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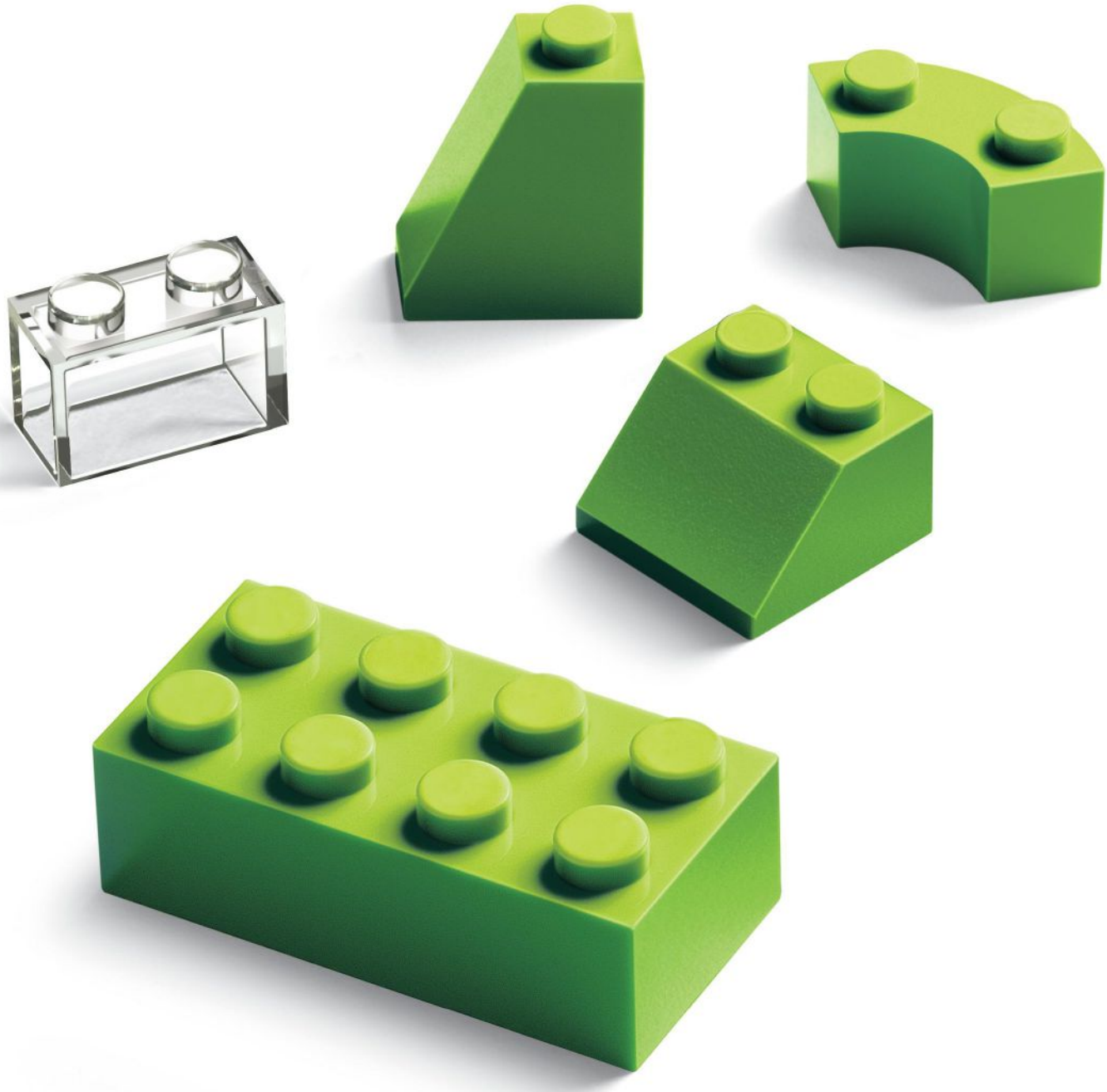

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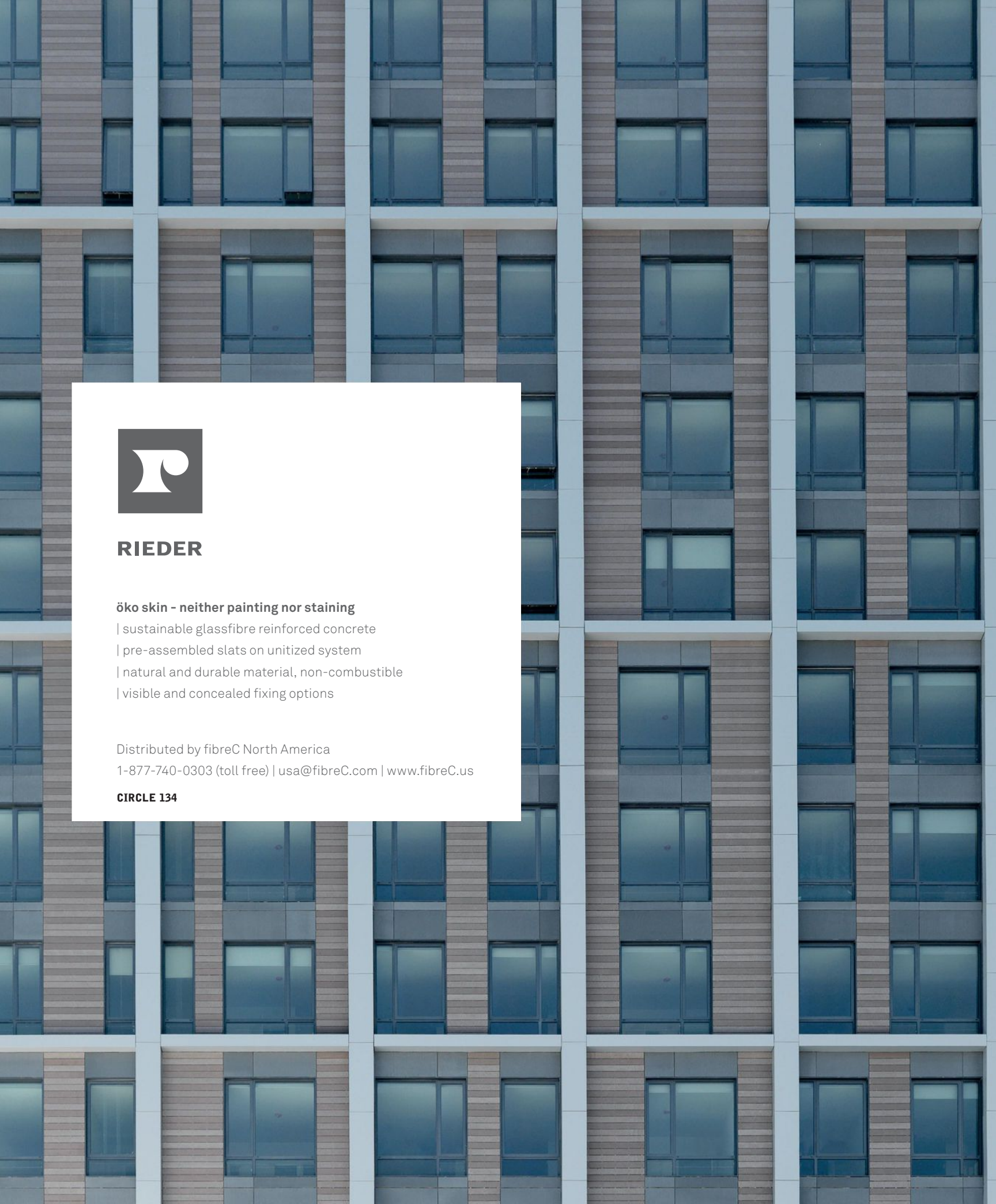

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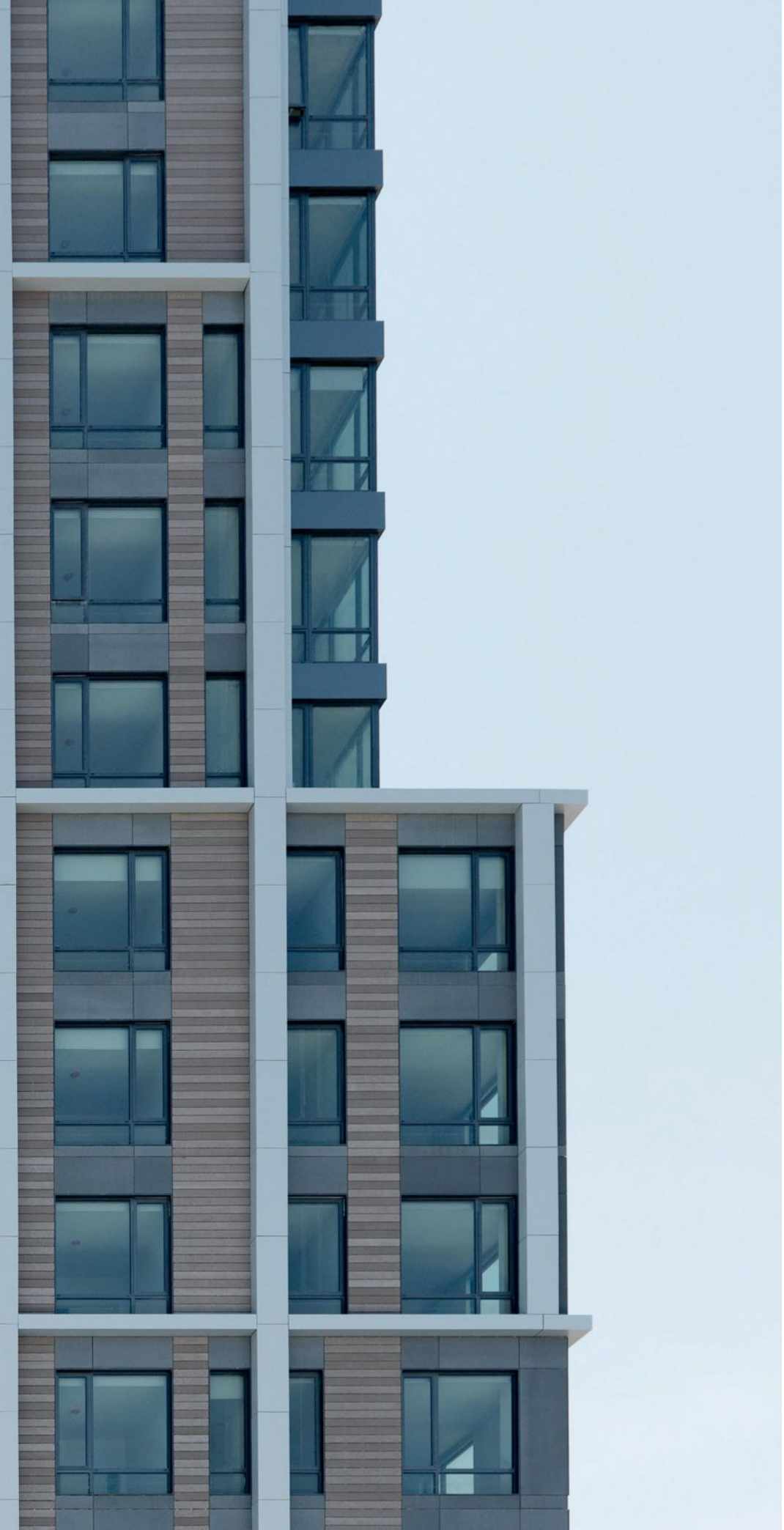

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Overcoming Structural Floor Squeaks in Wood-Framed Construction

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Top Five Tips for Successful Daylighting Design

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Optimizing Acoustics for Effective Sound Design and Performance

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RECORD celebrated its 125th anniversary with a gala at the Metropolitan Club in New York. Click through all our party photos to relive the event.

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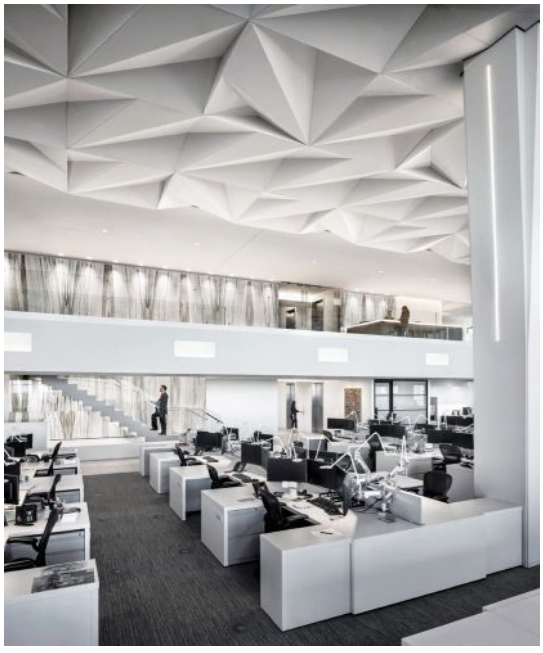
Do you agree with our lists of the Top 125 Buildings and Cult Classics? Let us know what you think in the comments section at the bottom of every article.



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HIGHLIGHTS

SCENES FROM THE NEWS
See Anderson Cooper in conversation with New York Mayor Bill de Blasio, designer Thomas Heatherwick, landscape architect Thomas Woltz, and developer Stephen M. Ross at the unveiling of Heatherwick's design for *Vessel* at Hudson Yards.

VIDEOS
Take a virtual tour of two RECORD Interiors projects: Vitol in Houston by PDR and Repossi Place Vendôme in Paris by OMA.

CONTINUING-EDUCATION ANIMATION
Watch a fly-through animation of the Shed, a multidisciplinary arts center under construction on the far west side of Manhattan, by Diller Scofidio + Renfro in collaboration with Rockwell Group.

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THE FUTURE

CONTINUING EDUCATION LEARNING OBJECTIVES

1. Discuss innovations and futuristic objectives for using shade structures constructed with fabric in commercial architecture.
2. Explain how shade structures made of fabric can add both appealing design and functionality to building structures.
3. Define the benefits of shade structures for personal health and UV protection.
4. Discuss how the use of textiles in shade structures can positively impact thermal performance and energy efficiency.
5. List LEED credits to which awnings and solar shades can contribute directly.

Learn more about the future of shade by completing this continuing education course at sunbrella.com/fosceu

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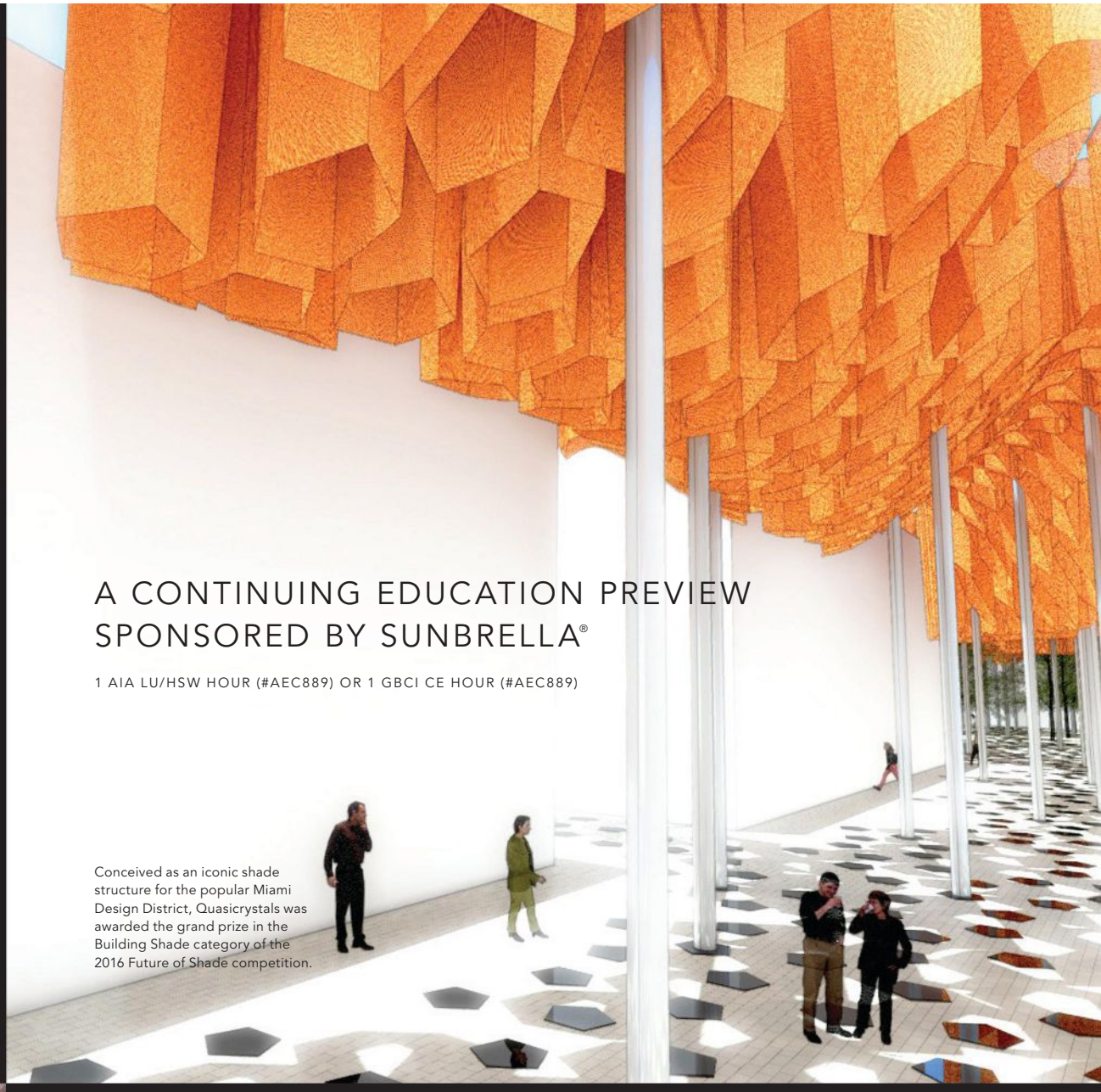

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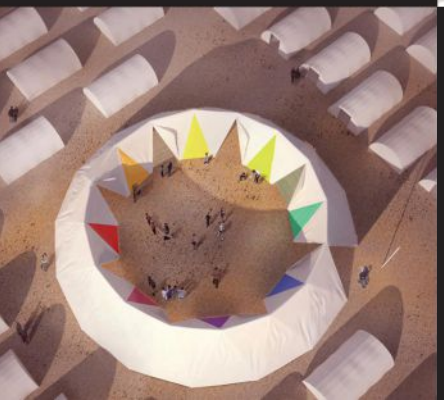
Conceived as an iconic shade structure for the popular Miami Design District, Quasicrystals was awarded the grand prize in the Building Shade category of the 2016 Future of Shade competition.



SHADE IS ARGUABLY ONE OF THE VITAL ELEMENTS IN MODERN LIFE, THOUGH NOT SOMETHING THAT TYPICALLY TAKES CENTER STAGE IN THE DESIGN DIALOGUE. UNTIL RECENTLY, FABRIC SHADE STRUCTURES WERE AN APPENDAGE TO A BUILDING, AN AFTERTHOUGHT, AN ACCESSORY.

A deployable school designed for refugee camps, REVOLVE, creates a free-flowing space that provides a balance between work and activity.

OF SHADE

FABRIC COMPONENTS IN SUSTAINABLE ARCHITECTURAL DESIGN

Increasingly, shade structures begin the design conversation. This is particularly so in commercial buildings, those in sunny climates, those which will inhabit a warming planet (this one), and by architects looking for new ways to create built environments in harmony with nature's forces. The future includes a conscious intention toward shade structures.

THE EVOLUTION OF SHADING FABRICS

In order to appreciate the future of shade and position oneself on the leading edge of this movement, it helps to review the past, the long history of using fabrics as architectural add-ons, and how the practice has evolved.

Prior to the 1960s, most awnings and shading fabrics were made of cotton canvas, which the sun broke down quickly. In 1961, the owners of one of the oldest, most respected fabric brands decided to change the nature of shading materials the company had been making since the 1880s. They replaced cotton with acrylic fibers and pre-extrusion pigments and offered an unheard-of warranty of five years. They were dubbed "performance fabrics."

In the 1970s, performance fabrics got the attention of boaters, and the outdoor furnishings industry exploded with these new, long-lasting yet pliable fabrics. In 1988, BMW became the first car brand to adopt this company's fabrics for its convertible models.

By the early 2000s, as the green building movement gained momentum with the U.S. Green Building Council's LEED rating program, more attention was paid to the sustainable nature of performance fabrics. As high-performing shade fabrics last longer, people use less fabric and thus generate less waste as compared to other fabrics that might fade, lose strength or give in to mildew and atmospheric chemicals. In fact, some fabrics can be recycled through manufacturer recycling programs, reducing impact on landfills.

SIGNAGE AND BRANDING WITH FABRICS

As the use of shading fabric continues its trajectory in modern architecture, its use as a business branding strategy spans the decades. Historically, a print canvas canopy over a cigar shop or beauty parlor signaled the establishment's presence to passersby. While that design practice continues today, modern corporate branding with fabric is often spectacular, with enormous printed banners moving in the breeze. They are a signal to passersby and even passing aircraft that business or cultural events are happening there. The colors of the shading fabric convey their own branding message, tying into the corporate, company, educational, or non-profit organization's identity.

EXPANDING SPACE

Shading strategies in corporate, cultural and residential settings create copious amounts of added space for meetings, gatherings, meals and leisure. While the cost of walls and a roof could be prohibitive, and most likely exceeding a particular lot's allowable square footage of structure, the addition of shaded "rooms" becomes a possible way to expand the amount of usable space. Fabric enclosures in commercial spaces such as restaurants can help boost profits by increasing the amount of outdoor seating available year round.

SHADE STRUCTURES FOR HEALTH AND UV PROTECTION

Protection from the sun has always been important to humanity, but never so much as it is in modern times, with holes in the ozone layer and the unprecedented speed at which our planet is warming. Whereas natural climate change occurs gradually, giving organisms the opportunity to evolve their own protections, the speed of this man-induced climate change requires man-made protections. Ideally, we don't want sunlight to be totally "on" or "off," and that is where UV-resistant shading fabric (as well as shade itself) comes into play.

Hanging Parasol Garden combines sun shading, illumination, water collection and climbing plants into one innovative shade system.

Cardo Plana is an efficient, easy-to-assemble flat-pack system designed to provide immediate shelter in disaster relief zones.

