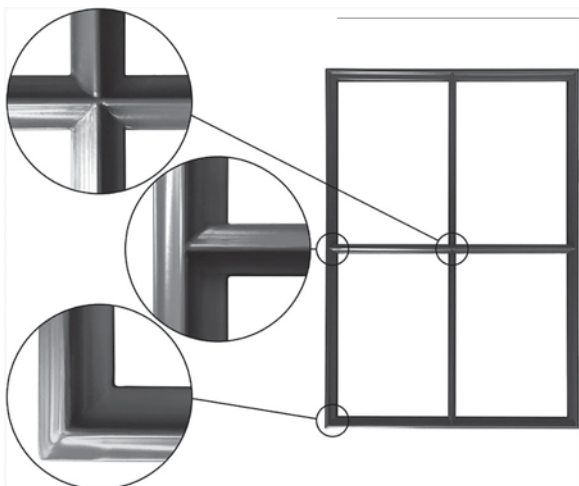
www.leviton.com/medstrips // Circle No. 31



← HISTORIC-REPLICA WINDOWS ACHIEVE ENERGY-EFFICIENCY STANDARDS

Hope's Windows Inc. has expanded its One55 Series fixed windows to feature Thermal Evolution technology, allowing the windows to achieve increasingly stringent energy-efficiency standards. The series replicates the aesthetic of historic, industrial steel windows with arrow-shaped profiles and delicate sightlines. Product features include custom, solid hot-rolled steel profiles; fusion-welded frame and muntin construction; welded steel simulated or true divided-lite muntin options; and Hope's Power of 5 Finishing System, including hot-dipped galvanizing, abrasion-resistant epoxy powder primers and UV-stable polyurethane top coats in unlimited color choices. The windows accommodate up to 1 1/4-inch-thick glass units.

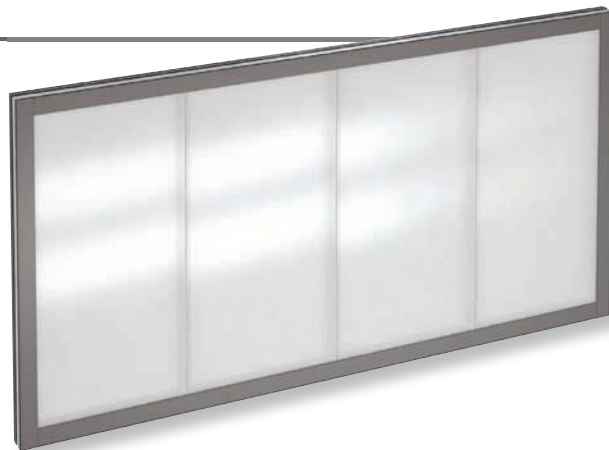
hopeswindows.com // Circle No. 32



→ TRANSLUCENT PANELS NOW AVAILABLE IN WINDOW SIZES

Kingspan Light + Air North America has scaled the size of its two-panel UniQuad system to create the more modular and versatile UniQuad Translucent Windows for smaller envelope openings. Available in heights up to 6 feet, UniQuad Translucent Windows can be built in limitless lengths. With the ability to specify custom window sizes and colors, the two-panel system allows buildings to coordinate with corporate or campus colors. UniQuad Translucent Windows feature the same two-panel composition with Removeable Skin Technology as the UniQuad system, allowing for the removal of the exterior panel while the interior panel remains in place. Additional insulation can be added between the two panels to improve thermal performance and further increase efficiency.

www.kingspanlightandair.com // Circle No. 33

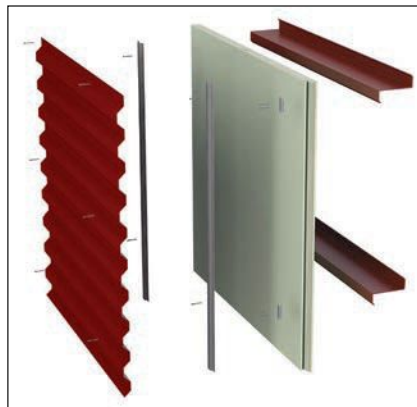


← INSTALL GUARDRAILS WITHOUT PENETRATING ROOF

Lamar Johnson Collaborative has patents pending for Superpaver, a code-compliant paver product offering a non-penetration installation of safety guardrails on rooftop areas of commercial and mixed-use buildings. Superpaver allows for the integration of guardrails directly into load-bearing pavers versus traditional installation around the perimeter of a roof area, attached to pedestals. Superpaver removes the need for this attachment and roof penetration, delivering a seamless design and roof surfaces that are less subject to water issues or damage. Superpaver is installed like other paver products and is available in any color to match other paver products on projects. Each Superpaver is supported by the existing pedestal system and meets all IBC requirements for load and safety while allowing for more usable square footage on rooftop designs.

