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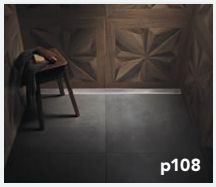

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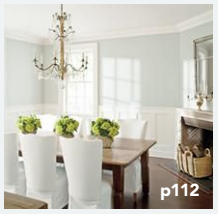

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Beyond the printed page: highlights from our website and other happenings.

THE REAL AND IMAGINED FUTURE OF LACMA

As demolition continues at the Los Angeles County Museum of Art to make way for a new flagship building by Swiss architect Peter Zumthor, an activist group continues to decry the contentious design. The Citizens' Brigade to Save LACMA organized an unofficial ideas competition for alternative schemes. Read more about the saga online—and see which concepts were dubbed "people's choice" winners of the Citizens' Brigade contest. (Finalist designs, clockwise from top, left: Coop Himmelb(l)au, Paul Murdoch Architects, Kaya Design, Barkow Leibinger, Reiser + Umemoto, TheeAe.)

NERI OXMAN AND THE WORLD OF MATERIAL ECOLOGY

In a three-part video series, editor in chief Cathleen McGuigan interviews Neri Oxman about her research-based approach to architecture, which considers nature the core client.

VIRTUAL VISIT TO A RECORD HOUSE

Before the pandemic, deputy editor Suzanne Stephens toured the Pebble Beach House in California, discussing the design with architect Jim Jennings and his clients. Watch the video on our website.

EDITORIAL MEETINGS GO DIGITAL

As the editors of Architectural Record continue to work from home, our regular staff meetings have come to look a bit different! We send our best wishes to each of you during this challenging time.

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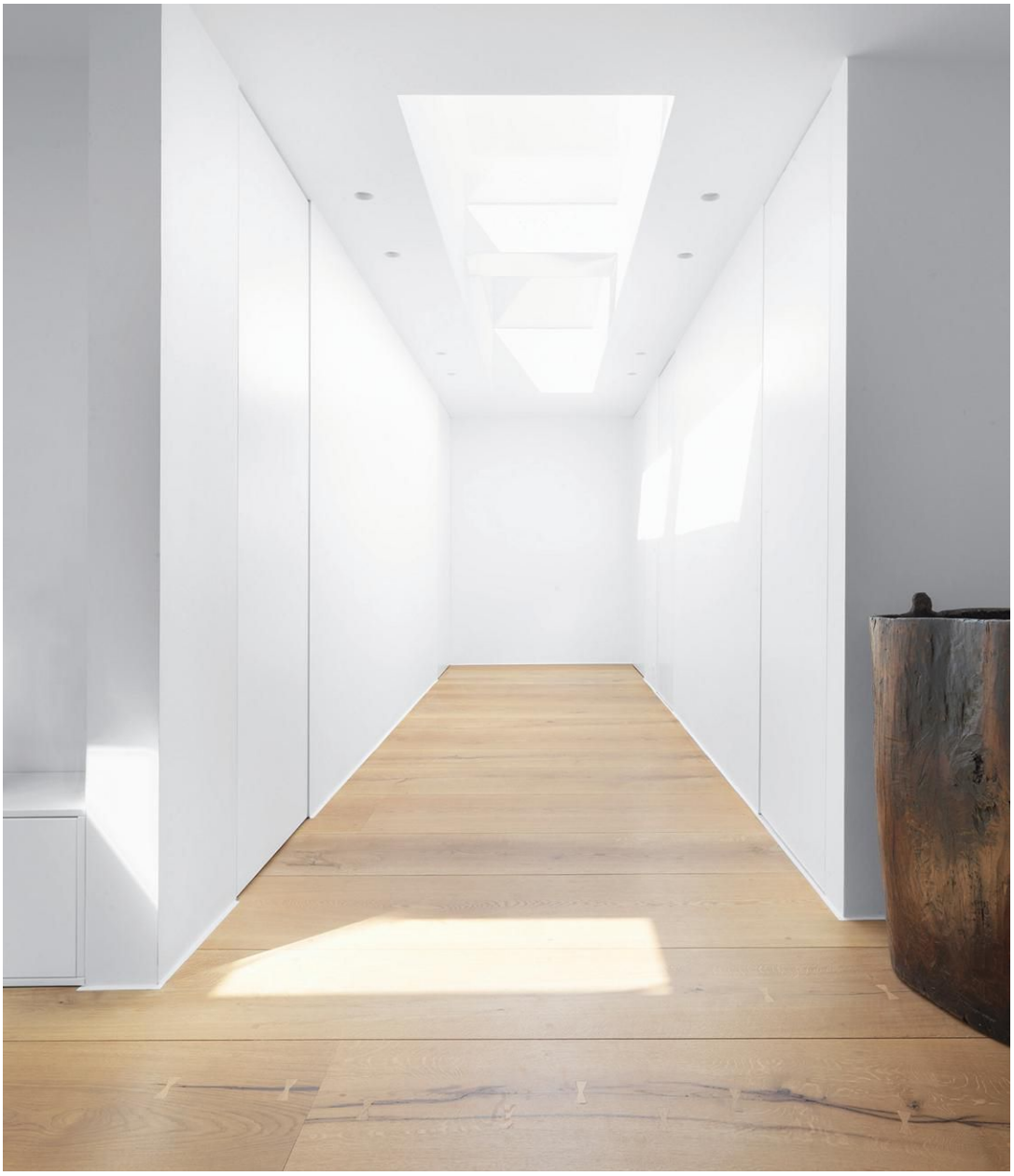

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A New Normal

While cities create pedestrian and bike-only streets, and architects redesign half-empty offices, everyone is braced for an unknown future.

AS COMMUNITIES across the United States and the world begin to reopen after pandemic lockdowns, planners and architects are looking ahead to how we can safely work and move about in cities in this uncertain period before a coronavirus vaccine becomes widely available.

One of the most intriguing responses, well under way, is the closing of miles and miles of streets to automobiles. With traffic all but gone, and clean skies soaring overhead, cities from Oakland, California, to Berlin have opened up vast swaths of roadways to pedestrians and cyclists only (page 15). There are immediate practical reasons: many city sidewalks tend to be too narrow for social distancing, and there's been a demand for more public space, as parks become crowded and cooped-up residents need room to walk or jog.

But the longer-term benefits to the health of both humans and the planet are obvious too, as carbon emissions and dirty air have radically decreased with much of the world's population housebound. In Paris, Mayor Anne Hidalgo, who has long campaigned against traffic congestion, declared that the City of Light would never return to heavy car use post-pandemic. "Pollution joined up with coronavirus is a particularly dangerous cocktail," she said. Indeed, a Harvard study has suggested a link between long-term exposure to air pollutants and death from the virus (even as the U.S. government rolls back clean-air regulations).

One major unknown is how many people—particularly in America—will give up their cars in the near future to walk, bike, or use public transit, especially with fears of crowded subway cars and buses. And will most street closures become permanent, or will those roads reopen to vehicles?

And how many people, now working from home, will be commuting to work again? A number of architecture firms, such as Gensler, Perkins and Will, and HGA, are busy advising clients on adapting office space to the new normal (page 16), despite the stark reality that a multitude of white-collar workers will probably never return to their old desks full-time. Still, barriers between workstations and conference rooms arranged for just a few people—with the rest joining meetings remotely—are among the simpler social-distancing strategies that companies are putting in place now. Planners are also suggesting HVAC upgrades to reduce the risk of infection via air circulation. And offices should be adapted to accommodate some staff, some of the time, to keep a creative culture alive. Clients of SOM, for example, "have embraced collaborative or shared semi-public spaces," says a firm director, Julia Murphy, allowing "different business segments to cross-pollinate. That won't go away."

Similarly, shops and restaurants are figuring out how to reopen to attract the confidence of customers. Last month, MASS Design Group released strategic guidelines for restaurants, proposing flexible spaces and table configurations as well as sanitation measures (it is one of a series of open-source documents on the firm's website that address safety for different building types). As summer approaches, the expansion of outdoor dining—aided by all those urban street closures—could make more American neighborhoods look a little like Paris.

In this, our annual issue of RECORD devoted to interiors, we are looking to the future with several well-crafted new projects, including two restaurants—one by Bates Masi + Architects in New York (page 65) and another in Bentonville, Arkansas, by Marlon Blackwell Architects (page 74)—that, by press time, remained closed or partly closed but are expected to reopen fully soon.

Especially sad, however, is the spectacular stage set, designed by Barkow Leibinger for Beethoven's *Fidelio* (page 52) installed in the empty Theater an der Wien: it ended up only as a production for television, filmed days before the opening—which never happened. (You can watch it on YouTube.)

One more nod to the future is the issue of RECORD you are holding in your hands or reading online. That's because we have a contemporary new look: a cleaner, more readable design undertaken by the magazine's art director, Mike Powell, in close collaboration with the editors. We hope you enjoy it, whether you're still sheltering in place, or beginning to venture out into the world once more.

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Cathleen McGuigan

Cathleen McGuigan, Editor in Chief

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Progress ultimately requires the consent of the governed: Economic segregation is getting worse because Americans with wealth and power don't want to help Americans without wealth and power.

—the editorial board of The New York Times, in May 11 editorial called "The Cities We Need"

'Slow Street' Initiatives in Cities Promote Social Distance

BY JOANN GONCHAR, FAIA

AS THE PANDEMIC emergency drags on, inhabitants of dense urban environments are challenged to effectively maintain physical distancing. Sidewalks are narrow and often obstructed, and much public space has been engineered around parking and the flow of vehicular traffic. "COVID has revealed how little space we give to people in our cities and how much space we give to cars," says Brent Toderian, a Vancouver-based city planner.

Now, as stay-at-home orders have resulted in largely empty streets, some local governments are temporarily converting roadways into pedestrian zones where people have space to safely accomplish essential trips on foot, to exercise, or to simply enjoy fresh air. Several U.S. cities—including Denver, Minneapolis, San Francisco, and Boston—have implemented programs that restrict vehicle access on select streets, prioritizing cyclists, joggers, and pedestrians. Oakland, California, has an especially ambitious initiative, with a phased plan for designating 74 miles, or 10 percent of its roadways, as "Slow Streets."

America's most populous metropolis, New York, is also implementing an "Open Streets" program that officials say will eventually encompass 100 miles, or about 2 percent of the city's total street area. The first seven miles of the program, opened in early May, were primarily in and around public parks—a strategy that some observers criticized. "They should be in neighborhoods that are open-space deserts," says New York–based transportation economist Charles Komanoff. However, as of press time, the city had designated an additional 23 miles of open streets across the five boroughs, with just a small fraction directly adjacent to or through parks. The latest roadways include nine miles of protected bike corridors to be phased in over several weeks, intended to connect existing bike lanes.

Across New York, officials have closed select streets to cars, including some in the Garment District of Midtown Manhattan (above) and uptown, through Fort Tryon Park (bottom).

Urbanists have advice for New York and other cities aiming to provide residents with more breathing room. Toderian has a "Top 10" list of recommendations that include making such spaces plentiful and "hyper-local," so the greatest number of people can have access; making them "ordinary" and "non-sexy," rather than a "destination or a scene," in order to avoid crowds; and to network streets into systems that serve both essential workers and local residents.

What New York's Open Streets program might look like as it expands, or how much of it will persist post-COVID, is unclear. "We want to see which aspects are applicable moving forward," says Eric Beaton, a deputy commissioner with the Department of Transportation. Activists suggest the initiative could help the city recover once restrictions are eased, providing people with transportation options other than cars—and their associated problems of congestion, carbon emissions, and poor air quality—especially as public confidence in mass transit has taken a devastating hit. Danny Harris, executive director of Transportation Alternatives, a New York–based advocacy group, points to cities around the globe as examples of what could be. Paris, for instance, is fast-tracking pre-pandemic plans for reducing on-street parking, widening sidewalks, and creating an extensive network of bike lanes, while Milan will revamp streets at the city's core for cyclists and pedestrians. And in Vilnius, Lithuania, streets are being closed to cars, allowing restaurants to create open-air dining areas that meet physical-distancing requirements.

Framed as part of a long-term vision for public space and transportation policy, rather than just a pandemic accommodation, the Open Streets plan could help ensure the future livability of New York—even, suggests Harris, helping to address environmental sustainability, fight economic inequality, and improve public health. "If we don't reimagine our city now for the next century," he says, "it would be a missed opportunity." ■

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As Clients Reopen Offices, Architects Offer Advice

BY JAMES S. RUSSELL, FAIA

WITH ENORMOUS pressure to restart the economy and reopen businesses closed by the pandemic, architects are considering how best to help their clients. Much remains unknown about the virus, but there does seem to be a consensus around remote work: it's here to stay, with long-term repercussions for the design of, and need for, office space. "The office may be increasingly dedicated to times when we want to be together," says Julia Murphy, a director at Skidmore, Owings & Merrill (SOM) in New York, while focused tasks would be relegated to the home.

Perkins and Will is among several firms that have published documents to assist clients in reopening their offices. Grounded in public-health guidance, "The Roadmap for Return" brings together physical, operational, and personnel considerations. During one-hour sessions to discuss the recommendations with clients, "the need to have a plan in place is a consistent theme," says Lisa Pool, the firm's Minneapolis-based director of workplace strategy, "one that brings people back gradually."

In surveying clients, Gensler expects only small numbers of people will return to offices on "day one"—perhaps just 10 percent, says Michael Chappell, director of strategy at the company's New York office. (Perkins and Will anticipates 20 to 40 percent.) "There is lots of momentum, but lots of caution," says Greg Mottola, a San Francisco–based principal of Bohlin Cywinski Jackson. He says the tech company Square, a client, instructed employees to work remotely until the fall.

In its guidance document, Perkins and Will (Minneapolis office pictured at left) shares a graphic (bottom) from the World Health Organization explaining phases of a pandemic.

"They don't want the risky commute, they don't want to force staff to come in when they can't get childcare, and they don't want to burden the health-care system with cases when they've been able to work so effectively at home."

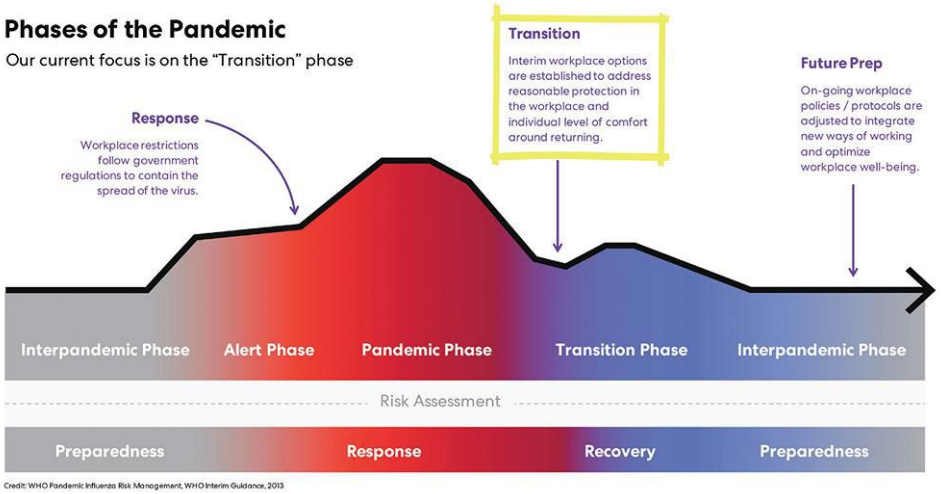
An office's ability to keep individuals 6 feet apart may determine how many return at first. Meetings too are problematic, since most rooms' capacities will be halved, with many participants videoconferencing. "If we can't use meeting rooms, and we must lower the density of people in our office, we're asking ourselves whether we want to go back yet," says Pool. "For what?"

The need for social distancing has also spurred conversations about the viability of shared gathering spaces and refreshment bars. The New York office of SOM was forced to reconsider the collaborative culture embodied in its new office space. "We remain bullish on the idea that creative people have to come together," says Murphy—a sentiment that extends to most corporate clients. "They have embraced collaborative or shared semipublic spaces to build identity, to reduce silos, and allow different business segments to cross-pollinate. That won't go away."

Staying closed much longer may not be an option for many companies, forcing them to consider risk-reduction strategies that "work now, work when there is a vaccine, and work when the next event hits," says Carlos Martinez, a principal at Gensler's New York office. (Pool notes that the World Health Organization does not refer to a post-recovery phase but an "interpandemic" one.) To serve for the short term, some architects are helping clients divide open offices with new partitions or deploy the equivalent of restaurant-buffet sneeze guards between desks. The architecture firm HGA's "Redefining Workplace" guidelines suggest a number of infection-control alterations pulled from the Center for Health Design. Other practices are taking a wait-and-see attitude on more permanent retrofits until more is known about the way the virus operates.

With a growing interest in healthy air—one that predated COVID-19—Olin McKenzie, an SOM director, believes there will be greater willingness to invest in upgraded HVAC systems that evidence shows are capable of eliminating (or diluting the presence of) viruses.

Tactics associated with the WELL building standard and Active Design Guidelines—like ample daylight, access to healthy food, and operable windows—won't control contagion but do convey a reassuring commitment to health and well-being. Given the traumas and dislocation of this pandemic time, dignity, respect, and affirmation of staff value can go a long way. ■



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Five Projects On the Boards

The COVID-19 pandemic has upended daily life across the globe, shifting timelines and postponing the completion and opening of many highly anticipated projects. While a few have stuck to their original schedules, many others won't make their debut until the fall or later. RECORD rounds up some of the most notable cultural projects in the U.S. opening this year. *Kara Mavros*

▲ **DENVER ART MUSEUM, BY FENTRESS AND MACHADO SILVETTI**
The $150 million update and expansion to the institution's Gio Ponti–designed building will add a new entrance and welcome center with a curved glass facade. Though the museum addition, meant to launch in June of this year, has been delayed to a possible fall opening, the new timeline is still ahead of the museum's 50th anniversary in 2021.

◀ **MEMORIAL TO ENSLAVED LABORERS, BY HÖWELER AND YOON**
At the University of Virginia (UVA) in Charlottesville, the Boston-based architecture firm collaborated with artist Eto Otitigbe; architect, educator, and activist Mabel O. Wilson; UVA professor Frank Dukes; and landscape architect Gregg Bleam to design a structure memorializing the enslaved laborers who worked on building the campus. Originally slated to be unveiled on May 8, a new inauguration date has yet to be announced.

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▲ **ST. PETE PIER, BY ROGERS PARTNERS, ASD | SKY, AND KEN SMITH**
Although construction has nearly finished on the 12-acre redesign of a public boardwalk and its buildings on Florida's Tampa Bay, the grand opening of the recreation and dining destination has been indefinitely postponed from its original date of May 30.

◀ **MUSEUM OF FINE ARTS HOUSTON, BY STEVEN HOLL ARCHITECTS**
In addition to existing structures by Mies van der Rohe and Rafael Moneo on the institution's urban campus, the new Nancy and Rich Kinder Building will add more than 100,000 square feet of exhibition space. The project will open its doors as scheduled on November 1.

▲ **NATIONAL EISENHOWER MEMORIAL, BY GEHRY PARTNERS**
Situated in a four-acre park at the base of Capitol Hill in Washington, D.C., the memorial to President Dwight D. Eisenhower will include a "tapestry" of woven stainless-steel cable depicting scenes of the D-Day landings on Normandy's beaches. The site's inauguration and dedication has been rescheduled from May to September 17.

Pandemic-Induced Hiring Freezes Strain New Grads

BY KATE MAZADE

WITH COMMENCEMENT in the rearview mirror, recent graduates of architecture programs are feeling the consequences of COVID-19 on their employment options. Excitement about the future has been replaced with desperate e-mailing and joblessness worries as hiring freezes become commonplace.

Some firms have been able to extend offers, taking on new hires with later-than-typical start dates; 5th Dimension Architecture & Interiors in Austin, Texas, for instance, hired Lauren Wertz, a new B.Arch. graduate of Auburn University. She started applying for jobs in January and notes that her peers who started interviewing in March are becoming frustrated.

Wertz had completed her third interview when the pandemic halted hiring among prospective employers, including 5th Dimension, which paused to reevaluate their workload, but finally offered her a position starting mid-August.

Other firms continue to suspend all hiring (and in fact may be laying off staff) until they have a better sense of how the pandemic is affecting their business. Perkins and Will rescinded the few internship offers they made before coronavirus and implemented a hiring freeze before the full-time offers were sent out.

"With uncertainty about how the crisis might impact our backlog of work, we opted to take a conservative approach and pause," says principal and chief talent officer Meg Brown. "This is a decision we did not take lightly, and we remain eager to revisit recruitment once this economic crisis is behind us."

Prior to the pandemic, Auburn University architecture students worked close together (above); 2019 architecture graduates pose outside of Syracuse University's Slocum Hall (bottom).

Some firms are staying in touch with prospective hires even if they cannot make an offer now. Greg Schaub, who just completed his B. Arch. at Iowa State University, continues to hear from a midsize practice in the Midwest. "I just have to be patient and wait until it's over," he says, grateful that the firm has at least let him know they are still interested. "They keep me up to date on things but just won't know for a while. It makes me think that this would be a good place to work."

That communication between emerging designers and potential employers will help to shape the post-pandemic landscape. "My encouragement to all of my students is to follow up with grace and knowledge that this is an unprecedented time," said Crystal Jalil, career-services specialist at Auburn's School of Architecture, Planning, and Landscape Architecture. "Don't give up on connecting with hiring managers or principals at firms that you really are interested in. Let them know that you still would love to continue a conversation with them when it makes sense."

The longer architecture grads go without employment, the more likely they are to expand their job search to related fields, such as interior, lighting, furniture, product, landscape, or experience design. Some may even look beyond design, to business development, communications, or education.

"There are transferable skills you will get from any job—communication, leadership, analytical skills—that you may not have expected," says Kristen DeWolf, director of career services at the Syracuse University School of Architecture. But such a detour can be risky, as HOK's Kimberly Dowdell (RECORD, May 2020) has seen firsthand. The Chicago-based architect, who graduated during the Great Recession, says nearly half of her architecture-school classmates are not employed in the profession in the traditional sense. "Between 2008 and 2010, people got really creative with what they were going to do," she says. "They went into real estate, construction, academia—and others took a major pivot into something else entirely."

In the meantime, candidates can build their technical skills. Mindy Levine-Archer, a partner at NBBJ in Seattle, encourages new graduates to take this time to learn the tools and platforms that their desired employers use, as well as build their knowledge outside design.

"Whether it's through technology, sustainability, business, or applied research, having additional skills in their toolbox is also compelling," says Levine-Archer. "All of those things are added benefits as they look for jobs. We learn from them as much as they learn from us." ■

PHOTOGRAPHY: COURTESY AUBURN UNIVERSITY (TOP); © ALEXANDRA MOREO (BOTTOM)

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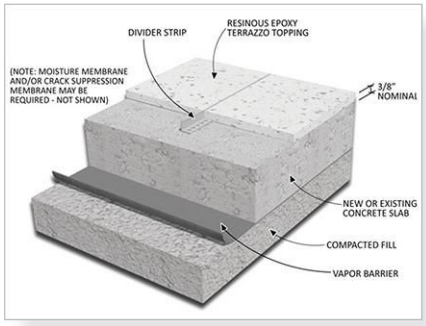

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NEWS in Brief

Remembering Jaquelin Robertson, 1933–2020

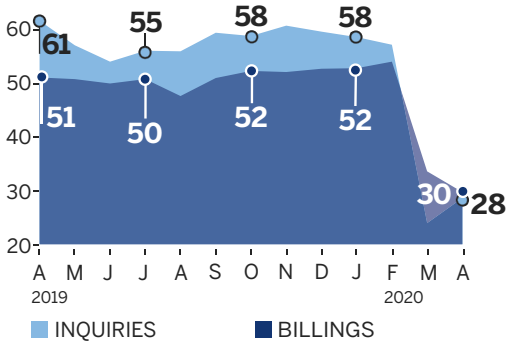
The architect, planner, and founding partner of Cooper Robertson & Partners died on May 9, 2020, at age 87. Born in Richmond, Virginia, Robertson worked for the City of New York in the 1960s, influencing the urban design of midtown Manhattan's streetscape. He was dean of architecture at the University of Virginia from 1980 to 1988 before establishing his New York practice with his former Yale Architecture School classmate Alexander Cooper. A descendant of James Madison and Zachary Taylor, Robertson is remembered by colleagues as a "tall, dashingly handsome figure" who "spoke eloquently, wrote poetically, and drew beautifully."

University of Minnesota Names Jennifer Yoos as Head of the School of Architecture

The CEO and principal of Minneapolis-based firm VJAA, Yoos is an alumna of UMN and the Architectural Association in London and a Harvard Loeb Fellow. A fellow of the AIA, she has taught at Cooper Union, Washington University in St. Louis, the University of Arkansas, and UMN. Her tenure as head of the architecture school begins June 8, 2020.

Sidewalk Labs Abandons Toronto 'Smart City' Project

A subsidiary of Alphabet, Google's parent company, Sidewalk Labs has scrapped plans to redevelop the 12-acre site in the industrial waterfront district of Quayside. Plagued by controversy and concerns about privacy since its inception in 2017, the scheme had become too difficult to make "financially viable without sacrificing core parts of the plan we had developed," wrote Sidewalk chairman and CEO Dan Doctoroff in a Medium post.



Firm Billings Continue to Fall

According to the AIA's latest data, the Architecture Billings Index (ABI) dropped to 29.5 in April, down from 33.3 in March, when the index experienced its largest single-month decline in its 25-year history as a result of the pandemic. (Scores below 50 indicate declining billings.) Inquiries scored 29.5, while design contracts scored 27.6.

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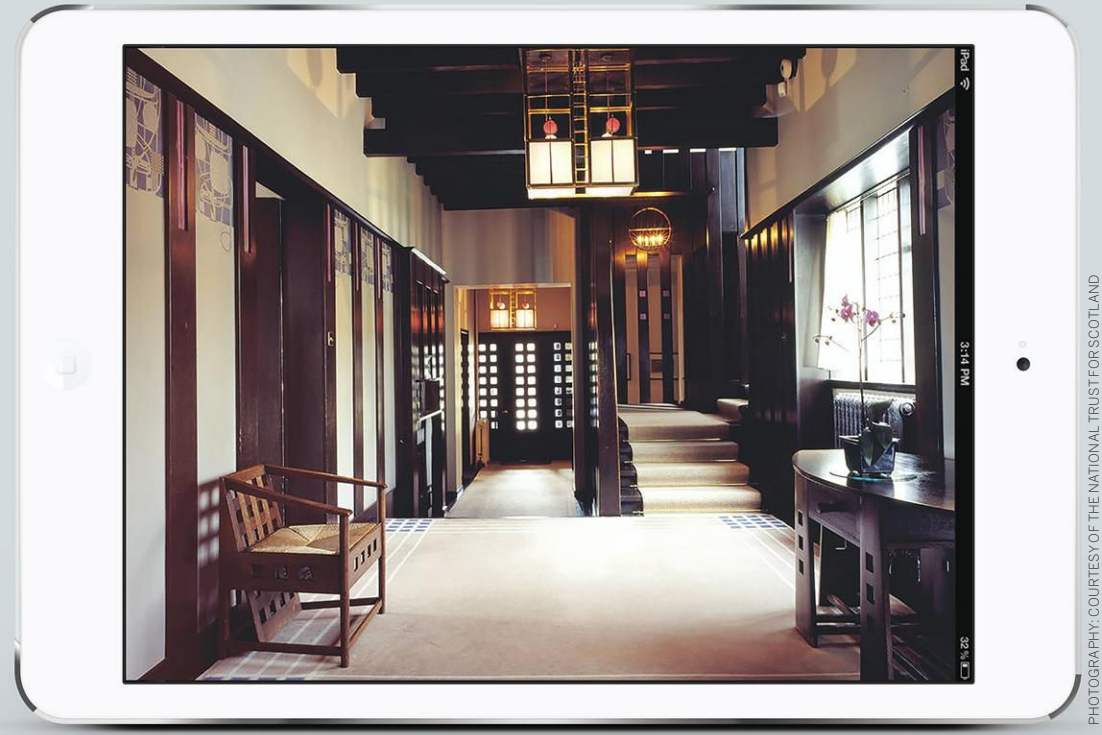

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▶ TAKE A LOOK ON PAGE 35

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A TIGHT SITE IN AMSTERDAM ENCOURAGED ARCHITECTS BUREAU LADA TO CREATE A SLIM, FIVE-STORY "TOWERHOUSE."