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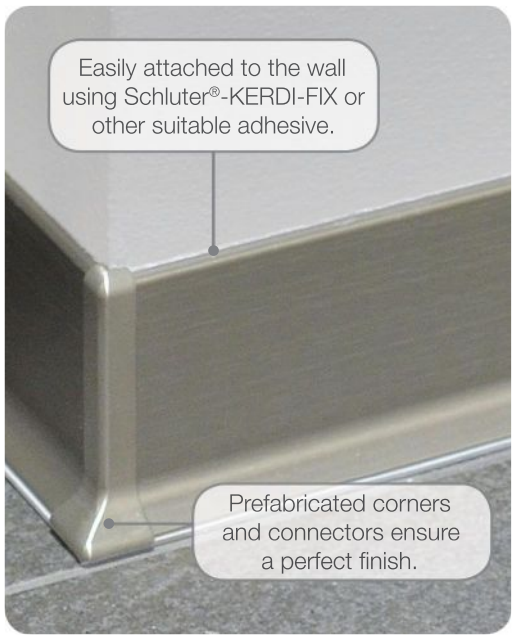

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Architecture and the History of Race

The story of the African American experience can be powerfully reflected in the built environment.

I GREW UP during the Civil Rights movement of the 1960s and, like many others of my generation, I like to think I am well-informed about the history of race in the United States. But, actually, no. I'm constantly finding gaps, small and large, in my knowledge of racial politics and its profound impact on the lives and experiences of so many fellow citizens.

Recently, I was in Detroit, a city I have visited all my life, and for the first time, I heard about "the Wall." Built of concrete, 6 feet high and 1 foot thick, and extending for a half-mile in the northwest corner of the city, it was constructed in the early 1940s to keep African Americans out of a planned new subdivision for whites and satisfy the FHA (Federal Housing Authority), which otherwise wouldn't guarantee a loan to the developer.

Today, on both sides of the wall are neighborhoods that are largely African American: the gabled-roof houses of the original development on one side and the tidy rows of more recent one-story brick ranch houses on the other. The wall itself is now a riot of color, adorned with murals and slogans, and paintings of figures such as Harriet Tubman and Rosa Parks. It stands as just one physical reminder of segregation and the obstacles African Americas have faced finding and investing in housing.

The story of racism isn't usually so clearly marked in the built environment. The prevalence of lynching in 19th- and 20th-century America is an ugly chapter of history from which people recoil, and the particular victims of its terrifying vigilantism have largely been forgotten. But, last year, the Equal Justice Initiative, a nonprofit based in Montgomery, Alabama, released a report documenting 4,000 lynchings that took place between 1877 and 1950. The group has collected soil from many of the actual sites of these murders, and is now planning to build a memorial in Montgomery, designed in collaboration with the MASS Design Group of Boston. The pavilion will include 800 6-foot columns representing the counties where lynchings took place, with the victims' names inscribed on them.

The effort to introduce specifics—names, places, and objects—into the sweep of historical events is a powerful tool for teaching. That is abundantly clear in the new National Museum of African American History and Culture, a vessel of evocative objects and individual stories, which opened last month in Washington, D.C. The architecture, by David Adjaye with Phil Freelon and the Freelon Adjaye Bond/Smith Group, is striking, particularly the three-tiered bronze-colored screen that wraps the entire building, inspired by the corona or crown of a Yoruban column from West Africa. Inside, the history begins with Africa, with the visitor traversing down handsome wide ramps to the softly lit spaces of the lowest levels of the museum, where an often harrowing narrative journey starts and moves through the Middle Passage and the cruelties and violence of domestic slavery to the institutionalized racism of Jim Crow. It is as if so much African American history has been buried and is now emerging into the light, capped by the triumph of African American achievement—or dominance—in every aspect of our culture and society.

London-based Adjaye had previously worked in Washington, designing two branch libraries over the last decade (RECORD, October 2012, pages 136 and 139). From meeting people in those neighborhoods, he learned that many African Americans don't feel part of the country's history. He was "charged" by that, he says, while designing the building.

At the media preview for the museum, I overheard someone ask a curator, "What would a white kid get out of this?" It was an unfortunate question, but one that this new institution will begin to answer. "This is not a *black* museum," the director, Lonnie Bunch, told *The New Yorker*. "This is a museum that uses culture to understand what it means to be an American." Not only will it help bridge the knowledge gap, but its presence on the National Mall, in the shadow of the Washington Monument, sends an unmistakable message that we have one vast, sprawling history, and all of us are part of it.

Cathleen McGuigan

Cathleen McGuigan, Editor in Chief

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perspective

A building has at least two lives—the one imagined by its maker and the life it lives afterward, and they are never the same. —*Rem Koolhaas, in a biographical documentary by his son, Tomas Koolhaas, which premiered September 9 at the Venice International Film Festival.*

Design Unveiled for Heatherwick's *Vessel* at Hudson Yards

BY MIRIAM SITZ

"I GET to be one of the first art and architecture critics here, and I really like what I see," said New York Mayor Bill de Blasio at the September 14 unveiling of Thomas Heatherwick's design for a monumental landmark at Hudson Yards—a $20 billion development along Manhattan's west side, spearheaded by Related Companies and Oxford Properties. But his praise came with a word of caution to the London-based designer: "If you meet 100 New Yorkers, you will find 100 different opinions," he said. "Do not be dismayed—this is just the way we are."

Drawing comparisons to an M.C. Escher composition, a pinecone, or even an insect's exoskeleton, Heatherwick's *Vessel* is a 16-story steel pavilion with 80 viewing platforms, 154 flights of stairs, and almost 2,500 steps. "Our project is about seeing if we could get a mile of public space and stitch it all together," the designer explains. The project will be the centerpiece of a new public plaza designed by Nelson Byrd Woltz Landscape Architects (NBW) in collaboration with Heatherwick Studio. Related Companies chairman and founder Stephen M. Ross—who has long touted the structure as "New York's Eiffel Tower"—said at the unveiling, "I wanted to create a 365-day Christmas tree."

Heatherwick says he and his firm felt "enormous pressure" to create a landmark worthy of its context: Hudson Yards, the largest private real-estate development in the United States, which will become home to half a dozen residential and commercial skyscrapers by 2025. "We knew we needed to engage with the space and somehow do justice to all these new places and special buildings around," he says, "but height couldn't be the primary thing."

The underside of the painted-steel-frame *Vessel* is clad in a copper-colored, polished steel skin. An entry garden and water feature will be situated at the structure's base.

The site's history didn't provide design cues either: "Other public spaces commemorate something," says Heatherwick, pointing to Trafalgar Square, which memorialized a British naval victory. ("Sorry to use a British analogy," he adds.) "But this is all new, with a rail line underneath."

"We were asked to make a landmark within this mature city, but we didn't want to make a sculpture for people to just look and clap at," says Heatherwick. The team pulled inspiration from stepwells—inverted pyramid-shaped water wells with step-lined walls, common in western India. "The act of rhythmically moving up and down multiple flights of stairs

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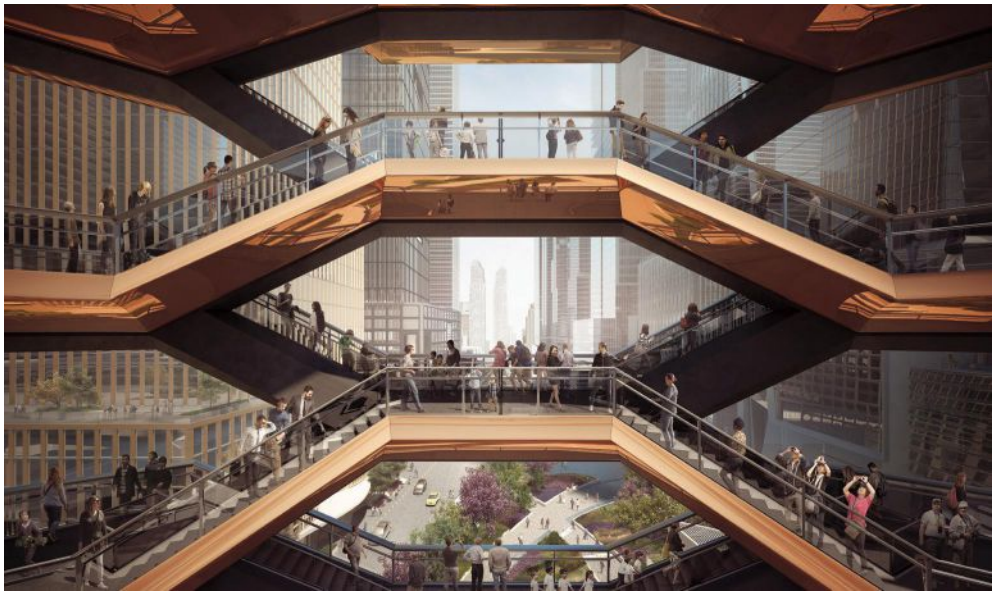
IMAGES: COURTESY VISUALHOUSE/NELSON BYRD WOLTZ LANDSCAPE ARCHITECTS; FORBES MASSIE/HEATHERWICK STUDIO (OPPOSITE)



While more than 150 staircases will connect the 80 viewing platforms, *Vessel* will also contain a glass elevator, allowing visitors with limited mobility to access landings on each of the 16 levels.

seemed to have the potential to become an extraordinary human experience," says Heatherwick. *Vessel*'s interconnected passages create a multipurpose space for exercise, meditation, sightseeing, and more, while providing shelter on covered landings and pathways.

The structure will be just one of the many areas of respite at Hudson Yards; almost six acres of plaza and gardens will contain tables, benches, and close to a mile of low walls for sitting. Landscape architect Thomas Woltz, principal and owner of Charlottesville- and New York–based NBW, led the design, working around the many structural constraints that come with a site built 7 feet above a working rail yard. "I will never again in my life take for granted being on real earth," he says. Heat generated by the commuter trains below can reach temperatures of 165 degrees Farenheit—too hot for tree roots to survive—so NBW worked with engineers at Jaros Baum & Bolles and Arup to embed a glycol tube-chilling system in the concrete slab at the base of the landscaping platform. The soil bed, ranging in depth from 19 inches to 4 feet, will support 225 trees in addition to tens of thousands of shrubs and groundcover plants, which Woltz and his team selected with multiseasonality in mind: "You'll find red twig dogwood that's a beautiful flowering shrub in the spring, has nice dark green foliage in the summer, and then, in the winter, the stems all turn an incredible glossy red."

Heatherwick sees the purpose of his *Vessel* and the Hudson Yards park and plaza as similar to that of the nearby High Line—which, he says, has "revolutionized" how people think of public space. "What's it for? It isn't for anything. It just gives you a different perspective and experience." The public space is slated to open in 2018. ■

Italy calls on Renzo Piano to Address Earthquake Resilience

BY ANNA FIXSEN

THE 6.2 MAGNITUDE earthquake that tore through a cluster of medieval towns in central Italy August 24 was swift and relentless. As emergency workers clawed their way through the rubble and as aftershocks continued, the death toll rose from one dozen to 120, then nearly 300. "Italy is crying," Prime Minster Matteo Renzi said in a televised statement.

Now that the dust has settled, the dead have been laid to rest, and some 3,000 displaced residents have been moved into tent camps, government officials are weighing long-term solutions to safeguard Italy's cities from future quakes. As part of these discussions, Renzi is calling on one of the nation's most prominent native sons—Renzo Piano.

The Pritzker Prize–winning architect, who was named a "senator for life" by the Italian president in 2013, is preparing a comprehensive strategic plan called Casa Italia to make the country's cities and historic structures more resilient.

"The project is not about the reconstruction of the little towns that were demolished," Piano told RECORD. "Instead, I've been asked to work on a generational project—I call it generational because it's not for the next five or 10 years, but 50 years.

"Italy is really fragile," he adds. "And beauty is fragile, by definition."

Italy has endured seismic events for millennia, with the towns scattered throughout the Apennine Mountains—a range that runs along the Italian Peninsula like a spine—being the most vulnerable. In 2009, the town of L'Aquila endured a 6.3-magnitude earthquake, killing 300; in 1980, a 6.9-magnitude quake killed 3,000. And a century ago, an earthquake laid waste to the town of Abruzzo, killing 30,000—95 percent of the town's population.

Piano is no stranger to earthquakes either, having designed buildings in seismic zones from California to Japan. In 1995, just one year after completing Kansai International Airport Terminal in Osaka (at the time, the world's largest), a 6.9 magnitude earthquake struck the region. The nearby city of Kobe was decimated, but not a single pane of glass broke at the Kansai airport.

"You will never be able to master earthquakes," Piano insists. "But you can limit the damage and the loss of life by being ready."

Per the request of Prime Minister Renzi, Piano will present a series of objectives to the Italian senate in the coming weeks. The architect has devoted his parliamentary salary to his independent research group, G124 (named after his senatorial office in Palazzo Giustinani). The group has spent the last few years researching ways to bolster cities' marginalized peripheries, but, this time around, they will devote their attention to earthquake resiliency.

"It's really a project that is more civic duty than architecture," says Piano, referring to his role as senator, "but I don't differentiate between civic duty and architecture—architecture is the art of making and preserving cities."

He adds, only half jokingly, "The advantage of being senator for life is that nobody can push you out."

In order for Casa Italia to be successful, Piano says that the government needs to prioritize two primary goals. The first, and most crucial, is to conduct a series of diagnostics to identify Italy's most vulnerable areas (mostly within the volatile Apennine range), to "introduce science instead of opinion."

Italy's prime minister asked Renzo Piano (above) to assist with a national resiliency plan following the earthquake that destroyed Amatrice, Italy (bottom, right). Piano aims to conduct retrofits without displacing residents, as with a 1979 project in Ontranto (bottom, left).

On paper, protocols exist: Italy has strict codes governing seismic standards–rules that were made even more stringent after the 2009 quake in L'Aquila. But they are poorly enforced, especially when it comes to retrofitting fragile historic buildings, an often complicated and costly process. According to a figure cited in *The New York Times*, the country has spent some 3.5 billion euros annually for the past half century fixing earthquake damage.

To mitigate some of the challenges of retrofitting, the second component of the plan is to develop a range of structural prototypes to reinforce a diversity of buildings—"almost like surgery"—in lieu of a one-size-fits-all approach. The architect cites a UNESCO-backed restoration project he conducted in 1979 for Otranto, Italy. Though the project didn't focus on quake resilience specifically, it aimed to preserve the town's historic center, utilizing unobtrusive construction techniques and tools. Such interventions reduced costs, and—crucially—circumvented the need to move people from their homes. "This is the most fundamental thing, socially speaking," says Piano. "The house is a safe place—it's everything."

Piano hopes to issue a complete report with G124 within the year. But the architect acknowledges there is only so much he can do alone: "I will certainly put my nose there, but of course I need the government for this to work." ■

PHOTOGRAPHY: © RPBW (TOP; BOTTOM, LEFT); DANIELE ALOISI/ITALIAN RED CROSS (BOTTOM, RIGHT)

Obituary: John Belle, 1932–2016

BY FRED A. BERNSTEIN

John Belle (left), a cofounder of Beyer Blinder Belle, passed away last month. Though best known for the renovation of Grand Central Terminal (below), his firm's projects included the restoration of the South Street Seaport and the creation of a landscaped mall at Stony Brook University.

PHOTOGRAPHY: © CHIA MESSINA (TOP); MAËLICK VIA FLICKR (BOTTOM)

JOHN BELLE, who died September 8, at 84, helped restore several of New York's most important buildings, including Grand Central Terminal and the soaring Enid Haupt Conservatory at the New York Botanical Garden. Those efforts earned Belle and his firm, Beyer Blinder Belle, a reputation as guardians of the city's architectural treasures.

Born in Cardiff, Wales, and educated in England, Belle moved to the United States in 1959, just in time to witness the destruction of cities by proponents of "urban renewal." "I was determined to find a different way," Belle later wrote. In 1968, after working for Jose Luis Sert and Victor Gruen, he started a firm with Richard L. Blinder and John Beyer. Inspired by the writings of Jane Jacobs, they focused not on "urban renewal" but on the rehabilitation of historic buildings.

The firm's first projects were tenement renovations in Brooklyn and the Bronx, but its careful approach to restoration gradually led to higher-profile commissions. Its acclaimed 1990 renovation of the abandoned Main Building of the Ellis Island Immigration Station turned the structure into a museum. The next triumph was the renovation of Grand Central Terminal, which included the creation of a new marble stairway on the building's east side. Critic Herbert Muschamp praised the firm for revealing that "Grand Central is above all a monument to movement," and Belle proved that he was capable of making buildings not just as good as new, but better.

In May 2002, Beyer Blinder Belle was selected to present concept plans for the rebuilding of the World Trade Center site. But the firm, known for historically inflected architecture, never had a chance—and not just because it was given an overly ambitious program and an absurdly tight deadline. When the massing study plans were released, the critics pounced. "John was being judged on buildings he hadn't designed and had no intention of designing," said Margaret Pine, a longtime friend. Belle told critic Paul Goldberger, "We were the first line of soldiers over the trenches, and you know what happens to them in wartime." (Daniel Libeskind was eventually selected as master planner.) Belle is survived by the scores of buildings he helped bring back to life. ■

[NEWSMAKER]

Mark Wigley and Beatriz Colomina

BY FRED A. BERNSTEIN

THE ISTANBUL Design Biennial has always been more symposium than trade show. The inaugural edition, in 2012, curated by Joseph Grima, investigated the cultural effects of new production methods. The follow-up, headed by Zoë Ryan, looked at how designers can predict, and influence, the future. Istanbul's third biennial addresses the question "Are We Human? The Design of the Species: 2 Seconds, 2 Days, 2 Years, 200 Years, 200,000 Years." Its cocurators are architectural historians Beatriz Colomina, a professor at Princeton University, and Mark Wigley, a professor and former dean at Columbia's Graduate School of Architecture, Planning and Preservation. After they began organizing the show, which will take place at four venues in Istanbul from October 22 to November 20, the country was rocked by a coup attempt and the government crackdown that followed.

When were you last in Turkey?

Wigley In June. But we talk with the people there every day, so we have a pretty good idea what's going on.

Did you consider ending your involvement?

Colomina Of course. But after 9/11, friends were asking how we could stay in New York.

Wigley It would be super-offensive to have an exhibition of beautiful chairs and lamps at this moment. If we were doing that kind of show, we would have said, "We're out." But we have the opposite feeling. We want to discuss the ethical responsibilities of design.

Colomina We have more than 70 contributors, from all over the world, and not a single one has said, "I'm not coming."

Wigley It's important also to say that none of us—the contributors, the organizers—are naive about what is a difficult, tense, and complex situation. If our colleagues internationally and in Turkey had said they think this is the wrong moment, we would have stopped. But you could even say that this situation makes the discussion of design more important rather than less.

How so?

Wigley People on this planet don't treat each other or other species well, and we think that's an issue the design community can engage with. Design is the conversation you must have when things are difficult.

As curators, do you ultimately answer to the Turkish government?

Wigley The Istanbul Foundation for Culture and Arts, which sponsors the biennial, is a private, not-for-profit organization. One of the reasons they asked us to do this in the first place is that they didn't want a business-as-usual design biennial.

You've said you won't be showing chairs or lamps. What will people look at?

Colomina There are more venues than before, and more to see. There will be a huge number of new things . . .

Wigley And also old things. In the section on the body, we're exhibiting the Dresden "glass man," the transparent model made for the German Hygiene Museum in 1935. In the section on time, you'll see 13th-century Islamic Renaissance automatons.

What else will you be showing?

Colomina We did an open call for two-minute videos on the question "are we human?" and 200 came in. All 200 will be exhibited.

It sounds like there could be too many voices.

Wigley I suppose we're more concerned that there aren't enough voices. We strongly believe that, in today's world, ideas are generated collaboratively. We want to avoid the situation where we're using people's contributions as illustrations of our ideas. We want to to present their ideas.

Colomina Whenever we mention the theme "Are We Human," people start to answer.

Which has led to a lot of discussion on social media.

Colomina So much so that, at the opening of the Venice Architecture Biennale in June, people said, "I'm sorry I missed your biennale." We said, "It hasn't opened yet."

What kind of audience do you expect?

Wigley The last Biennale drew 200,000 people. They think they may get even more this year, because a lot of the show deals with everyday things, like your behavior, your identity. The whole thing is set up as a mirror. So it should interest people from all walks of life.

noted

Museum of Arts and Design Appoints New Director

In time for MAD's 60th anniversary, Jorge Daniel Veneciano will take the helm at the New York museum October 3. Previously executive director of El Museo del Barrio, Veneciano has taught at Columbia and the Rhode Island School of Design.

Paulo Mendes da Rocha Wins Praemium Imperiale International Arts Award

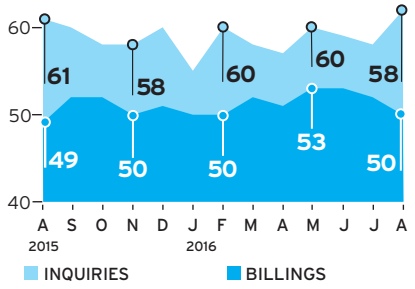
The Japan Art Association has honored the Brazilian architect, known for his brutalist architecture in São Paulo, with the prestigious international arts prize. Known for his work in steel and concrete, Mendes da Rocha was recognized alongside filmmaker Martin Scorsese, photographer Cindy Sherman, and others.

Jeanne Gang's Vista Tower in Chicago Breaks Ground

Construction began in early September on the 98-story riverfront skyscraper, which stands to become the third-tallest in Chicago and the tallest ever designed by a woman. The glass-and-steel-clad building will comprise three connected volumes with undulating silhouettes.

Carme Pinós Wins 2016 Berkeley-Rupp Architecture Professorship and Prize

The UC Berkeley College of Environmental Design (CED) has recognized the Spanish architect for her contributions to gender equality in the field of architecture, awarding her a prize of $100,000 in addition to a semester-long professorship and a gallery exhibition at CED.



ABI Slips in August

Though the AIA's Architectural Billings Index (ABI) has remained in positive territory for most of the year, August marked a slight downturn with a score of 49.7, a 1.8-point slump. Any score above 50 indicates an increase in billings. However, according to AIA economist Kermit Baker, "it doesn't appear that this is the beginning of a broader downturn." The new projects inquiry index meanwhile spiked to 61.8 points.