theljc.com // Circle No. 34

↓ BACKUP WALL SYSTEMS ARE ALL-IN-ONE BARRIER COMPONENT



Metl-Span's BW Universal System and BW Stretch System are backup wall systems, providing air, water, thermal and vapor protection in an all-in-one barrier component. The BW Universal System can be horizontally installed with nearly any type of exterior rainscreen system and can span up to 24 inches on center. The BW Stretch System can be vertically installed with

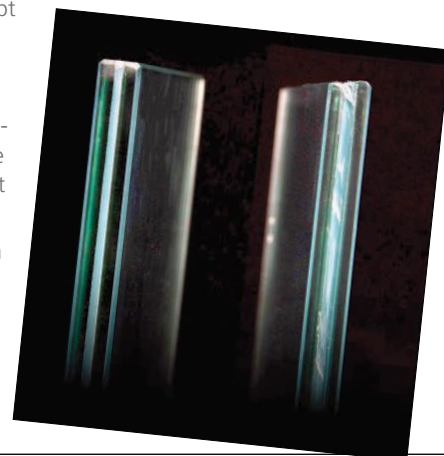
multiple types of exterior rainscreen systems and can span up to 6 feet on center. Both new systems are installed in a single step, eliminating the need for multiple work crews, expediting close-in/dry-in building times, and reducing the likelihood of improper installation.

www.metlspan.com // Circle No. 35

↗ ZERO-TOLERANCE EDGE WORK IS AVAILABLE FOR GLASS HANDRAILS

Pulp Studio has introduced PRECISION EDGE technology, a proprietary process delivering a high-quality, zero-tolerance finish with alignment for tempered and annealed laminated glass handrails. Codes require handrail glass to be laminated but high-quality edgework is still imperative for the integrity of the design. With PRECISION EDGE, designers and property managers do not have to accept a pre-polished laminate product. Pulp Studio offers a warranty on its edge work for post-tempering fabrication; there is no ASTM standard yet for this process.

www.pulpstudio.com
// Circle No. 36



LED LUMINAIRE OFFERS VARIOUS BEAM SPREADS

The AEON LED RGBA/RGBW Luminaire delivers full-spectrum-color flood lighting solutions. Designed to create dynamic scenes and bring excitement to a sports venue or facility, the indoor/outdoor luminaire is suitable for architectural, façade, wall washing, spotlighting and grazing. The product is adaptable to various wired or wireless intelligent lighting controls. AEON LED can be paired with AEON's HyLink Wireless Control and controlled from a laptop, tablet or smartphone. Available in various NEMA beam spreads, the AEON LED RGBA/RGBW Luminaire incorporates field changeable lenses and drivers.

aeonledlighting.com/rgb // Circle No. 37



NO-MIX FLASHING RESIN IS AVAILABLE IN RESEALABLE CAN

CertainTeed has made available SmartFlash ONE, a one-component, UV-stable, fluid-applied resin for steep- and low-sloped roof flashing details and repairs. SmartFlash ONE offers roofing contractors an economical and convenient waterproofing solution in a ready-to-use, resealable can that requires no measuring or mixing to activate. With no primer or component mixing, contractors can work quickly without fear of the product setting up too fast or going to waste. SmartFlash ONE resin is available in a 5-gallon pail (125-square-foot coverage) or 1-gallon pail (25-square-foot coverage). The 1-gallon pail is available à la carte or as part of a Flash Pack, which includes resin, fleece and application accessories.

www.certainteed.com/commercial-roofing // Circle No. 38

THIN STONE PRODUCTS NOW CAN BE SPECIFIED IN SAWN FINISH



Arriscraft has released its Sawn finish for its Thin Building Stone products, including Coastal, Midtown and Stack. The Sawn finish is a smooth alternative to the company's traditional split-face finish. Arriscraft uses only natural materials (plus color pigments) and replicates how stone is created in the earth. This proprietary process creates stone with the natural aesthetics and durability of quarried stone, plus the convenience of standard installation and unlimited supply. All Arriscraft thin building stone products are suited for indoor and outdoor applications in residential and commercial settings.