FOR YEARS, a triangular site, only 350 square feet in size and owned by the city, sat vacant in a neighborhood near the historic center of Amsterdam. Small and awkward, this urban remnant left from a decades-old demolition eventually tempted a couple—an architect/engineer and a gallery owner—to buy the parcel for their home. The two asked Croatian-Dutch architect Lada Hrsak—whose multidisciplinary firm, Bureau LADA, is based in Amsterdam—if she could come up with a livable design.

There was only one way to go: up. Hrsak designed a five-story shaft that would accommodate one function per floor in its polygonal plan. Entering the vestibule, you find a space for an office or a guest room on the ground level. Mounting the spiraling stair on the west, you arrive at the kitchen and dining area. Each floor serves as a de facto stair landing: you loop around and continue up, arriving at the living room on the third floor, then the bedroom above. A roof terrace occupies the top of the "Towerhouse." There is no elevator, but at least you don't need a home gym for your exercise.

On the third level is the living room (below). At dusk, various activities come into view (left).

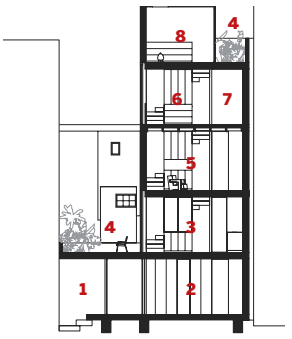
PHOTOGRAPHY: © IWAN BAAN

Hrsak says that a strong inspiration came from Japanese architect Takamitsu Azuma's exposed-concrete house that he built for his family in Tokyo in 1966. "I am fascinated with pocket houses in Japan," says Hrsak, "and, like this one's, Azuma's site was triangular." For Bureau LADA's building, which totals 900 square feet, top to bottom, the architects employed a prefabricated wood structure placed on a concrete foundation. Hrsak then clad the exterior in prepatinated, light-gray zinc that blends into the picturesque, mostly brick Jordaan district.

With its idiosyncratic form, in which large windows are placed at different angles, "You see the layers of city," Hrsak says. "We could have filled up the entire plot, but we cut the building back for diagonal views." Iwan Baan, who captured its diminutive quality in these photographs, adds, "Each floor has a different focus on the surrounding area, and, with the large windows, you feel as if you are almost outside, hovering above the street."

Suzanne Stephens

One function per floor is the rule for this diminutive shaft (top): up one flight of stairs from the street is the dining/kitchen area, which opens onto a terrace (above).



1 ENTRANCE
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3 DINING
4 TERRACE
5 LIVING
6 SLEEPING
7 BATH
8 STUDY

SECTION A - A

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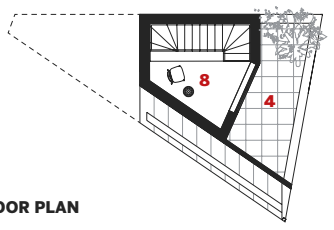
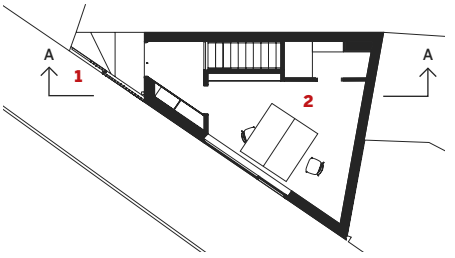


FIFTH FLOOR PLAN



GROUND FLOOR PLAN

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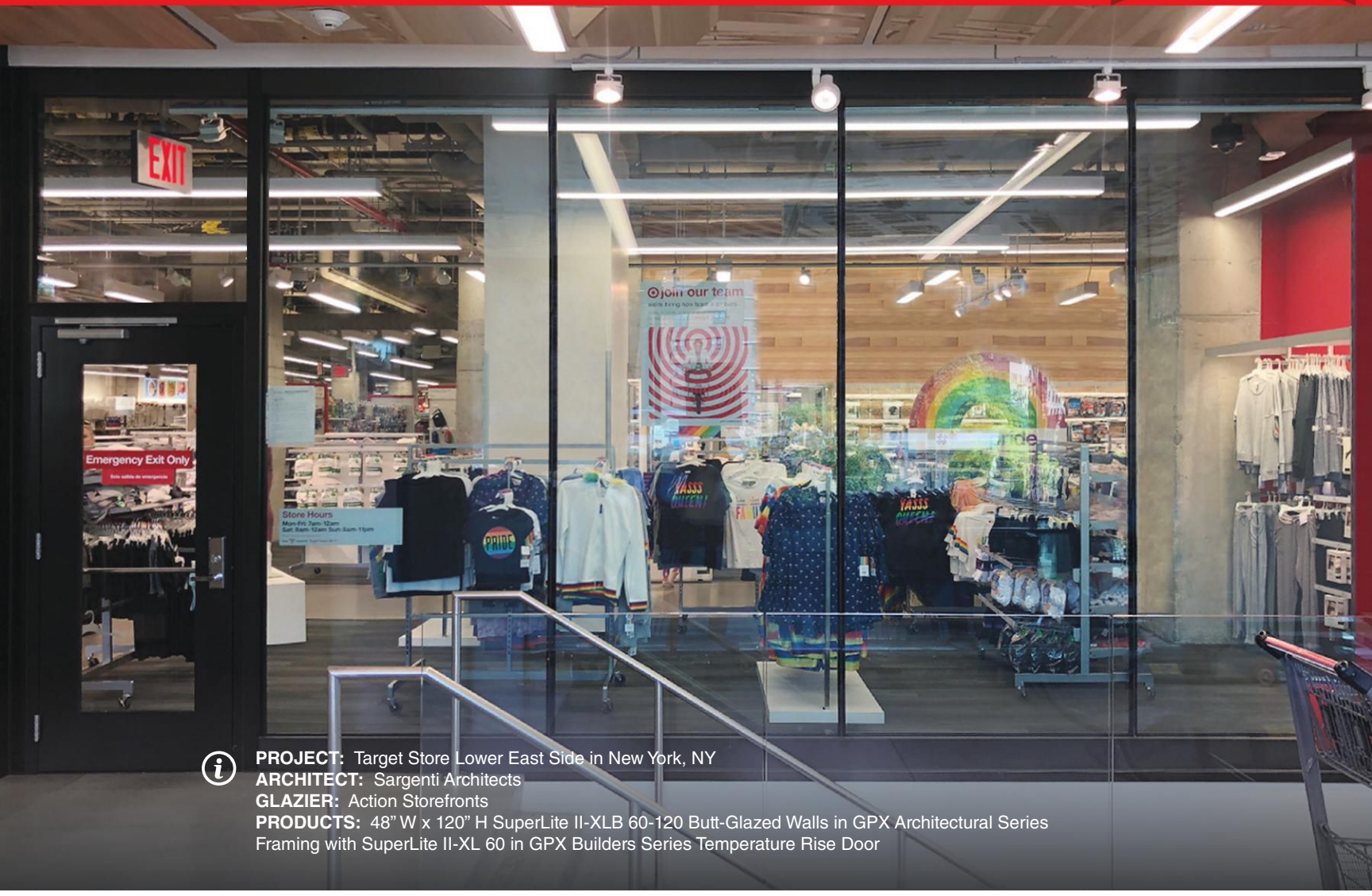

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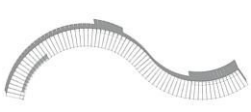

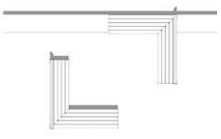

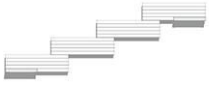

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LANDSCAPE

PLANORAMA EXPANDS AND REDESIGNS TWO PUBLIC PARKS FOR A SMALL GERMAN TOWN.

LAST SUMMER, over 300,000 tourists flocked to the quaint Bavarian town of Wassertrüdingen, about two hours north of Munich, not to indulge in beer and schnitzel but to enjoy its public parks. Each year for about four months, the state government holds a garden show, or *landesgartenshau*, in a different city within this German province. In preparation for the 2019 event—a major undertaking for the small town—Berlin-based landscape architecture firm Planorama expanded and redesigned almost 32 acres of Wassertrüdingen's parks and land, including—appropriately—several bodies of water (*wasser* means "water" in German).

"The city's existing green spaces were partially private, heavily overgrown or built over," says Katja Erke, associate partner at Planorama, so the team's design solution added two new public parks to the map, from newly purchased land: Wörnitzpark to the south, along the Wörnitz river (a tributary of the Danube), and Klingenweiherpark to the north.

The firm designed the new Klingenweiherpark with a singular concrete walkway whose edges are lined with gilded copper aluminum, unifying the nearly 18 acres, which include ponds, orchards, and a playground. The material, says Erke, was chosen because of its ability to reflect light and glimmer in the water—which it crosses in the form of footbridges with golden copper aluminum alloy parapets. Leading up to the park's highest point atop a former landfill, the gleaming pathway zigs and zags around a limestone gravel–covered hill, culmi-

The *Weihersteig* walkway—in German, *weiher* translates to "pond," and *steig* to "steep path"—spans the Klingenweiherpark, connecting the highest lookout point (top) to meadows and ponds (above).

PHOTOGRAPHY: © HANNS JOOSTEN

Planorama manipulated the Wornitz river so it no longer flows through the old town mill (above).

nating at a lookout point with views of the surrounding countryside.

In the 14-acre Wörnitzpark, the team had to reroute the Wörnitz river—which had previously flowed through the old town mill—for flood protection. The historic mill and its pond, meanwhile, sit adjacent to a specially designed tributary, away from the river's newly redirected flow. Landscaped promenades and play areas line the riverbank, inviting passersby to linger and enjoy the waterfront.

At the time of this writing, in early May, many parks in Germany were closed as a result of COVID-19, though some green spaces remained open under rules for social distancing. The permanent parks created for the 2019 Bavarian Garden Show are operating under these rules, though playgrounds are temporarily closed. Conceived to draw international visitors to the small town, Wassertrüdingen's revitalized landscape has, in these recent months of quarantine, had the added benefit of becoming an invaluable outdoor haven for the locals here. *Kara Mavros*

FRY REGLET

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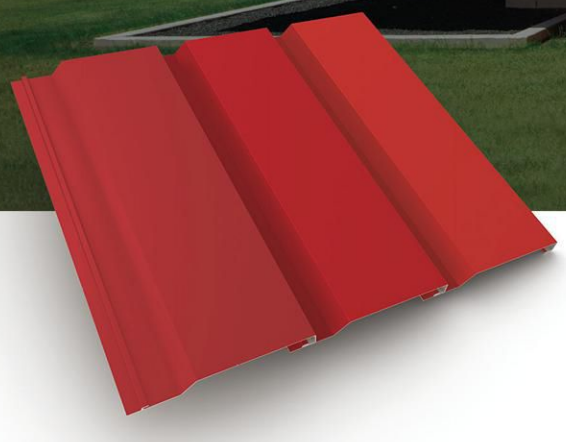

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The architect for the SAS Royal Hotel (now part of the Radisson Collection) in Copenhagen is **Arne Jacobsen**, who designed the building and its interiors in 1960. At 22 stories, it was the city's tallest skyscraper and featured Jacobsen's chairs and objects. Today it stands as an emblem of Midcentury Modernism.

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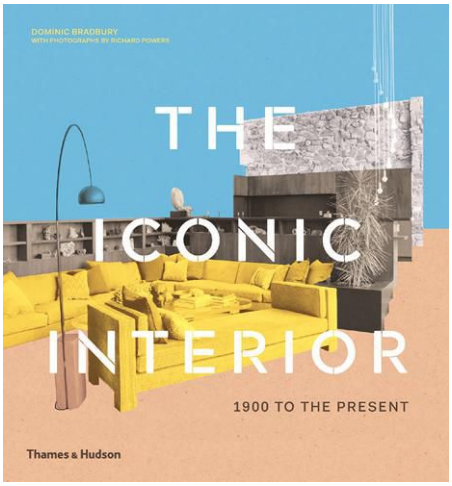
Worlds Within

The Iconic Interior: 1900 to the Present, *by Dominic Bradbury. Thames & Hudson, 368 pages, $35.*

REVIEWED BY WENDY MOONAN



ICONIC is an annoying word; it inspires skepticism.

And that may be the point.

In his new book, longtime British design journalist Dominic Bradbury presents 100 residential interiors to showcase the work of prominent architects and designers, as well as artists, product designers, couturiers, and "influencers."

The interiors encompass a wide variety of styles from Neoclassical to Art Nouveau, Arts and Crafts, Art Deco, Midcentury Modern, Postmodern, Minimalist, and more. With backing from his publisher, Bradbury had the luxury of hiring the photographer Richard Powers to shoot 600 pictures for the book, two thirds of the total.

So what makes interiors "iconic" to Bradbury? "Spaces that sum up a design movement or define a particular style, or suggest a fresh and innovative approach to interior space that resounds through the years," he writes. "These houses and apartments are essential reference points in the ongoing story of interior design."

He naturally includes Peter Behrens's own house of 1901 in Darmstadt, Germany; Frank Lloyd Wright's Hollyhock House of 1921 in Los Angeles; and Hans Scharoun's "Haus Schminke" of 1939 in Germany. But where are Victor Horta, Le Corbusier, or Mies van der Rohe? Not to mention Philip Johnson or Louis Kahn? Ultimately, of course, the author's choices are subjective. Still, some omissions are particularly mystifying. Why include Adolf Loos's Steiner House of 1910 in Vienna but neglect Otto Wagner and Josef Hoffmann?

Bradbury's other books on architecture and design include *The Iconic House: Architectural Masterworks Since 1900* (2009). This explains why Fallingwater is missing from the new volume—it's in his previous book.

The format of both are the same, 8 by 9 inches. "It was a conscious decision to make [the book] more affordable," Bradbury explains. Yet it is frustrating not to have more images of the projects and to have so many be so small, considering the goal of having original photography: there are often as many as four photos on a page. Perhaps it would have been better to focus on fewer spaces and show more of each.

Women designers don't make much of an impact in Bradbury's world. Denise Scott Brown and Lina Bo Bardi are the only two female architects. Where are Julia Morgan, Billie Tsien, and designer/architect Eileen Gray? Among all the decorators, under a dozen are women—Edith Wharton, Madeleine Castaing, and Andrée Putman among them.

Helpfully, the author has compiled a gazetteer of 18 properties open to visitors, however, many of which should not be missed. On this list are Edwin Lutyens's Castle Drogo in England, Bo Bardi's Glass House in Brazil, Eliel Saarinen's Hvittrask in Finland, and Alvar Aalto's Maison Louis Carré in France, along with Henry van de Velde's Villa Esche in Germany and Brinkman & Van der Vlugt's Sonneveld House in the Netherlands.

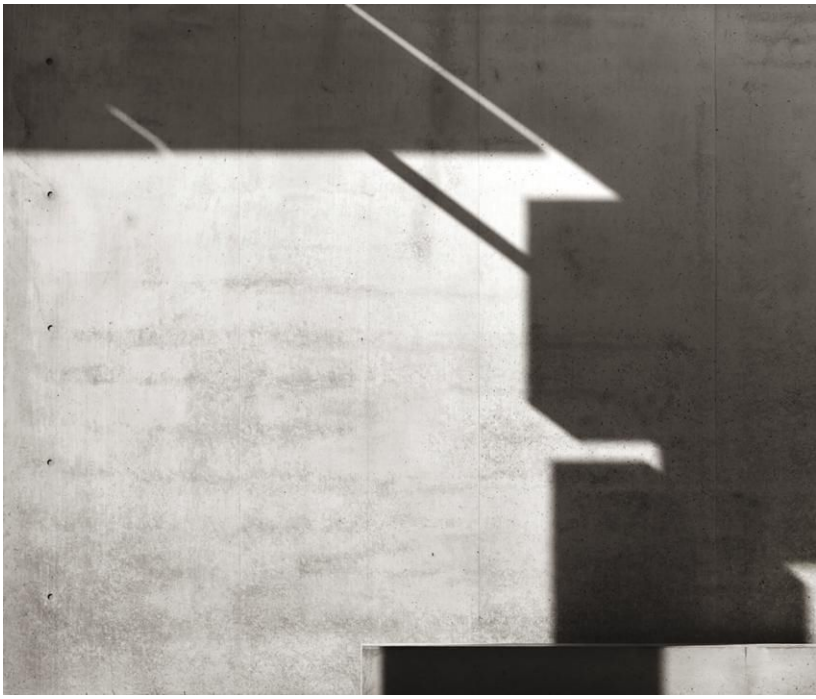
While we're stuck inside because of the pandemic, it's a source of fun to contemplate visits to such houses—and to start Zoom arguments about which is and isn't truly iconic. ■

Wendy Moonan writes frequently on design and architecture, and is the author of New York Splendor: The City's Most Memorable Rooms.

Architecture's Theater

THIS PAST WINTER, the West Vancouver Art Museum presented an exhibition of the photographs of Nic Lehoux, a longtime contributor to RECORD. The work, says Lehoux, "emphasizes the importance of human interaction in public spaces, and the need for us to share experience in close proximity." The exhibition, which is scheduled to travel to Venice for the Biennale (now postponed until 2021) has taken on a new significance in light of the COVID-19 crisis. "The images seem to reflect another era, although that era was just a few months ago," says the photographer. "But, if anything, the pandemic has reinforced the fact that experience is rooted in the human psyche and will not change."

HARPA CONCERT HALL AND CONFERENCE CENTER
Lehoux hoped to capture the Icelandic culture's intensity and whimsy with this image depicting Henning Larsen's green building shimmering in the light as runners at the start of the Reykjavik marathon race by, and a band strikes up.



VANKE CENTER Shooting Steven Holl's enormous mixed-use building in Shenzhen, China, Lehoux focused on a singular moment. "The girl peering behind the building skin in this abstract composition exemplifies human curiosity about architecture and its details," says the photographer.

GOHAR KHATOON GIRLS' SCHOOL For this complex in Mazar-i-Sharif, Afghanistan, the late Robert Hull of Miller Hull Partnership, in collaboration with the University of Washington, engaged sustainable strategies to enable the school to limit resource consumption while providing a comfortable environment in a challenging context. The students also contributed to the design process. "This project," says Lehoux, "exemplifies what architecture does at its best: enhances and heightens the human spirit."

KIMBELL ART MUSEUM EXPANSION
This image, shot in Renzo Piano Building Workshop's addition to Louis Kahn's masterpiece in Fort Worth, Texas, depicts the ability of even large-scale institutional architecture to foster intimacy and solace.

HIVE
In 2017 Studio Gang erected an installation in Washington, D.C.'s National Building Museum. It consisted of three domed structures made of silver and magenta cardboard tubes. Lehoux immortalized the artwork with a series of photos that communicate its power to engage as visitors shared the experience of occupying the volumes.

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hbftextiles.com

Noho Move

New Zealand–based Noho made its debut with an office chair born out of researching the body's pressure points. Made with Econyl nylon—a plastic composed of reclaimed fishing nets and used carpet—its mesh shell flexes and moves with the sitter. Noho Move is offered in black or white with optional interchangeable seat-and-back pads to add extra comfort.
noho.co

Fresh Data

This Greenguard-certified laminate collection from InteriorArts comprises 20 designs, the newest of which include textured wood-grain patterns; matte, anti-fingerprint finishes in black, white, or gray; and metallics. Most come in 4' x 10' sheets and all are 0.31" thick.
ialaminates.com

AJ Royal

When Arne Jacobsen designed Copenhagen's SAS Royal Hotel in 1960, he didn't stop at the building—he created its details down to the furnishings. Among them is AJ Royal, relaunched by Louis Poulsen in honor of the hotel's 60th anniversary. The spun-aluminum luminaire sports a ridge element at the shade's top, emitting subtle light upward.
louispoulsen.com

Adell

Elements found in nature, such as smooth pebbles and moss-covered mounds, informed the gentle, hugging curves of this chair by Arper. But Adell also honors nature through its sustainable shell, 80% of which is made from recycled polypropylene.
arper.com

Copenhagen

Combining Danish-modern styling with American craftsmanship, this case good line from Room&Board Business Interiors brings a residential look and feel into an office. It includes file cabinets, benching workstations, storage units, and bookcases, in a wide range of configurations.
roomandboard.com

Kalota Table

Designed by Neven and Sanja Kovačić and fabricated by Artisan, this solid-wood table from Stillfried Wien is offered in six different species with three finish choices. Options include ceramic inlays or colored wood. The largest of four sizes spans 94½" in length.
stillfried.com

Asmara

Ligne Roset is celebrating its 160th anniversary by reissuing its 1960s-era Asmara. The Bernard Govin–designed curvy modular seating system comprises 61"-by-78" modules in convex, concave, low-back, and high-back shapes. Grouped together, the units form a visually intriguing undulated surface that at once exudes comfort and fluidity.
ligne-roset.com

Telares

Nanimarquina blends the rug-making techniques of traditional kilims and dhurries to produce Telares's subtle, rustic, and shifting graphic that at once evokes mountain ranges, sand dunes, and the ebb and flow of open waters. The rug is 100 percent Afgan wool and offered in five colorways and three sizes: 5'7" by 7'11", 6'7" by 9'10", and 9'10" by 13'1".
nanimarquina.com

227 Range

This minimalist ergonomic chair from Wilkhahn can function as a task, guest, waiting-room, or conference chair. It's constructed with a die-cast aluminum base and a padded bent-plywood seat-and-back shell. Available with or without arms, additional customization options for the 227 chair include: a four-prong or caster base; choice of 11 upholstery textiles; and a high-polished or matte-black finish for the base.
wilkhahn.com

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The Sound of Silence

These latest acoustical products perform double duty as lighting or wallcoverings.

BY SHEILA KIM

Blume and Zyl

Combining acoustical properties with lighting, Focal Point's new pendants play on archetypal lamp shades: Blume is a tapered drum offered in 12" or 19" diameter while the cylindrical Zyl comes in 8" or 12" diameter and three heights. Both can be specified in 30 solid PET-felt colors or with pinstripe inserts.
focalpointlights.com

SoftScreen

Using its proprietary Soft Sound—a recyclable PET textile with an NRC rating of up to 0.9—Arktura developed a group of eye-catching wall panels that can be used multiple ways. They can be mounted on the wall, hung, or suspended from Arktura's track system to function as an operable divider.
arktura.com

Unity

This felt-like wall covering is made with post-consumer–recycled polyester fibers that make it durable as well as shrink-, stretch-, and pill resistant. What's more, the fibers incorporate silver and copper ions to naturally attack microbes. Unity has an NRC rating of up to 0.25 and comes in rolls.
hytex.com

Carved Wall Tiles

Turf has expanded its carved wall-tile collection with the addition of three new shapes—hexagonal, chevron, and triangular—and a geometrical linear pattern. The ⅛" x ⅜"-thick tiles are made of PET felt in single or two-tone colorways, offer an NRC range of 0.25–0.40, and come with or without adhesive backing.
turf.design

Trumpet

A trumpet's shape informs the subtle flare of this long, slender pendant from Unika Vaev. Measuring just over 3" deep, it is made with a plywood frame wrapped in felt, available in 157 hues. Lighting options include down-, up-, and bidirectional LEDs.
unikavaev.com

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The sketches of the winners and runners-up will be published in the November 2020 issue of *Architectural Record* and shown online in the ArchitecturalRecord.com Cocktail Napkin Sketch Gallery.

HOW TO ENTER:

- Sketches should be architecture-oriented and drawn specifically for this competition.
- Create a sketch on a 5-inch-by-5-inch white paper cocktail napkin. You may cut a larger napkin down to these dimensions.
- Use ink or ballpoint pen.
- Include the registration form below or from the website.
- You may submit up to 6 cocktail napkin sketches, but each one should be numbered on the back and include your name.
- All materials must be postmarked no later than September 4, 2020.

Winning Sketch 2019 by Jeongin Kim, Registered Architect

Winning Sketch 2019 by Jordan Lutren, Non-Registered Architect

DEADLINE: September 4, 2020. ENTER NOW!

For more information and official rules visit: **architecturalrecord.com/cocktail-napkin-sketch-contest**
Due to the volume of entries, cocktail napkin sketches will not be returned.

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5 INCHES

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❒ SPECIFICATION WRITER
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❒ CONTRACTOR
❒ OTHER _____

ARE YOU REGISTERED?

❒ YES
❒ NO

ARE YOU AN AIA MEMBER?

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Entry form the size of 5 x 5 cocktail napkin, for reference.

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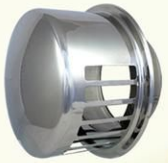

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Inside Out

Kengo Kuma's new Rolex building in Dallas rivals the Swiss company's fine timepieces with expertly crafted interiors that echo the profile of its shell.

BY NAOMI R. POLLOCK, FAIA

PHOTOGRAPHY: © ERIETA ATTALI

WHEN IT comes to Texas, the word that comes to mind is "big." Big hats. Big homes. Big skies. Matching the site's supersize culture, a new building for Rolex in Dallas makes a Texas-sized statement. Designed by the Tokyo-based architect Kengo Kuma, the tautly torqued, louver-clad form rises up dynamically from the ground. While its bold shape contrasts strongly with the city's boxy glass towers, its faceted surfaces maximize daylight and downtown views with each twist.

Mitigating a multilane artery and city streets, the prominent site of the eight-story concrete structure is located adjacent to a former Rolex building completed in 1984, which it has replaced

THE MAIN lobby (previous page) is clad with wood slats that echo the torqued building's external louvers (left and right). Kuma used similar wood details in the customer-service area (opposite, top) and staff lounge (opposite, bottom).

as a company center for operations here. In addition to a strong urban presence, requested by the developer, the new facility houses workshops and offices for the company. A Rolex in-house design team was responsible for planning and furnishing the service and technical operations on the first four floors, in addition to commercial, training, and administrative offices on the two levels above them. The building's common areas, however, were designed and outfitted by Kuma. These include two public lobbies and a staff lounge and roof garden at the top.

Since most visitors arrive by car, there is a small lower lobby adjoining the parking area, which is below grade. "We wanted that experience to feel important," explains Balazs Bognar, Kuma partner and the project's design director. Accordingly, this lobby, which receives daylight from above, features a rock garden and an open stair ascending to the upper lobby and adjacent customer-service area for watch repair. A diagonal footbridge leads from the street to the pedestrian entrance at street level, which has views of the parking lot on one side and a water feature on the other that opens to a garden by landscape architect Sadafumi Uchiyama, the curator and Kuma collaborator at the Portland Japanese Garden (RECORD, August 2017). Echoing the stacked lobbies, the staff lounge on the seventh floor, which includes dining and seating areas, and the roof garden are also linked with stairs and shared greenery.

The integration of nature—a defining feature of Kuma's architecture—is particularly evident at the building base, where three radiating tiers hold plantings and a reflecting pool. Each platform is contained by stone walls created by 15th-generation mason Suminori Awata, who also traveled from Japan to work with Kuma at the Portland garden. Resembling historic Japanese castle ramparts, the dry-jointed stone veneers —Baker Blue granite from Oregon—are applied with clips to a concrete substructure. In addition to mediating the site's slope, the splayed tiers lay the groundwork for the building's spiraling shape above.

Underscoring the project's profile, 16-inch-deep louvers wrap the building and provide sun shade. They are made of wood-grain-patterned anodized aluminum that could be fashioned with crisp edges and was suitable for the harsh Dallas climate. Except where anchored by metal struts integrated with the curtain wall, the fins are independent of the exterior enclosure. Their precise alignment was enabled by varying the length of the struts as they negotiate the building's angled geometry. Adjusting the louvers' vertical spacing yielded appealing views for both seated and standing Rolex staff.