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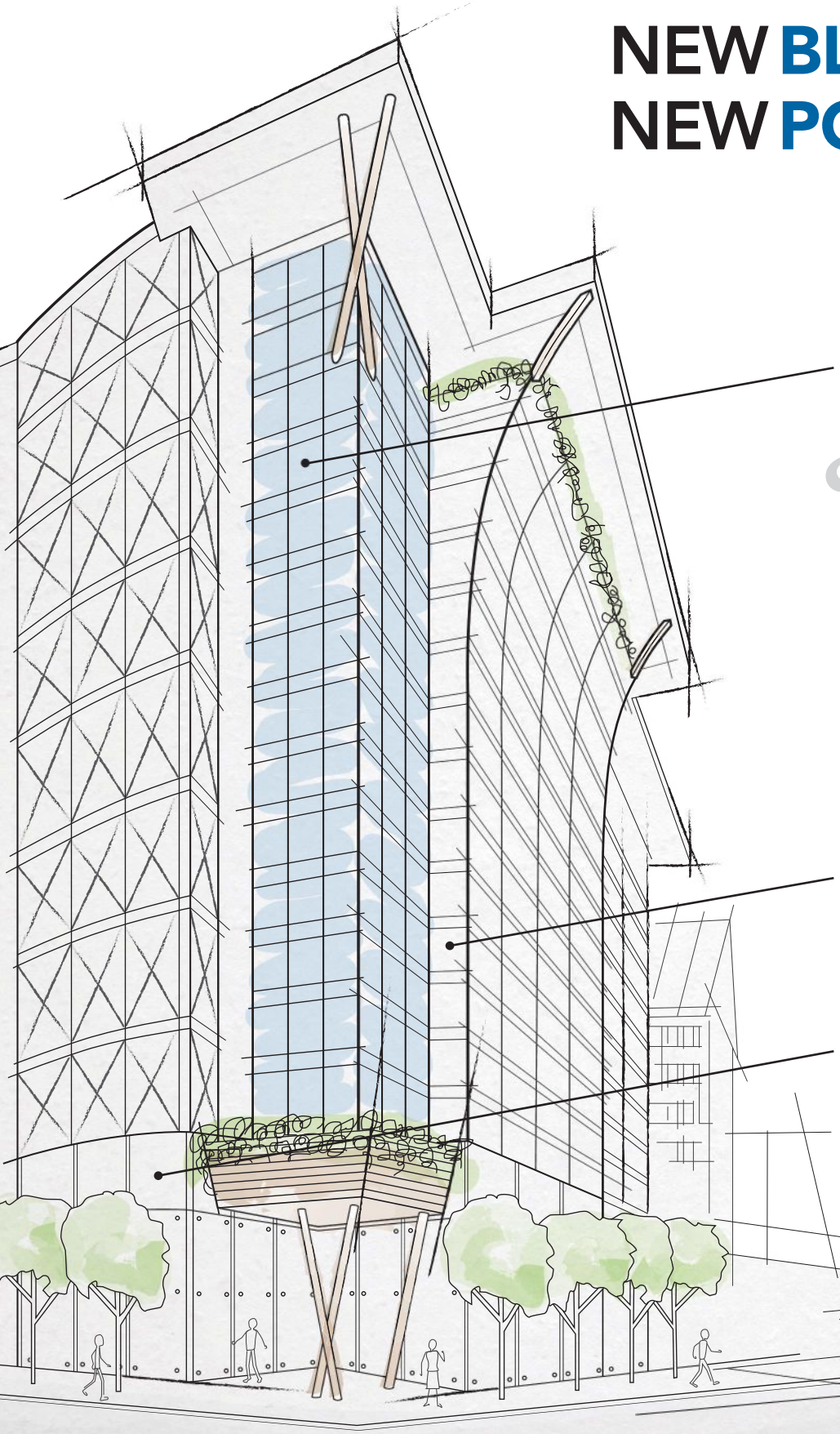

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perspective **house of the month**

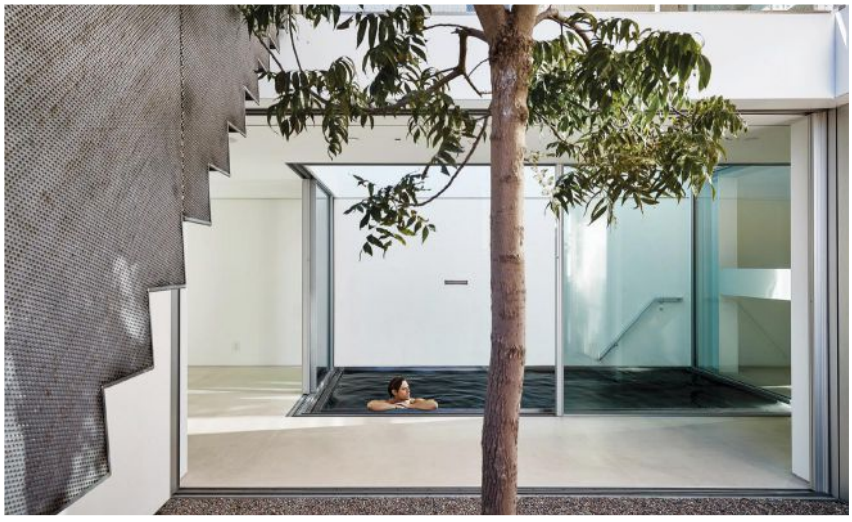
A COMPACT STREET PRESENCE BELIES EXPANSIVE LIVING SPACES IN JENSEN ARCHITECTS' URBAN HOUSE. **BY LYDIA LEE**

URBAN DWELLINGS can feel highly compartmentalized, composed of segregated levels. A recently completed four-story home, at the crest of San Francisco's affluent Pacific Heights neighborhood, is surprisingly expansive. Designed by Jensen Architects, the house is a series of glazed volumes with complementary outdoor spaces.

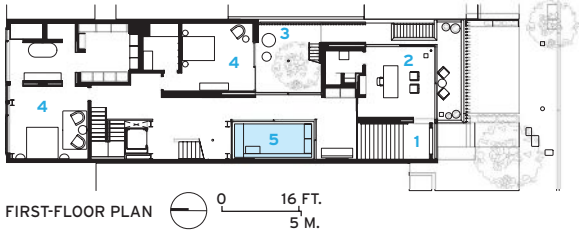
"The clients were interested in a radical level of openness," says Frank Merritt, a principal at Jensen. The property's original house was designed in 1941 by architect Gardner Dailey, an early Bay Area modernist. Over the years, its identity had been compromised by renovations, but it retained its unusual layout. Designed for a closer view of the Bay, the back of the house was nearly at the property line; instead of a backyard, it had a courtyard between the main structure and the garage.

The architects' design is essentially a new building inspired by the original layout. They excavated below the steeply sloping grade to create guest quarters, expanded the main house, and added a small penthouse level. A glass-walled hallway separates the new gravel courtyard from a jetted lap pool: an urban version of a suburban backyard. On the third level, the open living/dining/kitchen area flows onto a large deck that continues past the courtyard to the front edge of the house. At the top, the pavilionlike penthouse has glass sliding doors on three sides for enjoying the view. While the 5,800-square-foot house is considerably larger than the original, it is still well under the maximum allowed because of its emphasis on outdoor space. The main level is visually connected to the level below: from above, there's a clear sight line all the way through the courtyard to the entrance.

With so much transparency, solar gain and privacy are an issue. The architects installed translucent mechanical pocketed shades in front of every glass wall, and added a second layer for the street-facing spaces. The kitchen is shaded by the cantilevered penthouse, and the penthouse itself has external fins that offer a clear view straight on but obscure side views. The extruded-aluminum louvers have an airfoil-shaped profile that is 8 inches deep and 1 inch wide. "As much as we architects like big expanses of glass, there's the psychology of space—we needed to mitigate that feeling of living in a glass box," says Merritt. ■



Distinguishing the front facade, each volume has a different cladding, including a perforated metal screen for the vertical bifold garage door (top). A waterfall spout (not shown) over the pool allows it to double as a large water feature (above). The penthouse deck offers spectacular views of the Bay (left).



FIRST-FLOOR PLAN

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3 COURTYARD
4 BEDROOM
5 POOL

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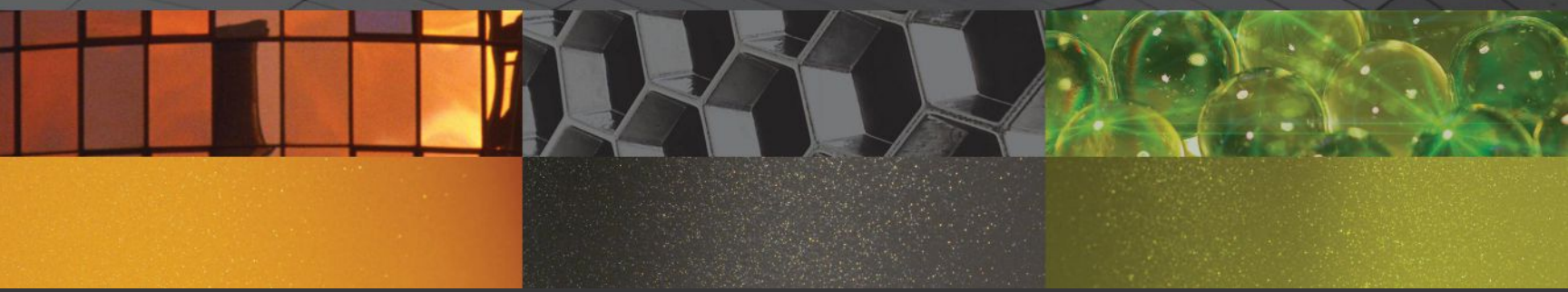

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CIRCLE 204

Tipping the Scales

Superunion Architects skillfully balances a variety of work—large and small.

BY ANNA FIXSEN

PERUSING THE Oslo-based firm Superunion Architects' portfolio is a bit like zooming in and out with a telephoto lens: some views reveal the wider picture, while others bring even minute details into focus. Take a 7-foot by 10-foot area rug the architects created patterned with topographic images of Las Vegas, or a 250-acre airport master plan in southeastern Norway. Superunion deftly navigates such leaps in scale.

"The detailing of an interior can inform work at a bigger scale," says Johanne Borthne, 38, who cofounded Superunion with Vilhlem Christensen, 32, in 2011. "The buildings in a master plan become more than abstract blocks on a field of grass, because you have developed a sense of what it feels like to be in different spaces. These shifts are interesting for us." Adds Christensen, "Overall, we have the same approach regardless of scale, which is to reach a clear and simple solution to a problem."

Superunion has swiftly established itself as one of Norway's most promising emerging architecture firms, receiving Norway's prestigious Anders Jahr Culture Prize for young architects in 2014 and participating in the Oslo Architecture Triennale this fall. At the moment, they are on the cusp of realizing their first major built work, a market in Oslo and a city square on the opposite coast.

Borthne and Christensen met while completing their M. Arch. degrees at the Oslo School of Architecture and Design. After graduating, the partners moved to Rotterdam to work—Borthne at the firm Powerhouse Company and Christensen at OMA. Two years into their stay, they had the opportunity to work with the firm Futureproof on a commission to develop a strategy for an airport in Rygge, Norway, that incorporated a regional transportation hub and several mixed-use buildings. Though the master plan wasn't realized, the experience impelled the pair to strike out on their own and return to Oslo. "It was the perfect chance to fulfill a dream and have our own thing," says Borthne.

After the airport study, the architects entered a wide range of competitions, from a development plan for two cities in southern Norway to an information kiosk that would cover an unsightly ventilation pipe in Oslo. The firm had a breakout moment in 2011 when a proposal for a natural-disaster museum in Turkey—a black rectilinear volume balanced atop a large gold statue of the god Atlas—circulated through architecture blogs. While the entry didn't win the competition, the model became a part of the Norwegian National Museum's permanent collection, alongside those by Sverre Fehn and Snøhetta. It also caught the attention of rapper and architecture buff Kanye West, who considered a similar design for an office.

At a larger scale, Superunion has a special interest in the design of public spaces, an asset that is abundant in major Norwegian cities but, in the firm's view, one that is underdesigned and underutilized. Borthne and Christensen (who also teach at various architecture schools) talk of "repairing" these conditions by introducing more intimately scaled elements such as pavilions, fountains, pedestrian paths, and plantings. "Oslo is trying to find its urbanity by discussing city life, but the recipe seems to be the same," says Borthne. "It's assumed that if you have an open ground floor and squares everywhere, you will have city life, but what kind of space are we actually creating?"

Superunion (inset) completed an atelier last year at Oslo's Kunsternes Hus, Norway's largest artist-run gallery. Its minimal interior features a spiral-shaped curtain to facilitate multiple activates at once. Currently, the firm is working on a food hall in Oslo (bottom, left) and a park and transit hub in Sandnes, Norway (bottom, right).

Borthne and Christensen are investigating these spaces in their current work. One project is a market, set to open next spring. The facility, called Vippa, will feature a brewery, food stalls, and an educational kitchen housed within an industrial shed in Fjord City—a rapidly developing zone along Oslo's waterfront. For the architects, it is important to maintain the area's raw character, while creating spaces for cultural events.

This June, Superunion won approval to build a public square in Sandnes, Norway, a coastal town of 70,000. The square, a competition-winning design in collaboration with the firm Space Group, will link the city's old quarter with its new district and connect bus, tram, and train lines. The project's focal point, a central ellipse, will accommodate activities ranging from ice-skating to film screenings and skateboarding.

At the other end of the spectrum, Superunion is featured in the main exhibit at the Oslo Architecture Triennale, on view through November 27, where the team has displayed free items gathered from finn.no (Norway's Craigslist)—vases, a TV, a puffy leather sofa, and plenty of IKEA castaways. "In 24 hours, we've collected everything you need for a home," says Christensen. "It's humorous, in a way. We're opening up a discussion about what objects mean to people." ■

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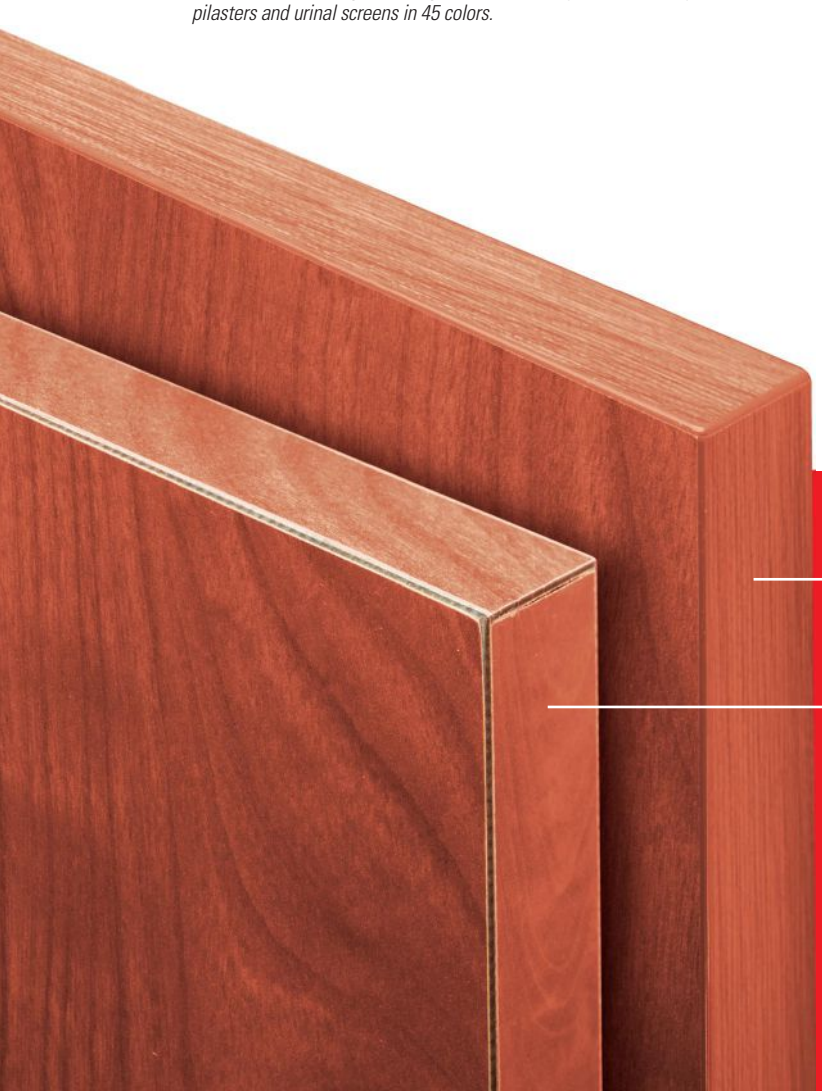

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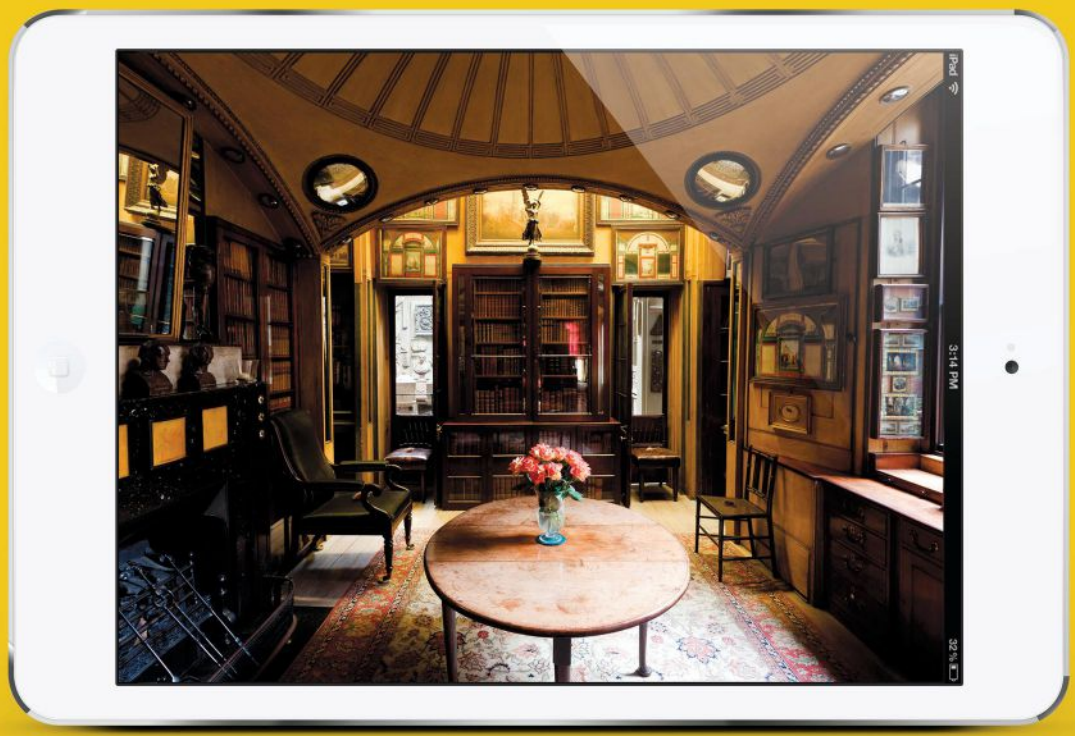

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Arts and Crafts

Gensler's headquarters for Etsy reflects a commitment to employees and the planet.

BY LAURA RASKIN
PHOTOGRAPHY BY GARRETT ROWLAND

SINCE ITS founding in 2005, Etsy has become the go-to online marketplace for handmade goods, with 1.6 million active sellers and 35 million items for sale, from food to furniture. When the company outgrew its headquarters in Brooklyn's DUMBO neighborhood—having gone from 50 employees to 500—it wanted to design its own space. But there was no question about staying nearby. "We've always been a Brooklyn-based company," says Etsy's capital projects manager, Justine Chibuk. "Staying here is part of our brand identity."

In May, Etsy moved into its new nine-floor, 200,000-square-foot headquarters around the corner from its old home. A handsome curved steel stair greets visitors and employees, leading them to the second-floor lobby. The weathered Alaskan Yellow Cedar stair treads come from decades-old water towers that used to sit atop the roof of the building—part of a complex of reinforced-concrete factories built in the 1920s by Squibb Pharmaceuticals. In addition to creating the welcoming entry, Etsy's architect, Gensler, placed a large dining room on the second floor, clustered programmers on floors three through five, and

A dramatic steel stair (top) connects Etsy's entrance lobby with a second-floor reception and lounge space. The headquarters includes numerous custom pieces by local makers, such as cast-concrete and walnut lighting pendants by IN.SEK (above).

Etsy hosts craft nights and workshops in its "lab" (top), which features tables sized for large, collaborative projects. Brooklyn designer and fabricator First Third created the office's workstations (above).

devoted the top floors to educational and employee-wellness programs.

When the architects first toured the warehouse-like building, "We were amazed by some of the fabulous things around the site," says Gensler principal Amanda Carroll. In addition to the water towers, they encountered artifacts such as heavy, sliding steel doors that once closed off bridges connecting the complex. The landlord had planned to discard these leftovers, but Carroll recalls saying, "No, no, no! Please give us that. Your trash is our treasure." (Gensler ultimately repurposed the doors for a conference room and as art objects throughout the space.)

Salvaging these materials made perfect sense for Etsy because of its dedication to sustainability and its employees' hackerlike predilection for reuse and reclamation. So, although it wasn't originally part of the project, the architects suggested pursuing the Living Building Challenge (LBC). They recognized that the stringent certification system—which bans the use of harmful materials, requires management of construction waste, and net-positive energy and water, among other directives—aligned well with the client's culture, says David Briefel, Gensler's director of sustainable design. Etsy is going after partial certification, aiming for LBC's Materials, Site, and Beauty and Inspiration "petals," or categories. It is one of the largest projects seeking petal certification.

In order to satisfy LBC's tough requirements for materials, the team scrutinized more than 1,500 products, everything from intumescent paint to insulation, millwork, and furniture. They needed to make sure that the items didn't contain ingredients on the Red List—a group of chemicals commonly found in building products but considered harmful to animals, humans, and the environment.

In order to convince manufacturers and makers to reveal their ingredients and adapt their products, Gensler and Etsy developed a two-pronged approach. For makers, they hosted workshops that explained LBC and why it was important, and they suggested alternative materials. The result was 30 maker-made products used throughout the headquarters that are free of Red Listed substances. For commercial manufacturers, the project team hunted for the right stakeholders within each company—a time-consuming endeavor. But once the appropriate contacts were identified, many manufacturers were open to modifying their products. One such manufacturer was Lukas Lighting. It swapped out the PVC in its fixtures for polypropylene. Maharam Kvadrat reengineered its wool wall coverings to eliminate a stain-resistant finish that contained Red List chemicals.

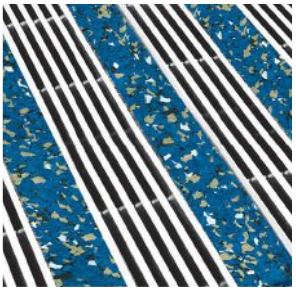
Gensler also partnered with longtime Etsy neighbors. Brooklyn-based First Third designed and built all the workstations, while IN.SEK created reclaimed-wood planters and walnut-and-concrete pendants. Because LBC dictated that all the wood in the project needed to be salvaged or Forest Stewardship Council–certified, Etsy helped some of its makers, including IN.SEK and First Third, to obtain group certification, reducing the cost and work necessary to achieve the designation.