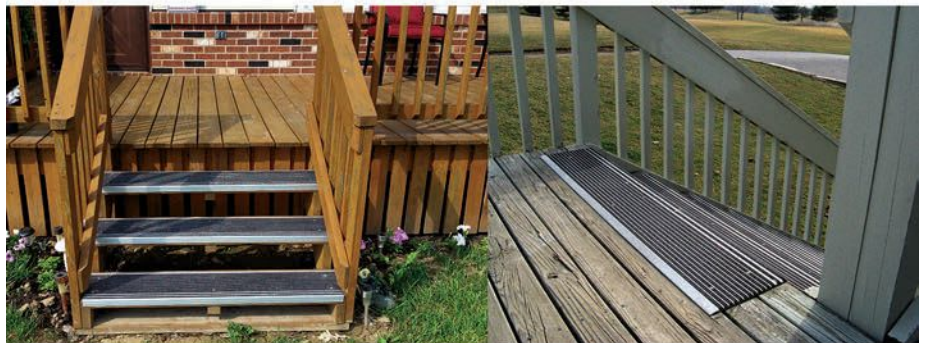
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Circle No. 40



← WOOD FLOORING OFFERED IN LOW-MATTE COLORS

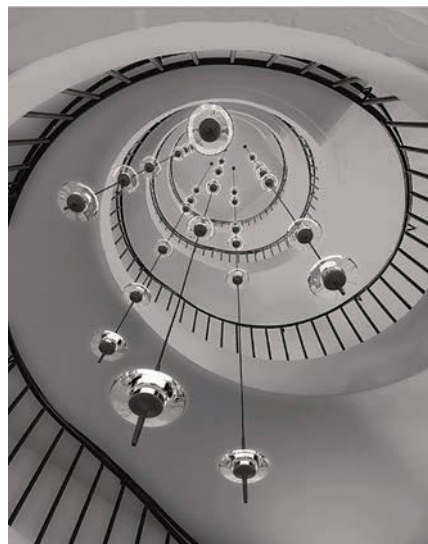
Carlisle Wide Plank Floors has unveiled the Tranquil Collection, a line of smooth-face flooring in a low-matte, layered finish. Available in 8-inch-wide Signature Grade planks, the collection includes six warm colors: Eden, Haven, Harbor, Oasis, Preserve and Sanctuary. The Tranquil Collection delivers the popular ceruse aesthetic without the use of brushing and provides fumed looks without the variance commonly seen in fuming. The collection utilizes a UV-cured oil that doesn't require specialty cleaning products or frequent reapplications of finish. The flooring exhibits a low sheen while eliminating the hazy appearance often seen in very low-sheen urethane finishes.

www.wideplankflooring.com/products/collections/tranquil // Circle No. 41

→ SLIDING DOOR SAVES SPACE, BLOCKS SOUND

ASSA ABLOY has launched the RITE Slide, an integrated opening assembly where all individual door components are included to create a complete door system. RITE Slide ensures privacy and quiet operation with sound seals, automatic door bottom, and soft-close operation to minimize slamming and wear and tear on the door and hardware. Offering acoustically rated and non-acoustic options, the sliding door has a perimeter seal that blocks out light and sound and operational door hardware for passage or privacy with locking applications. The acoustically rated series has been third-party tested to an STC 34 utilizing a flush wood door as a complete assembly, according to ASTM E90.

www.assaabloycenters.us/en/rite-slide // Circle No. 42



↑ LIGHTING DISC IS FORMED FROM ARTISANAL CASTED GLASS

Eureka has released its Celeste pendant, a decorative lighting disc that is formed from artisanal casted glass. It features integrated connectors that allow individual Celeste heads to be connected vertically, providing the opportunity to create large impactful installation, as well as smaller clusters. Celeste is offered in multiple canopy styles and in clear or frosted glass. Specifiers can choose from more than 30 configurations or create their own unique display. Each Celeste head has an integrated connector that enables up to six individual heads to be attached together vertically. The connection enables large-scale installations featuring multiple heads with very few cables. Connectors are hidden with the core of the fixture to maintain the aesthetic.