Scaled down, the horizontal banding carries over into the Kuma-designed interiors. "This is a single, unified vocabulary that can do a lot of things," says Bognar. In the lower lobby, local Mesabi-granite strips line the walls, incorporating the reception desk. Upstairs, the stone is replaced with wood. In both places—the ¾-inch-thick slats taper down to a mere ¼ inch at their exposed ends —Kuma's attention to detail mirrors the precision technology of Rolex timepieces. In the staff lounge, wider wood slats segue smoothly from walls to ceiling, creating a relaxed, cocoon-like space.

Descended from traditional Japanese *koshimado*, louvers are signatures of Kuma's architecture. Over the course of his career, they have been transformed from vertical to horizontal and from wood to stone or metal. "Our office is one of evolution rather than sudden revolution," remarks Bognar. With its unique form, the Rolex building sends that trope spinning in a new direction. ■

PHOTOGRAPHY: © CEDRIC WIDMER (TOP, LEFT AND OPPOSITE, TOP); BALAZS BOGNER (TOP, RIGHT); ERIETA ATTALI (OPPOSITE, BOTTOM)

Credits

ARCHITECT: Kengo Kuma & Associates — Kengo Kuma, partner; Balazs Bognar, design director; Adrian Yau, project manager; Hannah Applegren, Aigerim Szyzdykova, Laura Sandoval Ilera, project architects

ARCHITECT OF RECORD: HDF

ENGINEERS: L.A. Fuess Partners (structural); Halff Associates (civil); Blum Consulting Engineers (m/e/p)

GENERAL CONTRACTOR: Sphinx Construction Group with HCMS

CONSULTANTS: Uchiyama Design Studio (landscape design); Halff D+PC (landscape architect of record)

CLIENT: Rolex

OWNER: Harwood International

SIZE: 136,860 square feet

COST: withheld

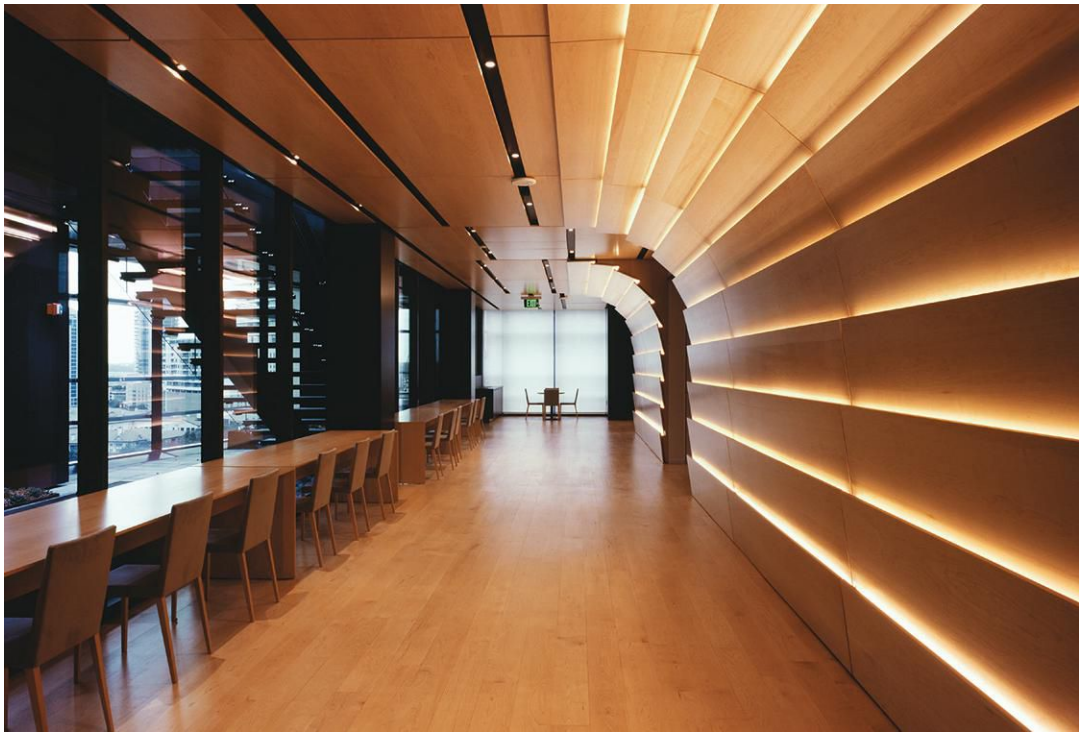
COMPLETION DATE: 2018

Sources

FACADE: Southern Glass (curtain wall; aluminum louvers)

MASONRY: Suminori Awata; Green Man Builders; SPSD; TST Construction

WOOD: Architectural Components Group



Stage Presence

Barkow Leibinger's set design for *Fidelio* in Vienna shows how architecture enhances dramatic action.

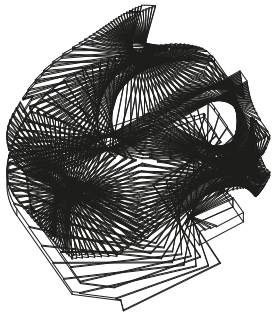
BY SUZANNE STEPHENS
PHOTOGRAPHY BY IWAN BAAN

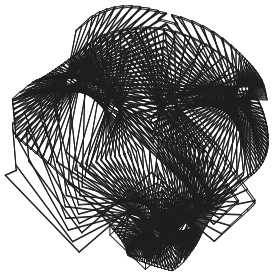
IN ADDITION to COVID-19's wrenching human toll and economic devastation are disheartening cultural casualties; one is a Viennese production of *Fidelio*, Ludwig van Beethoven's sole opera (first staged in 1805 but revised in 1806), marked by a new, impressively sculptural stage set designed by the Berlin-based architectural firm Barkow Leibinger. The architectonic assembly is based on a double helix that generates a spiraling construction of timber stairs. As with Beethoven's original two versions, the current production was slated to occupy the ornate interior of the Empire-style Theater an der Wien, built in 1801.

The 2020 staging, directed by the actor Christoph Waltz and performed by a primarily European cast, would have been a fitting way to celebrate the 250th anniversary of the composer's birth. Although the theater was shut down before the opera's opening night on March 16 because of the pandemic, the Austrian government allowed a performance to be captured on film for television.

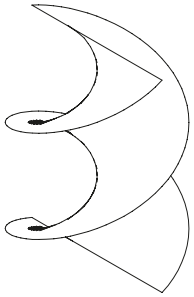
Frank Barkow, a founding partner of Barkow Leibinger, got involved in the design through his friendship with the Viennese-born Waltz, who has previously directed two well-received operas, *Der Rosenkavalier* in 2013 and *Falstaff* in 2017. Having an architect engaged in set design, as for this *Fidelio*, is somewhat unusual. While designers often successfully explore the dynamic interplay of two and three dimensions in set design—such as Carl Fillion's scheme for Wagner's *Ring Cycle*, directed by Robert Lepage at New York's

STEPPED CONTOURS predominate in the abstract design of Barkow Leibinger's stage set (this page) for Beethoven's opera *Fidelio*. Unfortunately, performances in the ornate Theater an der Wien (opposite) were canceled by COVID-19.

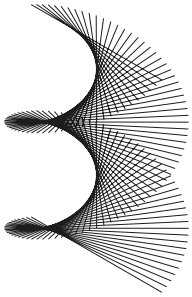




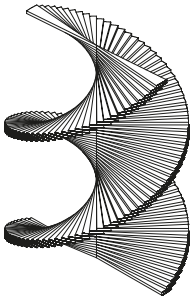
CONCEPTUAL LINE DRAWINGS



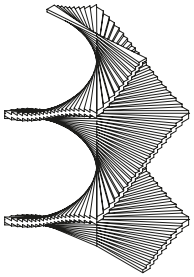
HELICOID/HELIX SURFACE



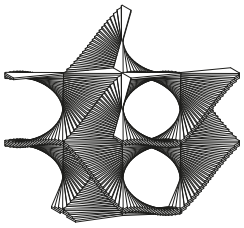
SEGMENTS



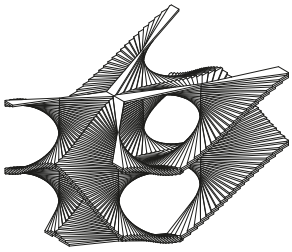
STEPS



CUTOUT

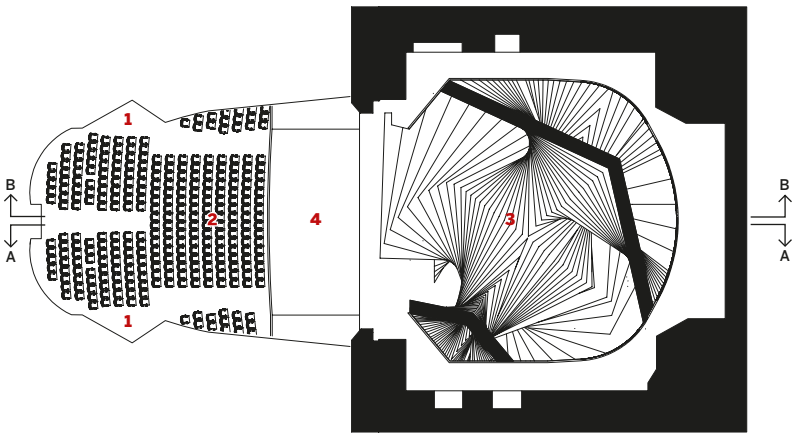


COMBINATION CUTOUTS



DISTORTION

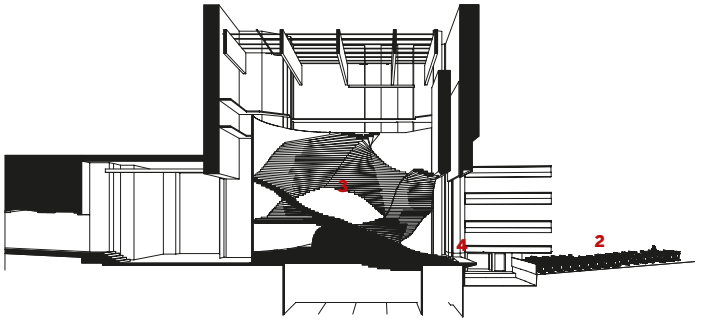
THE STAGE SET began with 3-D wire-frame drawings (top), then four helicoid progressions outlining surface geometry, ruled lines, and scaled steps. A circular perimeter drawing was deformed into a square (middle). Finally, four helicoid/helix drawings (bottom) were combined, distorted, and stretched.



MAIN-FLOOR PLAN

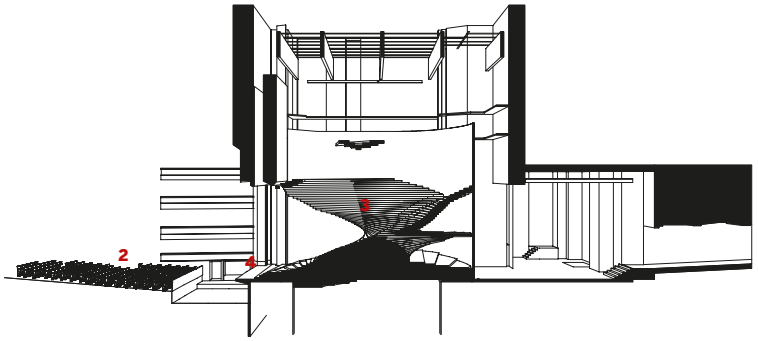
0 12 FT.
4 M.

1 ENTRANCE
2 AUDITORIUM
3 STAGE
4 ORCHESTRA PIT



SECTION PERSPECTIVE A - A

0 20 FT.
6 M.



SECTION PERSPECTIVE B - B

0 20 FT.
6 M.

THE CURVILINEAR WOOD set (above) emanates from a double helix, which swoops around dramatically as it fills the stage.

Metropolitan Opera (RECORD, March 2011)—the architectural contribution here appears, in photographs and video, to be purer, simpler, and stronger, and less gimmicky. Here Barkow's spatially curvilinear topography for *Fidelio* forcefully fills the 53-by-53-foot depth and width of the stage and its 36-foot height, framed by the ornate, curved arch of the proscenium.

The story takes place in a Spanish prison, where Leonora, disguised as a male guard called Fidelio, tries to save her husband, Florestan, a political prisoner, from sure death. (Spoiler alert: this "rescue opera" has a happy ending.) Both Waltz and Barkow envisioned a monumental set, such as a grand stair, that would vertically lift up, through the backstage area. Piranesi's mid-18th-century drawings of *Carceri d'Invenzione* (imaginary prisons), threaded with stairs, partly inspired Barkow, "only we wanted this to be more abstract," he says.

The architect's concept started with a helicoidal surface that spirals into a double helix with an oculus at its top. The design's sinuous timber construction, supported on a steel-tube scaffolding, provides ridges and steps where singers can enter from multiple points and move in diagonal trajectories, ascending to the light above or descending to the nether reaches of the dungeon below.

To dramatize this choreographic aspect, the architect had briefly thought of having the set revolve on a disc, but the cost would have been prohibitive. The opera's performers, no doubt, were relieved, since the slopes appear vertiginous enough. As it is, Florestan—performed by a stuntman, in a segment just before the orchestra begins—is flung from the top of the set by two guards and hurtles down the cascade of steps toward the dungeon. As for the rest of the cast, Barkow says, "the

singers didn't stumble. They were like mountain goats."

In executing the tiered construction, the architect created the drawings and digital models in Berlin. The set was put together in Poland, using CNC-cut timber segments, and then dismantled and sent off to a warehouse in Vienna, where it was reassembled for the rehearsals. Then the segments were taken apart again and carried through the narrow openings of the Vienna theater to be rebuilt on the stage "like a ship in a bottle," says Barkow.

The lighting's chiaroscuro effects enhance the drama of the gray-painted set, going from a bright light usually at the top to dark near the dungeon, with softly tinted illumination emphasizing the shifting moods. The lighting designer, Henry Braham, installed scrims of LED panels and screen diffusers to lend a sense of continuity and ethereality to the various mises-en-scene.

With regard to the acoustics, Barkow notes that the hard surfaces and swooping curves of the stepped forms helped project a balanced sound. The structure's undulating contours were also good for sight lines, he says. Not only did the vantage points change remarkably, depending on where you were sitting in the theater, but the conductor (in this case Manfred Honeck, who led the Wiener Symphoniker) could easily see the singers from the orchestra.

The set has remained in place in the theater during the pandemic's closing, at least until the end of June, so it can be there when and if the curtain rises again. But whether this production will have a live performance is to be determined. Meanwhile, the single staging of this riveting *Fidelio* can be seen on Youtube so that observers can put themselves almost anywhere the camera has ventured. ■

Credits

ARCHITECT: Barkow Leibinger — Frank Barkow, principal in charge; Regine Leibinger, principal; Antje Steckhan, project architect; Jan Blifernez, Reidar Mester, Andreas Mohling, Jens Wessel, team

DIRECTOR: Christoph Waltz

CONDUCTOR: Manfred Honeck

CONSULTANTS: Henry Braham (lighting design); Judith Holste (costumes); Knippers Helbig (structural)

CLIENT: Vereinigte Bühnen Wien GmbH, Theater an der Wien

SIZE: 2,800 square feet (53 x 53 x 36 feet high)

COST: withheld

COMPLETION DATE: March 2020

DISCREET lighting effects alter the mood of scenes as the plot develops (left and below). The singers walk up, down, and sideways on the timber construction as they gaze down to the audience and orchestra (opposite).

All Dressed Up

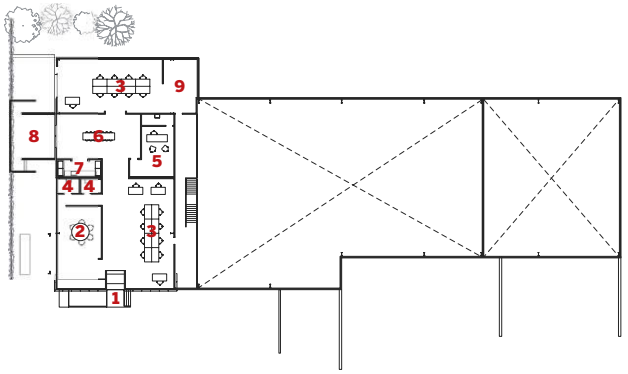
Fearon Hay transforms a banal warehouse into a sleek fabric showroom and offices in New Zealand.

BY JOSEPHINE MINUTILLO
PHOTOGRAPHY BY MICHELLE WEIR

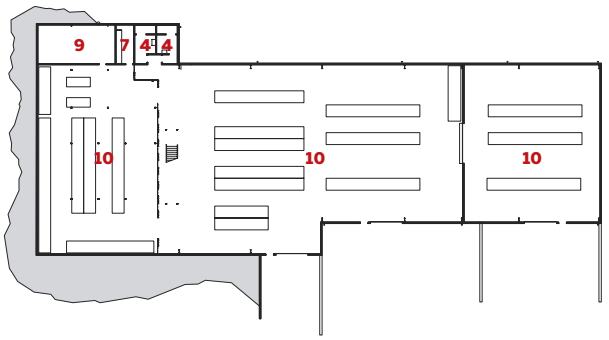
REPEAT CLIENTS are often the best clients—especially if they're not just asking you to repeat yourself. In 2013, New Zealand firm Fearon Hay Architects completed a renovation for Wall Fabrics, an importer and distributor of fashion textiles (RECORD, September 2013). The success of that project, located on the fringes of downtown Auckland, helped spark a regeneration of the area. Presented with an enticing offer from a developer, owner Roger Wall sold that space. He turned to Fearon Hay once again, and found a similar warehouse building to accommodate a similar program of office, showroom, and storage. Yet this revamp would take a very different approach.

The existing building for the new space, positioned at another part of the city's periphery with very different site conditions, was a long, low structure whose south end culminated in a dreadful two-story pink and green stuccoed confection that would seem to hold little promise. But its larger footprint—30 percent more area—would support the growing business, as well as Wall's other creative ventures. And in the hands of Fearon Hay—whose award-winning track record of adapting historic and industrial buildings includes numerous warehouse conversions (its own workspace among them), the transformation renders the original structure unrecognizable.

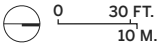
A DARKENED steel staircase leads to a lower-level storage area (opposite). A social space opens to a newly constructed private courtyard (above).



GROUND-FLOOR PLAN



LOWER-LEVEL PLAN



1 ENTRY
2 MEETING ROOM
3 OPEN SPACE
4 RESTROOM
5 PRIVATE OFFICE
6 SOCIAL SPACE
7 KITCHENETTE
8 COURTYARD
9 OFFICE STORAGE
10 FABRIC STORAGE

Credits

ARCHITECT: Fearon Hay — Tim Hay, partner and design architect; Doug Weir, senior associate; Alisha Patel

ENGINEERS: Sullivan Hall (structural); HSCNZ (hydraulic)

GENERAL CONTRACTOR: Rucon Construction

CONSULTANT: Holmes Fire (fire)

CLIENT: Wall Fabrics

SIZE: 23,500 square feet

COST: $1.8 million

COMPLETION DATE: January 2020

Sources

METAL PANELS: Dimond Roofing

GLASS: Metro

METAL FRAMING: Fairview Architectural

SUSPENSION GRID: Gib

SPECIAL SURFACING: Sto

PAINT: Dulux

HARDWARE: Drake & Wrigley, FSB, Dorma

ALUMINUM panels comprise the facade around the office space (opposite, left). A rotating display of the client's artwork punctuates the 12½-foot-high skylit interiors (opposite, right and right).

Whereas in the earlier project the architects put the fabrics on full display, now they have employed a more nuanced strategy, starting from the outside in. Two bands of thick-gauge aluminum panels in a 3½-foot by 10-foot module replace the stuccoed taller building segment. The panels, hung from custom-designed wall brackets that are hidden from view, form a windowless rainscreen surrounding the office space, and conceal the entrance. "Unlike the first building, the new one is very close to its neighbors, which are mainly light industrial," says Fearon Hay partner Tim Hay. "This business has a very different attitude, so we made the facade a bit of a mystery to the street—one of deflection and invitation at the same time." The aluminum has a raw finish that will oxidize over time, particularly in Auckland's coastal air.

Without daylight from the perimeter, Fearon Hay cut a series of oversize light shafts throughout the roof of the almost entirely rebuilt steel-frame office structure—the abundant wall space and overhead illumination providing an ideal setting for displaying Wall's significant art collection.

Seeing an opportunity to create different moments of focus, Hay, on the second go-round, separated the fabric storage from the office. He created a sequence of spaces upon entry—from the open office and meeting room to the large social space used for weekly lunch gatherings that include the dozen or so employees, and guests engaged in art and commerce. That space opens onto a small courtyard bound by walls of concrete block that Hay designed for privacy from the adjacent building. Just past the social space, another large office area accommodates specialized staff of the diversifying business and other enterprises. "There is a layering of what you reveal," says Hay.

The long lower portion of the building was retained—with the exception of the removal of some "architectural barnacles," according to Hay—and painted battleship gray. To access that space, used almost entirely for storing fabric rolls, Fearon Hay inserted a dramatic staircase, its darkened stainless-steel banister and railing treated in a phosphate dip and coated in beeswax.

Occupied earlier this year, this building may not be the last for this pairing of architect and client. Fearon Hay recently opened a studio in Los Angeles. While that office is currently at work on residential projects, Wall may be expanding there as well. No doubt a third collaboration would reveal yet another slant. ■

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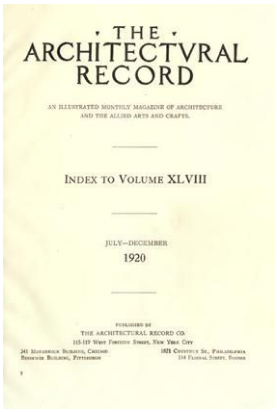

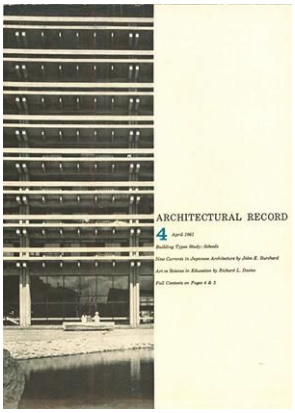

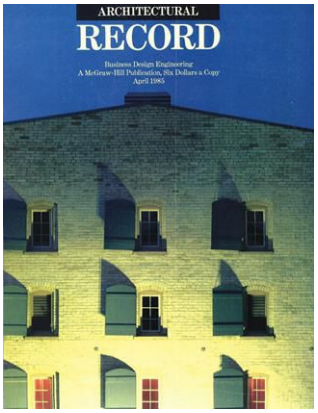

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Palette Pleaser

Bates Masi + Architects elaborates on an urban theme with refined materials for Asset, the firm's second Manhattan restaurant for the same client.

BY LINDA C. LENTZ

PHOTOGRAPHY © BATES MASI + ARCHITECTS

A VAULTED ceiling draws diners past the brass-topped oak bar toward a bilevel dining area anchored by a graceful curved staircase.

BEFORE TEMPORARILY shuttering its doors due to the COVID-19 crisis in March (along with all New York restaurants), the six-month-old Asset had become a welcome addition to the dining scene near Manhattan's Central Park and the American Museum of Natural History. According to early reports, its popularity stems from good food, an updated spin on New American cuisine, and a comfortably urbane interior by Bates Masi + Architects that blends industrial elements with a refined material palette—one that the food blog Eater says "sets it apart from family-friendly neighborhood spots."

The judicious scheme should come as no surprise to those who know Bates Masi's largely residential portfolio, though Asset is only its second restaurant project. (Their first was for the same client.) Based in East Hampton, Long Island, the architects have built a well-deserved reputation for designing relaxed, beautifully detailed modern houses that encapsulate

A MESH wall (left) creates an open yet intimate dining area next to the booths (opposite), which catch the glow from discreet LEDs under the stair. Brass signage near the entry (above) drops down to become a table at wheelchair level.

what many city dwellers and locals envision when they think, "East End." Several have appeared on these pages, with more than one Record House among them (RECORD, April 2012 and June 2017). What is surprising, says principal Paul Masi, is that the firm was asked to design a city restaurant in the first place. "We had designed a home for the client and were up-front about our hospitality experience, which was none," says Masi. "But he said, 'If you can give half the energy to my restaurant that you gave to my house, I'd be excited to have you do it.'"

That was more than six years ago. Their first venture, Tessa, in the same Upper West Side neighborhood as Asset, has done well since opening in 2014, says Masi. When the owner asked the architect to design a sibling establishment (the name Asset is the inverse of Tessa), Masi recalls, "they wanted a similar language and palette. If someone were to visit both restaurants, they would see a common thread." But, he adds, "we pushed it in a slightly different direction." With Tessa, the architects had employed a spirited mix of brick, wood, and steel grating for a gritty urban vibe. For Asset, the team developed a more sophisticated dialog with the bones of the existing architecture—specifically, metal lath vaults above the fire-rated ceiling, which were revealed during a ground-penetrating radar scan prior to design and construction.

Located within a historic district, on the ground floor of an 11-story, 120-year-old Lamb & Rich Renaissance Revival–style building, the 3,450-square-foot space has soaring ceilings, a mezzanine, and a basement level. Masi reimagined the hidden vaults using common steel expanded-metal mesh, blackened for an industrial look. The new vaults are anchored to the existing girders below the extant ceiling, with enough room between to conceal acoustic foam, mechanicals, and audiovisual equipment. This vaulting system, he says, draws guests into and through the 96-foot-long restaurant, which transitions from a narrow 15½-foot-wide entrance—which opens onto a 48-foot-long brass-topped oak bar—to a 31-foot-wide dining section at the back, where intimate groups of tables can be closed off by metal-mesh curtains for private events.

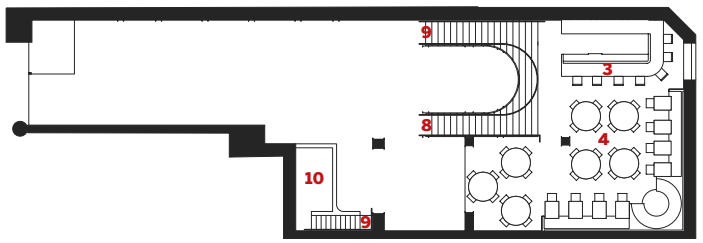

TESSA

THE DIAMOND motif recurs in the mesh wall and as a mirror in a basement restroom where the washbasins (right) overlook the kitchen. It also appears along the stair, where wait staff hurry to and from the mezzanine for service (opposite).

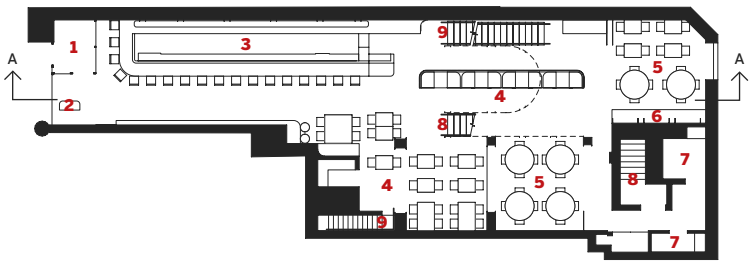
Wrapped in a blackened-steel armature delineated by LED cove lighting and punctuated by downlights, the girders are celebrated and serve as a structural fulcrum, supporting shelves behind the bar, skeletal steel pendants above it, and the room's focal point, a curved stair made of diamond-plate steel that hovers gracefully above the ground floor. Figuring out how to move people easily in such tight quarters was the biggest challenge, says Masi. "The owner was emphatic that staff and guests should not use the same pathways." The team's solution arcs the stair around a slender row of booths that discreetly divides the restaurant into guest and service zones. Patrons use the southern side of the room and stair; waiters are on the north, where they can move unimpeded from the bar, up to the mezzanine for dinner service or parties, and down to the basement kitchen.