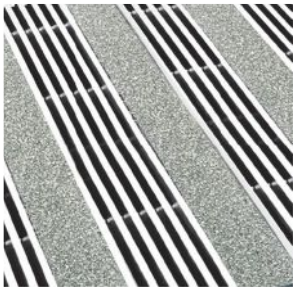
Gensler aimed to make each floor a "fully balanced ecosystem," says Carroll, with places for nourishment, stress relief, and, yes, work. Every floor has a kitchen, where employees are encouraged to recycle and compost. Quiet, plant-filled nooks with upholstered furniture can be found around many corners, and a variety of other environments—from standing tables to focus and meeting rooms—encourage people to work where and how they please.

On the roof deck, a solar array satisfies about 1 percent of the headquarters' energy demand. It's a gesture, says Briefel, but it is emblematic of Etsy's long-term goal of creating a carbon-neutral marketplace. Etsy plans to achieve this with Etsy Solar, an initiative to help sellers install solar panels on their roofs to offset the company's carbon emissions, which are mostly accrued by shipping goods to buyers.

Not only is the headquarters a benchmark project for Gensler, proving that it can go after LBC certification on a grand scale, but it is also a teaching tool. "A lot of these moves are great ways to point out how sustainability functions," says Carroll. "There's a ripple effect. It encourages better choices." ■

Laura Raskin, a former RECORD *editor, is a Brooklyn-based freelance writer.*





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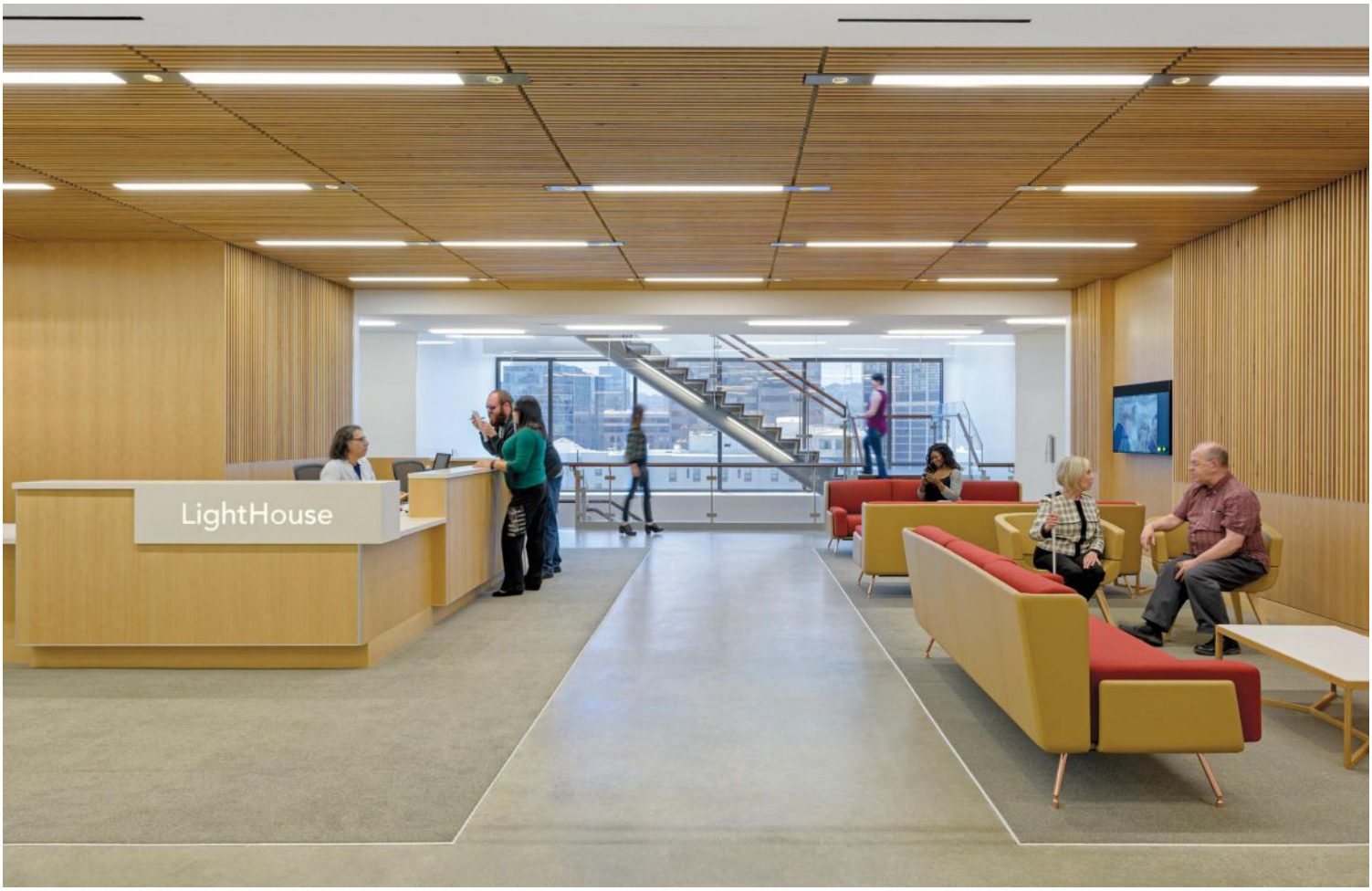

Light Touch

An agency employs subtle design strategies to better serve its visually impaired clientele.

BY PETER SLATIN
PHOTOGRAPHY BY JASPER SANIDAD

EXPECTATIONS ARE not usually high for the design of a nonprofit social service agency. When the client base and employees are overwhelmingly blind or vision impaired—as they are at the LightHouse, a 114-year-old private organization that provides rehabilitation, advocacy, and other services—those expectations slip even lower. But, thanks to the efforts of a forward-looking director and a board president who is an architect—both of whom are blind—and a committed design team led by Mark Cavagnero Associates, the new home of the San Francisco LightHouse, which needed to grow its space, stands such preconceptions on their heads.

Every element of the design—from circulation to lighting to mechanical equipment and the tactile and acoustic properties of surface materials—was shaped to the advantage of users whose visual challenges and compensating skills span an enormous range. The perceptions that LightHouse CEO Bryan Bashin most wanted to upend were those of new clients and their supporters. "Bryan wanted a space that was uplifting, not a woe-is-me experience," said Mark Cavagnero, whose San Francisco–based firm was selected by a design committee as the architect for the $13 million project. Even so, the environment couldn't be so "soft and gentle," says Cavagnero, that clients would be unprepared for the hard corners of the real world. The LightHouse also had an extremely unusual resource in Chris Downey, a successful Bay Area architect who became blind during an operation to remove a brain tumor in 2008. Downey, who immediately decided to continue in his chosen career, joined the LightHouse board in 2009 and is now its president.

The intimate reception area (above) opens to a central stair, daylit by glazing alongside and above it. Color-changing LED panels (left) animate the polished-concrete circulation path and an adjacent social space.

The new 45,000-square-foot facility—triple the size of the old space—occupies the top three floors of a Market Street office building that the organization acquired during the three-year design and development process, thanks to a surprise bequest after the relocation plan


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CIRCLE 209

A training kitchen accommodates 12 workstations and was designed so that instructors can be clearly heard over the activity.

was already well along. Staff offices, a boardroom, and a small conference room occupy the ninth floor. The 10th floor holds the main teaching spaces and features a large multipurpose room as well as a 12-station training kitchen, tech labs, a retail store, a low-vision optometry clinic, and music and videoconferencing rooms. Eleven dorm rooms (for short-term stays by students in immersive programs), a community kitchen and laundry, a maker's workshop, fitness center, and a STEM classroom occupy the 11th floor.

A central stair connects the three levels and ties the entire space together. It was Cavagnero's embrace of this element and the skylight that caps it that cinched the commission, says Downey. The other firms "failed to grasp the point of a skylight for blind users, but Cavagnero spoke convincingly and poetically about the power and meaning of natural light in our space." A relatively small percentage of blind people have no sight at all, and even for those who can only distinguish light and shadow, daylight provides wayfinding cues and a sense of time passing. The stairway is wide enough to accommodate two people and one service dog. The element that was possibly the most fully tested in mock-up for the entire project is the handrail, made of Brazilian hardwood and molded to feel warm and welcoming in the hand and physically connect visitors to the space through touch and scale. The heart of the project, the stair, conveys the sounds of foot traffic and conversation and the smells wafting from the training kitchen, linking users to all manner of activity going on around them.

The design team worked with Arup, which conducted extensive digital acoustic modeling of materials and room environments to balance acoustic resonance and liveliness with functionality and comfort. The goal, says Downey, was to achieve a "desirable level of speech intelligibility." Acoustics were modeled through digital animation to find a sound level that is warm but not overbearing, where cane taps and footfalls—human or canine—enliven the space. This drove the choice of a Brazilian hardwood for the staircase (in addition to the handrail) and polished concrete for the main circulation path. An aluminum band indicates the edge of this path and the start of carpeted function spaces, such as the tech labs. The team clad many of the public areas' walls and ceilings in slatted hemlock, chosen for its acoustical and visual warmth. And they wrapped the walls in the training and volunteer rooms in brightly colored, acoustic felt panels that "beg to be touched," says Katy Hawkins, project manager at Mark Cavagnero Associates.

In the boardroom, the modeling was used to allow for the admission of limited sound, like that of an occasional streetcar, keeping people connected to the city. But the general din of traffic is muted. Bashin's embrace of the new LightHouse is anything but muted. "When people enter a blindness journey and come here," he says, "instead of fear, they see hope, warmth, community, innovation. They see the LightHouse as an organization that is about empowering people to change." ■

Peter Slatin is an accessibility consultant and writer based in New York.

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CIRCLE 243

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ENTER NOW! A monthly contest from the editors of RECORD asks you to guess the architect for a building of historical importance.

CLUE: THE NEOCLASSICAL ARCHITECT EXPERIMENTED INVENTIVELY WITH HIS HOUSE IN WAYS THAT ANTICIPATED THE FUTURE. IN A BREAKFAST ROOM, A DOMED CEILING SPRINGING FROM FOUR PENDENTIVE ARCHES, INSET WITH CIRCULAR MIRRORS, AND TOPPED BY A LANTERN, FORESHADOWED MODERNISM'S LAYERING OF SPACES, SUSPENDED CEILINGS, AND BOUNCED LIGHT SOURCES.

The answer to the September issue's Guess the Architect is **FRANK FURNESS,** whose firm, Furness and Evans, completed the University of Pennsylvania's first library building in 1891. Now known as the Furness Building and housing the Anne and Jerome Fisher Fine Arts Library, it is known for its distinctive, picturesquely eclectic style.

By entering, you have a chance to win an iPad mini.
See the complete rules and entry form online at architecturalrecord.com/guessthearchitect.

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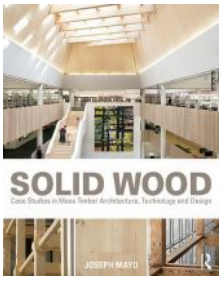
In the Nature of a Natural Material

New Architecture in Wood, *by Marc Wilhelm Lennartz and Susanne Jacob-Freitag, translated by Philip Thrift. Birkhäuser Verlag, November 2015, 184 pages, $81.48.*

Solid Wood: Case Studies in Mass Timber Architecture, Technology, and Design, *by Joseph Mayo. Routledge, March 2015, 358 pages, paper, $64.95.*

Reviewed by Sara Hart



TWO NEW publications make convincing arguments for timber as a viable alternative to conventional materials and methods for buildings that continue to trample the planet with giant carbon footprints. Presenting precedent-setting case studies, the authors of each demonstrate that wood is the optimal material for economically sustainable construction.

While the respective authors capture the reader's imagination with references to picturesque timber buildings dating back hundreds of years, they do not advocate a return to the simple wood structures of yore. This organic, renewable, honest material can be engineered to exceed the limitations of the past as well as to challenge the industrialized materials of established construction. Case studies in both books demonstrate how technological innovation through engineered wood products generates bionic reinventions far removed from the primitive hut.

In *Solid Wood*, author Joseph Mayo, who practices architecture in the Pacific Northwest, investigated abroad the application of timber that goes beyond current building codes. He notes that architects and engineers from the subalpine regions of Austria, Germany, Switzerland, and Italy explore new wood building materials, connection systems, and fire protection techniques in converting the artisan-like craft to modern practice. Because of wood's versatility and tactility, its architecture can express the cultural identity of various regions, which probably led to the organization of the book by country rather than building type.

In *New Architecture in Wood*, German authors Marc Wilhelm Lennartz and Susanne Jacob-Freitag adopt a different focus. Journalists who have closely studied this form of construction, they present their case studies by building type to show the diversity in German-speaking countries, where timber research and development occurs at the highest technical level.

Out of a combined 51 case studies, the books overlap only twice, most notably with the Woodcube project, built for the 2013 International Architecture Exhibition in Hamburg. The five-story residential building is constructed almost entirely of thick, prefabricated solid-wood elements, and adheres to stringent Passivhaus energy standards. Lennartz and Jacob-Freitag explain that Woodcube was constructed using the Austrian Thoma Holz100 system of prefabricated wall, floor, and roof components, which precluded the need for any adhesives, nails, metal fasteners, foil, or plastic sheathing in the envelope and interiors, although metal angles, bolts, and screws were necessary to secure the components to the floor slab. With 90 percent of the building made of pure timber, including exposed surfaces and structure, Woodcube is, in principle, a building made of a single material.

The slowness of the U.S. to adopt wood for large and tall structures is revealed by a paucity of North American case studies in both books. Mayo includes only the high-profile Bullitt Center designed by the Miller Hull Partnership (RECORD, June 2013, page 217) in Seattle, praising its hypersustainability ethic as an "urban prototype." While Lennartz and Jacob-Freitag's book lacks North American projects entirely, they delve in detail into Konrad Wachsman's pioneering work investigating automation and prefabrication of wood systems. As they point out, the German-born Wachsman emigrated to the U.S. after World War II and, with Walter Gropius, founded the General Panel Corporation (GPC) to produce a modular system for prefabricated timber construction.

Although engineered wood products have been used in U.S. home building for decades, the lag in scope of timber building could be shortened. The Timber Innovation Act of 2016, now working its way through Congress, promises to accelerate the use of timber in tall construction, in developing new markets, and modernizing building codes. If signed into law, it will authorize institutions of higher education to fund research into and development of longer wood spans, taller walls, and higher buildings. All parties stand to benefit markedly from such legislation. These books by Lennartz and Jacob-Freitag and by Mayo should be useful in providing American professionals with much research material for the future. ■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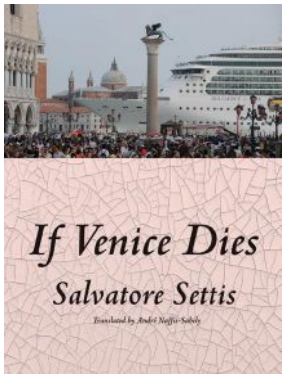
CIRCLE 35

That Sinking Feeling

If Venice Dies, *by Salvatore Settis, translated by André Naffis-Sahely. New Vessel Press, September 2016, paper, 180 pages, $16.95.*

Reviewed by Philip Nobel

IT MIGHT seem strange that, in a book titled *If Venice Dies*, the first mention of rising sea levels doesn't come until page 45, and a discussion of the city's scandal-plagued flood-barrier construction is held back until page 140. Isn't the inevitable sinking of the city the most likely cause of its long-discussed demise? Actually not, as Salvatore Settis makes all too clear in this bracing and beautifully written little book.



Settis, an archaeologist, art historian, and former director of the Getty Research Institute, sees that the threats to Venice are amplified not only because of its unique, precarious geography, but because of similar threats to urban health across the planet. The expunging of local tradition, "hit and run" tourists ferried in on "skyscraper ships," along with skyscrapers themselves, Settis condemns as tools of oppression wielded by global capital and misguided local pride. The habit of "putting a dollar sign on everything" he blames on a growing blindness in government to the value of human qualities. The ersatz is lovingly defined and attacked in a chapter where we visit imitation Venices from California to Chongqing. Similarly, he identifies, as others have, the commodification of experience found in theme parks as the harbinger of doom.

It would be easy to dismiss this book as another impassioned cry in the wilderness by a writer in love with the past. But Settis sets himself apart from others, in this genre of blaming greed and the pressure to change, by virtue of his focus. Venice really is dying, and fast. Its people, particularly the young, have been exported to suburbanizing hinterlands on the far side of the Lagoon. Wealthy interlopers are displacing those who once did the work of maintaining Venice's everyday existence. And its physical integrity is threatened by proposed megaprojects (such as a ring of skyscrapers on artificial islands shown at the Venice Biennale in 2010).

In his analysis, Settis gives special attention to the complicity of architects; they give "professional camouflage" while acting as "henchmen of the looting of our historic cities and landscapes." His suggestion to help free architects from service to destructive economic forces is to develop and implement an equivalent to the Hippocratic oath, medicine's affirmation of purpose. He proposes one derived from mandates given in Book I of Vitruvius: for a broad, generalist education and a practice guided in equal parts by theory and knowledge of construction. This "Vitruvian oath," only sketched out in his book, reminds us as professionals to serve the needs of a society as we wrestle with the particular wishes of those who pay us—to act in a way that promotes civic health—and, it follows, to push back with force when that health is threatened.

Can a simple oath help architects remember their dual responsibility to clients and society? That may be less likely than keeping the sea from swallowing Venice. But as a necessary precondition to saving that city, perhaps it's worth a try. ■

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CIRCLE 99

In the House

The fall edition of the Parisian home-decor show featured a cheerful mix of French and Scandinavian design.

By Josephine Minutillo

Journal

Designed by Simon Legald for Danish company Normann Copenhagen, Journal is a small desk with a colored writing surface. The simple frame, inspired by old French industrial furniture, is constructed from a combination of tubular steel and sheet steel; the legs slope slightly outward. Available in four colors, the desk comes flat-packed.

normann-copenhagen.com

CIRCLE 100

Air

This sideboard by Mathieu Gustafsson features woven cane panels stretched between solid wood frames. The design keeps the stored items—whether clothing, accessories, or electronic devices—protected and well ventilated. The piece's relative transparency allows the item to function as a room divider too. A wardrobe version will be available in early 2017.

designhousestockholm.com

CIRCLE 101

Zaha Hadid Collection

The Zaha Hadid Collection features gift items and accessories that are informed by the architect's work. The Icon teacups and mugs (top) have four distinct designs, each with the outline of one of Hadid's buildings: the Heydar Aliyev Center, Riverside Museum, London Aquatics Centre, and the Serpentine Sackler Gallery. Radiating linework on the Illusion range of fine bone china dinnerware (above) creates the appearance of a three-dimensional surface.

zaha-hadid-design.com

CIRCLE 102

Ultra Sofa

Based in southeastern France, venerable outdoor-furniture line Fermob has been producing classics for over 50 years. Frédéric Sofia has designed many of them. His latest, Ultra Sofa, is finally available after being introduced several years ago as a prototype. The large outdoor sofa features a single-piece frame and sun- and water-resistant fabric that is soft enough to be used indoors as well. The collection also includes a two-seater, armchair, and ottoman.

fermob.com

CIRCLE 103

Beetle

Danish furniture line Gubi expands its popular Beetle chair collection, designed by Copenhagen-based Stine Gam and Enrico Fratesi, with a new two-seater. The elongated version has a rounded, protective outer shell combined with a soft interior—just like a beetle. Available in fabric (shown) and leather upholstery.

gubi.dk

CIRCLE 104

For more information, circle item numbers on Reader Service Card or go to architecturalrecord.com/products.




ARCHITECTURAL RECORD 125 years

Last month, Record celebrated its 125th anniversary with cocktails and dinner at New York's landmark Metropolitan Club and toasted 125 top works of architecture built since 1891.