www.eurekalighting.com // Circle No. 44



← MOVABLE COOLING, HEATING UNITS NOW INCLUDE LCD SCREEN

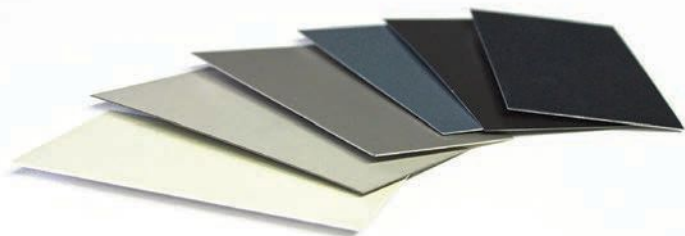
MovinCool has reconfigured its Climate Pro series to include a streamlined control panel with an LCD screen and easy-to-read graphics, black matte finish that hides dust and aging, reinforced bumpers, built-in power cord holder and heavy-duty casters for mobility and greater protection against wear and tear. Eleven models are available: six models for office use, three models for industrial applications, and two models offering heating and cooling. All units are covered by MovinCool's three-year warranty and are equipped with a built-in communication module and antenna that will allow users to remotely operate, monitor and track the unit's location.

www.movincool.com // Circle No. 43

➤ SIX MATTE COLORS NOW ARE AVAILABLE FOR METAL PANELS

To complement the industry-accepted standard gloss finish of more than 35 standard colors, ATAS International now stocks four matte colors. The new low-gloss finish offers a more subdued aesthetic, like that of natural metals. Matte Black has been a popular color choice for many building components recently, and that color leads the new matte palette, which also includes Almond, Anchor Grey, Ash Grey, Char Brown and Thunder Grey. The matte colors are stocked in .032 and .040 aluminum and 24-gauge steel; other gauges are available upon request. The matte finish is achieved using a 70 percent PVDF coating, which resists fading, chalking and abrasion, as well as meets the requirements of AAMA 2605-13 and AAMA 620-02.

www.atas.com // Circle No. 45



◀ METER ENHANCES IMAGES OF MOISTURE, AIR LEAKS AND INSULATION VOIDS

FLIR Systems Inc. has announced its FLIR MR277 building inspection system, a moisture meter with Infrared Guided Measurement to offer Multi-Spectral Dynamic Imaging technology. This all-in-one, thermal-

enabled moisture meter with hygrometer provides users with a full understanding of problem areas by enhancing IGM thermal images with visual details so users can quickly find moisture, air leaks and insulation voids. Inspectors then can streamline diagnosis and documentation by connecting to mobile devices running the FLIR Tools mobile app. This allows users to upload measurements and images from the job site to complete and share full reports with customers.

www.flir.com/mr277 // Circle No. 46



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06 ☐ Remodeler
10 ☐ Other

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

HOW MANY EMPLOYEES IN YOUR FIRM?

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

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03 ☐ 2-4 million
04 ☐ 4 million plus