Natural oak walls and furnishings—in contrasting smooth and rough textures—provide a warm, hospitable foil for the assertiveness of the black steel and the repeated diamond motif, which recurs at varied scales throughout the restaurant on perforated mesh walls, large black-granite floor slabs, restroom mirrors, and even an umbrella stand. And, while no one would describe Asset as homey, it is imbued with the kind of thoughtful custom details, materiality, and spatial versatility found in many of the firm's residences. Ultimately, says Masi, "our homes are about creating memories and entertaining. There are definite parallels in that." ■

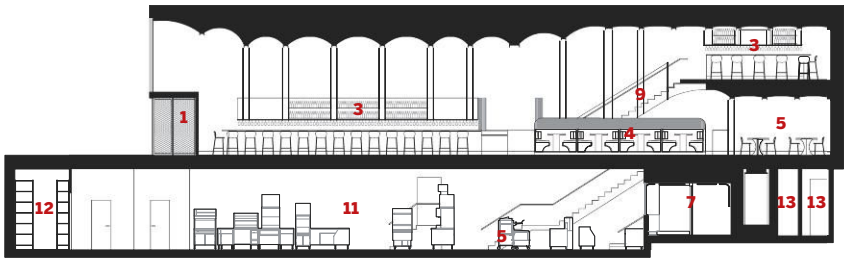
1 ENTRANCE
2 HOST STAND
3 BAR
4 DINING
5 PRIVATE DINING
6 WINE RACK
7 RESTROOM
8 STAIR
9 SERVICE STAIR
10 DJ BOOTH
11 KITCHEN
12 WALK-IN
13 MECHANICAL



MEZZANINE-FLOOR PLAN



GROUND-FLOOR PLAN



SECTION A - A

0 12 FT.
4 M.

Credits

ARCHITECT: Bates Masi + Architects — Paul Masi, principal; Xiao Lin, Nick Braaksma, project architects

ARCHITECT OF RECORD: SRAA+E

ENGINEER: CRAFT Engineering Studio (structural)

GENERAL CONTRACTOR: MTC Construction

CONSULTANT: Radiance Lighting (lighting design)

CLIENT: 329 Hospitality Group

SIZE: 3,450 square feet

COST: withheld

COMPLETION DATE: September 2019

Sources

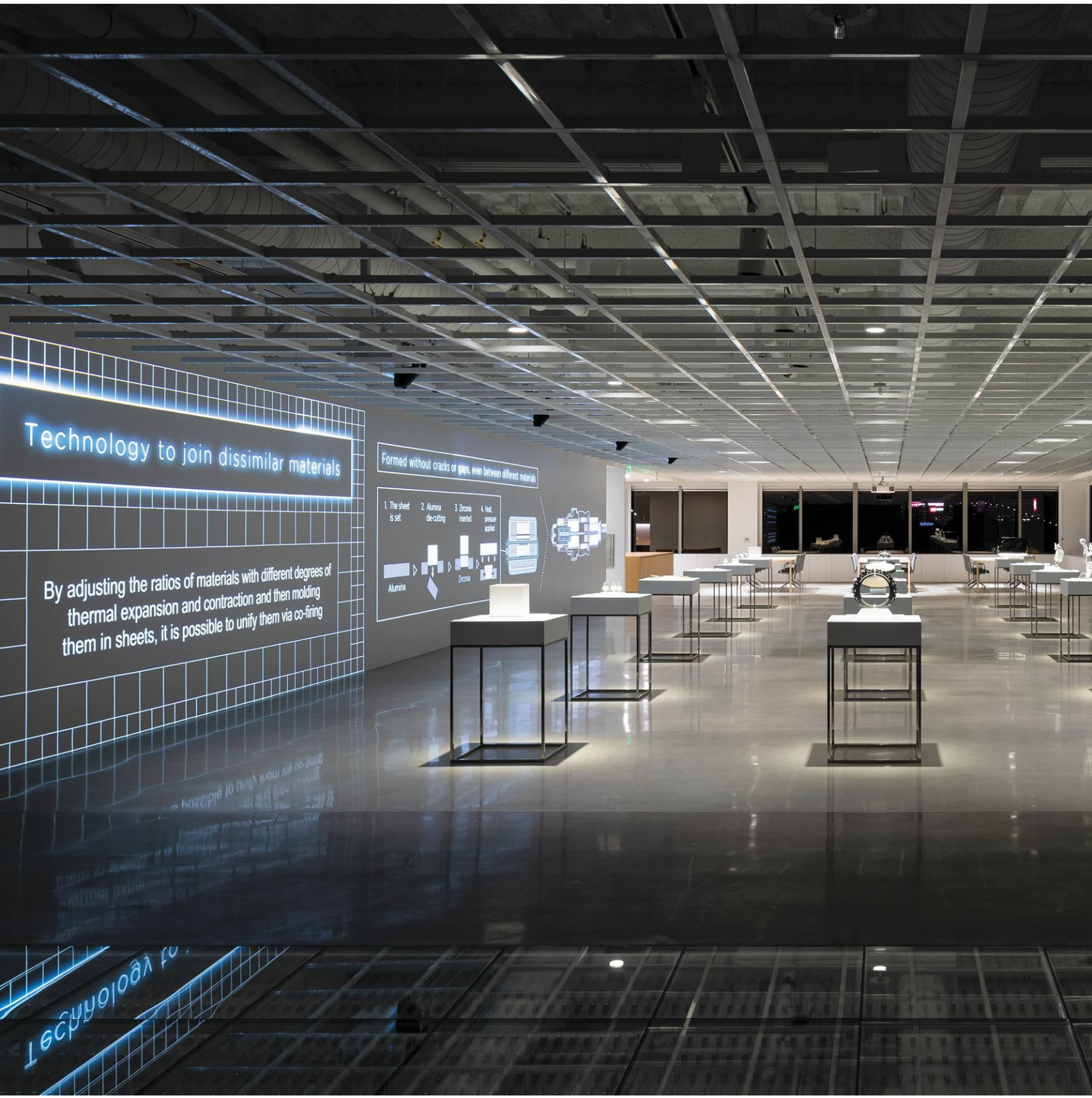
DEMOUNTABLE PARTITIONS: Cascade Coil (Mesh Curtains)

FLOORING: Cold Spring (Black Granite)

SEATING: Gestalt New York (stools); United Fabrics (upholstery)

LIGHTING: Zaniboni (architectural); Lutron (controls)

PLUMBING FITTINGS: Watermark


Technology to join dissimilar materials
By adjusting the ratios of materials with different degrees of thermal expansion and contraction and then molding them in sheets, it is possible to unify them via co-firing
Formed without cracks or gaps, even between different materials
1. The sheet is set
2. Alumina die-cutting
3. Zirconia inserted
4. Heat, pressure applied
Alumina
Zirconia

ALIGNED with a suspended metal grid, applications of the the company's ceramic technology are displayed in the gallery, enhanced by augmented reality content that can also be projected onto the room's west wall.

Paradigm Shift

Co-designed by two young Japanese firms, the NGK Spark Plug Venture Lab in Silicon Valley shapes the dynamic vision of a leading auto-parts maker.

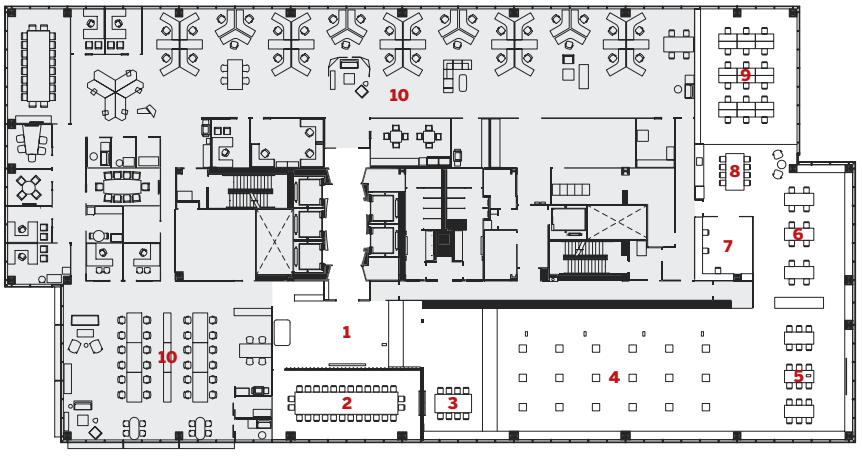
BY NAOMI R. POLLOCK, FAIA
PHOTOGRAPHY BY ANNA NAGAI

AN INCUBATOR of fresh ideas, Venture Lab Silicon Valley (VLSV) links start-ups in the United States with a high-tech ceramics producer in Japan. Founded in 1936, the innovative facility's parent company, the Nagoya-based NGK Spark Plug Co., is a leading manufacturer of vehicular spark plugs utilizing ceramic material. But when the arrival of electric cars signaled a slowdown in spark plug use, NGK began retooling their ceramics products for medicine, energy, and other industries. Keen to explore business opportunities with cutting-edge entrepreneurs, NGK hired Hakuhodo, an advertising agency, who, together with its production arm Hakuhodo Product's, organized a team to create a brand experience for the company through spatial design. They recommended two Tokyo firms, Katagiri Architecture+Design and Kakizoe Architects, to help develop the concept and design for headquarters of its new subsidiary in Tokyo and Silicon Valley.

VLSV occupies an 8,600-square-foot space on the fourth floor of a 12-story office building in Santa Clara, California, where parent company NGK Spark Plug has offices. The project's L-shaped plan is loosely divided into a linear sequence of function zones. Moving from presentation to work sections, it starts with a reception lobby that opens onto the "Ice Break" area, where visitors meet VLSV staff before moving to the Exhibition Space. This gallery leads to the Collaboration Lounge, followed by a meeting space, mini-kitchen, glass-enclosed workshop, and workstations for visiting collaborators. A large conference room is tucked behind the Ice Break and lobby.

While the exhibits familiarize visitors with the company's capabilities, the work areas enable the development of joint projects from idea to prototype. This functional division is underscored by the architectural interventions. The design team stripped out the existing partitions, 9-foot-high ceilings, and carpet tile. Next they overlaid the raw space with a grid, an organizational device inspired by an archeological surveying technique for precisely documenting objects in situ. Guided by this framework, the architects inserted minimal elements that would not detract from the presentation of the client's technology.

Comprising 2-foot by 2-foot frames, the white-metal grid hovers above the Ice Break, Exhibition Space, and Collaboration Lounge that occupy the project's east-facing wing. This open framework reveals the mechanicals. It also allowed the architects to arrange lighting and projection equipment above the space while giving it a sense of height. Reflected in the polished concrete floor, the grid's geometry is implicit in the alignment of the gallery's 18 2-foot-square solid-surface and



FLOOR PLAN

1 RECEPTION/LOBBY
2 CONFERENCE ROOM
3 "ICE BREAK" MEETING AREA
4 EXHIBITION SPACE
5 COLLABORATION LOUNGE
6 MEETING SPACE
7 WORKSHOP
8 CAFÉ
9 SHARED OFFICE
10 NGK SPARK PLUG CO. OFFICE

mirror-finished steel display tables. These showcase various applications of the client's diverse ceramic products and incorporate augmented reality (AR) 3-D content that enables visitors to visualize NGK Spark Plug's technologies at a microscopic level. The architects then inserted a second grid beneath the Ice Break meeting area. Supporting a triple-glazed raised floor above a 10-inch deep cavity, its matrix frames 10,000 spark plugs encased below it and illuminated by discreet LEDs—a polite bow to the company's legacy.

Ringed with windows and views of the greenery outside, VLSV is filled with daylight. But the presence of nature can be masked by blackout blinds when the displays and lighting system are activated. In the Exhibition Space, low-intensity luminaires with wide cones provide ambient lighting, while high-intensity spotlights with narrow cones are positioned above each display. A custom-programmed audiovisual master control system manages the lighting, projectors, and AR content with a tablet, enabling staff to adjust the atmosphere and highlight exhibits relevant to individual visitors. This sophisticated system also enables the display of the AR 3-D content—as

well as screenings of virtual factory visits—on the room's 56-foot-wide projection wall, a way to showcase for visitors the NGK Spark Plug's ability to mass-produce high-quality products.

Like traditional Japanese devices writ large, screens are also used as space dividers. In the lobby, a folded 36-foot-wide checkerboard-like expanse forms the backdrop for VLSV's backlit logo. Filtering sunlight from the windows beyond into the interior space, this semitransparent surface is made of 182 clear-resin rectangles containing gradations of pebbles that symbolize the earth's strata. "It's a visual representation of where ceramic material comes from," explains architect Masaki Kakizoe. Fixed but frameless, the ⅜-inch-thick panels are secured with metal clips and cables. Abutting this partition, a wall that doubles as another viewing surface for videos slides aside like a movable fusuma panel to dramatically reveal the exhibits beyond. By contrast, basic glass partitions and placement of furnishings (mainly ready-made) loosely separate work areas.

Having an ocean between studio and jobsite is never easy. But working remotely comes naturally to Katagiri and Kakizoe, who collaborated closely as project architects on Kengo Kuma's V&A Dundee, in Scotland, before launching their respective Tokyo practices. "What can be done in different countries is an interesting challenge for us," says Kakizoe. In addition to sparking their creativity in Santa Clara, this outlook is a jump-start on the COVID-induced, Zoom-fueled practice style being required of architects globally. ■

Credits

ARCHITECTS: Katagiri Architecture+Design — Kazuya Katagiri, design architect. Kakizoe Architects — Masaki Kakizoe, design architect

CREATIVE DIRECTION: Hakuhodo Product's — Takusei Kajitani, creative producer

ENGINEERS: LPA (structural/lighting design/architect of record); GT Jordan (electrical); AGC Mechanical Process & Piping Contractors (mechanical); Pappa Piping (plumbing)

GENERAL CONTRACTOR: Core Group

CONSULTANTS: Hakuhodo (project management); Sugio Lighting Office (lighting); Ray Corporation, Wow (visual/AR); BENA (exhibit production); Token Graphics (graphics)

CLIENT: NGK Spark Plug

SIZE: 8,600 square feet

COST: withheld

COMPLETION DATE: July 2019

Sources

FEATURE SCREEN: 3Form

CEILING: Armstrong (grid and acoustical)

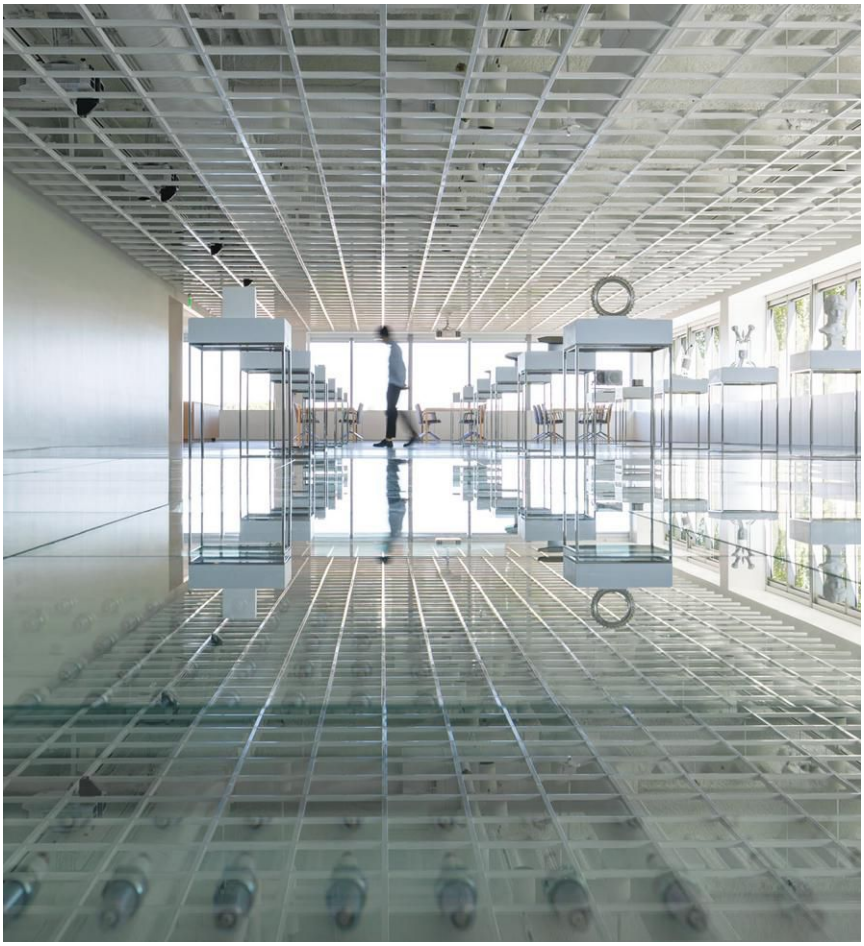
CONTROLS: Wattstopper

LIGHTING: Optic Arts; USAI; Selux

RAISED FLOOR: Tate Access Floors

DOORS: Dorma (sliding); Crown Industrial

PAINT: Sherwin-Williams



INTERSPERSED with openings, the 8-inch by 16-inch resin panels that make up the lobby screen (opposite) enable sunlight to activate the room. In the "Ice Break" meeting area (top), a custom table stands on a raised glass floor. While spark plugs are visible below, the gallery exhibits (above) fan out in front.

A PLYWOOD coffered ceiling runs throughout the restaurant. The edges are painted black to lend some abiguity to the material, say the architects. A plywood screen next to the granite front counter (opposite) conceals a secondary dining area with booths.

Knock Wood

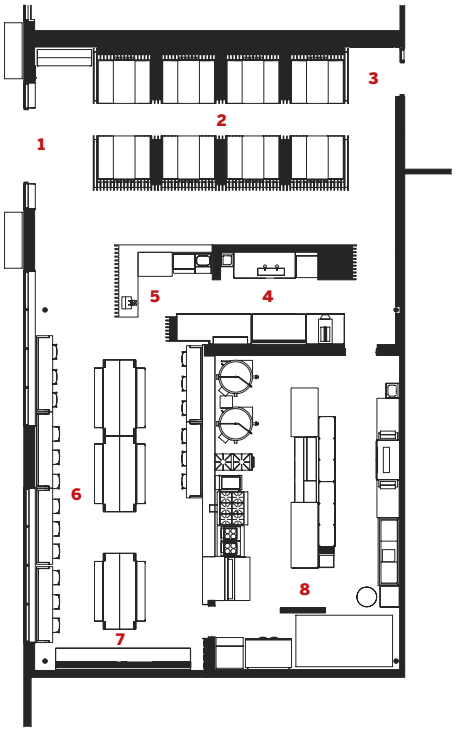
Marlon Blackwell Architects' Bentonville, Arkansas restaurant uses a plain-spoken design language to put a new spin on the ramen bar.

BY BETH BROOME
PHOTOGRAPHY BY TIMOTHY HURSLEY

THERE IS a certain irony to the fact that a former meat processing plant in Bentonville, Arkansas, which for years churned out frozen chicken cordon bleu, is now home to the 8th Street Market, a food emporium selling such au courant offerings as fromage blanc and acai smoothies. It is also a sign of the times, since Bentonville's most famous native—Walmart—has, over the years, caused the northwest-Arkansas enclave to balloon from small town to global business hub, bringing with it a wave of young professionals.

The 8th Street Market is part of downtown Bentonville's Market District, a former industrial area that has as its focal point the brand-new Momentary contemporary arts center—a satellite of the Crystal Bridges Museum of American Art—which has made its home in a decommissioned Kraft-cheese factory. At the heart of the 75,000-square-foot Market building (whose core and shell were adapted by Hufft, out of Kansas City) is Brightwater—a food-study center affiliated with Northwest Arkansas Community College and backed by the Walton Family Foundation, the nonprofit led by the founders of the big-box retailer. The perimeter houses about a dozen rental spaces dedicated to local entrepreneurial ventures, from a brewery to a chocolatier, that highlight regional food systems. (At press time, 8th Street Market concerns were operating at a reduced capacity due to COVID-19.)

The Market's most recent addition, an "Ozark ramen house" called CO-OP, is a carefully crafted interior designed by Marlon Blackwell Architects (MBA) that aims to cater to Bentonville's recently transplanted millennials, as well as locals, without straying too far from the area's roots. "We wanted this project to feel it was of the region, the neighborhood, the building," says Rob Apple,



FLOOR PLAN

0 10 FT.
3 M.

1 MAIN ENTRY
2 THE CAVE
3 SECONDARY ENTRY
4 BAR SERVICE
5 POINT OF SALE
6 MAIN DINING AREA
7 GREEN WALL
8 KITCHEN

former CEO of Ropeswing Hospitality Group, which he founded with Tom Walton. CO-OP's localized strategy is reflected in the plain-spoken menu, which offers an Arkansas take on ramen, riffing on the traditional Asian comfort food by incorporating such Southern fare as fried chicken. MBA's design approach for the 1,700-square-foot interior takes a similar tack. Referring to the Japanese principle of *wabi-sabi*, which is based on the acceptance of imperfection, the architects drew on a limited list of basic ingredients—plywood and concrete masonry units—to build a refined interior that still reflects the rough-and-ready spirit of place. "We wanted high design with a low finish," says Apple.

Approaching the raw interior, the design team, led by Meryati Blackwell (a principal at MBA, and Marlon's wife), divided the space into two main zones. Building on the idea of a "dining cave," the architects created, directly off the entry, a compressed space, double-loaded with two rows of four booths each. "I wanted it to be comfortable, but also tight," says Meryati, pointing to an intimacy through proximity in contrast to the suburban preference for grossly scaled, empty-feeling restaurants. Diners can peer through a plywood screen into the expansion of the main dining area, with its high ceiling, big community table, and green wall. Bar seating lines the 12-foot-high storefront windows along the area's perimeter wall; it also runs alongside the kitchen, visible through a long aperture and separated from the dining area by an expanse of unfinished CMUs installed in a sawtooth pattern.

Meryati had the initial impulse to do something special with the ceiling, as a continuous element that visually connects the restaurant's distinct spaces. "I said, 'Let's start with a grid of boxes,'" explains the architect. Marlon likens the move to the Moore Honeyhouse, one of his early projects incorporating a structural-steel-plate-gridded facade that is used to store jars of honey, extracted from the adjacent hives. "We took the honey out, turned the grid upside down, and said, 'This is the ceiling.'" The pair then asked, "What kind of material do these boxes want to be made of? What will create a big impact in this small space? And what can we buy at Lowe's?" Brainstorming together, the architects found the answer to their questions in plywood. Wood is something Arkansas is known for, and it would be "precise but warm," says Meryati. The team showcased plywood's three-dimensional capabilities by connecting planes of the material to fashion origami-like ceiling coffers (with black-

A CUSTOM white oak community table dominates the main dining area (above), whose storefront windows are shaded with a steel-bead curtain. Raw CMUs installed in a sawtooth pattern define the open kitchen. The Cave (opposite) contains eight intimate booths "carved" out of plywood.

painted edges), which have the added benefit of providing sound absorption, as well as forming baffles for the lighting—basic low-Kelvin dimmable LED bulbs tucked between the fins. Further extending the conceit, the team put the plywood to work elsewhere. The Cave is a clever composition made almost entirely of the material: imagine a volume composed of an array of flat planes the thickness of a single sheet of plywood laid parallel to one another, separated by 3-inch gaps. The architects then "carved" into this composition to create the voids of the booths and the passage between them. The overall effect of the material use is a cohesion within the restaurant that achieves the desired tailored but down-home informality.

As the Fayetteville-based MBA takes on bigger commissions of greater prominence, the firm sees diminutive, scrappy projects like CO-OP as an opportunity to reconnect with their own roots designing small-scale work. "And," the pair says, "projects like this reaffirm the ethos that everything deserves architecture." ■

Credits

ARCHITECT: Marlon Blackwell Architects — Meryati Blackwell, Marlon Blackwell, Stephen Reyenga, William Burks, Callie Kesel, Steven Kesel

ENGINEERS: Gore 227 (structural); HP Engineering (m/e/p)

CONSULTANTS: Taylor & Miller (lighting); Daniel Butko (acoustic)

GENERAL CONTRACTOR: Heart & Soule Builders

CLIENT: Ropeswing Hospitality Group

SIZE: 1,700 square feet

COST: withheld

COMPLETION DATE: December 2019

Sources

CUSTOM COFFERS & BOOTHS: Up & Down Industries

PAINTS & STAINS: Sherwin-Williams

PLASTIC LAMINATE: Formica

LIVING WALL: Wall Flower Farm

LIGHTING: Red Dot, Nora, diode led, Sunlite

LIGHTING CONTROLS: Lutron

FURNISHINGS: C by M Creative, Philippe Starck

UPHOLSTERY: Camira

Twist on Tradition

Neri&Hu employs a city's humble milieu to create a modern oasis for Taipei's Kimpton Da An Hotel.

BY ARIC CHEN
PHOTOGRAPHY BY PEDRO PEGENAUTE

WHEN Lyndon Neri and Rossana Hu of Shanghai-based Neri&Hu Design and Research Office were commissioned to design a hotel in Taipei, they were presented with something between an adaptive-reuse project and a blank slate.

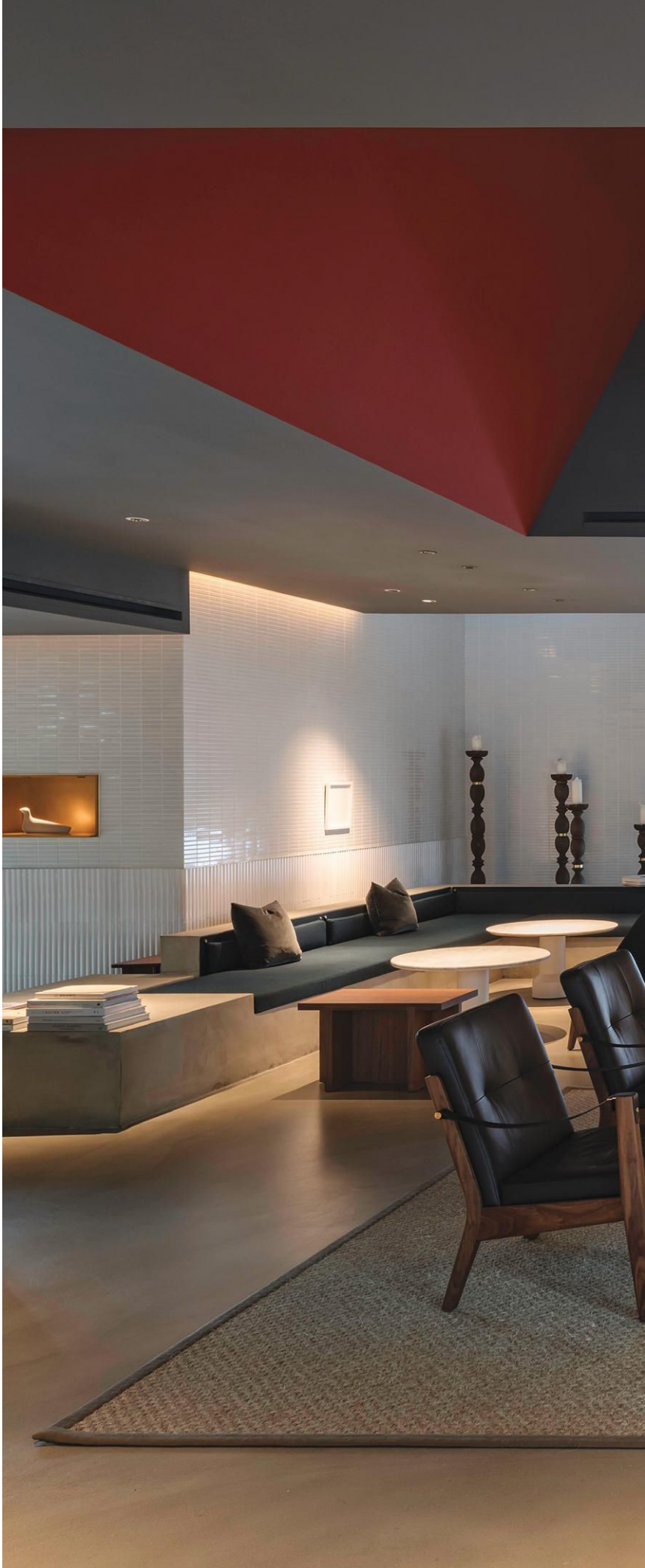
The 15-story tower they had been given to work with, in the upscale Da'an district of the Taiwanese capital, had been newly designed and built for high-end apartments. But the developer's 11th-hour decision to make it a hotel instead left it mostly an empty shell, save for a few flourishes, like a traditional Chinese-style garden (nice enough to keep), black-granite neoclassical facades (too late to change), and two Corinthian columns in a marble-clad lobby (which had to go).