1 *Robert Ivy, Cathleen McGuigan, Beth Broome* **2** *Metropolitan Club* **3** *Edward Siegel, Craig Hartman, Suzanne Stephens, Brant Coletta, Joann Gonchar* **4** *Sarah Gore Reeves, Enrique Norten, Michael Arad* **5** *Louise Braverman, Sarah Williams Goldhagen, Mildred Schmertz* **6** *Elizabeth Kubany, Ben Prosky* **7** *Richard Gluckman, Susan Rodriguez* **8** *Liz Diller, Ricardo Scofidio* **9** *Mary Burnham, Jill Lerner* **10** *Richard Meier, Annabelle Selldorf* **11** *Peter Gluck, Frances Halsband* **12** *Hana Kassem, Marianne Kwok* **13** *Rachel Judlowe, Billie Tsien, Richard Olcott* **14** *Julie Taraska, Linda Lentz, Ted Porter, Sylvia Smith* **15** *William Chilton, John Schrei* **16** *Cathleen McGuigan, Michael Sorkin* **17** *Josephine Minutillo, Lorcan O'Herlihy* **18** *Audrey Matlock, Michael Manfredi, Marion Weiss, Cathleen McGuigan* **19** *Peter Bohlin, Helen Han, Merrill Elam, Tom Trenolone* **20** *Todd DeGarmo, Fred W. Clarke, Cesar Pelli* **21** *Bernard Tschumi, Anthony Vidler* **22** *Cathleen McGuigan, Alex Bachrach* **23** *Cynthia Davidson, Peter Eisenman, Deborah Berke*












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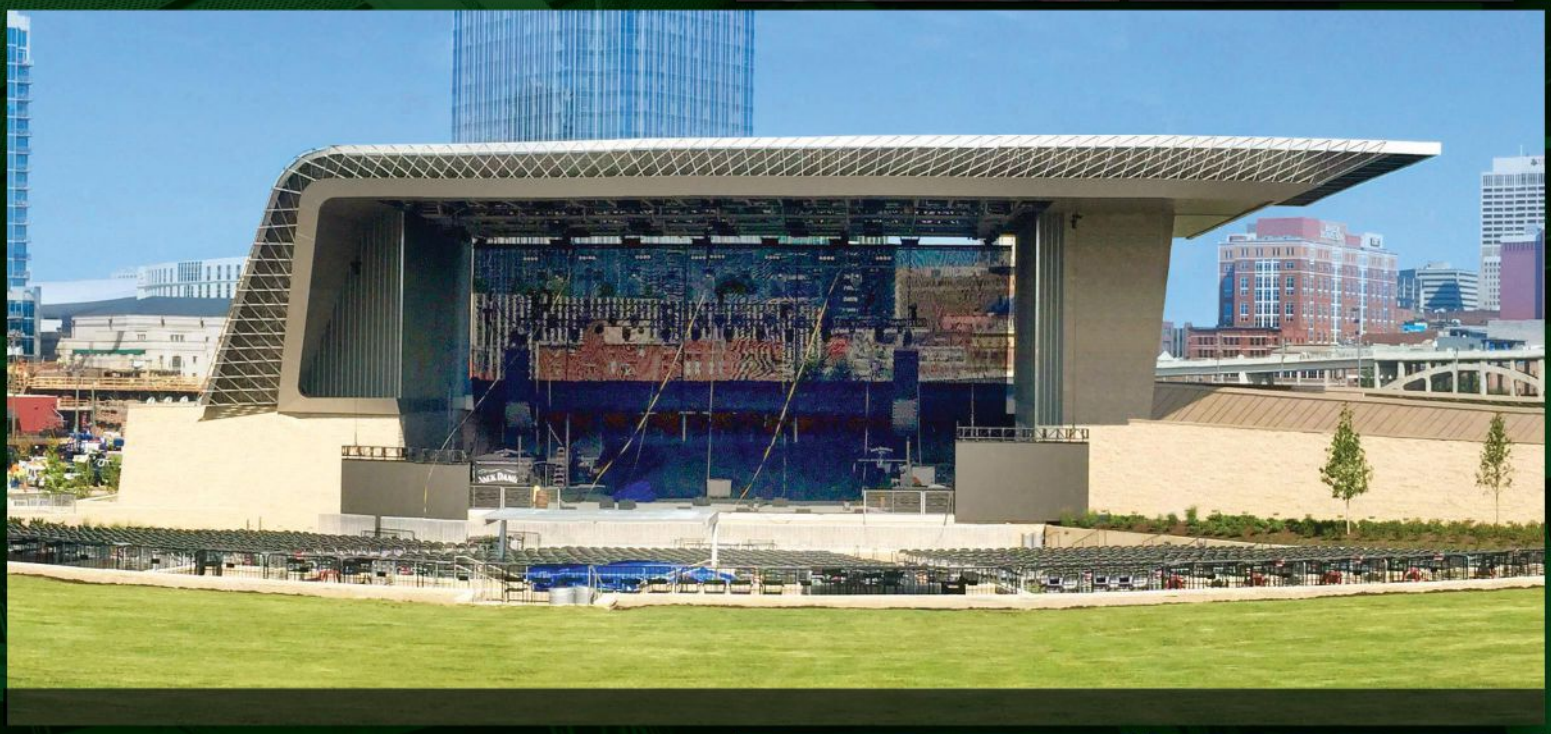

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CIRCLE 38

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By Julie Taraska

Fallbrook
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crl-arch.com
CIRCLE 106

Wave
Made of recycled aluminum, this set of two knobs and four pulls can be installed horizontally or vertically, changing the way the textured pattern plays with light and shadow. Pieces are hand-finished and available in a choice of satin nickel, antique brass, and oil-rubbed bronze.
duverre.com
CIRCLE 105

FoldFlat
This option for NanaWall's wood WD65 and aluminum SL45 single-track systems allows telescoping doors to fold, pivot back, and stack parallel to the door opening. Up to three panels may be chained, with inward- and outward-opening doors added to the ends.
nanawall.com
CIRCLE 107

Therml=Block 900RW
These ribbon windows, designed for low- to mid-rise commercial buildings, have a U-factor of .30 and a frame condensation resistance factor of 72. Coming in a variety of thermally broken options, each features a 2¼"-wide aluminum frame available in depths of 4½" or 6". Standard finishes include seven anodized hues and 20 paint colors.
tubelite.com
CIRCLE 108

Insynctive Sensors
Expanding upon its smart-hardware efforts, Pella is integrating security sensors into select models of its Architect, Pella, and Designer series of doors and windows. The sensors communicate with a stand-alone device that indicates whether one of the home's openings has been left ajar or unlocked; the sensors also may be synched with home-automation systems.
pella.com
CIRCLE 109

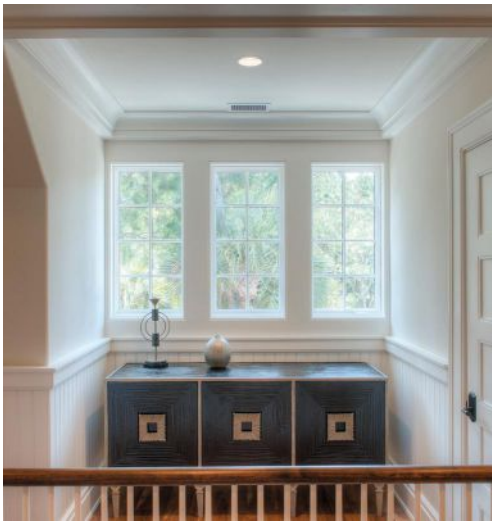
products windows & doors

Spoon Sash Lock

Created with historic renovations in mind, the double-locking Spoon combines Old World aesthetics with modern convenience: it allows sashes to be tilted in for easier cleaning. The hardware, an option for Kolbe's Heritage- and Ultra-series windows, comes in eight finishes, including antique brass, shown.
kolbe-kolbe.com
CIRCLE 110

Wood-Ultrex Sliding French Doors

Corrosion-resistant hardware and Impact Zone 3 options that can withstand wind speeds up to 130 mph are among Integrity's enhancements to this sliding-door line featuring pultruded fiberglass frames. The two- and three-panel models have been redesigned to match the four-panel ones; all also can be specified with a new bronze-colored sill finish.
integritywindows.com
CIRCLE 111



Siteline Coastal Windows with ImpactGard

This fenestration collection, capable of withstanding winds up to 130 mph, now has a laminated-glass option that, in the event of a pane's breakage, prevents shards from falling inside a room. A small clip discreetly holds the glass in place, keeping sight lines free. ImpactGard may be specified for awning, casement, fixed, and double-hung windows, as well as sliding and swinging patio doors.
jeld-wen.com
CIRCLE 112

American Heritage SDH uPVC

Rather than slide up and down, these simulated double-hung (SDH) replacement windows for historic buildings feature a fixed upper section and lower tilt-and-turn window that can provide ventilation. The fenestration's two compression gaskets, steel-reinforced frame, and standard triple-pane glass combine to provide superior airtightness and thermal performance. Numerous lite patterns, color options, and glazes are available.
zola.com
CIRCLE 114

Magneo and ED100

Homeowner Stephen Winthrop, who suffers from the neurological disorder ALS, has improved his house's livability by retrofitting it with two commercial Dorma products. The Magneo sliding-door operators keep the residence's pocket doors 3" from fully open, allowing Winthrop to adjust them with a nudge. The ED100 swing-door operators (one pictured) send a signal that causes standard doors to open for a predetermined time so that Winthrop can pass through.
dorma.com
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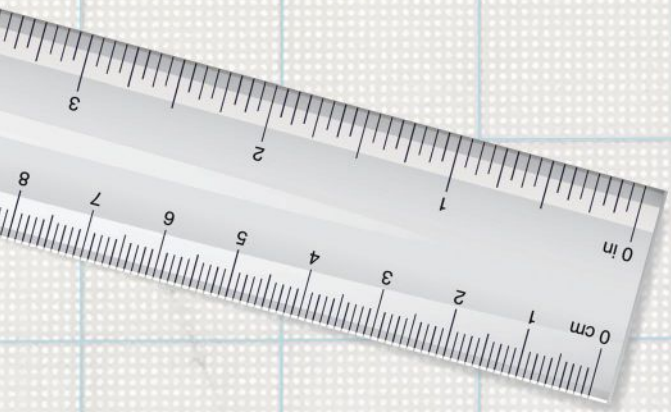
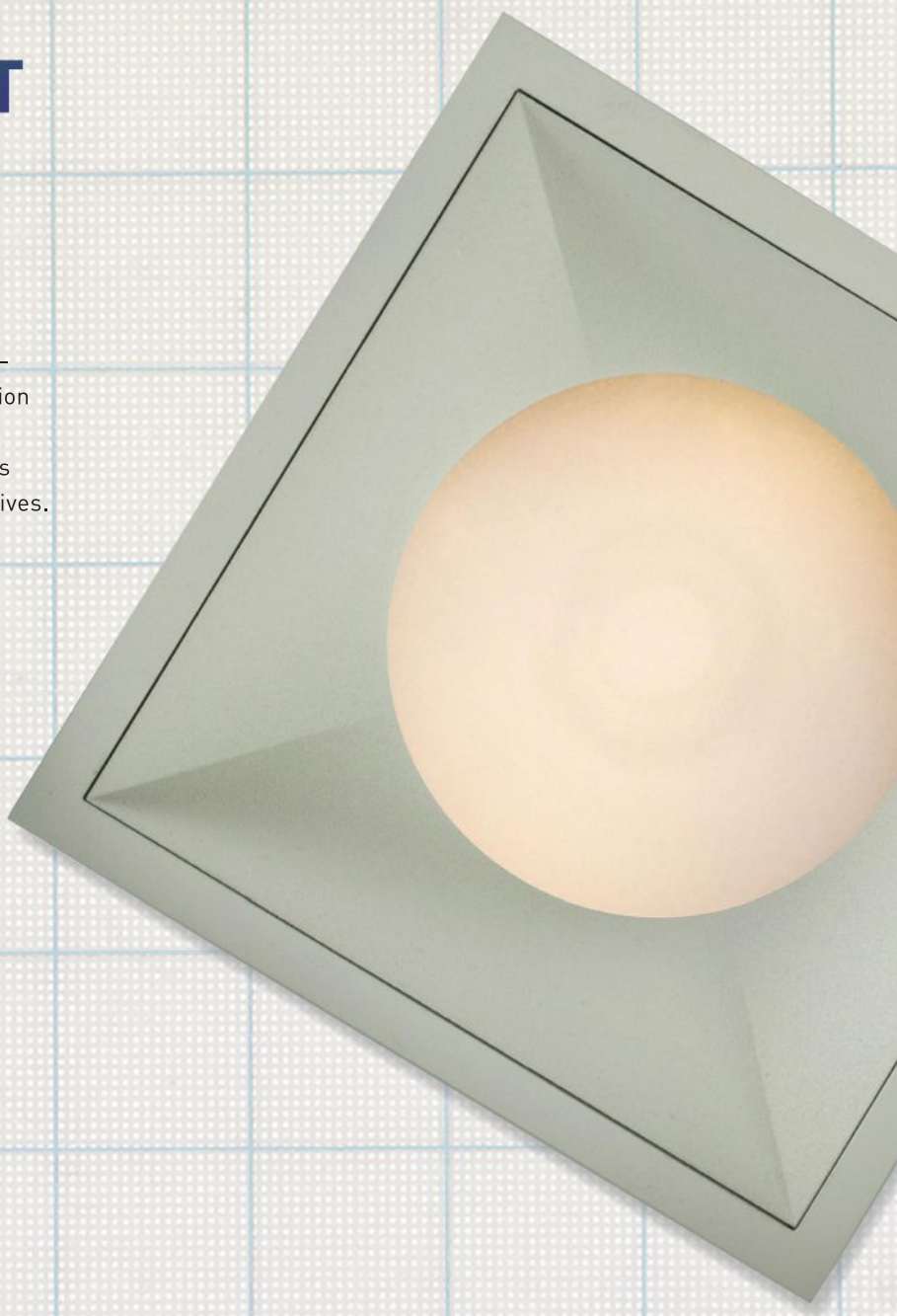
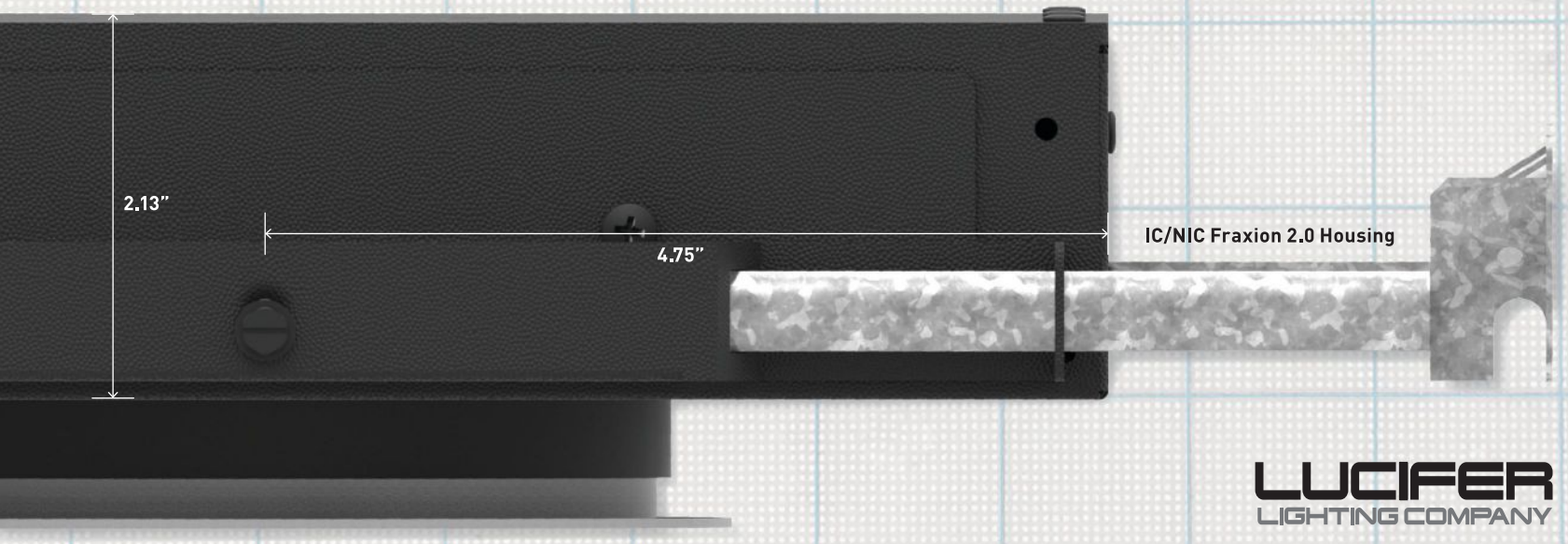
luciferlighting.com





CIRCLE 159



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By Julie Taraska

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aerolite.com

CIRCLE 115

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carrier.com

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us.grundfos.com

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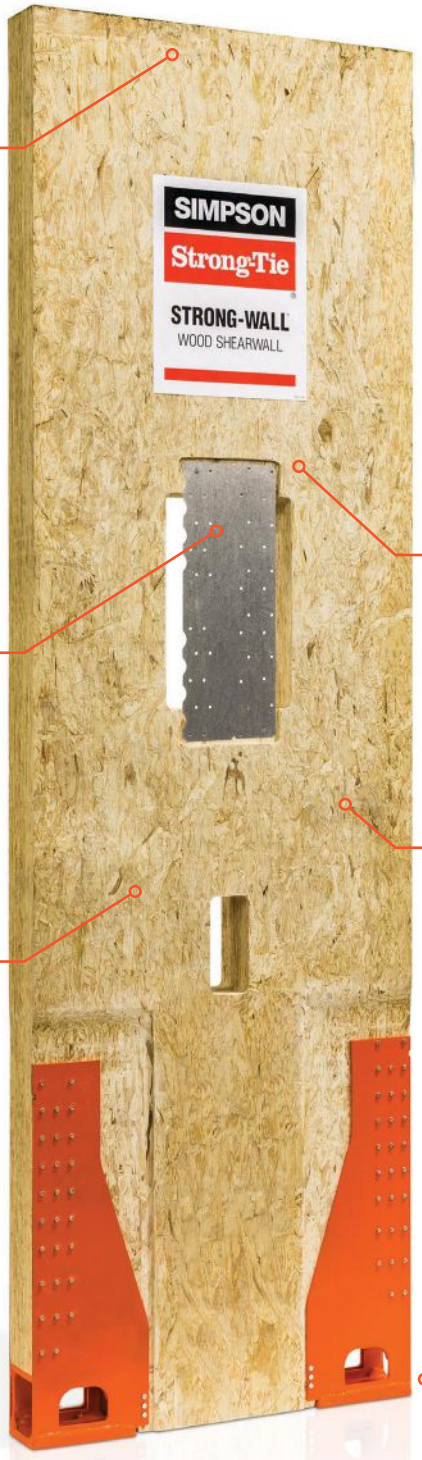

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RECORD INTERIORS 2016

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Lagrange12 | Turin, Italy | Dimore Studio

Fashion Statement

A Milan-based design studio evokes a timeless aura of luxury for a clothing boutique.

BY LINDA C. LENTZ

PHOTOGRAPHY BY PAOLA PANSINI

Just one block from the frenetic activity of Turin's Porta Nuova train station, the Via Giuseppe Luigi Lagrange (or Via Lagrange) is emblematic of the urban revival propelled by the winter Olympics held here in 2006. A traffic-free oasis, the rapidly gentrifying promenade is dotted with restored palazzi and museums, inviting gastronomic haunts, and such designer boutiques as Chanel, Miu Miu, and Prada. Among these, a new multibrand store, Lagrange12—so named for its address—offers more than immediately meets the eye from the street. Pristine single-label departments for Dior, Celine, St. Laurent, and Valentino—each designed by their in-house architectural teams—are located on the ground floor around the perimeter of this corner site, visible through the store's windows and five entrances. What is not readily apparent to passersby, or those entering for the first time, is a luminous portal at the store's core—behind the proprietary designer shops-within-the shop—which signals a unique retail experience.

Lustrous, gold-painted walls greet customers as they cross the brass-clad threshold that transports them into the store's sensuous multibrand area, which comprises most of the 10,800-square-foot Lagrange12—about one and a half floors. Designed by the Milan-based Dimore Studio, it is devoted to a mix of men's and women's fashion from numerous upscale lines curated by store manager Loredana Panetta. Steering away from the minimalist decor of the dedicated designer shops, firm principals Britt Moran and Emiliano Salci developed a complex palette of colors, patterns, and materials that recalls more sumptuous eras yet underscores the seasonal collections with remarkably modern and understated results.

The retail complex occupies the first two levels of a luxury residential development in a restored and renovated 18th-century palazzo that had until recently housed offices for the municipal police. The space, which was gutted and apportioned by the client and construction team, reflects the historic six-story structure's roots, with elegant daylit suites of rooms on each

TIME WARP A vintage velvet slipper chair and Vico Magistretti Lambda sconces (opposite) from the Dimore Gallery greet shoppers at the portal to Lagrange12's multibrand area. In an adjacent corridor (right), Dimore Studio's evocative scheme combines mid-20th-century Stilnovo table lamps with a custom display console.

FOLLOW THROUGH Marble-clad doorways emphasize an enfilade on the second floor (above). Taking cues from the work of Louise Bourgeois, Oscar Tuazon, and Jean Prouvé, Moran and Salci created sculptural iron clothing racks with polished-steel details (right) and centered them in the rooms for easy circulation and sight lines.

floor, some with vaulted ceilings. An enfilade on the second level reinforces the aura of a stately home.

The layout inspired Moran and Salci, who derived the name of their 13-year-old firm from the Italian word "dimora," a dwelling or aging aristocratic villa. "But we don't reproduce historical elements," says Moran. "Rather, we try to recreate what in our imaginations is that historical moment." The partners devised a scheme that exploits the interior's gracious proportions, integrating decorative elements with the architecture to maintain a variety of apartment-like spaces—intimate, transitional, and spacious. As a departure from the building's neoclassical shell, they drew from Art Deco motifs to create an atmosphere that reflects the passage of time.

With a near-baroque opulence, the designers emphasized deep jambs at the doors and windows, as well as corridor floors and ceilings, by cladding them with honed Ming Green marble edged by strips of brass. This softly-burnished metal reappears in the form of a balustrade that runs alongside a brushed stainless-steel stair and throughout the comfortably appointed rooms as perforated grills under windows (conceal-

SINGULAR DETAILS Green satin was used for dressing room drapes and bronzed-mirror-clad steamer-trunk displays (left). An LC4 chaise longue, Stilnovo floor lamp, and Oueffice marble table (opposite) lend an urbane air to the renewed 16th-century building (bottom).

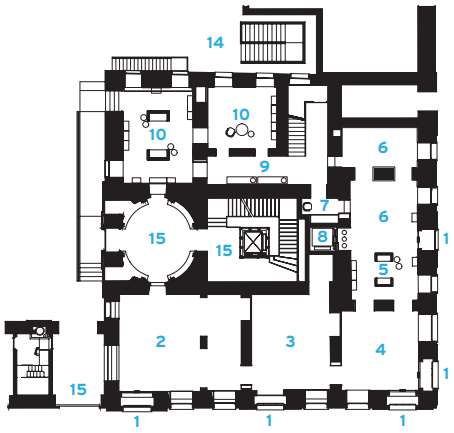
ing HVAC equipment), on custom light fixtures, and between tufted wall panels of moss-green faux suede.

In less assured hands this rich layering would be excessive. But Moran and Salci—known for the fusion of art, fashion, and architecture in their work—demonstrate a restraint that never overpowers the merchandise. According to Salci, "by using bold, often matte colors, the palette becomes quite neutral." Dark blue-green ceilings, for instance, offset the numerous green surface treatments.

An audacious use of pattern, too, fades into a surprisingly subtle backdrop for the sculptural iron clothing racks and bronzed mirror-clad trunk displays designed by Moran and Salci. On the floors, sections of low-pile carpet, resin, and black granite converge in large geometric swaths. Overhead, a series of Mondrianesque light fixtures—panel compositions made of polished and oxidized steel, brass, black-painted iron, colored glass, and backlit translucent acrylic—conceal downlights and illuminate sales areas with both ambient and direct light. The designers, who also own a gallery of period and contemporary furnishings, further augment the residential ambience with such select pieces as a vintage LC4 chaise longue by Le Corbusier, Pierre Jeanneret, and Charlotte Perriand. A visit to Lagrange12, says manager Panetta, is like being a guest at "a villa."