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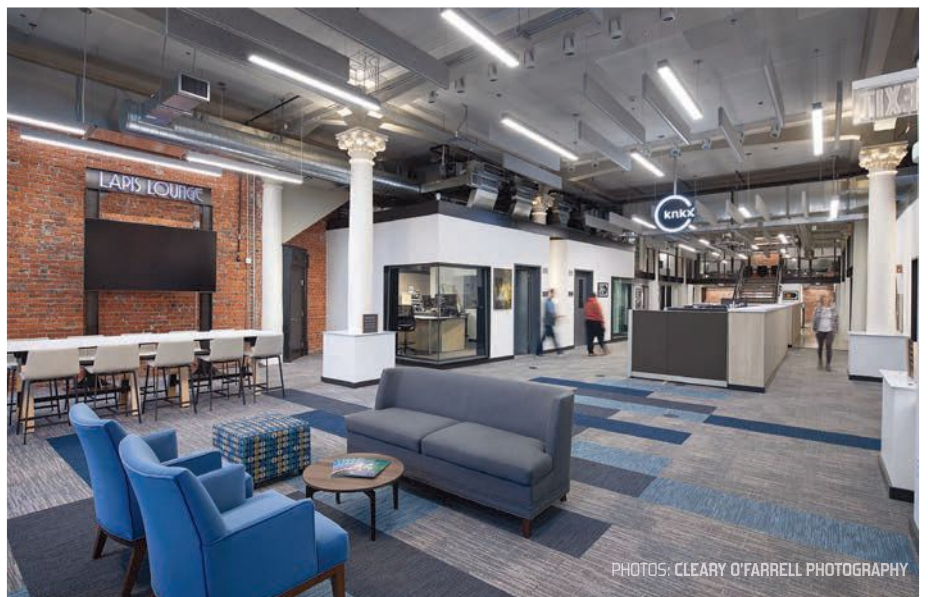
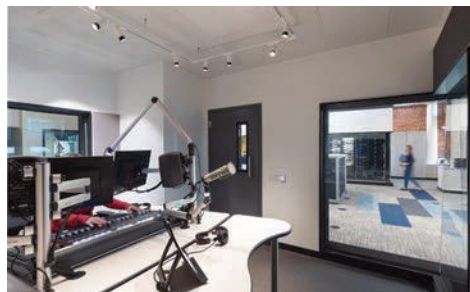
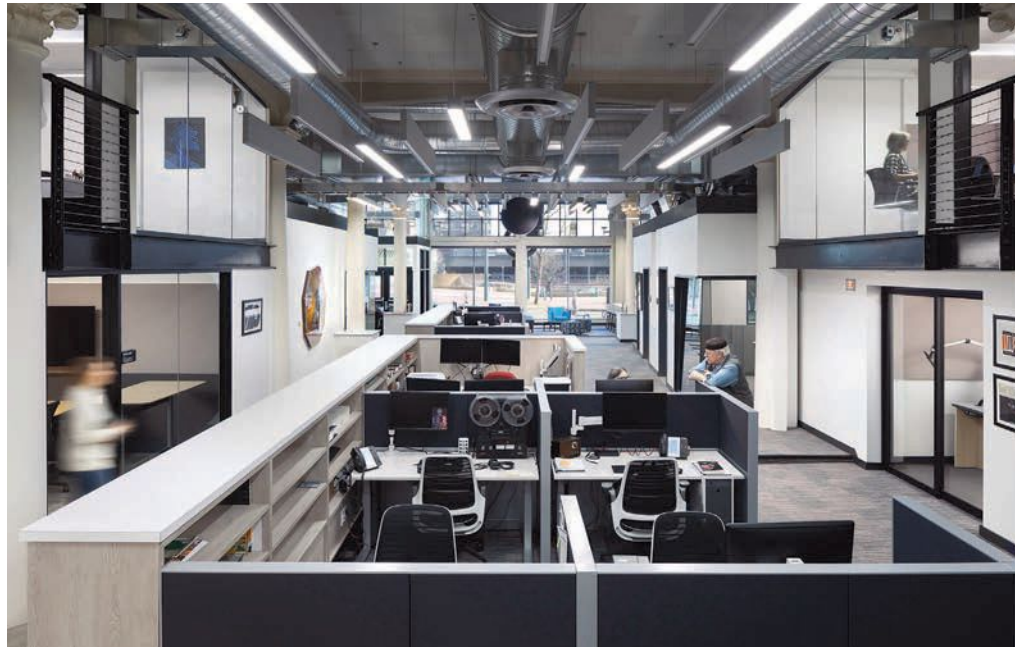
KNKX PUBLIC RADIO

Historic Building Is Adapted for Modern Broadcasting Needs

After a momentous fundraising effort provided KNKX with the \$7 million necessary to purchase its broadcast license from Pacific Lutheran University, the public radio station's representatives doubled down on their community values by building the station's new home in the historic C. N. Gardner Building in the Theater District of Tacoma, Wash. V Three Studios partnered with KNKX as a design consultant for the renovation of the 7,600-square-foot ground floor. The space's new features include four studios and a community-focused multi-purpose "living room" performance space, along with general open office and support spaces underpinned by a complex retrofitted technical infrastructure.

The C. N. Gardner Building, designed by highly regarded regional architect George Wesley Bullard and constructed in 1906, boasts original architectural details, including Corinthian columns, elegant structural beams and an elaborate cut stonework façade. With a goal of accentuating the original architecture as much as possible, the design team allowed these columns to dictate the location of certain elements throughout the design process, resulting in unique integrations with the reception desk, glass partitions, on-air studios, acoustic elements and more. Additionally, the original structural beams framing the second-level mezzanine were left exposed, allowing visitors to see and appreciate the historic components of the building's interior.

Technologically, the station is equipped with the latest industry-standard broadcast equipment for producing and distributing various forms of digital media. This technical infrastructure had to be retrofitted into the existing historical structure, resulting in cable trays, conduits and other equipment being openly visible and celebrated. Visitors can view the station's central hub of rack equipment through a glass partition near the front entrance, along with electrical and data connections mounted directly to the exposed brick throughout the space. The renovation includes the planned flexibility to integrate new technology moving forward, making this the perfect long-term home for KNKX. 



PHOTOS: CLEARY O'FARRELL PHOTOGRAPHY



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