And with no brand to design for—the U.S.-based Kimpton group wasn't tapped to run the property until just months before its pre-coronavirus, 2019 opening—Neri&Hu had latitude, early on, to "look at issues beyond hotel issues," Neri says, "and explore urban and cultural ones too."

Known for their hospitality projects—and, increasingly, art museums, chapels, and institutional projects—Neri&Hu has a knack for creating architectonic spaces of extreme precision and discipline while infusing them with a sensitivity for materials and local context, to add a warmer, narrative touch. Their vocabulary is rigorous and tactile but also versatile, and, at the Kimpton Da An, they sought to create a proverbial hotel as "inner sanctuary" that made the most of a tight footprint while taking cues from the streets and spatial strategies of the dense city outside.

Past the Chinese garden, which is to the side of the hotel, one enters the lobby. With its Corinthian columns and marble removed, what remained was a double-height space that was being eaten away by a hotel's additional mechanical and utility requirements. Faced with the developer's plan to drop the ceiling and add a mezzanine, the architects instead carved out a sculptural volume in order to preserve the interior's height and natural illumination. "We needed the mechanical, so we carved around it," Neri says. "What was left over became the skylight," with its trapezoidal sides painted in contrasting dark gray and light-softening red.

The resulting variation in ceiling heights helped organize seating groups on the new polished concrete floors below. A reflecting pool was



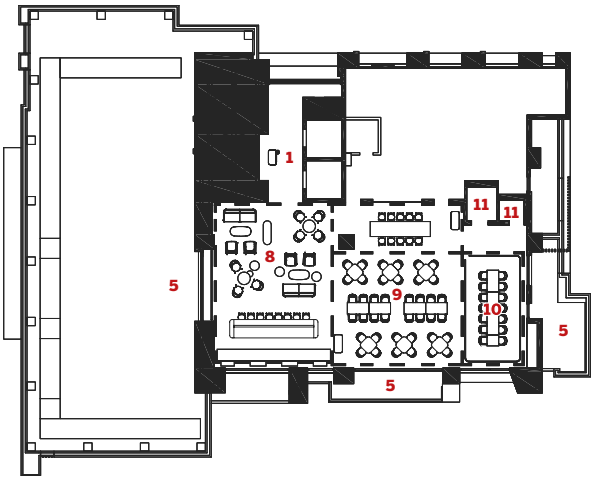
SCULPTURAL volumes in the lobby were carved around the mechanical equipment above the ceiling (right). The architects also made use of typical Taipei materials like white ceramic tile and off-the-shelf industrial brass tubing to enliven this space, and the entire hotel, with local color.

THE LOBBY lounge sits under a double-height volume and opens to the garden (left). Framed with efficient oak casework, most guest rooms (all, opposite) are entered through tiled, compartmentalized bathrooms.

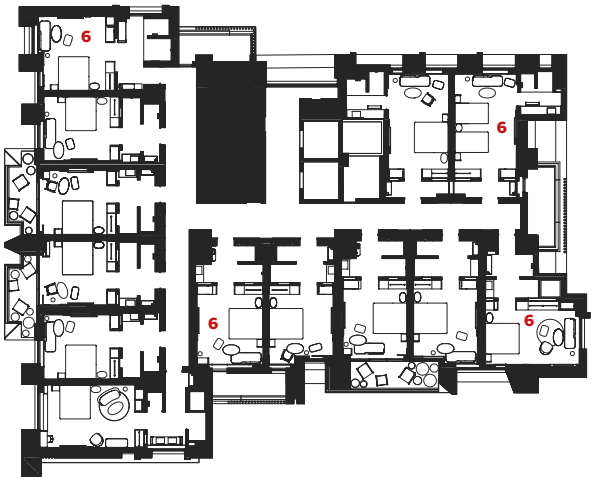
installed along an existing ground-level window to refract rippling light into the interior, while new openings were cut to bring in additional daylight and provide views outside.

But perhaps the most unsung feature of the lobby—which "was getting a bit monastic," Hu admits—is its white ceramic tiles. Recalling the "bathroom tile" cladding that was once the default exterior facing for buildings in Taiwan's humid subtropical climate, the architects took the now largely maligned material and, as Neri says, "we put it everywhere"—on the lobby walls, along corridors, in the guest rooms.

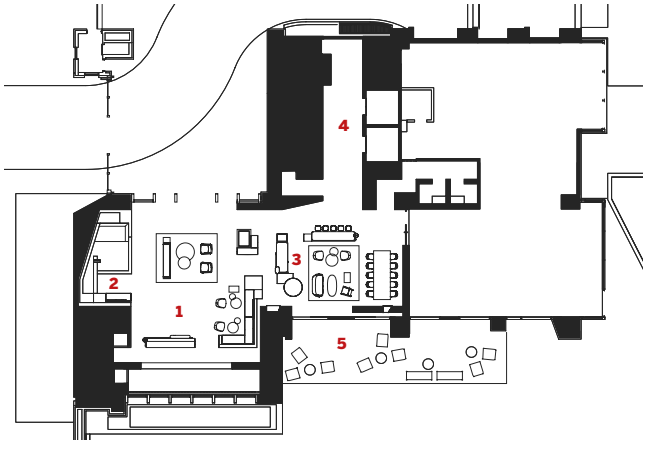
Alongside metal grilles and mesh—a nod to the profusion of screens and window grates that often abut those ubiquitous tiles in Taipei—the



BAR/RESTAURANT-FLOOR PLAN



TYPICAL GUESTROOM-FLOOR PLAN

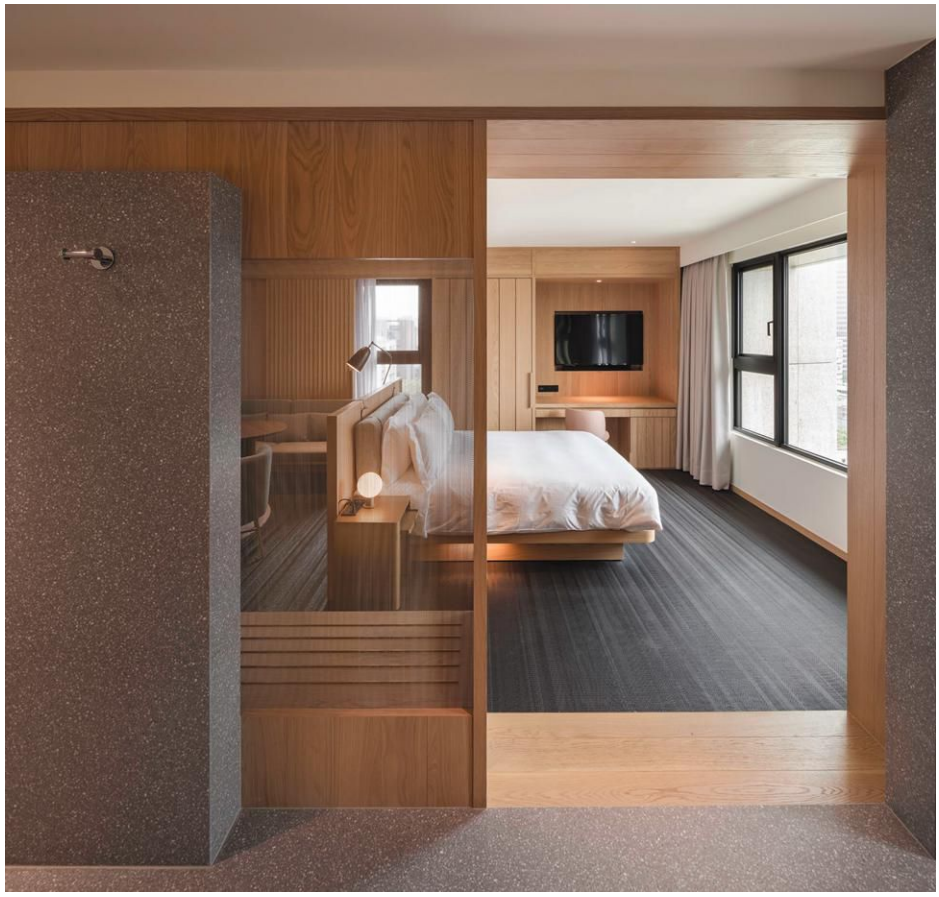


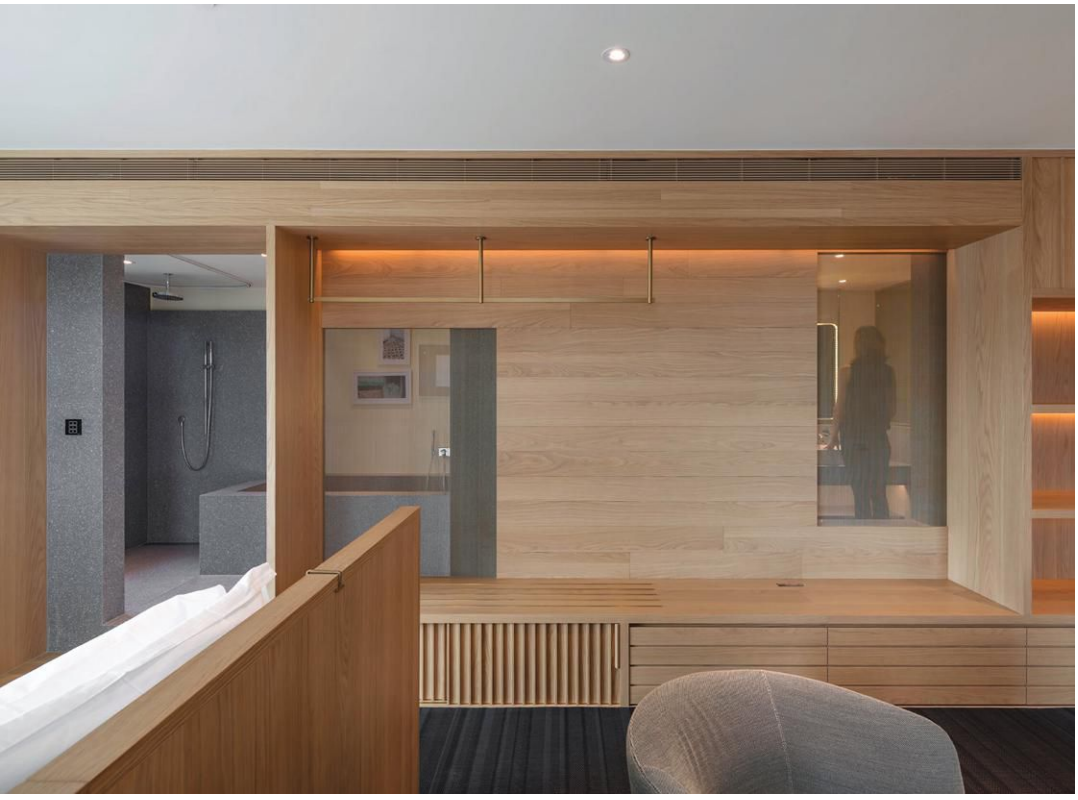
LOBBY-FLOOR PLAN

0 15 FT.
5 M.

1 RECEPTION
2 WATER FEATURE
3 LOBBY LOUNGE
4 ELEVATOR LOBBY
5 TERRACE
6 GUEST ROOM
7 SUITE
8 BAR & LOUNGE
9 DINING ROOM
10 PRIVATE DINING ROOM
11 RESTROOM

TYPICAL SUITES-FLOOR PLAN





AN OAK storage wall in one suite is pierced by screens to provide "voyeuristic" views into the bathroom (left, top and bottom). A raised partition separates the bar and lounge from the hotel's emerald-green-tiled dining room (opposite, both).

ceramics could easily be thought of as a faddish quotation of the urban vernacular. But they also offered a chance to reappraise a readily available and inexpensive material for a project on a tight budget, using the skills of local workmen. "These guys are really good at working with this stuff," says Neri, referring to the tiles, but also to the terrazzo (another common material in Taipei) of the restaurant floors and suite bathtubs, and to the custom-designed lights, made from off-the-shelf industrial brass tubing, that hang above the lobby.

Moreover, the tiles helped prompt the architects to rethink room typologies. An unusual feature of the property's 129 guest rooms is that you enter them through their (tiled) bathrooms—a space-saving move that also recalls the bathrooms in older Taiwanese buildings, where there's often no barrier between tubs, showers, and other functions. "Growing up, the entire bathroom was a wet room," says Hu, who was born and partly raised in Taiwan. (In this case, however, the guest rooms' separate toilet and shower are enclosed by a sliding door.)

To further make the rooms as efficient as possible, the architects devised seven compact room and suite configurations with "voyeuristic openings to the bathrooms, where we borrow light from the bedroom," Neri says. Oak millwork fits out the latter with yacht-like precision, including folding screens that bring interior consistency to a hodgepodge of window openings (a result of the building's original residential purpose). Even the custom furniture was made 15 percent smaller than standard sizes to maintain comfortable proportions.

The space-maximizing tricks extended to the 12th-floor restaurant, where the restaurateurs' request for a range of different rooms in a tight 2,150-square-foot floorplate was satisfied by areas covered in tiles or wallpapers of different colors and patterns, and divided by partitions mounted on footers. In Taiwan—which has so far avoided the lockdowns implemented elsewhere due to its success in controlling the coronavirus pandemic—"we always find this blurring of space, like restaurants where you line up or sit and eat, and everything bleeds into the sidewalk," says Neri. "This project was about negotiating thresholds." ■

Credits

ARCHITECT: Neri&Hu Design and Research Office — Lyndon Neri, Rosanna Hu, principals in charge; Laurent Tek, Brian Lo, associate directors; Akrawit Yanpaisan, Chloe Chiu, Federico Salmaso, James Beadnall, Chao Ji, Lara de Pedro, Junho Jeon, design team

ARCHITECT OF RECORD: Mo Architects and Planners

GENERAL CONTRACTOR: Rich Honour Design Group

CONSULTANTS: Yuchen Design (m/e/p); Originator (lighting design)

CLIENT: IHG Hotels & Resorts

SIZE: 86,000 square feet

COST: withheld

COMPLETION DATE: March 2019

Sources

PLUMBING FIXTURES & FITTINGS: Duravit; TOTO; Zucchetti

LIGHTING: Parachina; Artemide; Neri&Hu (custom)

FURNITURE: De La Espada; E15; Hay; Stellarworks; TON; Neri&Hu (custom)

TEXTILES: Kvadrat

Curtain Call

Gensler devises a luminous and fluid veil to make a vibrant new lobby for One Embarcadero Center in San Franciso.

BY JOANN GONCHAR, FAIA
PHOTOGRAPHY BY JOE FLETCHER

JOHN PORTMAN is known for the mixed-use complexes that transformed the downtowns of several American cities in the second half of the last century. The architect, who died in 2017 at the age of 93, had a peculiar brand of inward-looking urbanism that combined office space, retail, and hotels (often with thrilling atria) in interconnected, multi-building developments. The most famous such "city in a city" project is Peachtree Center in Atlanta, where his practice was based. In San Francisco, during the 1970s and '80s, he completed Embarcadero Center, a Brutalist ensemble in the city's financial district—initially developed by Trammell Crow and David Rockefeller—that grew to encompass nearly 10 acres, comprising five office towers and two hotels, on top of a shopping mall.

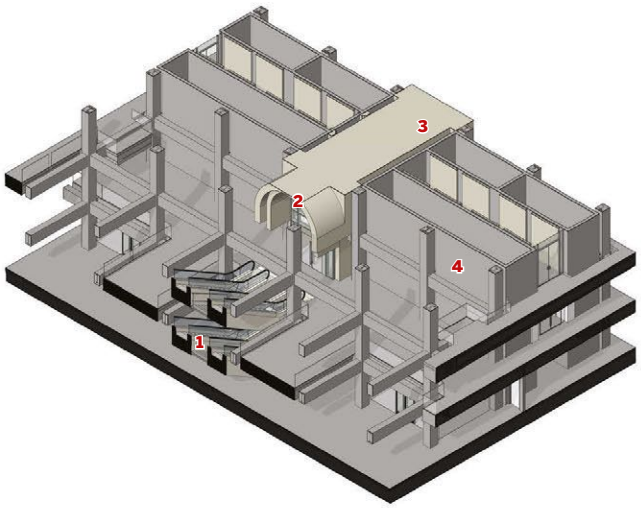
A consequence of Portman's insular approach is a sometimes confusing and uninviting entry sequence for the individual buildings that make up his developments. Such was the case for One Embarcadero Center, completed in 1971, and the first tower built at the complex. The 45-story office building had a minimal-size lobby, with just enough space carved out of its central core to provide elevator access. The entrance was almost hidden, raised off the street on the second level of the three-story retail podium it sits on. There was no waiting area for visitors and little security, with no control of who entered the building.

These problems have been remedied with a revamp by Gensler for Boston Properties, the owner of the complex's four primary towers. (Gensler-designed renovations of the real-estate firm's other three Embarcadero Center buildings are currently under way.)

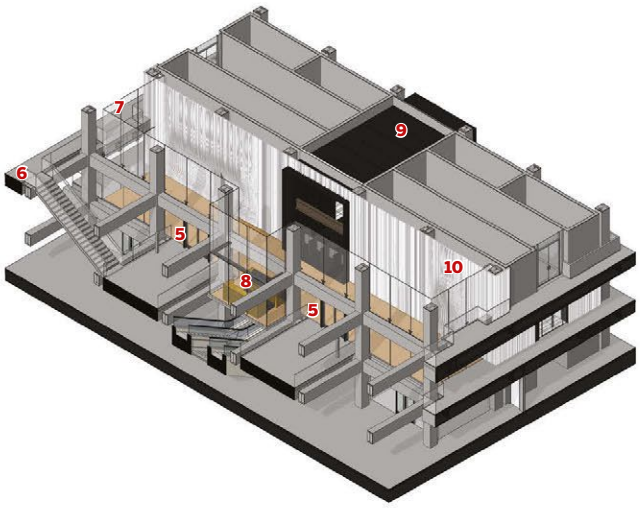
For the recently completed project, Gensler first stripped away extraneous elements added in a 1990s renovation by Portman's own office, including an imposing barrel vault that had "Postmoderned up"—and further cluttered—a space already congested with a "forest of concrete columns and beams," says Doug Zucker, Gensler's principal in charge of the project. Zucker and his colleagues next created a capacious waiting and reception area by claiming additional real estate in front of the core, within the retail podium. They defined the new 25-foot-deep and 96-foot-long space with a pristine, mullionless glass curtain wall. They also made the lobby easier to find for first-time visitors by removing escalators that had connected the second and third retail levels but obscured the entry, replacing them with a stair off to one side.

These moves are both clever and practical, but what makes the project stand out is Gensler's strategy for camouflaging the building's core. The design team enveloped it in a veil of glass fiber reinforced concrete (GFRC) "ribbons" that extend 23 feet from the floor to the ceiling. They bend and curve to create the impression of a curtain, and near the bottom

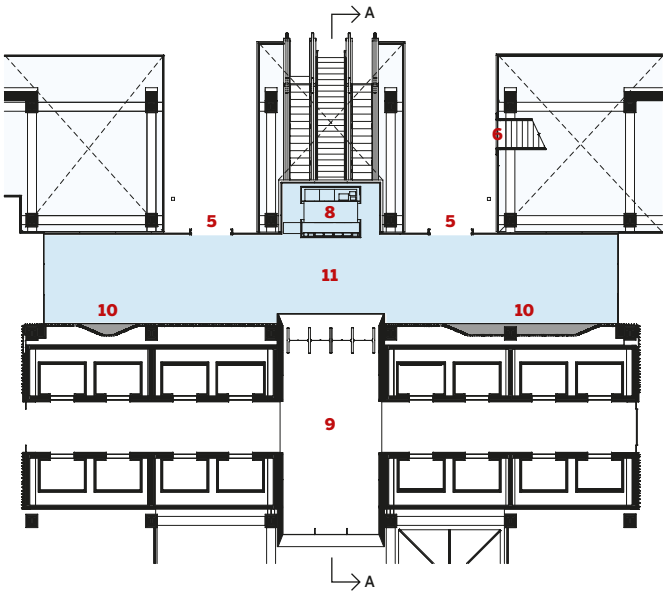
A GENEROUS LOBBY was created by claiming real estate from the surrounding podium and enclosing it within a glass curtain wall (opposite). The growth rings in the new end-grain wood-block floor echo the circular pattern of the tiles found throughout Embarcadero Center (above).



EXISTING LOBBY — AXONOMETRIC



NEW LOBBY — AXONOMETRIC



NEW LOBBY — PLAN

0 10 FT. 3 M.

1 EXISTING ESCALATOR AND STAIR
2 EXISTING ENTRY
3 EXISTING LOBBY
4 EXISTING CORE WALL
5 NEW ENTRY
6 NEW STAIR
7 NEW CURTAIN WALL
8 NEW RECEPTION DESK
9 NEW SECURE AREA
10 NEW GFRC VEIL
11 NEW LOBBY

NEW LOBBY
OPEN TO BELOW

NEW LOBBY — SECTION A - A

0 10 FT. 3 M.

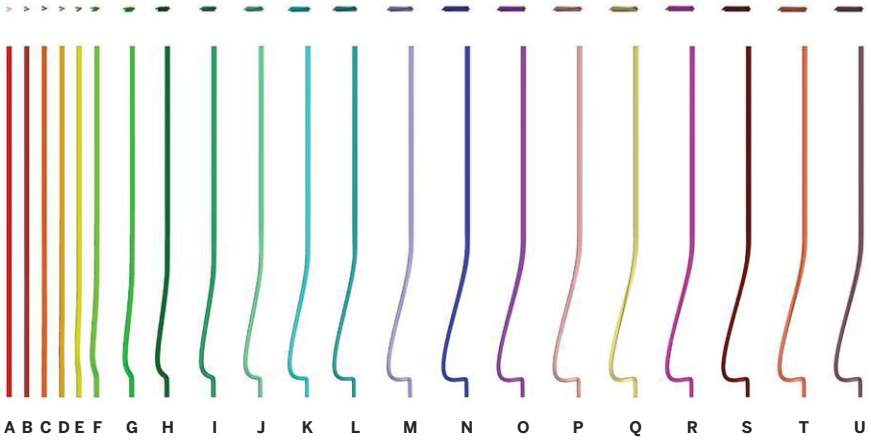
transform into benches. The elements, V-shaped in plan, with a 1½-inch-diameter steel pipe concealed inside for reinforcement, are spaced about 1 inch apart, screening the core beyond but providing glimpses of it between the narrow gaps. In some places the existing columns surrounding the core protrude from the sinuous veil, revealing the shared qualities of the ribbons and the original concrete. "The GFRC has crispness and warmth, and you can see the aggregate," says Batya Keshet, Gensler design director. "It felt right for this building."

Although each of 230 ribbons appears unique, there are only about 20 distinct types. The shapes were developed with various computational tools and studied in virtual reality and with full-scale mockups. The architects and the local fabricator, Concreteworks, passed the digital files back and forth for refinement before molds were CNC-milled from rigid foam and then cast in GFRC.

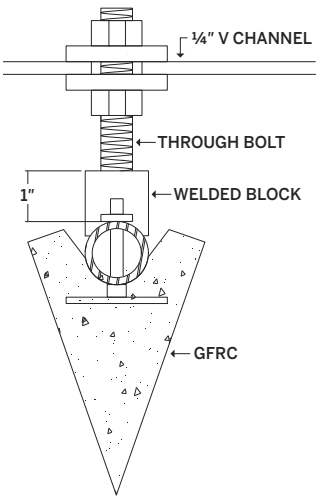
The ribbons are, of course, solid and immovable, but the lighting scheme dematerializes them, helping them to appear soft and fluid. In addition to illumination from behind, lights concealed in a cove at the ceiling's edge and spots inserted in a slot running down its center wash the ribbons from above, making the installation glow.

In juxtaposition to the delicate and undulant GFRC, the architects have created a muscular 19-foot-high steel portal to mark the access from the lobby to the elevator bank. The secure zone beyond—newly protected by turnstiles—has walls clad in black acid-etched glass. The darkness of the walls in this 16-foot-wide, 37-foot-long space, which

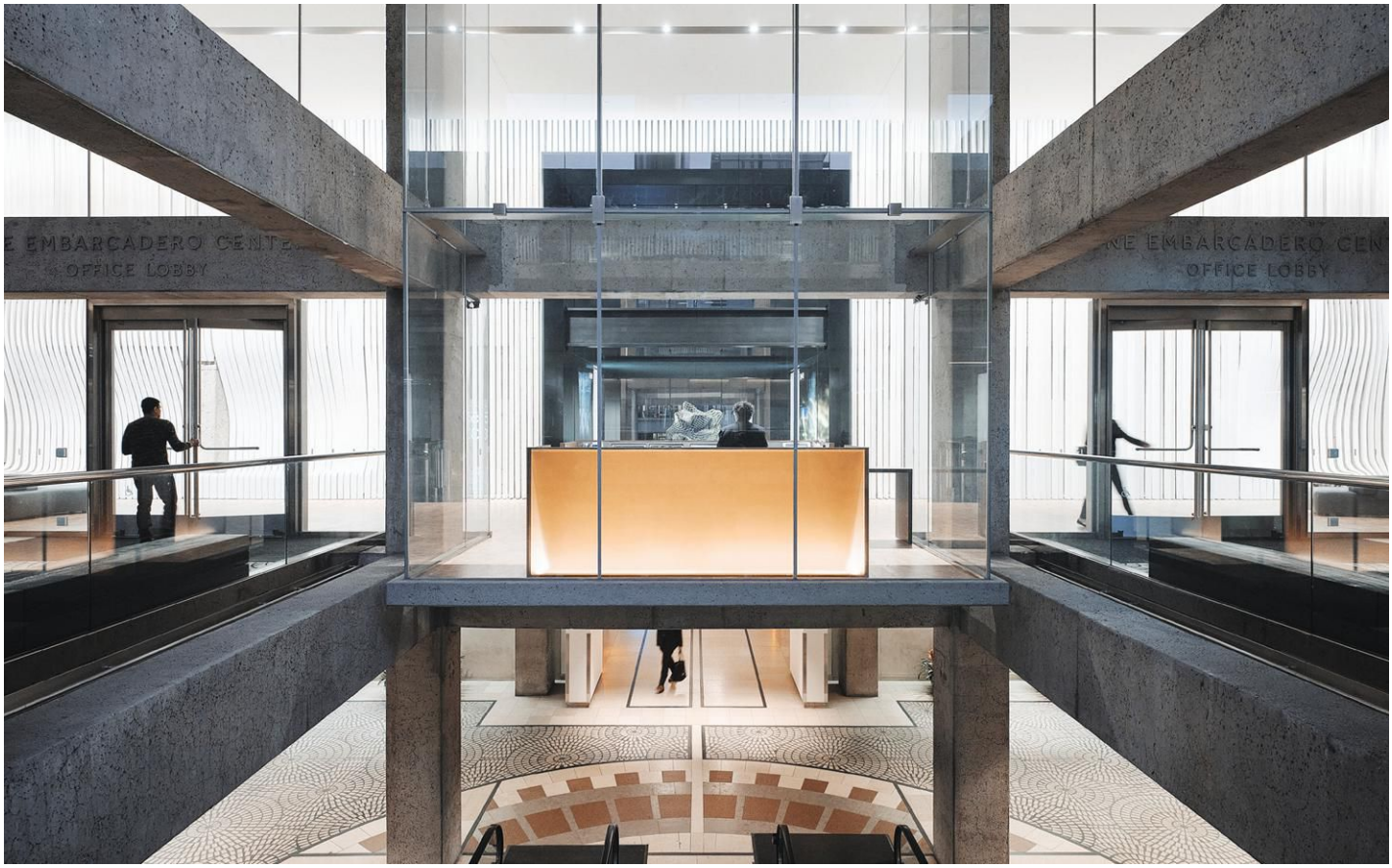
THE CURVACEOUS ribbons, triangular in plan (below, center and right) are spaced about 1 inch apart, allowing glimpses of the core and its columns and beams beyond (above). Though each of the 230 undulant elements appears unique, there are only about 20 distinct shapes (below, left).