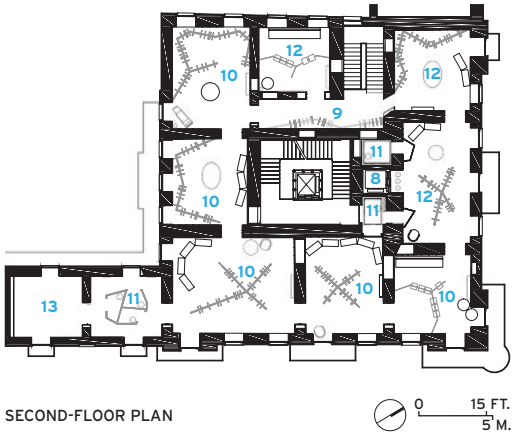
Working largely with local artisans, Dimore Studio has crafted an evocative space that is both timely and timeless. ■

1 ENTRANCE
2 DIOR
3 ST. LAURENT
4 CELINE
5 FENDI
6 VALENTINO
7 INNER PORTAL
8 ELEVATOR
9 HALL DISPLAY
10 WOMEN'S WEAR
11 DRESSING ROOM
12 MENSWEAR
13 STORAGE
14 COURTYARD
15 RESIDENCE



GROUND-FLOOR PLAN

COURTESY LAGRANGE12



SECOND-FLOOR PLAN

credits

INTERIOR DESIGNER: Dimore Studio – Britt Moran, Emiliano Salci, partners in charge
ARCHITECT: Building Group (building restoration)
ENGINEER: Building Group
GENERAL CONTRACTOR: Fabbri Services
CLIENT: G&B Negozio
SIZE: 10,800 square feet
COST: withheld
COMPLETION DATE: May 2016

SOURCES

TEXTILES: Alcantara (wall panels); Rubelli (upholstery); Dedar (poufs, changing room curtains, trunk displays)
FURNISHINGS: Dimore Gallery (LC4 chaise longue; BBPR, Stilnovo, Vico Magistretti, lighting; Paolo Buffa, Giò Ponti, chairs; Oeuffice, marble tables); Azucena (poufs)

Vitol | Houston | PDR

The Art of the Deal

A bustling trading floor infused with art and daylight exudes a sophisticated energy.

BY MIRIAM SITZ

PHOTOGRAPHY BY AKER IMAGING

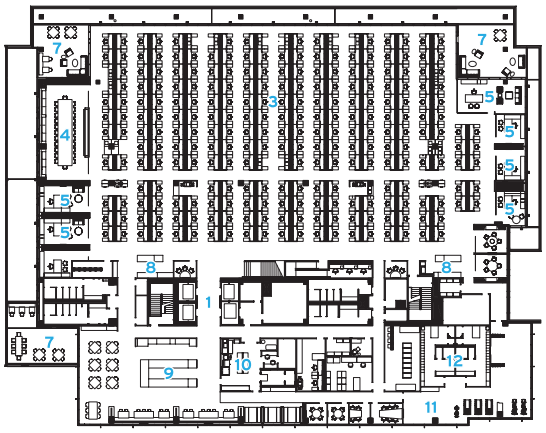
As defined by countless Hollywood depictions of the frenetic world of Wall Street, the term "trading floor" conjures up images of crowded, raucous places filled with arm-waving and shouting. But that picture doesn't match reality at the Houston branch of Vitol, an international energy- and commodities-trading company. Though imbued with a sense of controlled intensity, the spacious new offices more closely resemble an art gallery than a fevered scene from *The Wolf of Wall Street*.

Growing from a staff of just five traders to almost 300 over the span of 30 years, Vitol needed more office space and, in expanding their quarters, also hoped to consolidate their workforce. "We're big believers in the synergy of a trading floor," says CEO Mike Loya, who has run the company's operations in the Americas since 1997. "Concentrating all the traders in one area streamlines the flow of information." But the company's new, larger office also achieves something else: contemporary art and smart design elevate the trading floor from the merely utilitarian, creating a dynamic and elegant environment for Vitol's work.

In 2012, Loya commissioned Houston-based PDR (an acronym for the corporate interiors firm's focus on planning, design, and research) to lead the project—the group's fourth for the company since the 1980s. From day one, PDR worked closely with Munoz + Albin, the architect of the new One Grove Street tower—a 16-story building in the trendy Inner Loop neighborhood of Upper Kirby—to tailor the two top floors to suit the anchor tenant's needs.

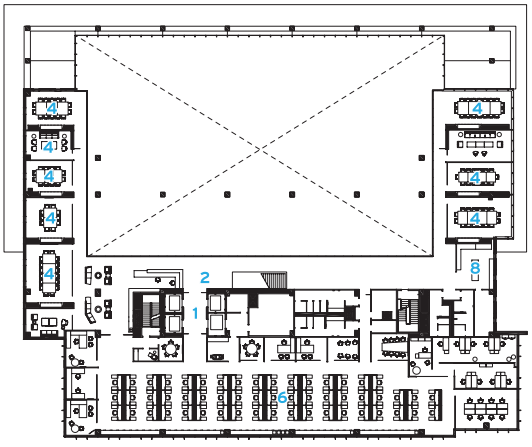
A floor-to-ceiling glazed wall on the northern side floods light into the main level's 300-desk trading floor, which is flanked by glazed private offices, conference rooms, a support-staff suite, and a cafeteria and gym. Three corner terraces connect employees to the outdoors, offering ample opportunities to take a break. A U-shaped mezzanine level with reception and glass-fronted meeting rooms surrounds the square theater on three sides, while windows on the east and west faces allow even more daylight to penetrate deep into the floor. A double-height marble wall alongside the engineered-quartz staircase creates visual continuity between levels. Confining

HIT THE FLOOR Antony Gormley's wire sculpture, *Feeling Material XII,* hangs above the trading floor. The dense arrangement of workstations facilitates communication between traders.



LEVEL-10 PLAN

0 40 FT. 12 M.



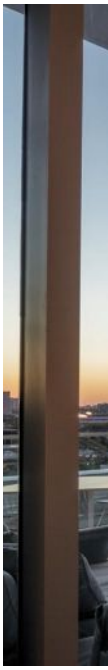
LEVEL-11 PLAN

1 ELEVATOR LOBBY
2 RECEPTION
3 TRADING FLOOR
4 CONFERENCE ROOM
5 PRIVATE OFFICE
6 SUPPORT-STAFF AREA
7 TERRACE
8 COFFEE BAR
9 CAFETERIA
10 KITCHEN
11 GYM
12 LOCKER ROOM

public areas to the upper floor enhances security, and "getting the traders all together in one room lets energy feed off itself," says PDR partner in charge Wayne Braun. Indeed, spirited but hushed activity buzzes throughout the cavernous space as employees chat across aisles and speak into headsets, while screens flash on innumerable computer monitors. It's a reminder that all of PDR's design choices were made within the constraints of Vitol's manifold information-infrastructure requirements. "The technology that supports their work is very complex," says PDR project manager Marc Bellamy, "and they don't want to worry about it not working or getting in the way."

By increasing the overall square footage, Vitol now has more space, too, to display its sizable art collection—which Loya, like his predecessor, has curated during his tenure. Large, vibrant paintings

STEP RIGHT UP
White laminate on the risers gives the impression of an open staircase. With an acoustical origami-like ceiling above and carpet below, ambient noise is kept to a minimum on the trading floor.

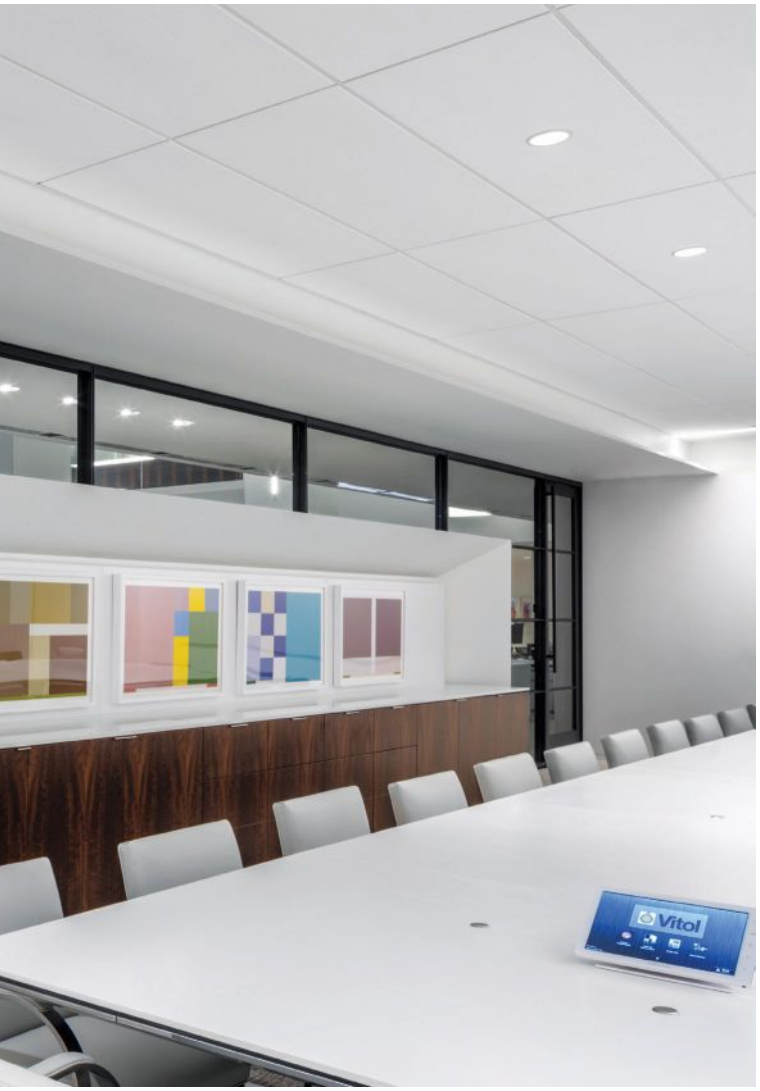


ARTISTIC DETAILS Fixtures on columns and in wall pockets supplement the extensive daylighting of the trading floor (left). Four colorful works by Jason Salavon animate a conference room (above). *Irruption*, by Henrique Oliveira, breaks through a column in reception (opposite, top). Two corner terraces outside the fully glazed north-facing wall face the downtown-Houston skyline (right).

and eye-catching sculptures throughout the black-and-white office lend an almost museumlike quality to the space. *Feeling Material XII*, a tornado of steel wire by British sculptor Antony Gormley, hovers over a corner of the trading floor, while *Irruption*, by Henrique Oliveira, seems to grow out of a column in the lobby. Loya commissioned this plywood and tree-bark sculpture from the São Paulo–based artist, who installed it as construction of the interior went on around him.

While the Oliveira piece incorporates architecture into art, PDR brought art to the architecture: a striking white acoustical ceiling, composed of a seemingly random array of angular protrusions, floats above the trading floor, demarcating the large arena below and emphasizing its 24-foot-high ceiling. "We knew the ceiling was going to be the wow factor," says lead designer Amy Collins. "You can see and experience it from almost everywhere in the space." Fabricated from recycled plastic milk cartons, the 8-by-8-foot panels make as strong a visual impact as the works of art on display, while keeping the sound to a low din. Instead of ceiling-mounted light sources, which would interrupt the origami aesthetic and require a lift to maintain, the designers opted to uplight from the perimeter, tucking fluorescent fixtures into pockets on the mezzanine fascia and adding LED strips to columns, which gracefully taper to the floor. At night, the scheme dramatizes the space with shadows, while workers use task lighting to focus illumination just where it's needed.

By integrating diverse artworks into adroit architectural solutions for spatial, acoustical, and technological challenges, the design team has greatly improved Vitol's environment—which, the CEO believes, will enhance the way people work. "Employees find it a much more pleasant setting," says Loya. "We want to see that translated into profits, because, at end of the day, we're here to make money." ■



credits

DESIGN ARCHITECT: PDR – Wayne Braun, partner in charge; Marc Bellamy, project manager; Amy Collins, lead designer; Laura Feist Malek, Karen Wetmore, Steven Shultz, project team

ARCHITECT OF RECORD: Kirksey

ENGINEERS: I.A. Naman + Associates (m/e/p); Walter P Moore (structural)

CONSULTANTS: HFP (acoustic); Kinzelman Art Consulting; TechKnowledge (IT/AV)

GENERAL CONTRACTOR: Structure Tone Southwest

CLIENT: Vitol

SIZE: 63,000 square feet

COST: withheld

COMPLETION DATE: March 2016

SOURCES

ACOUSTICAL CEILINGS: Arktura

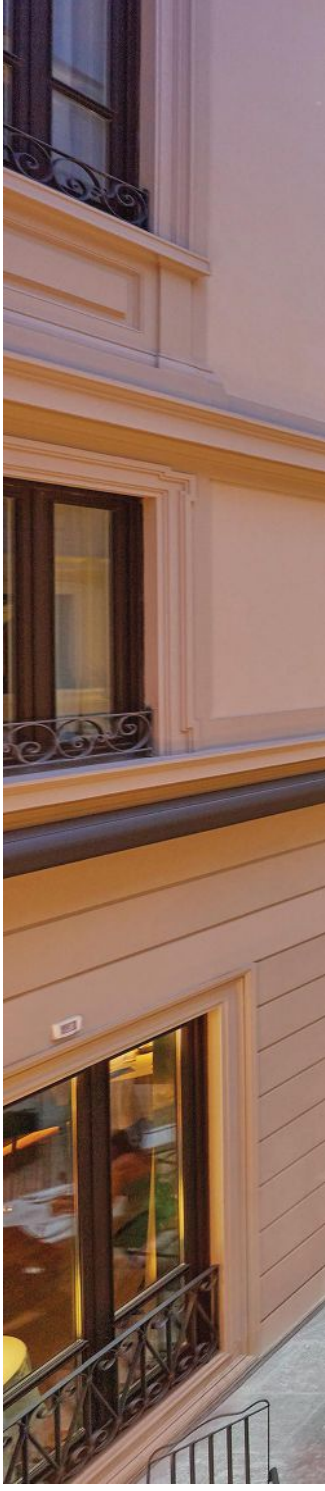
SUSPENSION GRID: Armstrong

SURFACES: Corian (countertops, wall panel), Formica (millwork)

TILE: Imola

FURNISHINGS: Bernhardt, Davis, Gandia Blasco, Halcon, Haworth, Herman Miller, Knoll, Nienkämper, Tuohy

LIGHTING: Focal Point, Forum, Humanscale



Mandarin Oriental Milan | Italy | Antonio Citterio Patricia Viel Interiors

The Italian Job

An international hotel draws on a city's incomparable design culture.

BY JOSEPHINE MINUTILLO

Antonio Citterio and partner Patricia Viel found themselves in an enviable position. Not long after completing the Bulgari Hotel in Milan in 2004, they were approached to design luxurious accommodations for another high-end chain just a few blocks away. If the first reflected the Milan-based architects' signature elegance and refined palette, the next—a new outpost for the Mandarin Oriental—would show off a more playful, and nostalgic, side.

"There's a lot of surface decoration at this hotel, which is very unusual for us," says Viel. "But as a brand, Mandarin Oriental wants to offer a rich experience based on the local culture rather than have a consistent or recognizable look."

As a point of reference, Milan, of course, is a designer's dream. Citterio and Viel drew inspiration from giants of 20th-century Italian design, including Gio Ponti and Piero Portaluppi, for the colorful and often exuberant interiors. And, in addition to outfitting the hotel with Citterio's own furniture, lighting, and fixtures—for which he is well known—the architects chose distinct pieces by other masters, including Franco Albini, Luigi Caccia Dominioni, and Angelo Mangiarotti.

Like the Bulgari, the Mandarin Oriental is tucked into a quiet side street in the center of Milan, within steps of the city's famous Duomo cathedral and La Scala opera house. The new hotel comprises four 18th-century residential buildings that had been converted to bank headquarters several decades ago. The merging of those classical structures, wrapping around several interior courtyards with arched colonnades, created irregular floor plates and floor slabs at varying elevations that needed to be maintained. As a result, each of the guest rooms is unique, and long corridors are occasionally interrupted by steps. Because nothing could be altered on the landmark buildings'

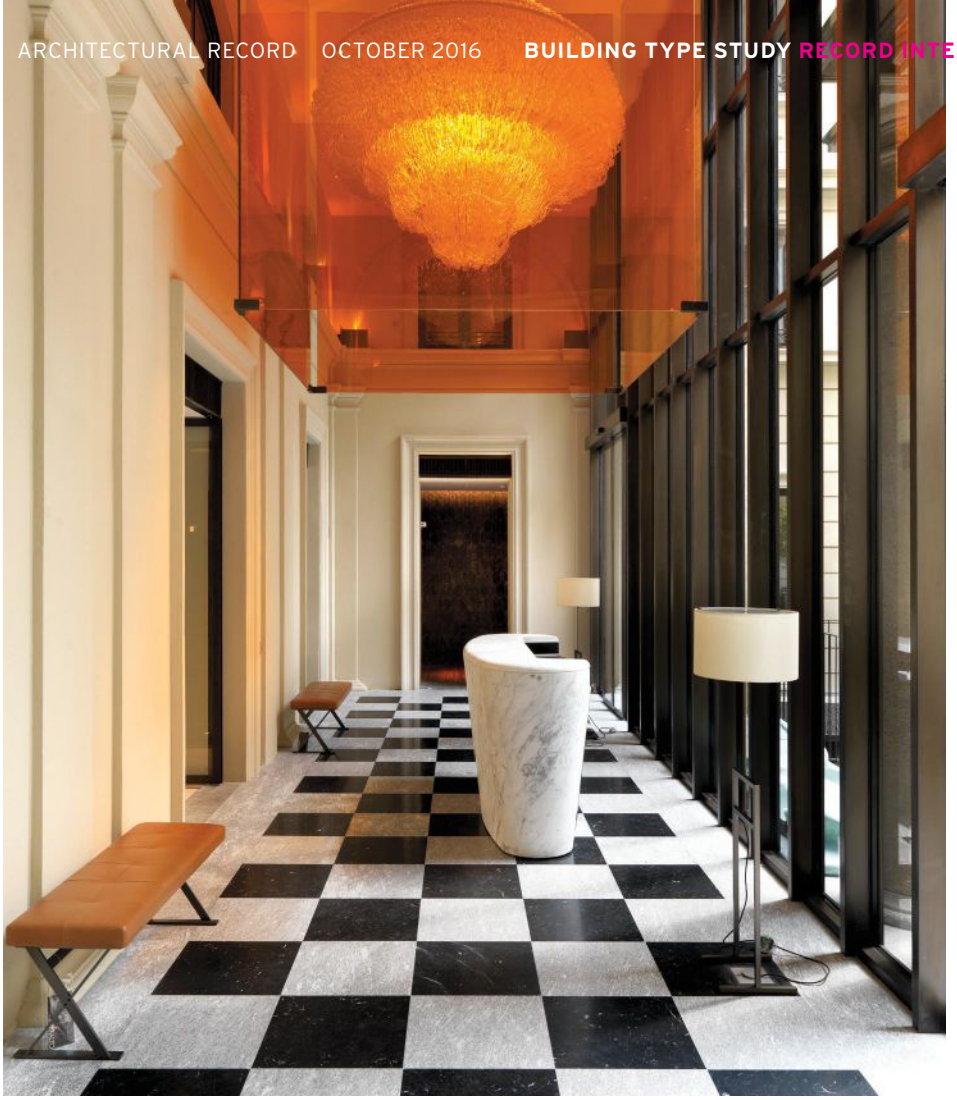
PHOTOGRAPHY: COURTESY MANDARIN ORIENTAL MILAN

BE OUR GUEST The hotel is tucked behind a quiet side street in the center of Milan (bottom). The exuberant design of the interiors is immediately apparent upon entry at the concierge desk (opposite). Within one of several courtyards is an outdoor dining area for the Michelin-starred Seta restaurant (above).

facades, the design team had to lay out the 72 individual rooms and 32 suites with respect to the fenestration. "Sometimes the proportions of a bathroom or the sequence of spaces are not as you would normally design them because we had to conform to existing window openings," Viel admits.

Perhaps more significantly, as buildings that once housed the city's upper-class families, the ceiling heights of the top floor, originally the servants' quarters, are meager compared with those of the floors beneath, forcing the architects to locate the more lavish suites on the lower levels.

The eclectic Milano suite, on the second floor, is a tribute to Milanese



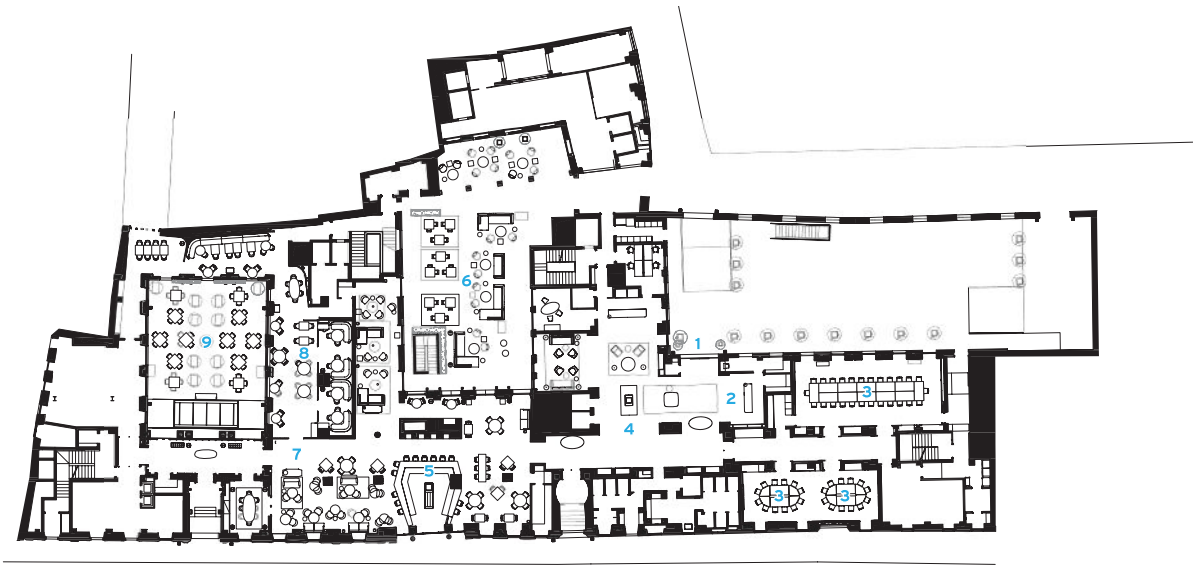
SHARP CONTRAST The restaurant's reception is topped with a dazzling chandelier by Milan-based artist Jacopo Foggini (left). At the bar, black and white marble covers the walls and floors (opposite, top). A casual lounge features boldly patterned wallcoverings and draperies (opposite, bottom).

designer Piero Fornasetti. His iconic pieces turn those guest quarters into a whimsical escape. An homage to Gio Ponti in another suite—with rich woods and upholstery—offers a more sedate ambience. "Designing those spaces was real fun," recalls Viel. "The Gio Ponti suite in particular is very close to us. Ponti has always guided our interior and product design."

Many of the remaining guest rooms feature a more neutral palette of beige and soft purples, with bathrooms covered in white or black Italian marble.

Presenting an abundance of diverse environments was at the core of the Mandarin Oriental's strategy for this location, and it is most apparent in the hotel's public spaces, beginning with the colorful concierge area that greets guests upon entering.

Past the lobby, where seating is laid out around a central fire pit, the bar and restaurant—both overflowing into stately courtyards—make up the heart of the hotel. The harlequinesque decor of the bar, with its wide U-shaped counter and adjacent bistro seating, is a lively counterpoint to the quieter restaurant (where meals are served on Fornasetti plates). Small pieces of black and white marble, in a modified diamond pattern, cover the



1 ENTRY
2 CONCIERGE
3 MEETING ROOM
4 LOBBY
5 BAR
6 BAR COURTYARD
7 BISTRO
8 RESTAURANT
9 RESTAURANT COURTYARD

GROUND-FLOOR PLAN

0 30 FT.
10 M.

PHOTOGRAPHY: © MASSIMO LISTRI

credits

ARCHITECT: Antonio Citterio Patricia Viel Interiors – Antonio Citterio and Patricia Viel, partners in charge; Ella Dinoi, project director

CONSULTANT: Isometrix (lighting)

CLIENT: Mandarin Oriental

SIZE: 130,000 square feet

COST: withheld

COMPLETION DATE: July 2015

SOURCES

DOORS: Lualdi, Garofoli, Rimadesio

HARDWARE: Assa Abloy

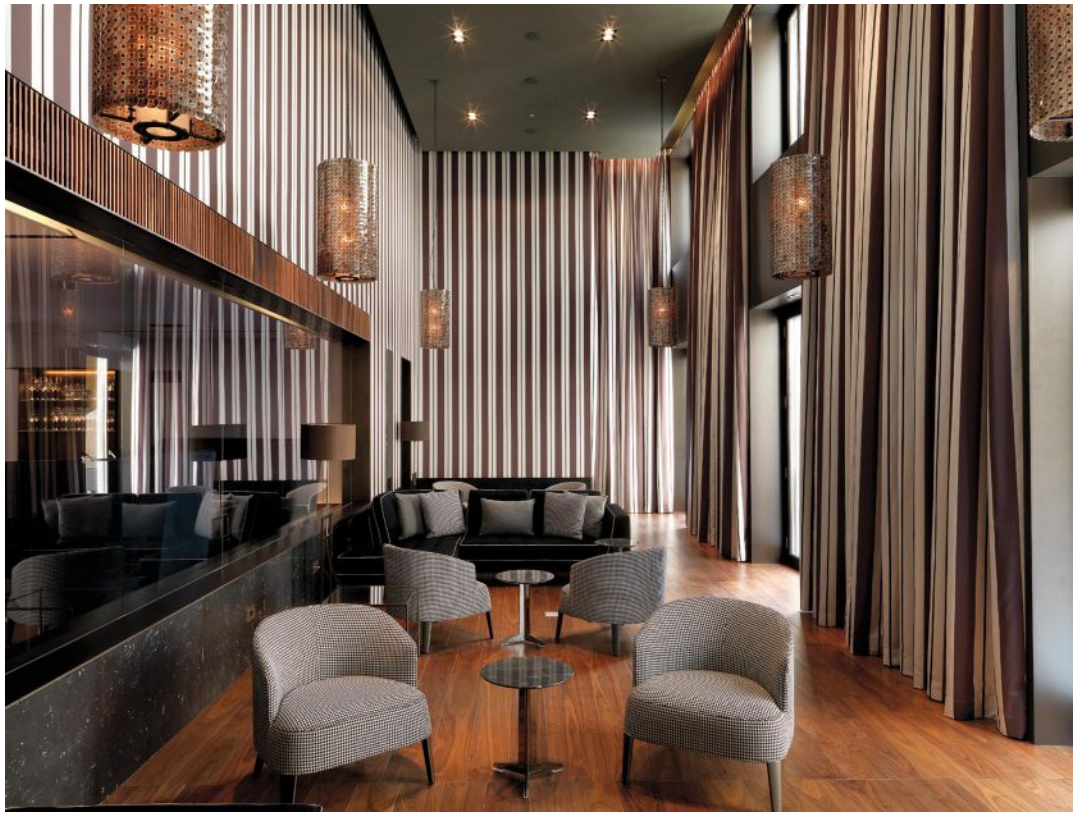
CUSTOM JOINERY AND PANELING: Poliform

PLUMBING FIXTURES: Pozzi-Ginori, Hansgrohe, Kaldewei, Boffi

INTERIOR AMBIENT LIGHTING: Flos, Santa & Cole, Produzione Privata, Moooi, Lasvit, Davide Groppi, Azucena, Maxalto

RUGS: Tai Ping

FURNITURE: B&B Italia, Living Divani, Cassina, Flexform, Gervasoni



walls of the bar, while a similar design is reflected at a larger scale on the floor.

The restaurant, Seta (it already has a Michelin star) features wood floors and ceilings. Accommodating up to 50 diners, it is accessible from the bar but also has a separate entrance on a main street behind the hotel, becoming a destination not just for hotel guests but Milanese as well. "It is one of the best restaurants in town," Viel points out.

Carved out under the existing buildings, in a newly excavated basement, a 9,700-square-foot spa is a serene sphere. The dark public areas are punctuated by walls of mirror-polished, hammered stainless-steel sheets.

For Citterio and Viel—whose architectural practice has grown tremendously in recent years, with a number of large-scale, ground-up construction projects around the world, especially in Asia—the Mandarin Oriental Milan represents a more personal experience. "It's very important for us to be involved in projects in Milan that touch this level of quality," says Viel. "We try as much as we can to work in our city." ■

SUITE TALK The wood-clad Gio Ponti suite features the architect's Dezza chair, among other pieces designed by him (top). On the second floor, the 1,000-square-foot Milano suite is dedicated to Piero Fornasetti and is furnished with original Fornasetti tables, chairs, desk, console, accessories, and wall coverings (above and opposite).

PHOTOGRAPHY: © MASSIMO LISTRI (TOP AND OPPOSITE); COURTESY MANDARIN ORIENTAL MILAN (BOTTOM)


FASHION
VALENTINO

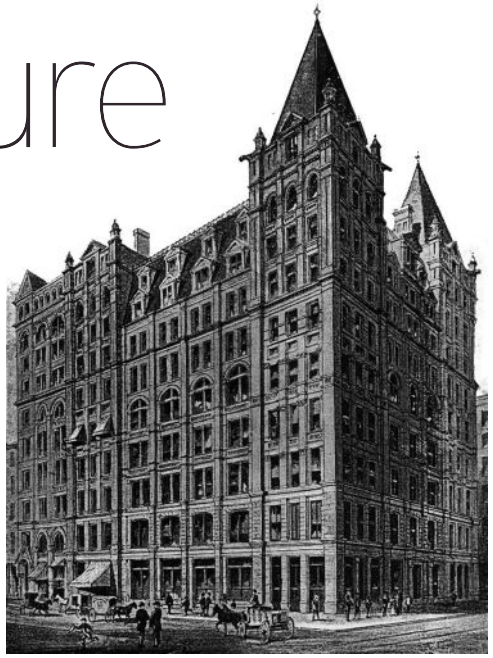
The Beekman | New York | Gerner Kronick + Valcarcel

A Hidden Treasure

A neglected 19th-century landmark reveals an astonishing space for a new hotel.

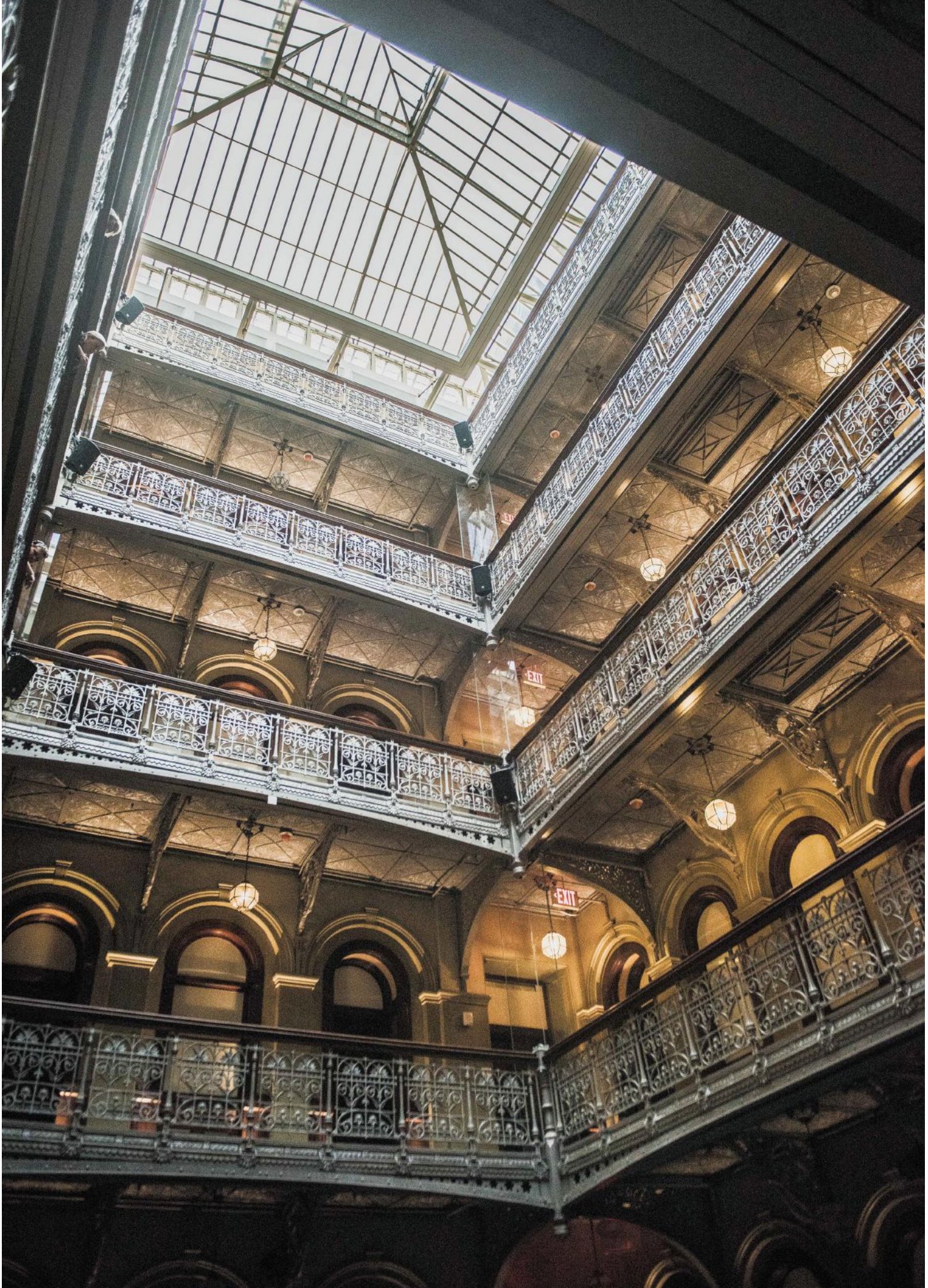
BY SARAH AMELAR

Buildings can hide secrets, but at the core of New York's Temple Court was a truly spectacular one. For more than 60 years, the structure's nine-story atrium—with ornate ironwork railings and a great pyramidal skylight—remained walled in, so completely removed from public view that most tenants were unaware of its existence. But this 19th-century office building, rechristened the Beekman, has just reopened as a hotel. And its central court has been restored and unveiled, inspiring new interior design that plays against the vintage landmark and its historical saga.



THEN & NOW
The twin-turreted office building (right) was completed in 1883. Its skylit atrium was completely walled in, hidden for more than 60 years. Newly renovated, the atrium (opposite) has a curated art program displayed in the court (below), honoring figures such as Edgar Allen Poe, who spoke at an earlier building on the site.

IMAGES: COURTESY THE BEEKMAN (TOP); © BJORN WALLANDER FOR THE BEEKMAN (BOTTOM); TEDDY WOLFF (OPPOSITE)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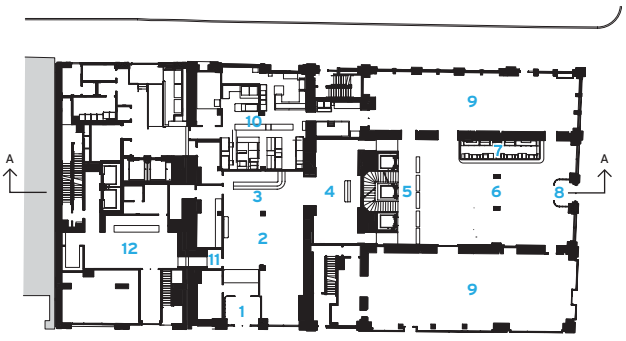
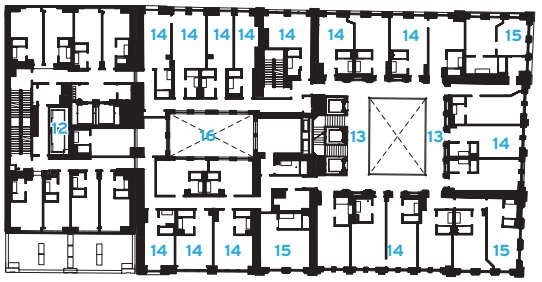


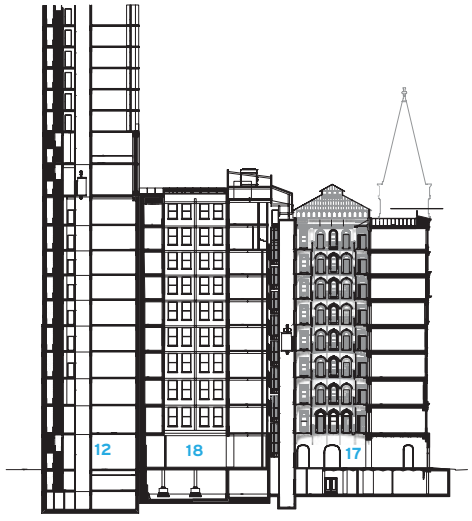
GROUND-FLOOR PLAN

0 20 FT.
6 M.



SIXTH & SEVENTH-FLOOR PLAN

1 HOTEL ENTRY
2 LOBBY
3 FRONT DESK
4 CONCIERGE
5 ELEVATOR/STAIR LOBBY
6 GRAND COURT
7 BAR
8 GRAND COURT ENTRY
9 RESTAURANT
10 KITCHEN
11 RESIDENCE ENTRY
12 TOWER
13 ATRIUM BALCONY
14 GUEST ROOM
15 SUITE
16 LIGHT WELL
17 1883 BUILDING
18 1890 ADDITION



SECTION A - A

0 30 FT.
10 M.

In 1883, when architect Farnsworth & Silliman completed the building, with an adjoining annex added seven years later, it ranked among Manhattan's tallest. Twin-turreted and lavishly decorated, this nine-story proto-skyscraper at the corner of Beekman and Nassau streets was clad in brick, sandstone, and granite, combining Queen Anne, Renaissance Revival, and Neo-Grec motifs. And like Chicago's Rookery and Los Angeles's Bradbury buildings—its close contemporaries—Temple Court translated the indoor shopping arcade into an emerging genre: the office tower. Here, on Lower Manhattan's booming Publishers' Row, storefronts for lawyers, accountants, and other businesses supporting the newspaper industry were in high demand. So the design capitalized on that need by offering premium "street-front" (really atrium-front) space on nine levels, giving each office a glazed,

PHOTOGRAPHY: © TEDDY WOLFF; RICHARD BARNES (OPPOSITE, TOP); BJORN WALLANDER FOR THE BEEKMAN (OPPOSITE, BOTTOM)

balcony-accessed entry door and windows (in addition to exterior fenestration). But by the late 1940s, the neighborhood had declined, and fire-code changes, most likely, prompted the complete enclosure of the atrium. And so it remained, even after the exterior attained landmark status in 1998.

Meanwhile, tenancy was waning. The last remaining occupants moved out in 2001 in the wake of the 9/11 attacks—leaving Temple court vacant for more than a decade. During that time, various developers (who knew about the atrium) jockeyed to find an economically viable solution that would balance the demands for preservation and adequate revenue-generating space. Finally, in 2012, GFI Development hired Gerner Kronick + Valcarcel Architects (GKV), whose solution involved converting the existing buildings into a boutique hotel with an adjoining 51-story condominium tower. Continuous with the vintage floor plates, the new building's lowest stories would house 80 guest rooms, giving the luxury Beekman, a Thompson Hotel, a total of 287 keys and 199,000 square feet. The tower would also hold, as GKV principal Randolph Gerner puts it, "the brains and guts" (or major mechanical units for the complex), enabling the architects to retain the original roofscape's purity, uncompromised by equipment. "In many ways," he muses, "Temple Court's history reads like a romantic novel: great success at the beginning, downfall in midlife, and, finally, rebirth."

Since the typical office size here (about 250 square feet) suited guest rooms, GKV retained that basic division. But the

PAST FORWARD
Glass-enclosed bookcases screen the elevators from the main atrium (opposite), where vintage-look inlaid wood floors echo the original border pattern of the balcony floor tiles above. A 20-foot-long sofa is part of the lobby's whimsical decor (above). The hotel features casual sitting areas in the grand court (left), along with two high-end restaurants.

ARTFUL REVIVAL
The guest rooms (left) have a residential character, with stylishly mismatched yet compatible furnishings from different periods. The newly restored elevator dials (bottom) were salvaged from a building of the same era. The atrium balconies (opposite) have original iron ceiling panels, dragon brackets, and guardrails, as well as encaustic floor tiles (partially covered here with a custom runner).

team relocated the main entrance to a quieter side street, leading into the annex instead of the grand court. "We didn't want to give away the spectacular atrium so soon after you crossed the threshold," says Gerner. "The idea was to compress and release, to delight and surprise."

While "accidental preservation" saved the atrium, the street-level facades had seen significant alterations. GKV restored their integrity using granite from the same Maine quarry as the original. Now interior vestibules with curving glass and brass mullions lead inside.

There, a whimsical front desk—upholstered in draping antique oriental rugs—introduces the interiors strategy of Martin Brudnizki Design Studio (MBDS). "It's playful, with a layering of materials and styles that makes the building's rich eclecticism even more decadent," says MBDS's Amy Cann, who oversaw the project. The reception floors evoke the hexagonal penny-tiles so familiar in classic New York bathrooms, yet with a twist: exaggerated in scale and made of polished Carrara marble. Similarly, the lobby sofa is quasi-old-fashioned, but in bright two-toned velvet and 20 feet long, functioning socially like a communal table. Throughout the hotel, quirky fringed or tasseled Victorian furnishings, and modern riffs on them, brush against pieces from other periods. "The interiors are meant to feel as if they'd evolved like a world traveler's home, with collections from different places and times," explains Cann. "But we avoided nostalgia about the building's first period," adds MBDS principal Martin Brudnizki. "Instead, we wanted to evoke an atmosphere—a moody, sexy, partly dimly lit one, with pools of light and layering of high and low, grit and glamour, raw with polished, rough with smooth."

Architectural feats make it all appear effortless. Though only the facades were landmarked, the owners obtained a tax credit for the building's preservation, including its interiors. GVK's restoration is faithful, with modern systems threading imperceptibly behind patinaed surfaces. "But where elements were completely missing, we didn't try to replicate them," says Gerner, who worked with preservationists Higgins Quasebarth & Partners and restorers from EverGreene. "Instead, we replaced them with modern interpretations that honor the design intent." So etched glass panels—patterned like the 1880s ironwork—border a long stretch where balcony guardrails were absent. But where the decorative encaustic floor tiles merely needed patching, the team matched existing ones.

The atrium once had interior storefronts flanking it at grade. While the space is more dramatic without them, floor inlays now acknowledge the missing walls. Two high-end restaurants will open in the hotel, one with a long bar within this soaring gathering space.

But if fire-safety standards once closed the court, they needed to be

PHOTOGRAPHY: © RICHARD BARNES (TOP); TEDDY WOLFF (BOTTOM); BJORN WALLANDER FOR THE BEEKMAN (OPPOSITE)

addressed now. GKV's solution included an automatically deployed system of glass-fiber smoke curtains surrounding the central space, coatings over the ironwork, and extensive sprinklers.

Upstairs, the balconies regained the original rhythm of mahogany-framed doors and windows. But adapted to hotel needs, those illuminated windows are now blind, backed with fire-rated partitions, and the mahogany-veneer doors are solid wood, without translucent glass panes. Inside, MBDS gave the rooms and suites an intentionally residential feel, stylishly mismatching lamps, bedside tables, and chairs. In the twin turrets, duplex penthouse suites with private outdoor spaces await completion.

In the thick of Manhattan, this extraordinary building's dormancy seems unimaginable. But its tale parallels the district's vagaries. The newspaper companies decamped long ago (and many are now defunct). Decades later, the 9/11 attacks took a toll here. But the neighborhood is making a comeback—and through all the changes Temple Court has seen, its long narrative lives on in its latest incarnation. ■

credits

ARCHITECT: Gerner Kronick + Valcarcel – Randolph Gerner, design principal; Miguel Valcarcel, principal in charge; Benita Welch, historic-preservation principal; Julia Meier, project manager; Magda Dlugosz, project architect

INTERIOR DESIGNER: Martin Brudnizki Design Studio – Martin Brudnizki, principal

ENGINEERS: WSP Parsons Brinckerhoff (structural); Lilker Associates (m/e/p)

GENERAL CONTRACTOR: Broadway Construction

CONSULTANTS: Brian Orter Lighting Design; Higgins Quasebarth & Partners (historic preservation); Hicks Design Group (food facilities); Israel Berger & Associates (building envelope); Katherine Gass (art)

CLIENT: GFI Development

SIZE: 199,000 square feet

COST: withheld

COMPLETION DATE: August 2016

SOURCES

WINDOWS: Caoba (wood); Quaker (aluminum)

DOORS: Maiman (wood); Ecco (barn)

SMOKE CURTAIN: U.S. Smoke & Fire

TILE: Denton Stoneworks, SDCI, Wilson Custom Design Tile

FURNITURE: Credible Upholstery, McLaren, Quality & Company, Benchmark, ABC Carpet & Home

LIGHTING: iWorks, Chelsom, Preciosa, Urban Electric Co.

Repossi Place Vendôme | Paris | OMA

Jewel Box

A modern shop sets itself apart within a historic enclave of luxury boutiques.

BY JOSEPHINE MINUTILLO

Although she's scarcely 30 years of age, Gaia Repossi has been revamping her family's century-old jewelry house, founded in Turin, since becoming creative director in 2007. Part of that transformation has included a complete overhaul of its flagship boutique on the Place Vendôme in Paris. Considering designers, the precocious scion immediately thought of Rem Koolhaas. "Many architects don't consider retail a ground for intellectual reflection," Repossi says. "But we need to question the place shopping has in society."