RIBBON SCHEDULE



RIBBON MID-BEAM CONNECTION



NOW THAT a set of escalators has been removed, the lobby is newly visible within the retail podium (above). Black glass-paneled walls and a black terrazzo floor (right) in the zone beyond the security turnstiles provide a contrast to the lightness and delicacy of the GFRC ribbons.

Zucker refers to as a "sleeve," focuses attention on its far end—now opened up with clear glazing that brings in daylight and provides previously obscured sight lines to the streetscape outside.

This new visibility, the combination of darkness and light, and the contrast of rippling and orthogonal, represents more than a skillful resolution of functional challenges. At One Embarcadero, Gensler has created an entry sequence that is lively and gracious. ■

Credits

ARCHITECT: Gensler — Doug Zucker, principal in charge; Craig Slavsky, design manager; Batya Keshet, design director; John Bender, senior project architect; Luda Hoe, project architect; Caroline Duncan, Peng Jin, designers; Alan Sinclair, graphic designer

CONSULTANTS: Glumac (m/e/p, security); Tipping (structure); Luma (lighting); RWDI (wind)

GENERAL CONTRACTOR: Hathaway Dinwiddie

CLIENT: Boston Properties

SIZE: 2,800 square feet

COST: withheld

COMPLETION DATE: May 2019

Sources

GFRC RIBBONS: Concreteworks

CURTAIN WALL: Novum

GLASS WALL PANELS: McGrory

ENDGRAIN FLOOR: Kaswell Flooring Systems

TERRAZZO FLOOR: Associated Terrazzo

STONE WALL AND FLOOR SLABS: Da Vinci Marble

LIGHTING: Edison Price

LIGHTING CONTROLS: Wattstopper

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THE WORLD'S first house built of structural cork, in Eton, England, comprises five linked volumes, each topped with a corbeled roof.

Planting the Future

Materials derived from nature—as an alternative to conventional building products—grow up.

By Katharine Logan

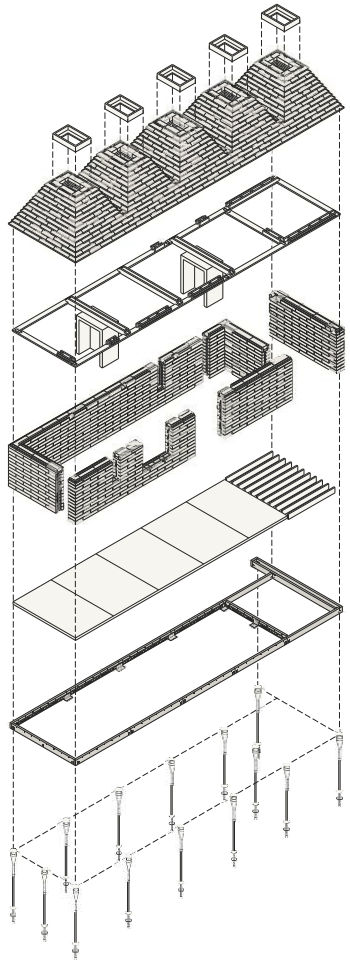
YOU MAY HAVE HEARD the saying "If it's not grown, it's mined." It's as true for construction materials as it is for anything. The challenge for architects as climate crisis accelerates is to shift the materials palette away from inputs that are extracted from the earth and toward the ones that regenerate.

While the supply of extracted material is finite, biogenic material is inherently—and in some cases rapidly—renewable. Because extracted substances require significant amounts of energy to get them out of the ground and turn them into such familiar forms as steel, concrete, and rigid-foam insulation, biogenic substances typically entail lower levels of energy to make into building products. What's more, the atmospheric carbon that plant-derived materials such as wood, cork, hemp, and straw sequester during their growth can even exceed the carbon emissions their processing generates, making them net carbon sinks.

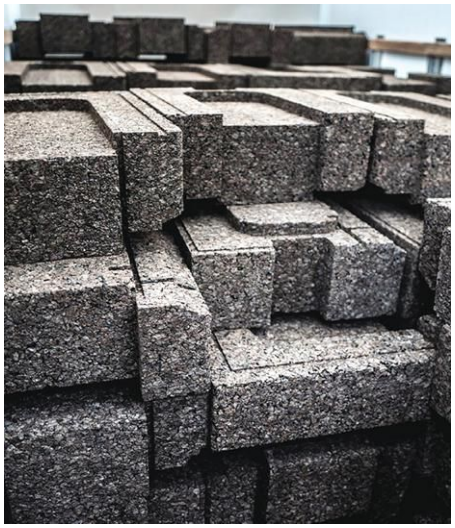
So on two major counts—renewability and embodied carbon—stuff that grows can play a vital role in the building sector's climate-crisis response. And, besides saving the world, architects exploring the use of innovative bio-based materials are finding that they have some significant implications for practice.

"Form follows life cycle," is how Matthew Barnett Howland, director of research and development with UK-based CSK Architects, sums up the design philosophy emerging from his pioneering work with cork blocks. Designing, building, operating, and maintaining—and, eventually, disassembling—a building for responsible reuse is a process that could extend over hundreds of years (longer if the time to generate the materials and to break them down again are counted in). "Are there legible connections that can be made between what a building is, as a time-based process, and how it looks and feels as architecture?"

That's the question to which Cork House, a RIBA Stirling Prize–shortlisted residence in Eton, west of London, responds. Howland



CORK HOUSE - EXPLODED AXONOMETRIC DIAGRAM



THE STRUCTURE, weather envelope, insulation, and interior finish (above) of the Cork House consist almost entirely of cork blocks (left) that are tongue-and-groove friction-fit together.

designed the project in collaboration with Dido Milne, also a director with CSK, and Oliver Wilton, director of technology at the Bartlett School of Architecture. The world's first structural-cork house, the 473-square-foot building consists of five linked volumes, each topped with a distinctive pyramid roof. Exemplifying "form follows life-cycle," the project didn't set out with a pyramid parti and then figure out how to execute it as sustainably as possible. Rather, the corbeled roof form "sort of designed itself," says Howland, from a series of matrices of rules-based decisions in relation to sourcing, fabrication, and even eventual disassembly.

The construction system consists of cork blocks made purely of heat-expanded and -bonded granules from the bark of the cork oak tree. The species, native to the Mediterranean region, and not to be confused with North America's endangered white or stave oak, can be removed without damaging the tree, and then regrows, so that a single tree can be harvested more than 15 times over its 200-year-plus lifespan. Ancillary structural elements, such as lintels and a ring beam to take lateral roof loads, are built in acetylated wood[1] (softwood that's been hardened in a process that essentially pickles it in a kind of vinegar). Cedar weatherboards clad sloped surfaces on the roof blocks to prevent water from seeping between the horizontal blocks' granules.

The blocks were developed by the design team in collaboration with researchers at the Bartlett, University of Bath, and cork-product manufacturers Armorim UK and Ty-Mawr. Deriving from the architects' longstanding dissatisfaction with the life-cycle complexity of contemporary building materials, the blocks provide all-in-one structure, weather envelope for vertical surfaces, insulation, and interior finish. They are site-assembled by hand, with a tongue-and-groove friction fit that requires neither fasteners nor glue, and are designed for disassembly and reuse at the end of the building's life.

Having socked away more atmospheric carbon than its construction entailed, the house was carbon negative at its completion in

PHOTOGRAPHY: © MAGNUS DENNIS (TOP); COURTESY CSK ARCHITECTS (BOTTOM)

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2019. Its whole-life emissions are estimated at an extraordinarily low 618 kilograms of carbon dioxide equivalent per square meter ($kgCO_2e/m2$). That figure includes 286 $kgCO_2e/m2$ in embodied carbon (because the standard used for the assessment doesn't account for carbon sequestration) and 332 $kgCO_2e/m2$ in operational carbon, based on the standard's assumption of a 60-year lifespan. The emissions, which include end-of-life, are the lowest the project's third-party assessor has evaluated to date. "Embodied carbon was a particular focus for this project," says Howland. "Because this reduction in CO_2 is delivered at the start of the building's life, it helps contribute to urgently needed carbon reductions now."

A factor limiting the widespread adoption of cork at this point is its structural capacity. It's a bit squidgy, so the load-bearing blocks will compress over the first year or so of the building's life. The next building in this ongoing investigation will incorporate slightly more wood, expanding the utility and market potential of cork to include multistory construction. But for Howland, the project's thesis isn't simply cork. It's the architectural response to life-cycle considerations behind material resources, fabrication, disassembly, and "how those considerations manifest themselves in the actual architectural thing."

Another building making that question central is Ashen Cabin, designed by Leslie Lok and Sasa Zivkovic, researchers at Cornell University's Department of Architecture and co-principals at Ithaca-based HANNAH Architecture and Design. But instead of cork, this building, completed last year in upstate New York, expresses the properties of an innovative material developed in response to the catastrophe now overtaking North America's ash trees.

Casualties of global connectivity, most of the continent's 8.7 billion ash trees are expected to succumb in the next 50 years to the invasive emerald ash borer. Tens of millions of trees have already been killed, and, unlike the beetle-killed pine forests that went before, the irregular geometries typical of ash defy regular sawmills. To prevent all that wood's going to waste—and, in the process, releasing its sequestered carbon to an overloaded atmosphere—Lok and Zivkovic have developed a process that applies contemporary technologies to transform the irregular logs into an affordable and distinctive building material. "Looking at this ash tree as a resource reminds us that, as designers, we're often limited by the standard materials offered by the building industry," says Lok. "This biomaterial is an opportunity for us to find how to use an enormous alternative resource in a meaningful way."

3-D LASER SCANNING and robotics-based manufacturing techniques helped HANNAH Architecture and Design create the 100-square-foot Ashen Cabin (opposite and above) in upstate New York from trees killed by the emerald ash borer.

The process she and Zivkovic have developed deploys 3-D laser scanning and robotics-based fabrication techniques (basically, a programmable band saw) to cut irregular logs into naturally curving boards of desired thicknesses. The boards are then assembled with a biodegradable closed-cell foam to form structural insulated panels (SIPs).

Ashen Cabin, the 100-square-foot prototype, consists of an ash SIP superstructure on a 3-D-printed concrete foundation. (3-D printing allows the design to minimize the amount of high-embodied-energy concrete.) The cabin comprises three programmatic areas: a table, a storage-seat element, and a 21-foot-tall fireplace. As a building rather than an installation, the project is intended to demonstrate the material's ability to provide a ventilated, waterproof, and structural envelope.

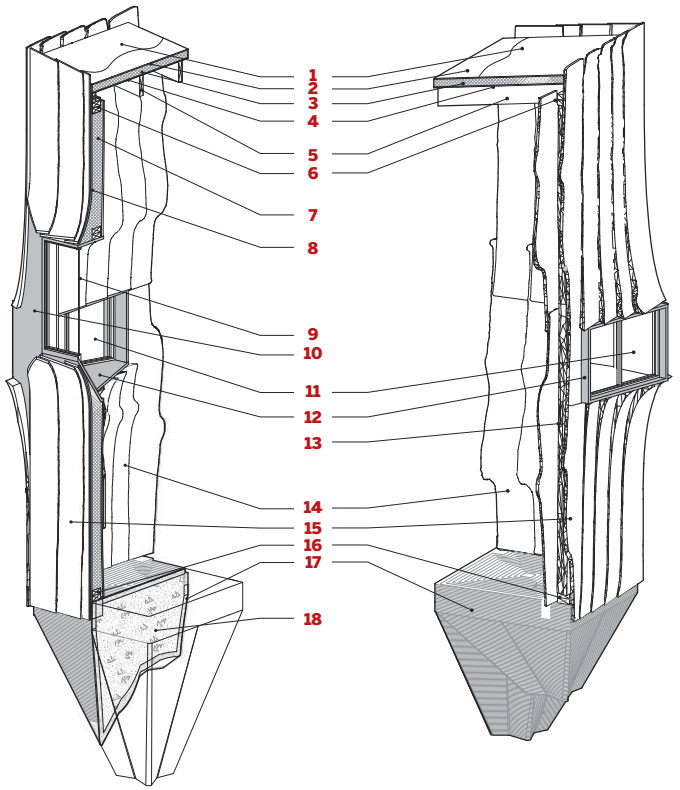
The designers developed the initial scheme around a set of ash trees' typical irregularities—for example, forks and bends—organizing these features to highlight such architectural moments as windows, downspout, and door. The project's crew then headed out into the forest, selected and scanned their lumber, and the designers refined the scheme in response to the specific potential of the chosen wood. "It's very different from the conventional method of making a design that you give to the contractor, who then builds what you drew," says Lok. "There is a reciprocity between the design intent and what the raw material can offer."

A process that responds to the uniqueness of organic, found materials might seem to have limited application to the massive scale of both the ash borer catastrophe and the contemporary construction industry. But the integration of laser scanning, robotic milling, and more advanced computational protocols make it conceivable to inventory and digitize an entire forest, says Zivkovic, so architects can know exactly what kind of tree is available to them. "We can actually mass customize," he says.

It's also an option to adapt the fabrication method to produce conventional materials, such as glulam, cross-laminated timber, and laminated-veneer lumber. The sheer quantity of dying ash would justify these more standardized uses, but Lok and Zivkovic hope for a middle ground, where the unique characteristics of the material remain legible. "Rather than processing a tree into a standardized material that then gets customized again through design," they say, "we're interested in how the idiosyncrasies of the material push for a new architectural expression."

While bio-based products such as cork blocks and robotics-enabled ash panels have significant, perhaps revolutionary, implications for architectural expression, others are ready to substitute directly for conventional counterparts. For example, a four-year research project sponsored by the European Union's Horizon 2020 program, called ISOBIO, concluded in

THE WOOD COMPONENTS of Ashen Cabin have been designed to take advantage of the irregular geometries typical of ash trees, including forks and bends.



ASHEN CABIN - SECTION DIAGRAM

1 EPDM ROOF MEMBRANE
2 ROOF COVERBOARD
3 RIGID INSULATION
4 PLYWOOD SHEATHING
5 2 X 6 WOOD RAFTER
6 2 X 4 WOOD TOP PLATE
7 CLOSED-CELL SPRAY-FOAM INSULATION
8 CORRUGATED DRAINAGE PLANE
9 FIXED GLAZING
10 PLYWOOD SPANDREL
11 OPERABLE GLAZING
12 PLYWOOD WINDOW BOX
13 LOG POST
14 INTERIOR LOG SHEATHING
15 EXTERIOR LOG SHEATHING
16 2 X 4 INTEGRAL WOOD BOTTOM PLATE
17 3-D-PRINTED CONCRETE FORMWORK
18 POURED-CONCRETE INFILL

2019 with the launch of three new low-impact alternatives for common building products.

They include an insulation board, consisting of hemp and a bio-based binder; an insulating lime stucco that uses a high proportion of hemp shiv (the chopped up, woody core of the plant, also known as shives or hurds) as its aggregate; and an insulating and fire-protective clay plaster (incorporating hemp powder) with enhanced moisture-buffering properties. In addition to their stand-alone functionality, these innovative materials have been combined into a composite panel that can be used either as a building envelope in new construction or as an external or internal retrofit. The embodied emissions of the structural panel, at 27.5 $kgCO_2e/m2$, amount to about a quarter of those of a standard new exterior wall; taking into account the atmospheric carbon stored in the panel's biogenic material would make it carbon-negative.

A related product, hempcrete, is a biocomposite of hemp shiv mixed with a lime-based binder and water. It can be either poured or cast into blocks to form an insulative, nonstructural wall. In the United States, since the Industrial Hemp Farming Act of 2018 removed the eponymous plant from the list of controlled substances, hopes for reliable, commercial-scale production of hempcrete are growing.

Meanwhile, a recently completed facility[2] in California is expected to begin using rice straw to manufacture medium density fiberboard (MDF) later this year. Rice straw–based MDF upcycles an abundant agricultural waste material, the stems and leaves left behind when the grain is harvested, previously disposed of by burning, and now commonly flooded to speed decomposition. According to the manufacturer, rice straw is in some ways even better suited to MDF than wood: its curling shape and natural waxes make for a stronger panel with better moisture resistance, and it certainly grows faster.

While there's excitement around the prospect of bio-based alternatives for such common components as insulation board and MDF, the availability of substitutes for structural and envelope components—often among a building's highest embodied-carbon materials—remains limited. "There's a world of advancement right now in products like carpet and furnishings," says Christiana Moss, a principal at Phoenix-based Studio Ma. "We'd like to see that level of innovation in primary architectural materials."

IMAGES: COURTESY HANNAH; STUDIO MA (OPPOSITE)

FOR A HOUSE under construction in Eden, Utah, Studio Ma looked for a cladding material that could withstand the harsh climatic conditions of its mountainside site and store carbon.

Studio Ma has been tracking carbon in its projects since 2010, when the firm conducted a full embodied-carbon study. "Learning about how much embodied carbon already exists in the built environment was eye-opening," says Moss. To curtail its projects' contributions, the firm's design approach seeks first to maximize the use of a development's given conditions, to evaluate and then minimize additional requirements, and to meet remaining needs as much as possible with materials that are renewable. Examples of products the firm has used include plant-based ceiling tiles and cork-and-linseed-based resilient flooring; products it is monitoring for opportunities include the ISOBIO panels, mycelium composites (using the filament network of fungi), and denim- and wool-based duct liners.

For a 1,500-square-foot house now starting construction in Eden, Utah, Studio Ma designed a rainscreen envelope using an innovative bio-based cladding. Because the project's mountainside site provides views of the two-story house from above, the cladding will even be used on the roof. The building will be wrapped in a sustainably sourced softwood that has been impregnated with furfuryl alcohol, a nontoxic waste product of agricultural crops such as sugarcane and corn. Developed in Norway, the toxin-free treatment thickens the cell walls of the softwood, rendering it hard, dimensionally stable, rot-resistant, and low-maintenance[3].

Located at an elevation of 9,000 feet, the house will be exposed to sun, wind, snow, and a daily freeze-thaw cycle that lasts from November to May. In these harsh conditions, the maintenance requirements typically associated with wood might well have trumped its ability to store atmospheric carbon at about 50 percent of its dry weight, and led the house's owners to prefer a higher-carbon option. But for a price and expected lifespan comparable to metal cladding, says Moss, "the fact that we have a 30-year-warrantied facade from this material is a game-changer."

That's a term that could apply equally well to an expanding, but still regrettably limited, range of bio-based building products. The houses profiled here demonstrate the carbon-saving potential of some of them. The projects also invite consideration of the role and tectonics of environmentally innovative materials and methods in contemporary practice. These alternatives offer, as Howland says, "more of a medium through which to explore a broader architectural idea." Whether that's to do with simplicity of materials and construction, authenticity of expression, or the nature of an environmentally aligned practice, the bio-based materials now emerging onto the market offer a strong place to start. ■

Katharine Logan is an architectural designer and writer focusing on design, sustainability, and well-being.

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Learning Objectives

1 Explain why bio-based materials typically have lower embodied carbon than conventional materials.

2 Describe ways that materials normally thought of as waste are being used in construction.

3 Discuss processes and technologies that can extend the lifespan of some bio-based materials.

4 For the three houses covered in this article, discuss the relationship between their use of environmentally innovative materials and their architectural expression.

AIA/CES Course #K2006A

FOOTNOTES

1 Accoya
2 CalPlant
3 Kebony

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p99

Innovative Interiors

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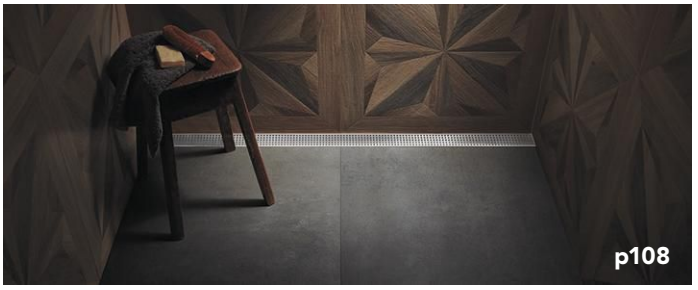
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Linear Drain Systems for Barrier-Free Bathrooms and Wet Rooms

Sponsored by Infinity Drain

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Deployable Fire- and Smoke-Protection Solutions

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The Science of Visible Light and Its Impact on Paint Specification

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Pursuing a Circular Economy

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Photo courtesy of NanaWall Systems

The ever-changing needs of building owners and occupants continue to drive innovation and new options for the design of interior spaces.

Innovative Interiors

Products to maximize the design of indoor spaces

Sponsored by Bradley Corp., Inpro, NanaWall Systems, and Thermory USA

By Peter J. Arsenault, FAIA, NCARB, LEED AP

Commercial interiors seem to be ever evolving, ever changing, and ever focused on meeting new criteria. Some of these changes are driven by building owners, occupants, or users who simply have changing desires, tastes, or functional needs for operations. Others are driven by updates to codes and standards that require more attention to details of health, safety, or welfare, including the health and well-being of people in a building. And of course, some are simply driven by a need for maintenance of and upgrades to a building because everything has a useful service life. In this course, we look closer at some of these drivers of change and some of the practical ways that they can be addressed and incorporated into well-designed building interiors.

BIOPHILIA IN DESIGN

A growing interior design trend that is directly related to human health and welfare is the use of biophilia in contemporary buildings. Defined literally as a love of living things or a love of nature, biophilic design is a concept focused on increasing occupant connectivity to the natural environment in creative ways. Theorists argue that this design approach taps into the hard wiring of human beings who, over the span of history, have developed an affinity for the life-supporting aspects of the natural world.

One biophilic approach is to allow building occupants to have direct access to nature through areas like a rooftop garden, an adjacent nature walk, or a garden courtyard. If that is not feasible or practical, then providing living "green walls" or plants in the space is a good alternative. Direct views out to natural

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Learning Objectives

After reading this article, you should be able to:

1. Identify and recognize the significance of biophilia as part of an interior design strategy to promote health and wellness throughout buildings.
2. Assess the acoustic and daylighting performance aspects of operable glass wall systems as they relate to the welfare of building occupants and users.
3. Explain the characteristics of selected materials for use on walls and elevator cabs to improve safety and durability as well as aesthetics.
4. Determine ways to incorporate advanced principles of commercial restroom design for better hygiene, decreased germ transfer, and improved cleanliness.

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areas work well too. These approaches have tremendous merit in improving mood, air quality, and the overall look of the space.

There is another approach that is also effective and often more readily incorporated into a building, namely the use of graphics and imagery that portray scenes from nature. As part of an interior design strategy, there are at least three ways in which to do this effectively on a large scale, including the following:

Digitally printed wall cladding and art: Imagine turning nature scenes into whole-wall imagery or using large-scale graphics to create inspiring biophilic designs. This is now possible using printed wall-protection products that combine high-resolution images with durable wall protection. These are fabricated by back-printing a graphic image onto a clear, resilient sheet. Along with truly endless design capabilities, this approach also provides high-impact durability to wall surfaces. Since the graphic is back-printed on the protective sheet, there is no worry about the image being scratched over time. That means high-resolution photographs, artwork, or any other biophilic graphic can be printed and incorporated onto as large a wall space as a design may require.

Printed roller shades: If entire walls are not available for biophilic design graphics, then perhaps windows are. Views out of windows can sometimes be less than pleasing and look onto areas that are not natural or soothing. In cases like this, one option is to incorporate printed images onto roller-shade fabrics. Depending on the density and weave of the shade, daylight can still be allowed in, but the image looking out can be much more natural and uplifting.

Solar shades: When views are to natural areas, positive biophilic effects can be achieved. Incorporating solar shades with fabrics containing more openness in the weave can reduce the sun's glare and heat gain, yet still allow for those outside views.

BALANCING ACOUSTICS AND COLLABORATION

Many indoor environments are designed around fostering collaboration, interaction, and communal activity. This is true in commercial settings, such as offices with open-concept floor plans, schools with collaborative learning spaces, and universities with open, informal meeting areas. However, these indoor environments, regardless of their function, require that attention be paid to how noise and sound travels in order to protect privacy, promote productivity, and even safeguard health.

However, a Harvard Business School study has challenged the practice of all of these open spaces. It analyzed the effects of open floor plans in office spaces and discovered that it actually is not an ideal layout for optimal productivity. The study reported a decrease in coworker interaction, productivity, and direct communication between team members, as well as increased distraction and poor decision-making by employees.

In light of this information, an emerging trend now shifts design strategies away from an open concept and instead focuses on reconfigurable spaces to increase flexibility. This flexibility of spaces is achieved by using movable or operable glass walls that can open to accommodate group gatherings when desired and close to create smaller, more private spaces when needed. The operable glass walls still provide natural light transmission when closed and can also achieve very high degrees of sound control. Contemporary workspaces that incorporate this reconfigurable design approach seem to deliver higher levels of worker productivity and satisfaction. They can also increase the sense of flow and connectivity between different spaces within a building while allowing for more efficient space planning.

With the above in mind, architects and designers who recognize the benefits of such reconfigurable spaces need to consider several factors that go into a successful design.

Flexibility

Studies have also shown that part of creating a productive work environment means providing a variety of different workspaces that employees can choose to utilize at will. This includes large conference rooms that can be divided into smaller, more intimate meeting rooms to offer collaborative or independent workspaces as needed. It also means combining private offices, cubicle banks, and open floor plans as well as communal areas and sound-proof rooms where employees can concentrate. When operable glass wall systems are used, they allow for a smaller footprint with more multifunctional, sound-controlled office enclosures and meeting rooms, while reducing the need for extraneous dedicated rooms that serve only one function.

Natural Light

According to the WELL Building Standard, a building certification program focused on health and well-being, natural daylighting has a substantial impact on building occupants. It includes guidance on how occupied spaces with good natural lighting enhance productivity, provide visual acuity, and minimize circadian rhythm disruption. There are other noted positive effects on people in the form of stress reduction, cognitive performance, concentration, and overall mood enhancement. Operable glass wall systems allow architects and designers to create flexible enclosed spaces that allow such natural light transmission. Whether open or closed, the transparent nature of an opening glass wall system ensures greater diffusion of natural light within the space.

PRIVACY

Privacy, like collaboration, is essential for better workplace engagement, innovation, and advancement. Focused work is often

Photos courtesy of Inpro

Biophilic design can be incorporated into buildings using large scale graphics back-printed on clear wall protection sheets (left) or onto roller shades (center). When natural views are available, solar shades allow for direct views with effective glare control (right).

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The offices of SK&A Structural Engineers located in Washington, D.C., were designed by MV+A Architects and include a prominent operable glass wall at the lobby conference room to allow for a balance between collaboration and acoustical control.

valued as the most important activity in a workplace and takes up the majority of an employee's time. To efficiently complete such work, a sizeable amount of visual, auditory, and spatial privacy must be provided. These essential ingredients allow individuals to work without distraction, accurately communicate sensitive information, clarify ideas, focus, and recharge. Operable glass walls can provide this privacy through the use of tinted or shaded glass, art glass, or operable shades.

Sound

Sound control and transparency typically are the "oil and water" (i.e., they do not mix) of office environments. The benefits of the open, transparent, collaborative spaces can be quickly overshadowed by the downside of unwanted noise causing distractions and interruptions. Uncontrolled noise can happen in just about any indoor environment, and it can be enough to distract employees or students and lower their productivity. In extreme cases, when the noise is continual, it can make it hard to concentrate and add stress to the workplace, which in turn can reduce morale, make some people irritable, and even introduce adverse health effects.

Of course, some spaces do not require acoustic control all of the time and instead can benefit from acoustic barriers that can be folded away when they are not needed. Offices with flexible or reconfigurable meeting spaces are a great example of this. Operable glass wall systems offer sound control when needed at differing levels. Among the best, sound transmission class (STC) ratings of up to STC 45 are available. At this rating, loud conversations in adjacent spaces are reduced down to low levels of speech, while common speech is reduced to an unintelligible, quiet murmur.

Overall, operable glass wall products can be specified to achieve the desired characteristics of flexible, reconfigurable spaces while still meeting the critical needs of privacy, light, and sound control. Options are available that include standard bifold doors, a single-track sliding system, frameless interior opening glass walls, and a minimally framed large panel sliding system. All of these can be fine-tuned to meet performance needs with specific enhancements, such as higher-STC glass or specialized seal and track systems.

IMPROVED WOOD INTERIORS

Many commercial and residential interiors desire the use of wood for a more natural and comfortable indoor environment. In the interest of sustainability, it has become very popular to use reclaimed wood for such interior designs. With a distressed look and color variations, designers are creating unique, rustic, and occasionally eclectic spaces that appeal to many building owners and occupants. However, there are plenty of uncertainties about the quality of reclaimed wood since only so much information may be available about its sourcing or previous use.

Similarly, there are design trends that incorporate charred cedar known as *shou sugi ban*, named after a Japanese tradition of charring the face of the wood for longevity. The dark or black appearance also appeals to many design schemes; however, it also creates a cleanliness issue indoors since the surface (essentially charcoal) can rub off onto people or other things in the space.

Instead of using reclaimed or charred wood, a new option has emerged known as thermally modified wood. This is a process where a common species of wood, such as ash, pine, or spruce, is treated with heat and steam in a very precise, scientifically controlled manner. When done properly, thermal modification of wood results in boards that are more durable, dimensionally stable, and rot resistant than virtually any other wood product currently available. Further, because the basic wood species used are readily available, they can be specified based on requiring responsible sourcing, sustainable harvesting, and minimizing carbon footprint throughout the milling and delivery processes. This can all be documented and verified by recognized sustainability organizations, such as the Forest Stewardship Council (FSC) or others. As such, thermally modified wood is coming to be seen as a sustainable alternative to tropical woods, reclaimed wood, and charred wood.

The process of thermally modifying wood focuses on enhancing virtually every fiber of the wood, from the surface all the way through to the core. Nonetheless, the wood still retains its natural beauty since the grain is preserved and the coloration is enhanced. While the surface can be coated with a clear finish if desired, the thermal modification process is intended to allow the wood to be exposed and weather naturally over time without degrading. As such, it is delivered in natural colors that are the result of the heat process rather than a stain. Over time, this color can lighten to a natural light grey in much the same way exposed cedar and teak naturally age in color. All the while, the integrity and natural beauty of the wood remains visible and intact.

From a performance standpoint, thermally modified wood has been tested to show some very attractive traits. First, in terms of durability, thermally modified white ash has achieved a Class 1 durability rating of more than 25 years, while thermally modified Scots pine is rated for 20-plus years of rot resistance. More specifically, testing has been conducted with fungus spores introduced to thermally modified ash samples with the intention of promoting fungal growth over a period of time. These samples were contrasted with control samples to interpolate the class of rot resistance based on European standards. The result was Class 1 rot resistance achieved in thermally modified ash, meaning that, on average, it can be expected to last outdoors for at least 25 years or more with minimal maintenance or added oils.

Overall, thermally modified wood is both beautifully appealing and very practical. The clean modification process uses only heat and steam for a completely nontoxic product, leaving each board highly stable and rot resistant. With these attractive qualities, there are currently three types of thermally modified wood to consider for interior as well as exterior applications as follows.

Traditional Wood Look

Common species of wood like ash and pine are thermally processed to offer the simple, timeless beauty of clean, natural wood. The

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modification process leaves each board a rich color that will vary from species to species. Building owners have the choice to oil the boards yearly to maintain this color, or leave them unoiled to allow the wood to naturally undergo a truly unique and beautiful color evolution. Over time, the wood will transform with an elegant color change to platinum grey, offering a new take on an elegant aesthetic. These wood cladding products routinely undergo a meticulous milling process, leaving them exceptionally straight, flat, and smooth to the touch.

Photos courtesy of Thermory USA

Thermally modified spruce is available in a range of colors that are more predictable and perform better overall than reclaimed wood or barn boards.

Reclaimed Wood Look

Thermally modified spruce is another option that can create a weathered look nearly indistinguishable from reclaimed wood. Available in a range of realistically weathered colors, they offer the reliability that comes from thermal modification plus the aesthetic desired to bring many designs to life. This type of thermally modified cladding offers the look of reclaimed wood, or barn wood, without the risks. Reclaimed wood is beautiful but difficult to source, difficult to vet, and often contains debris like stray nails, insects, or hidden rot spots. Thermally modified spruce mimics the look of reclaimed wood, but the modification process ensures consistent quality. In addition, if manufacturer-applied brushing and staining is selected, then each board will have the texture and color of naturally aged wood, ultimately providing the same effect with more control over the result.

Charred Wood Look

For designers seeking the ancient look of traditional *shou sugi ban*, or charred cedar, thermally modified, black-colored spruce can be a superior option. The ancient Japanese method of preserving wood by charring the surface is beautiful but difficult to achieve. On old-growth cedar, this process was effective, but today, it leaves the center of the boards vulnerable. Plus, charred wood is messy unless properly sealed. Thermally modified products provide the look without the hassle. They offer a bold, charred wood aesthetic that truly merges ancient traditions with modern design via the consistency of thermally modified wood in a deceptively flame-free process. There is no mess or residue; rather, the wood is stained and embossed to look realistically charred. It is available in brushed or dragon-scale textures for both interior and exterior cladding.

BETTER RESTROOM DESIGN

Every commercial building has restrooms, and all of them are used by almost everyone who enters the building. Public infectious health concerns (most recently, COVID-19 and flu outbreaks in particular) necessitate that restroom cleaning and maintenance support reliable handwashing for building visitors and occupants as well as a clean restroom environment. A leading manufacturer conducts a Healthy Handwashing Survey annually. The latest one has determined that 93 percent of Americans say that they employ at least one evasive measure in commercial restrooms to eliminate the risk of touching surfaces that might house germs. Similarly, 65 percent use a paper towel to avoid contact with a door handle, faucet, or toilet flusher. In addition, the survey shows that the top improvement Americans would like to see in commercial restrooms is making everything "touchless" (i.e., relying on sensors to activate fixtures rather than touching them with hands).

Based on all of the above, it is not surprising that designers and manufacturers spend considerable time and effort in making restrooms both look and function to high standards. Consider several examples of better restroom design discussed as follows.

All-in-One Handwashing

Typical restrooms often incorporate separate fixtures for dispensing soap, water, and hand drying. However, there is a new concept that is gaining popularity: innovative "all-in-one" handwashing fixtures are now available that incorporate a soap dispenser, a water faucet, and an electric hand dryer all in one streamlined wash bar unit. When paired with an appropriately designed sink, these touch-free fixtures support hygienic handwashing, reduce germ touchpoints in restrooms and improve overall facility cleanliness. All-in-one handwashing models are designed with accessible, easy, and intuitive handwashing interaction for users. LED lighting and easy-to-identify icons guide handwashing while keeping touch-free soap, water, and dryer in close reach. The dryer and bowl work in tandem to keep water from splashing outside the basin onto the floor, walls, or user, improving restroom cleanliness and safety. Integrating soap, water, and dryer into one fixture also eliminates deck and restroom clutter.

Certain all-in-one handwashing models have several features that curb germ transmission and improve restroom cleanliness. Similarly, a larger, 1-gallon soap container can be incorporated that requires fewer refills. When the low-level LED indicator illuminates, the soap container is replaced with a new full container, minimizing germ contamination associated with refills. Finally, to stop germs and bacterial growth in the fixture between uses, it is programmed to purge water every 24 hours for 5 seconds if the unit has not been activated. In effect, stagnant water is drained from the piping system and flushed with water to reduce and prevent the growth of bacteria.

In all, this cohesive handwashing design enhances user-friendly touch-free handwashing functionality while elevating cleanliness, safety, and aesthetics in restrooms.

Coordinated Soap and Faucet Sets

If all-in-one fixtures are not appropriate for a given project, then well-coordinated separate fixtures should be considered. Specifying matching soap dispensers and faucets harmonizes the overall appearance and adds a unified design element to washbasins. New touch-free models are universally designed and can be used on all types of basins. Such attractive handwashing fixtures create a cohesive and unified aesthetic in restrooms.

With advanced sensing technology, new soap and faucet pairs come in an array of styles, popular finishes, and advanced

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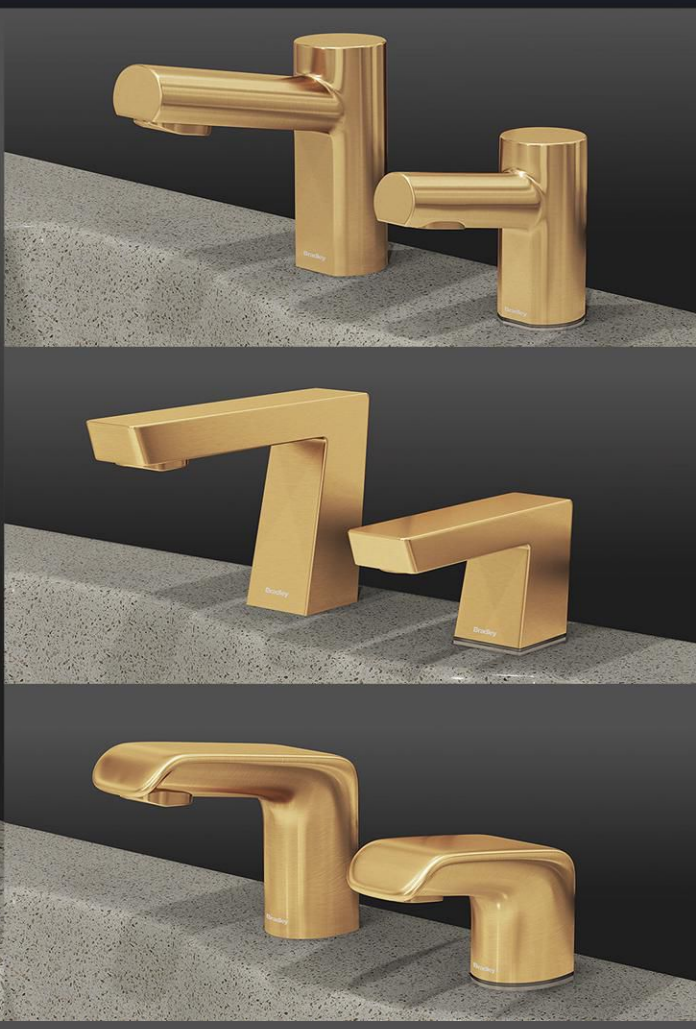

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features. Some of the newest features include hidden sensors to deter tampering, optimized sensing to eliminate false activations, longer spouts for increased handwashing space, and cast brass spout construction with popular and environmentally friendly PVD finishes. Faucets should have multiple low-flow options to match water-savings preferences and multiple run-time options to fit the application. To minimize germ buildup, an auto-flush feature is available to flush the water line every 24 hours. A manual valve override feature is also available for longer water flushing.

Some soap dispensers are designed with a wide range of top-fill options and a smart sense system with LED light indicators that display low soap and battery. Audible and visual alert systems guide refilling to avoid soap overfilling or spilling. The dispensers use universal bulk soap in foam and liquid options. For high-traffic applications using multiple handwashing stations, a top fill multi-feed soap system can supply soap up to six dispensers at once. The system includes a translucent ring that illuminates when the tank begins to run low on soap or power.

Matching soap dispensers and faucets come in popular finishes such as polished chrome, brushed black stainless, brushed nickel, brushed stainless, brushed brass, and brushed bronze. They are also available in modern and classic styles that range from elegant to sleek to organic to complement and integrate with any restroom design.

Privacy Partitions

With privacy emerging as a key user preference in commercial restrooms, privacy partitions add extra height, width, and discretion to create the feeling of an individual room. Using privacy partitions helps architects create comfortable, durable restroom retreats for users.

Privacy partition models feature 72-inch-tall doors and panels mounted 6 inches above the finished floor for standard stalls, and 69-inch-tall doors and panels mounted 9 inches above the finished floor for ADA stalls. To provide additional space, panels are available up to 84 inches deep and feature a stacked panel design that is seamed together with an aluminum H-bracket, providing a cleaner design aesthetic and faster installation. Other options are also available to eliminate gaps between doors, pilasters, and panels to deliver even more privacy. These partitions are available in a variety of high-quality and durable materials like stainless steel and solid plastic that stand up to everyday wear, high traffic, and vandalism attempts.

This need for privacy is not a new concept. According to a noteworthy study on restroom design, "The Bathroom" by Alexander Kira, Americans have been uncomfortable with the lack of privacy in restrooms for decades.

Accessible Showers

Restroom privacy is a particular concern when showers are included in the design. It is further the focus of design attention when accessibility is required. While most design professionals are familiar with the requirements of the International Building Code (IBC) and Americans with Disabilities Act (ADA) related to restrooms, the details of showers should not be overlooked since they are included in a wide range of accessible buildings.

The intent of accessible or "universal" design is to move toward inclusion and accommodation of people with physical disabilities to mainstream them wherever possible versus separating them from everyone else. Showers need to embrace this universal design too. No-threshold or curbless shower stalls are often used to achieve this, which allow ease of pedestrian access as well as wheelchair movement in the bathing space. A trench drain allows for better control of drain water flow and linear access, easing wheelchair maneuverability. Where a no-threshold or curbless shower may not be feasible, the installation of ADA-compliant ramps can be used.

With all of the above as a basis, many designers find that solid-surface panels are an excellent choice as a shower-enclosure material. Since solid surface is nonnutritive, it does not promote the growth of mold and mildew, and it resists bacterial growth. The inclusion of "active" antimicrobials like copper within the solid surface itself can reduce odor-causing bacteria. By contrast, with tile and grout, the porous grout is usually where the first black splotches of mold start growing. Where grout cracks or falls out, there is risk of water getting behind the tile, leading to tiles failing or moisture seeping into the gypsum board or other substrate. Cleaning and resealing tile means more work for maintenance staff and leaves room for error.

Solid-surface showers also mean quicker turnaround on installation over traditional tile. From start to cured finish, solid-surface showers can be ready to use in as little as four to five days compared to 12 days for traditional tile work. Slid surface receptors (floor pans) can be installed in as little as 1 hour versus three days for tile.

Solid-surface shower receptors can be poured and fabricated into many standard or custom shapes (L shapes, T shapes, neo angles, etc.) in a wide variety of sizes. The integral nonskid surface helps prevent slips and falls, and ADA edges and ramps can ease the transition from floor to receptor.

Continues at ce.architecturalrecord.com

Peter J. Arsenault, FAIA, NCARB, LEED AP, *is a nationally known architect, consultant, continuing education presenter, and prolific author advancing building performance through better design.* ***www.pjaarch.com, www.linkedin.com/in/pjaarch***

Photos courtesy of Bradley Corp.

Innovative "all-in-one" handwashing fixtures include touchless functions of soap dispensing (left), water washing/rinsing (center), and hand drying (right).

PRODUCT REVIEW

Innovative Interiors

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Inpro

Photo courtesy of Inpro

Aspex® Wall Protection

Bring the biophilic beauty of nature indoors with Aspex® Wall Protection from Inpro. Aspex merges vivid back-printed graphics with the high-impact durability of PETG wall protection. Your image, your branding, your statement—Aspex gives you total design freedom. For additional information, please call 800-222-5556.

www.inpro.com

NanaWall Systems

Photo: David Wakely Photography

Interior Opening Glass Wall Solutions

NanaWall Systems offers the most comprehensive range of sound-rated interior opening glass wall solutions. The company offers an array of interior folding, sliding, and frameless glass wall products depending on a project's unique design constraints, including STC, structural, space planning, and cost.

www.nanawall.com

Thermory USA

Photo courtesy of Thermory USA

Ignite Wall Cladding

Ignite provides the ancient look of traditional *shou sugi ban*, or charred cedar, using Thermory USA's deceptively flame-free process. This offers the aesthetic of charred wood with the stability and rot resistance of thermally modified wood. There is no mess because Ignite is stained and embossed to look realistically charred. It is available in brushed or dragon-scale textures.

www.thermoryusa.com

Linear drain systems allow for the use of large-format tile and large stone slabs that do not need to be cut to create a central drainage plane.

All images courtesy of Infinity Drain

Linear Drain Systems for Barrier-Free Bathrooms and Wet Rooms

Streamlined shower design feature offers sophistication and sanitation

Sponsored by Infinity Drain | *By Kathy Price-Robinson*

It is no wonder that the specification of a shower drain could be overlooked, especially in a high-end bathroom. Here, the designer or architect naturally focuses most heavily on the selection of tile, stone, fixtures, cabinetry, lighting, the heated towel rack, the flow of the space, and so much more. The choice of drains may well be left to the plumber. And while the plumbing contractor has deep knowledge of showers and drains, by the time this trade shows up on the job site or studies the plans, many waterproofing details that are already in place may limit the options to a standard, commonplace drain in the middle of the enclosure.

However, there is another option: the specification of a sleek, stylish linear drain system that kicks the shower up to another level of sophistication.

LINEAR DRAINS AND THEIR BENEFITS

For the clients of Miami-based interior designer Amber Engebretson, LEED AP, ID+C, product selection comes down to aesthetics and a high-end look.

"Clients are looking for something different and want something that sets their property or project apart from others," Engebretson explains. "A linear drain is one of the details that does this."

Linear drain systems can be found in many high-end projects. For example, 512 linear drain systems were customized for the TWA Hotel at the John F. Kennedy International Airport. Linear drain systems were included in the bathrooms and spas at the renowned One57 building located in the center of the city. Linear drain systems can also be found at the Century Plaza Hotel in Los Angeles, the Hard Rock Hotel in Orlando, Florida, and the Quicken Loans Arena in Cleveland, Ohio.

Linear drain systems have more than good looks going for them as compared to traditional center-placed drains. As Engebretson notes, linear drain systems can eliminate the need for the difficult, time-consuming, and expensive cutting of high-end stones to create a complicated slope. They are also an essential feature in a high-end wet room that can be sprayed down and sanitized. Linear drain systems

CONTINUING EDUCATION

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Learning Objectives

After reading this article, you should be able to:

1. Define linear drain systems and their benefits in bathroom applications.
2. Specify linear drain systems based on both style and function.
3. Discuss the features of a wet room that can be sprayed off and sanitized.
4. Identify ADA requirements for bathrooms and wet rooms, and explain how linear drain systems can help meet this criteria.
5. Discuss outdoor architectural drain design and applications.

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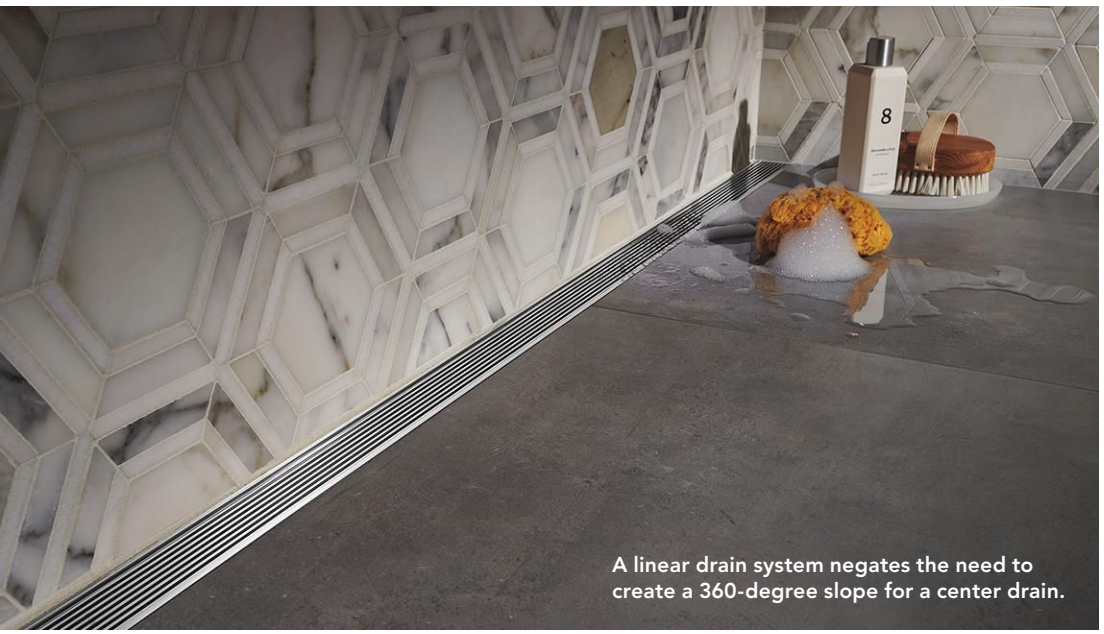
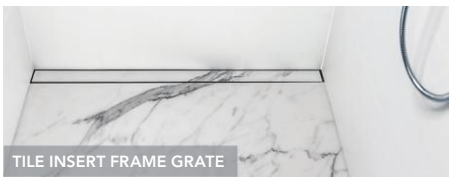


A linear drain system negates the need to create a 360-degree slope for a center drain.

WEDGE WIRE GRATE

PERFORATED GRATE



TILE INSERT FRAME GRATE

perform well in Americans with Disabilities Act (ADA) approved showers. And they add form and function to their original use, which is in landscaping and outdoor settings.

Linear Drain Systems versus Traditional Drain Systems

To understand the basic differences between linear drain systems and traditional drain systems, consider a traditional shower enclosure. This is one where the drain is in the middle of the shower, with the shower floor sloping 360 degrees in a bowl shape toward the center. While this four-way pitch is standard in many budget or unexceptional showers, such a placement can limit flooring material choices. The typical scenario is to either specify a small mosaic tile or create the need to cut large-format tile on a diagonal to accommodate the floor pitch. In this way, the stone is pie-pieced together to accommodate the floor pitch.

With a linear drain system, the location of the drain is changed from the center of the shower to placement along one of the side or back walls or along the threshold of the shower enclosure. In this scenario, the floor is sloped toward the linear drain in one plane, as opposed to the four-way pitch toward the middle. This allows the use of large-format tile, stone slab, or any solid-surface material. And, because the floor is sloping in one direction toward the linear drain , the integrity of the tile or stone is maintained and not cut up to accommodate the dish-style pitch.

When specified early in the planning phase, the drain can become a sleek aesthetic feature rather than a lost design opportunity that is specified by the installer.

There are two ways to specify a linear drain system. One is based on form, or style, while the other is based on function, or intended use and infrastructure. One is based on visual preferance; the other is based on performance. We will discuss form here and function a bit later.

SPECIFYING A LINEAR DRAIN SYSTEM BASED ON FORM

Depending on the linear drain system manufacturer, there are typically four types of decorative top grate styles: wedge wire, perforated, tile insert, and solid, discussed as follows.

Wedge wire grate: Wedge wire grates are the sturdiest of all the grates, typically constructed of grade 316 stainless steel. This type of stainless steel is food grade and salt and chemical resistant. It contains 16 percent chromium, 10 percent nickel, and 2 percent molybdenum. The latter helps resist corrosion. Such grates may have a load rating of up to 5,000 pounds. This is an appropriate option for bathrooms and outdoor installations.

Perforated grate: Perforated grates are typically the least expensive and may be constructed of grade 304 stainless steel. This type of stainless steel contains 18 percent chromium and 8 percent nickel. Manufacturers offer different patterns, but these grates are essentially fabricated the same way on a break press with the pattern either punched or cut on a laser.

Tile insert frame grate: The tile insert frame allows the drain to blend in with the rest of the shower floor, essentially making it disappear. The tile insert tray comes empty, and the tile setter makes a mini tile floor within the tray. Depending on the manufacturer, the frame can accommodate flooring material up to ¾ inch thick. In this style, there is a ¼-inch gap between the tile frame and the linear drain channel. This is where the water drains down to the outlet and through to the waste line.

Continues at ce.architecturalrecord.com

Kathy Price-Robinson *writes about building and design. Her remodeling series* "Pardon Our Dust" *ran 12 years in the* Los Angeles Times. *She specializes in buildings that are durable and resilient to climate disruptions, as well as products and designs that provide shade in hot climates.* ***www.kathyprice.com***

New deployable solutions in fire and smoke containment enable architects to create more space-savvy, open designs while satisfying the latest life-safety codes.

All images courtesy of Smoke Guard

Deployable Fire- and Smoke-Protection Solutions

A closer look at the space-savvy systems delivering safe and code-compliant interiors

Sponsored by Smoke Guard

Elevator hoistways and other multistory openings, such as atriums and open staircases, require special attention to prevent the vertical migration of smoke and fire in the event of an emergency. Unfortunately, traditional fire- and smoke-management solutions such as enclosed elevator lobbies, elevator pressurization systems, compartmentalization, and smoke evacuation systems undercut an architect's ability to create the open floorplan desired by so many building owners and can seriously strain a project's budget. A new solution is gaining momentum in designs around the United States that delivers both the life-saving functionality demanded during a fire event and the out-of-sight, out-of-mind, design-supporting presence dreamed of by architects and owners alike during typical day-to-day operations.

A deployable smoke- and fire-rated curtain strikes the delicate balance of safety and aesthetics. This system can offer the protection against vertical smoke migration required by the various codes during an emergency. When unneeded, the system is stored in a retracted position that leaves spaces clear and open.

This course will explore the advantages of using flexible fabric solutions to satisfy fire- and smoke-related code requirements at vertical openings throughout a building and describe how these systems are being employed by design firms in high-profile projects to create the safe, corporate-culture-forward, awe-inspiring interiors that their industry-leading clients demand.

FIRE AND SMOKE SAFETY CODES

The fire and life-safety codes designed to stem vertical smoke migration that architects must meet today were, in many cases, informed by hard lessons learned in the aftermath of great

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Learning Objectives

After reading this article, you should be able to:

1. Explain the fire- and smoke-related criteria that must be satisfied at elevator hoistways to create a design that is compliant with the 2018 International Building Code (IBC).
2. Explore the similarities and differences in the fire- and smoke-protective measures that must be incorporated, per the IBC, into the vertical openings described as two-story spaces and an atriums.
3. Identify the limitations of traditional smoke- and fire-rated solutions, such as enclosed elevator lobbies, elevator pressurization systems, compartmentalization, and smoke evacuation systems.
4. Describe how rolling magnetic gasketing systems and fire- and smoke-rated vertical, horizontal, and perimeter curtain systems enable architects to meet fire and life-safety codes while delivering open and spacious interiors.

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tragedies. For example, codes that require multiple protected means of egress in hotels were first introduced after the fire at the Winecoff Hotel in Atlanta in 1946.

Built in 1912, the Winecoff had been advertised as fireproof, a claim made in reference to its revolutionary steel construction. However, in the early morning hours of December 7, 1946, a fire erupted on the third floor of the 15-story structure. The one, single stairway serving all 15 floors was compromised, trapping guests above the third floor in the burning building. Deemed the deadliest hotel fire in U.S. history, 119 people died that night. The disaster sparked a national outcry for a better, more concentrated effort dedicated to preventing fire-related losses of life and property. The National Conference on Fire Prevention was created by President Harry Truman the following year, in 1947. New life-safety requirements emerged from the conference, such as requiring multiple protected means of egress and self-closing fire-resistive doors. These two key provisions were quickly adopted across the United States.

Since then, life-safety codes have proliferated to address the importance of controlling the spread of fire and smoke throughout a building. Today, there are various building and fire codes that can be adopted, including the International Building Code (IBC), written by the International Code Council (ICC); NFPA 5000: Building Construction and Safety Code, written by the National Fire Protection Association (NFPA); and NFPA 101: Life Safety Code, also written by NFPA. These codes define the minimum fire-prevention performance and design elements that must be incorporated into a structure. Items within their sphere of influence include structural integrity, ventilation, means of egress, fire prevention, and smoke containment, among others.

Smoke containment is an especially important aspect of life safety because in a fire event, smoke inhalation often causes more fatalities than fire exposure. The goal of smoke containment is to prevent the movement of smoke and heat from one area to another, allowing building occupants to escape safely and making it easier for firefighters to address the fire.

Continues at ce.architecturalrecord.com

CASE STUDY: FACEBOOK LA

In the Facebook LA offices, Gensler selected a fire-rated perimeter curtain to frame all four sides of the upper-level atrium to protect peripheral spaces in case of a fire (left). Openness was a key objective in the Facebook LA office, so architects created a sun-soaked atrium that presented challenges related to fire and smoke control that had to be addressed (right).

The offices of tech and social media giants are often referenced for the latest and greatest innovations in the approach to office spaces, such as nap pods, slides, play spaces, and third spaces, which are casual seating areas that offer employees alternative workspaces to their desks. In addition to inspiration, these interiors offer the design community excellent examples in how to achieve the next level of design while also satisfying the many building and life-safety codes that have been established over the years to keep people safe.

Headquartered in Menlo Park, a city in California's San Francisco Bay Area, Facebook first established offices in the Playa Vista neighborhood in 2011. In 2016, the company moved into its current Playa Vista office, referred to internally as Facebook LA, a two-story, 35,000-square-foot location that can accommodate 200 employees. But, before these employees could find their desks, the interior was renovated by Gensler to better match corporate culture.

In a 2016 article titled "Facebook's new L.A. digs have frozen yogurt, yoga, and no privacy" published by the *Los Angeles Times*, Brian Stromquist, design manager at Gensler, is quoted as saying of the design, "We explored concepts that are integral to the Facebook way of working—agility, flexibility, and innovation—and crafted them into a space that evokes L.A.'s culture of arts and entertainment." Bright colors and a few of the company's best-known mottos—"Move Fast And Break Things" and "Fail Harder"—were incorporated throughout to add vibrancy and a reminder of purpose.

One key objective of this two-story renovation was to open up the interior and increase the amount of natural light present in the space. To accomplish that, Gensler removed a portion of the second floor to create a two-story staircase and sun-soaked atrium. The creation of an atrium brought with it new fire and smoke-control-related challenges that had to be addressed.

The International Building Code (IBC) requires that smoke control be incorporated into vertical openings, like an atrium, to prevent smoke from traveling unchecked up through an atrium and deeper into the building or from originating on a floor and finding its way into the larger, central atrium. A fire-rated curtain can shield staircases or escalators from smoke and flames, or provide a reservoir for smoke on the upper floors of an atrium. To provide the requisite opening protective for fire and smoke control, while maintaining the feeling of openness necessary to support corporate culture, Gensler selected a deployable fire-rated perimeter curtain to be installed along all four sides of the upper-level atrium to protect the peripheral spaces. This perimeter curtain can be an effective complement to existing mechanical fire- and smoke-containment systems or additional fire curtains.

This is how the system works. The 36-foot by 32-foot by 12-foot pleated curtain is formed, for this project, in the shape of a square that perfectly frames the four sides of the atrium. When smoke is detected in the building, the curtain deploys, compartmentalizing the office areas on the second floor from the large, open atrium space. When the threat has been addressed, the curtains are retracted into the recessed headbox in the ceiling and hidden from sight until needed again. This type of smoke- and fire-rated retractable solution offers projects like Facebook LA a way to satisfy fire and life-safety codes while still keeping their interiors open, bright, and beautiful.

The type of light that illuminates a room or surface greatly impacts how we perceive the color.

All images courtesy of Benjamin Moore & Co.

The Science of Visible Light and Its Impact on Paint Specification

A foundational understanding of how artificial and natural lighting affect paint color

Sponsored by Benjamin Moore & Co. | *By Julia Grable*

It might seem like an obvious statement, but without light, there would be no color. However, perhaps less obvious to most is the impact that certain types of light have on the colors that we perceive.

THE SCIENCE OF LIGHT

Think about how a human face appears when illuminated by early morning light. No matter what the color of skin, it will appear warm and soft. This same face in the midday sun will be marked with harsh, contrasting shadows, and the skin tones will appear cooler. Now imagine how this same face appears when bathed in candlelight versus a conventional fluorescent fixture. While candlelight is kind to most of us, under the fluorescent fixture, human skin often takes on a sallow greenish cast.

The colors that we perceive are determined in part by the quality and quantity of the light that illuminates them, whether it be natural, artificial, or a combination of both.

For millennia, humans relied solely on the sun or firelight. Today, of course, artificial lighting illuminates our world day and night. We lived with the incandescent, or Edison bulb, for more than 100 years. Today, several types of artificial lighting systems, each with its own unique characteristics and impacts on color, illuminate our buildings. Light-emitting diodes, or LEDs, are quickly replacing other types of lighting in both new and existing buildings.

Because light has such a profound impact on color perception, design professionals should ideally have a foundational understanding of how lighting choices will impact paint color and finish selections for their projects. For this, we must first look at the nature of light itself.

The Electromagnetic Spectrum

Light is composed of many wavelengths of energy. The full range of these frequencies is called the electromagnetic spectrum. Only a small portion of these wavelengths are visible to the human eye. This narrow band is known as the visible light spectrum, and it includes all of the colors of the rainbow.

The visible light spectrum includes wavelengths ranging from 780–390 nanometers (nm). For comparison, UV light ranges from 10–400 nm, and X-rays are shorter still. Specific wavelengths correspond to specific colors. Reds have the longest wavelength and range from 650–700 nm. Cooler colors have shorter wavelengths. The violets have the shortest wavelengths of all and range from 390–430 nm.

CONTINUING EDUCATION

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Learning Objectives

After reading this article, you should be able to:

1. Describe the visible light spectrum, including how the human eye sees and how the brain interprets color.
2. Explain how correlated color temperature (CCT), color rendering index (CRI), and spectral power distribution (SPD) impact the quality and color of light.
3. Distinguish the CCT and CRI of different artificial light sources, and describe their affects on color.
4. Discuss trends in lighting technology that allow users to choose and change color temperature and other lighting characteristics.
5. Provide examples of how design professionals can use their knowledge of light to help specify paint color and sheen.

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Warmer, longer wavelengths are easier to see in dim light, while cooler colors tend to disappear. This concept is important to remember when we discuss the impact of light on paint color.

Two Ways of Creating Different Colors with Light and Substances

When a beam of light is projected onto an object, the object will absorb some wavelengths while reflecting others. For instance, a red object absorbs all but the red wavelengths. However, it is not always this simple. For example, an object may appear yellow if the object absorbs blue light but reflects green and red light because when these wavelengths mix, they create yellow.

You can create different colors by mixing light in what are called the "primary wavelengths" of red, green, and blue. This is called additive color mixing. Mixing red and green produces yellow, mixing red and blue yields magenta, and mixing green and blue makes cyan. Mixing all three primaries creates white. Color televisions, computers, and other displays rely on additive color mixing for a full range of colors.

Another way to create colors is through subtractive mixing. You likely recall the thrill of using tempera paints to make new colors—for instance, mixing blue and yellow to create green. This is known as subtractive color mixing. Most materials, including dyes, paints, colorants, and inks, all rely on this mixing process.

Most design professionals are familiar with the color wheel. Based on the primaries of red, yellow, and blue, this tool uses subtractive color mixing to create a plethora of secondary and tertiary colors. White and black can be added to create a nearly limitless number of tints and hues. The printing process, which relies on inks, uses slightly different primaries of cyan, magenta, and yellow, but this is still a subtractive process that relies on the mixing of substances, not on the mixing of light.

Following are the key differences regarding additive and subtractive color mixing.

Additive:

- Involves the mixing of light.
- The primary light colors are red, green, and blue.
- Resulting color will become lighter and eventually turn white.

Subtractive:

- Involves the mixing of substances.
- Primary substance colors are red, blue, and yellow (cyan, magenta, and yellow for inks).
- Resulting color will become darker and eventually turn black.

How the Eye and Brain See

Whether color is created through additive or subtractive color mixing, the way we see and process color is the same. To better understand the relationship between color and light, let us first recall the basic biology of the human eye and how the brain interprets information received by it.

The human eye works very much like a camera. A transparent cornea allows light to enter the eye, and the iris controls the amount of light entering through the pupil. The cornea and lens work together to focus the image on the retina, which is located at the back of the eye.

The retina—comparable to the film, sticking with the camera analogy—is lined with light-sensitive receptors called rods and cones. These photoreceptors convert light into electrical signals, which are then transmitted to the brain via the optic nerve. The visual cortex of the brain converts the image impulses into objects.

The human eye has far more rods than cones—about 125 million rods to 7 million cones. Each type of receptor plays a distinctive role in vision. (The retina actually contains a third type of receptor, which does not play a role in vision but is essential for regulating the body's circadian rhythms.)

Rods primarily perceive light and dark, and they are more sensitive to dim light than cones. Hence, rods are especially important for night vision. Rods are far more sensitive than cones and better at detecting motion.

Cones detect colored light. The human eye contains three types of cones: red, green, and blue. Each is sensitive to a different range of wavelengths. Many cones are located in the fovea, a small pit located in the back of the eye that helps us perceive sharpness and detail.

The color of the objects we see is largely due to the way that the objects interact with light, and how that light is ultimately reflected or transmitted to our eyes. If an object transmits green and red wavelengths, the green and red cones are stimulated, and we see the object as yellow.

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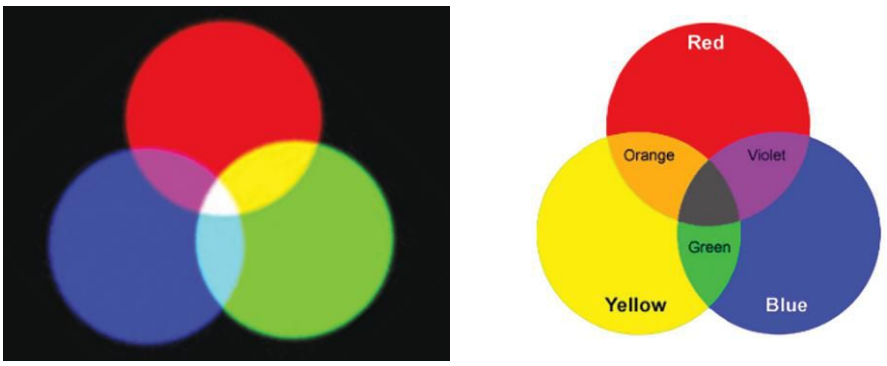

Additive mixing (left) involves the mixing of light where the resulting color will become lighter and eventually white. Subtractive mixing (right) involves the mixing of substances and results in a darkening of colors.

Juliet Grable** is an independent writer and editor focused on building science, resilient design, and environmental sustainability. She contributes to continuing education courses and publications via Confluence Communications. **www.confluence.com

Michigan's Kalamazoo Public Library is a strong example of how design elements like natural lighting, recycled materials, and creative use of space can support a circular economy philosophy.

Photo courtesy of Armstrong World Industries

Pursuing a Circular Economy

Understanding how materials, design, and planning can increase sustainability

Sponsored by Armstrong Ceiling and Wall Solutions | *By Jessica Jarrard*

The traditional manufacturing, specification, distribution, and waste-management process is a linear path that begins with extraction of natural resources and ends with landfill disposal. In a world of endless resources, this may be a practical approach. However, the reality is that this linear path is neither sustainable nor viable anymore. By contrast, a circular economy is one based on the philosophy of extracting the maximum value from each resource available and then establishing a system that encourages the best use, reuse, and replenishment of natural resources possible. This course will discuss how the building industry is part of the circular economy, and how design and planning allow for more sustainable buildings.

THE CIRCULAR ECONOMY

At the dawn of the Industrial Revolution, materials that were once meticulously and painstakingly made in small shops or in people's homes started being mass produced in large factories using heavy machinery. These new and improved manufacturing processes were made possible through technological advances and inventions like the steam engine, which helped power manufacturing equipment.

CONTINUING EDUCATION

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Learning Objectives

After reading this article, you should be able to:

1. Understand the difference between a linear and circular economy.
2. Explain how the building industry can be part of a circular economy.
3. Describe how the building industry drives reduce, reuse, and recycle processes.
4. Discuss how materials, design, and planning allow buildings to reduce their carbon footprints.
5. Identify programs, initiatives, and projects that promote sustainability.

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Textiles, clothing, building materials, and even food were made and processed at a much faster rate than could ever have been imagined before. The invention of the steam engine not only helped boost production but also improved the way that materials were shipped from the manufacturer to the end user.

The Industrial Revolution quickly created a new way of life and a new speed at which raw materials could be turned into consumer goods, building materials, and commodities. In the late 1800s and early 1900s, the earth seemed to have more resources than its occupants could ever possibly use. Materials were harvested, manufactured, used, and then discarded.

More than 100 years and many technological advancements later, we have now learned that the earth's natural resources are not nearly as abundant as they once seemed. Standard manufacturing practices and demand are depleting the earth's resources faster than they can replenish themselves, and landfills across the globe are filling up. This linear process of take, make, and discard, also known as the linear economy, is no longer a viable plan for our current time or the future.

In 2010, the Ellen McCarther Foundation launched an idea for a new concept called the circular economy, consolidating various schools of thought and ideologies that have been around since the 1970s. These include cradle to cradle, biomimicry, industrial ecology, regenerative design, and natural capitalism.

In a circular economy, every element of what is created or produced is considered a resource, meaning that all materials and the products they make are designed in such a way that they can be returned to the cycle through recycling, biodegradation, composting, or upcycling. The circular economy is focused on reducing or eliminating waste, including material waste from the beginning to the end of the product's life cycle.

The circular economy concept took off in many industries worldwide as stakeholders realized that it is time to be creative in how we as a society handle population growth and increased housing density, advancements in computer and phone technology, and waste management, to name a few. While the concept of a circular economy can apply to most modern-day industries, it is especially important in the construction industry, which uses more raw materials than any other industry.

Two Main Types of Cycles in a Circular Economy

There are two main types of cycles in a circular economy: technical cycles and biological cycles.

Technical cycles recover and restore products, components, and materials. This is achieved through recycling, repair, and reuse, where materials are manufactured into new products.

Biological cycles refer to "consumption," for example when food and biologically based materials, such as cotton or wood, are designed to feed back into the system through processes like composting and anaerobic digestion. These cycles regenerate living systems, such as soil, which provide renewable resources for the economy.

Both the technical and biological cycles are currently present in the construction industry, as materials range from those that have been engineered and manufactured to those that are naturally occurring, renewable, and/or biodegradable. Specifying a combination of these materials, takeback, and creating a construction waste plan can help with the sustainability and longevity of a project, as well as the responsible disposal of waste materials.

The Importance of a Circular Economy

The circular economy helps reduce waste and environmental impacts caused by production and consumption of materials, drives greater productivity, helps boost the economy, and reduces scarcity concerns with regard to resources. This all happens at multiple levels and on multiple scales, whether it is being done by large corporations, small businesses, or government entities, on a global or local scale.

This transition to a circular economy not only refers to adjustments aimed at reducing the negative impacts of a linear economy, but it also represents a systemic shift that promotes long-term resilience while generating new business and economic opportunities as well as opportunities for sustainability.

Another benefit to a circular economy is in the reduction of embodied carbon in materials. By using recycled material streams, the burden of these materials is basically "free." This then reduces the overall carbon footprint of a product.

Identifying Key Players in a Circular Economy

Many industries and entities (including government entities) worldwide are interested in being part of the circular economy. Not only does it make fiscal sense, but it is also an investment in long-term sustainability for businesses, communities, and our economy as a whole. Over the long term, the circular economy will prove to be more cost-effective while also reducing waste and pollution, which in turn reduces greenhouse gas emissions to combat climate change.

Stakeholders in the circular economy include engineers, material specifiers, others involved in the design process, material and supply-chain providers, building industry companies, contractors hired for installation and/or deconstruction, occupants, consumers and end users, building owners, government entities that track emissions and waste management, code enforcers, agencies that provide recycling and waste management services, and many others in between.

In a circular economy, it is vital that all stakeholders do their part. Suppliers must responsibly source materials and ensure that they are sustainable. Manufacturers must design innovative solutions and specify quality materials to produce products that will last, have low impact on the environment, and be recyclable at the end of their useful life. Manufacturers should also provide a process to return products for recycling.

Specifiers should limit the use of different types of materials in a single project. Construction waste plans and recycling of each material should be outlined in specifications.

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Jessica Jarrard *is an independent writer and editor focusing on health, science, and technology. She contributes to continuing education courses and publications through Confluence Communications.* ***www.confluencec.com***

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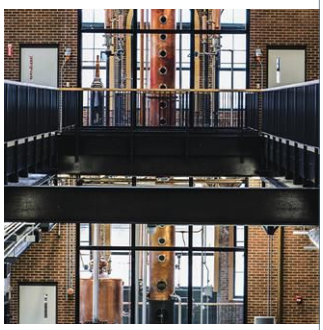

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DATES & Events

Online Programming

Crystal Bridges Museum of American Art
Bentonville, Arkansas
Online visitors can view art and architecture collections through narrated virtual-reality tours. Works available online are Kerry James Marshall's *Our Town,* and *Kindred Spirits* by Asher B. Durand. Virtual tours are also available through Google Street View for the Frank Lloyd Wright–designed Bachman-Wilson House (including a visit to the second floor, which is normally closed to the public) and R. Buckminster Fuller's *Fly's Eye Dome*, a 50-foot structure envisioned as a prototype for efficient, economical housing, which was recently reconstructed on the museum's grounds. View at crystalbridges.org/vr/.

Hollyhock House
Los Angeles
A web tour, called the Virtual Accessibility Experience, provides online guests with 360-degree views of the facade, interiors, and roof terraces, offering tidbits about the house's history and design along the way. The digital Hollyhock House Archive, which contains original drawings and blueprints by Frank Lloyd Wright, is also free online. Visit hollyhockhousevirtual.org and hollyhockhouse.omeka.net

LACMA
Los Angeles
The museum—which is currently under renovation—has a wide selection of videos online about the artworks and artists in its past and present collections. Also on its site are curated audio soundtracks, compositions, live recordings, courses, lectures, teaching resources, articles, interviews, exhibition catalogues, and artworks from its permanent collection. See lacma.org.

Menil Collection
Houston
Visit the institution's YouTube channel for artist talks, lectures, and an interview with architects Sharon Johnston and Mark Lee, designers of its new Drawing Institute. Much of the Menil's 10,000-piece collection is also viewable online. See menil.org/collection.

MoMA
New York
Images, interviews, and artwork descriptions from current exhibitions are on the museum site. See the *Neri Oxman: Material Ecology* exhibition online. Also available digitally are learning guides with slideshows, worksheets, and other museum resources. Additionally, MoMA offers free online courses through Coursera. Each course features original videos, texts, and audio, including studio visits and conversations with artists, educators, and curators. Visit moma.org.

Museum of Fine Arts, Houston
Houston
The institution's collection of 70,000 artworks, plus selected exhibitions, are online. Virtual visitors can also access film screenings, art-making activities, recorded lectures, artist's talks, and more, on the museum's site and through Google Arts & Culture. See mfah.org

Museum of Islamic Art, Qatar
Doha, Qatar
Online visitors can tour the I.M. Pei–designed museum and much of the collection on Google Arts & Culture. Family activities

DATES & Events

including coloring exercises, puzzles, word searches, and art-tutorial videos are also available on the website. Visit mia.org.qa/en.

National Building Museum
Washington, D.C.
Documenting Crossroads: The Coronavirus in Poor, Minority Communities, a new online-only exhibition of work by Camilo José Vergara, is available on the museum's website. It features 49 photographs taken from early March into early April, as well as an essay chronicling Vergara's firsthand observations. For more, see nbm.org.

Solomon R. Guggenheim Museum
New York
Though the Frank Lloyd Wright–designed museum is closed, visitors can still tour it online via Google Arts & Culture, with an audio guide about the building's design if desired. Online visitors can also learn about the exhibitions that will be on view when the Guggenheim Museum reopens, including *The Fullness of Color: 1960s Painting* and *Marking Time: Process in Minimal Abstraction.* Additionally, a collection of video interviews with museum staff and recently featured artists is online. See guggenheim.org.

E-mail information two months in advance to areditor@bnpmedia.com.

Advertisers Index

Ⓡ Regional AD

SNAPSHOT

THOUGH Jun Aoki doesn't create handbags or luggage, his own designs are also integral to the Louis Vuitton brand. The Tokyo-based architect's firm has designed 10 of the luxury line's boutiques in Japan, Hong Kong, and New York. The latest, Maison Osaka Midosuji, is a four-level store with a partially open-air restaurant at the top—a first for the label. The building's curved glass facade, illuminated from within after dark, recalls the billowing sails of Osaka's maritime history, yet it also showcases the futuristic forms now possible with current glass techniques. *Kara Mavros*

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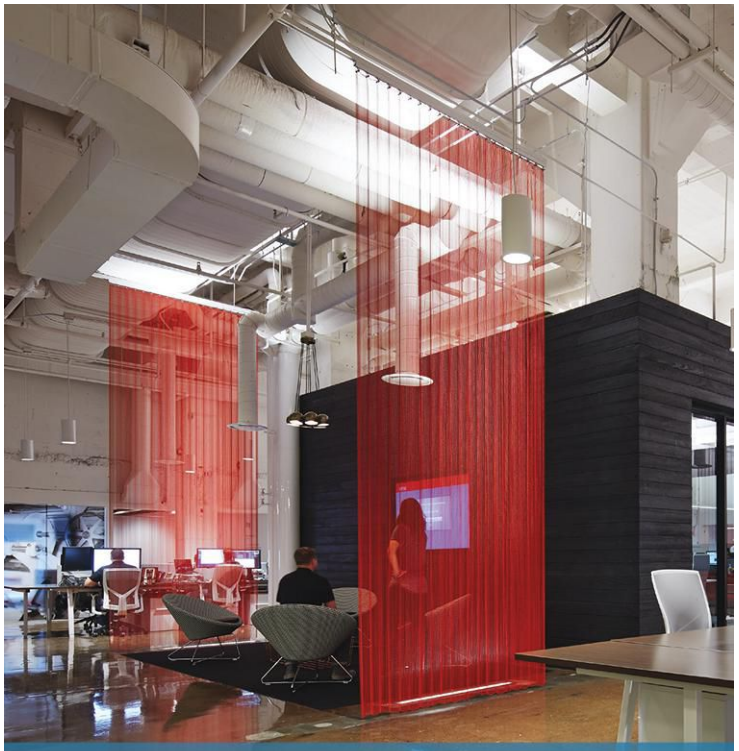
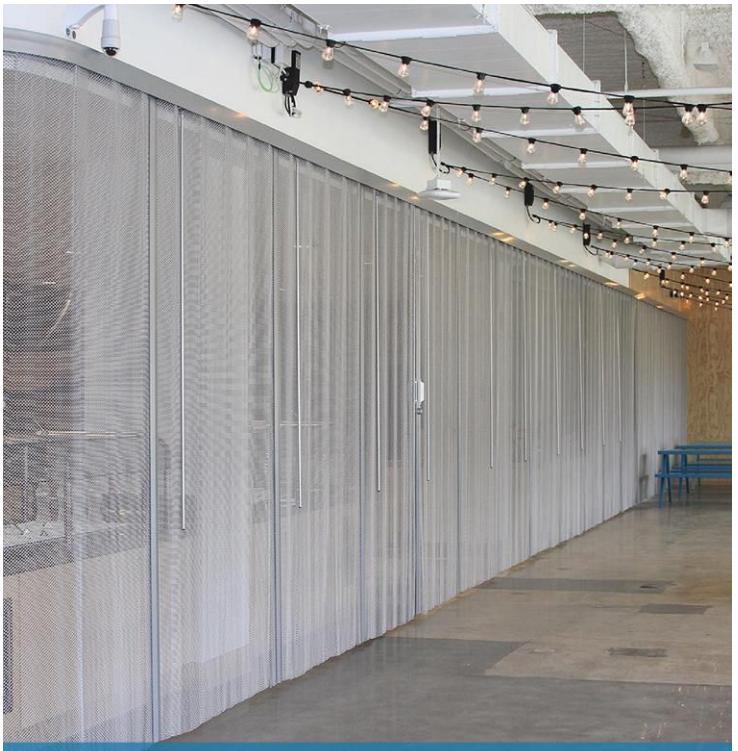
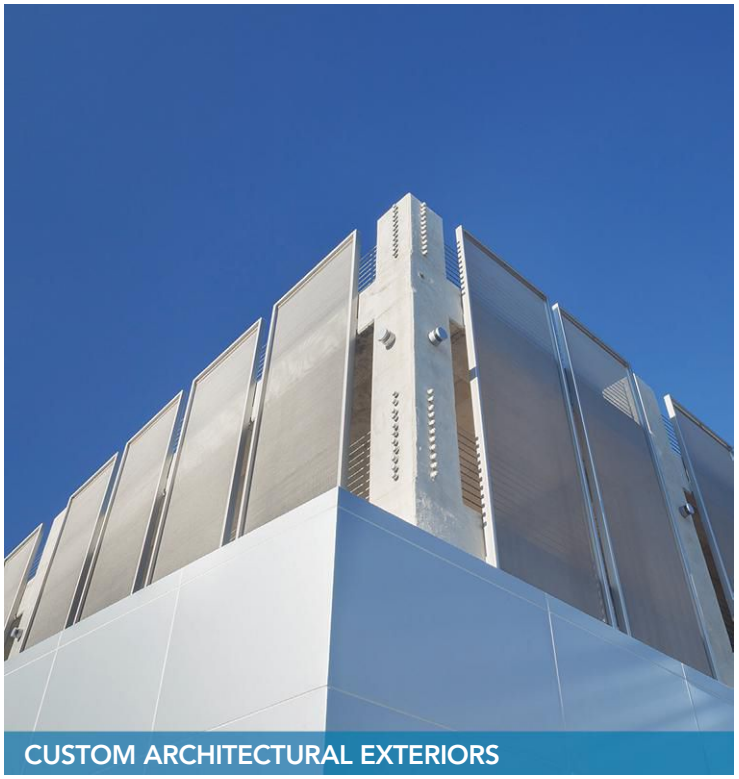


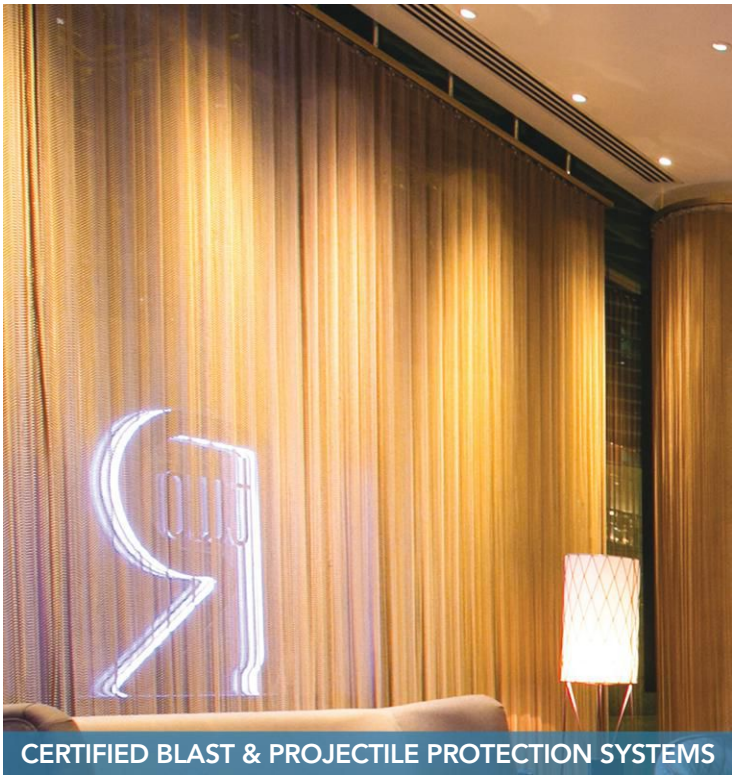
CUSTOM ARCHITECTURAL INTERIORS



PRE-ENGINEERED SECURITY GATES



CUSTOM ARCHITECTURAL EXTERIORS



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