Repossi was intrigued by the aesthetics of Koolhaas's early work and his assailing of the typical shopping experience in the essay "Junkspace" (2001). For the design of her modern boutique, she worked with him and Ippolito Pestellini Laparelli, the youngest partner at Koolhaas's firm, OMA.

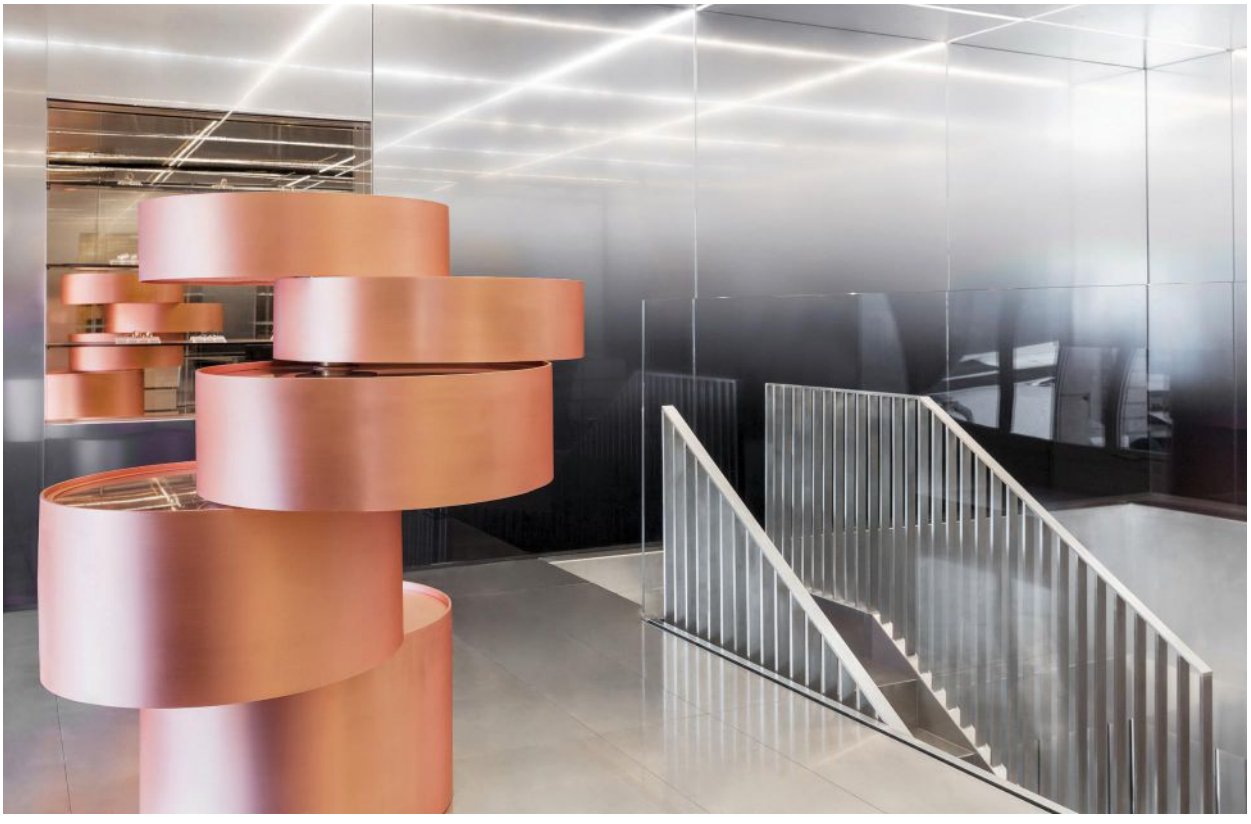
Together, Repossi and her architects sought to create a space that would correspond to the needs of her diverse clientele—a few pieces cost under $1,000, while others have price tags that reach into seven figures—and that would reflect the contemporary bent of her unique jewelry. (Inspiration for her collections ranges from tribal tattoos to Le Corbusier's architecture, as well as sculpture by Calder and Serra.)

"There are affinities between Repossi and OMA, mainly in the conception of projects," says Pestellini Laparelli, "but jewelry brings the investigation of the small scale to an extreme."

The small scale of this particular space—970 square feet, distributed over three levels—is somewhat unusual for the global firm, but OMA has completed similarly sized projects, including Le Dauphin restaurant (2010) and Maison Ullens boutique (RECORD, May 2015, page 222), also in Paris. While those projects, carried out by different associates in OMA's office, made use of tradi-

AT YOUR SERVICE The store's upper level, where clients browse the jewelry collection at acrylic podiums, overlooks Paris's famous Place Vendôme. The small space's surfaces are completely clad in aluminum. LED strip lighting crisscrosses the ceiling.

PHOTOGRAPHY: © CYRILLE WEINER, EXCEPT AS NOTED



ON DISPLAY
Variously rotated circular cases in galvanized copper display a range of jewelry on the upper level (left), while a standing aluminum display greets visitors on the ground floor (opposite). Display windows make up one of the three faces of the kinetic billboard at street level (top).

PHOTOGRAPHY: © DELFINO SISTO LEGNANI AND MARCO CAPPELLETTI (TOP AND BOTTOM)

tionally luxe materials like marble and onyx, Pestellini Laparelli chose to experiment with new materials, eschewing the finishes—wood, carpet, leather—typically associated with high-end jewelry showrooms. This was also an opportunity to execute a level of detail and craftsmanship for which the firm is not generally known. "Working on a small project is simply a shift of focus," says Pestellini Laparelli. "But the amount of information you have to process is still vast. The very microscale is a universe as big as any large-scale project."

The resulting surfaces and display elements—made from thick resins and acrylic and aluminum in various forms—reflect the color palette of Repossi's distinctive baubles, from steely gray to subtle pink and rose gold.

The spectrum is on full display upon entry into the boutique's compact ground level, its floor, unconventionally, concrete. There, the store's signature feature—what OMA refers to as a billboard: automated walls that rotate to reveal three distinct faces—allows the ground floor to double as showroom and, quite literally, an extension of the street. "We designed the ground floor

credits

ARCHITECT: OMA – Ippolito Pestellini Laparelli, partner in charge; Antonio Barone, Paul Cournet, Leonardos Katsaros, Francesca Lantieri, Kate Lee, Francesco Moncada, Silvia Sandor, team

ASSOCIATE ARCHITECTS: DATA Architectes

ENGINEERS: Batiserf (structural); BET Louis Choulet (m/e/p)

SIZE: 970 square feet

COST: withheld

COMPLETION DATE: July 2016

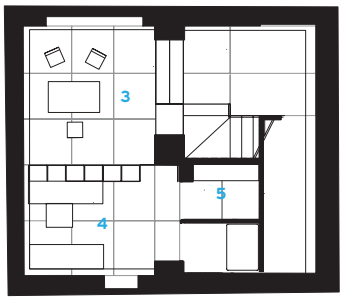
SOURCES

WALL AND MECHANICAL DISPLAYS: Goppion

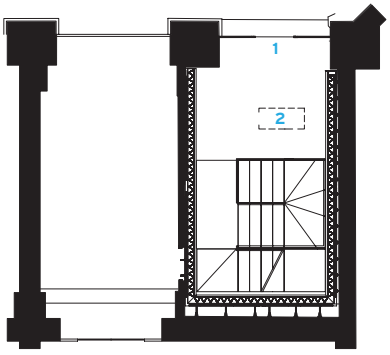
STANDING DISPLAYS: Sice-Previt

MIRROR DESIGN: Sabine Marcelis Studio

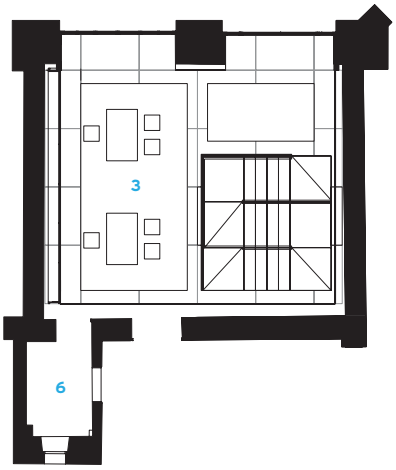
LEVEL OFF The staircase, sandwiched between the rotating billboard of the side walls, is a focal point (opposite). Its steps are formed from aluminum foam filled with resin that has the appearance of terrazzo (left). A wall of thick, sliding resin cases separates the office from the salon-style space on the lower level, furnished with Donald Judd tables and chairs (above).



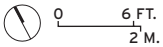
BASEMENT PLAN



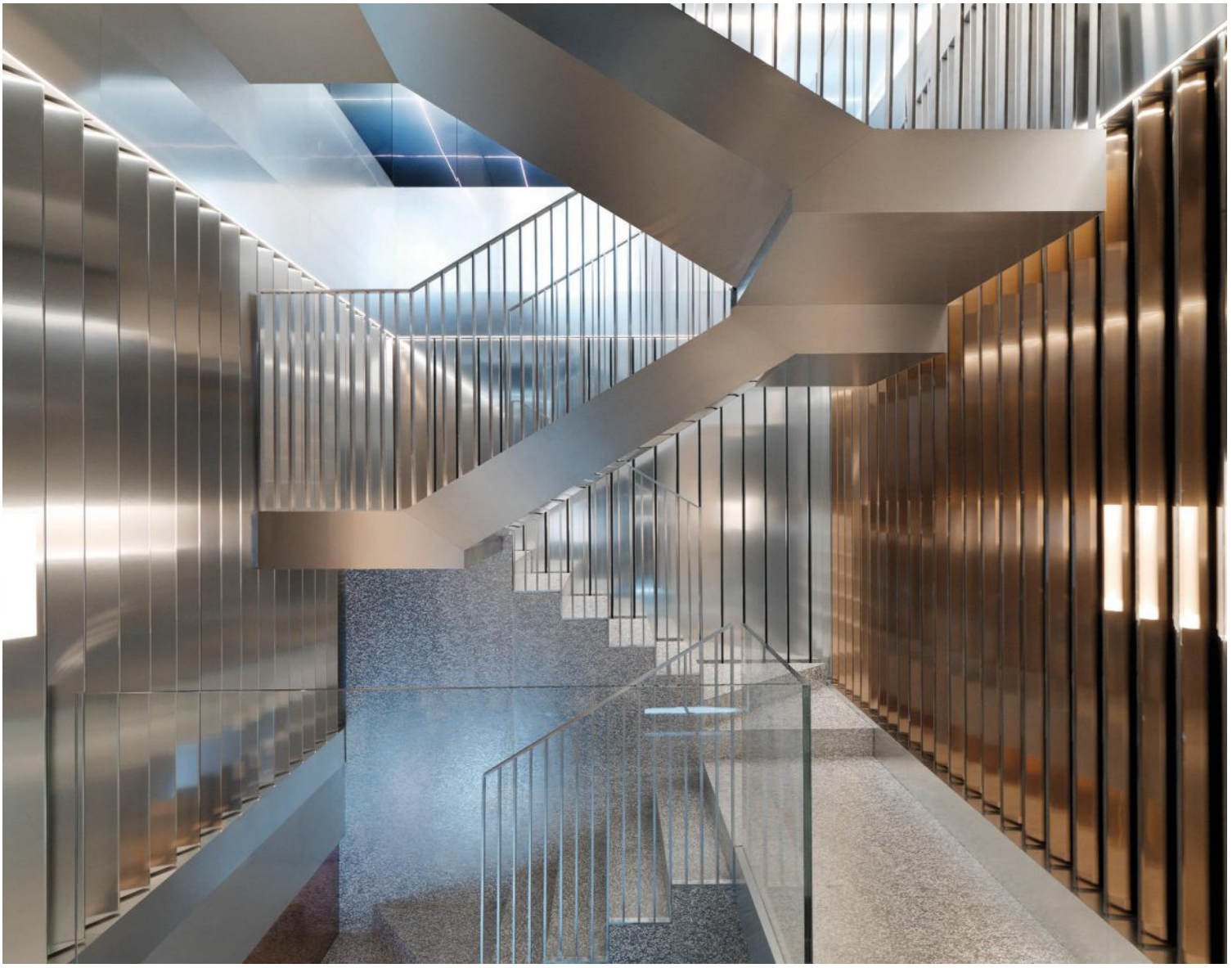
GROUND-FLOOR PLAN



SECOND-FLOOR PLAN



1 ENTRY
2 COUNTER
3 SHOWROOM
4 OFFICE
5 RESTROOM
6 SAFE



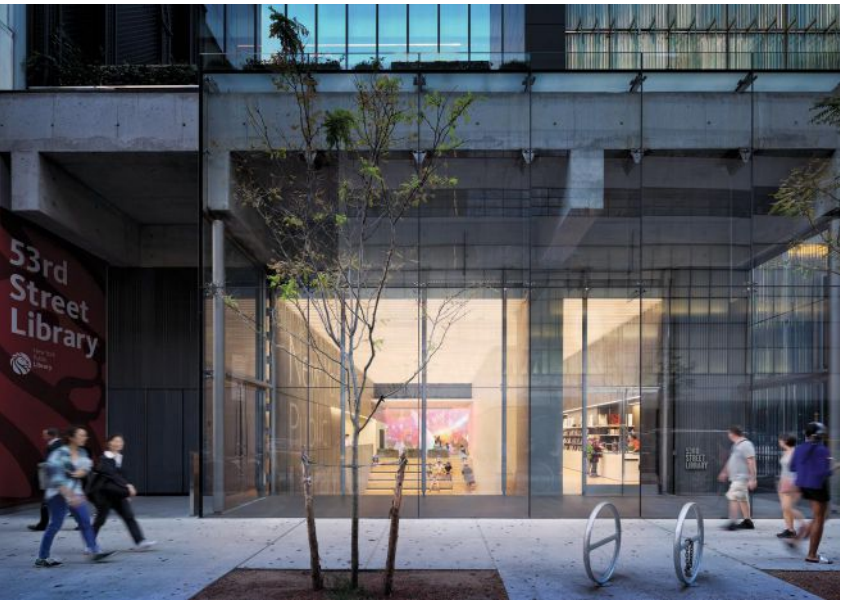
to be very flexible," explains Pestellini Laparelli. "When the billboard is turned so that the jewels are hidden, the showroom can become a public space for receptions or speeches. It was a very interesting concept, since space is probably the most luxurious item you can get on Place Vendôme."

When not showcasing jewelry, the other two faces of those triangular columns that rotate within the walls feature either a traditional mirror or a bronze-colored mirror that was developed in partnership with young Rotterdam-based designer Sabine Marcelis, using a film that is laminated into the glass. According to Pestellini Laparelli, "The colored mirrors don't reflect reality exactly but add a layer of interpretation to the products, to the space." (There are future plans to include a graphic element on one of the faces some of the time.)

Another arresting feature of the showroom is the staircase that connects the ground floor to the completely aluminum-panel-clad mezzanine above and the intimate, rose-hued lower floor, below grade. According to OMA, each level of the store corresponds to a certain category of customer described by the client—those who shop fast, slowly, and very slowly. Fast purchases of iconic pieces are made at street level. Upstairs, clients take more time to browse the collection. Downstairs, a classic salon-style space allows for one-on-one consultation for close inspection of desired pieces.

For the staircase, OMA turned to aluminum foam, a material it had originally experimented with when developing furniture for Knoll and then used extensively on interior and exterior walls at the Prada Foundation in Milan (RECORD, July 2015, page 56). Unlike Prada, however, here the air spaces within the foam treads, risers, and landings are filled with white resin to smooth the gaps and make it feasible as a walking surface. The effect, somewhat unintentional, are steps that appear to be made of terrazzo.

"We really wanted to create an experience," explains Repossi. "I was not sure to what degree OMA would let me participate, but I was surprised by how much they enjoyed entering the client's world." While she admits to being less technologically inclined than her architect, she concedes that the automated walls of the ground floor invite people in. And any fear she may have had about the jewelry being able to shine within such a dynamic space have been put to rest since the store opened in July. "I'm very satisfied with how the pieces stand out," she says. "It's almost hypnotic." ■



53rd Street Library | New York City | TEN Arquitectos

Open Book

A new library speaks volumes about design thinking, cultural values, and the persuasion of real estate.

BY SUZANNE STEPHENS

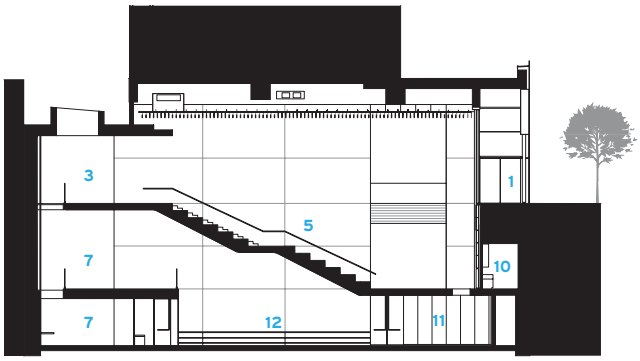
PHOTOGRAPHY BY MICHAEL MORAN/OTTO

As you peer through the elegantly glazed vestibule of the new 53rd Street Library in Manhattan, instead of book-lined shelves, you see a large amphitheater with expansive wood tiers. Edged on one side by a stairway, it spills exuberantly down from the back of the street-level lobby to the floor below. This mostly underground facility, designed by TEN Arquitectos (Taller de Enrique Norten), is quietly tucked into the east end of a faceted glass and black-aluminum-paneled, 50-story Baccarat Hotel and Residences by Skidmore, Owings & Merrill, which opened last year.

You might well ask, where are the books? They are there—though not in huge numbers, because this small branch is part of the trend to turn libraries into digital resource centers and community gathering places.

But the story of the 53rd Street branch also illustrates the tough choices facing civic and cultural institutions in overheated urban real-estate markets. What seems to be a one-story-high volume has replaced an entire building—the Donnell Branch of the New York Public Library (NYPL), a venerable, if shabby, five-story limestone-clad structure built in 1955 and demolished in 2011. The 28,000-square-foot, sleek new quarters is less than a third the size of the

REFLECTIONS IN A GLASS EYE From a concrete-framed glazed vestibule on West 53rd Street, visitors enter the library's western end (opposite). There they find a 34-foot-high open theater fitted with tiers of oak bleachers edged by stairs (this photo).



SECTION A - A

1 ENTRANCE VESTIBULE
2 WELCOME DESK
3 GALLERY
4 OVERLOOK
5 AUDITORIUM
6 READING ROOM
7 STUDY AREA
8 CLASSROOM
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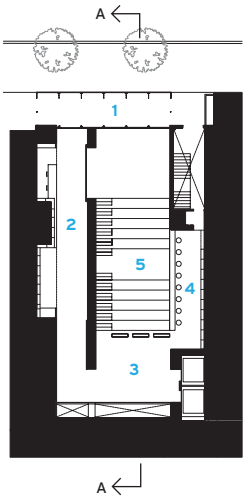
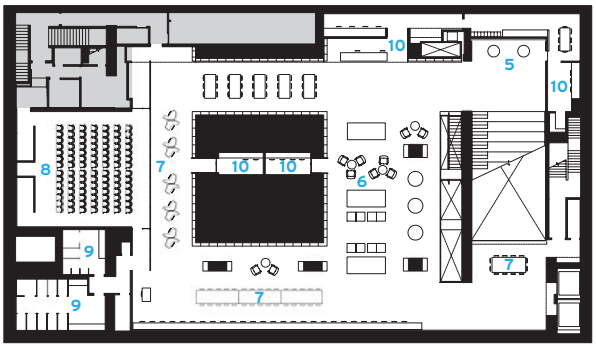
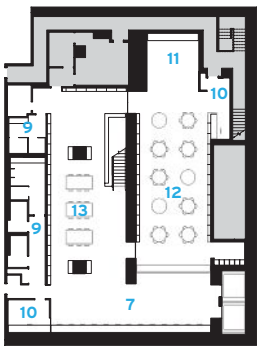
10 OFFICE
11 YOUNG READERS' AREA
12 CHILDREN'S READING ROOM
13 TEEN ZONE



ENTRY-LEVEL PLAN



CENTRAL-LEVEL PLAN



LOWER-LEVEL PLAN

DOUBLE VISION Sitting on the amphitheater's stadiumlike steps, visitors face a 20-foot-long screen on the north wall, directly below the sidewalk (above). Corrugated and perforated zinc panels backed by acoustical fabric line the east wall, while, on the west, concrete divides the main reading room from the amphitheater (opposite). Live events are planned for evening use.

97,000-square-foot original, a transformation that has invited scrutiny and some protests.

In 2007, the NYPL, under financial pressure, realized the soaring real-estate value of the Donnell site, directly across from the ever-expanding Museum of Modern Art—where a residential tower by Ateliers Jean Nouvel is currently under construction, on land sold by MoMA in 2006 to bolster its own bottom line. So NYPL decided to sell its property on the block as well, with a proviso that it could lease back space for a small branch. But this was before the economic downturn.

The first buyer backed out during the 2008 recession, the beginning of an eight-year period that left neighborhood residents and office workers without a branch library closer than a temporary one on East 46th Street. Then, in 2011, a second developer, Tribeca Associates and Starwood Capital, sealed the $67.4 million deal. Yet the plans for the new branch rankled many locals, with the greatly reduced space, and reading rooms that would occupy two underground levels in the reinforced-concrete structure of the hotel/residential tower.

For the architect, the challenge was making a subterranean library appealing. Norten scooped out space for the amphitheater to

connect the below-grade spaces with the street as a “continuous topography.” The architect, who has offices in New York and Mexico City, invokes Rome’s Spanish Steps when he speaks of wanting to “negotiate the different levels of the city outside and in” to “generate energy between the people on the street and the users within.” To get as much daylight as possible into the main level belowground, Norten not only glazed the facade but added a skylight and several openings in the floors at the rear of the lobby, so that illumination filters down to the nether regions below.

Visitors enter the library from the vestibule on 53rd Street to find the lobby wraps around the amphitheater in a space 34 feet high; at the rear are also elevators to levels below. The grand stair along the west wall of the stadium seating descends 17 feet to the main reading room. There, books, desks, and computers extend into the far reaches of this 11,000-square-foot level, which includes the acoustically paneled walls of an enclosed community room for 120. A second, airy

LIGHTENING UP
In spite of having more space underground than above, the library seems quite luminous and airy. Suspended white metal-mesh ceiling panels give the reading rooms an added sense of height (above). The children's reading room, on the lowest level, borrows space from the mezzanine above and from the angled ceiling that follows the shape of the amphitheater (left). At the rear of the library, a skylight and slotlike openings in the floors let daylight permeate the two subterranean levels (opposite).

staircase, fitted with glass balustrades and open risers, takes visitors down to young-adult reading areas as well as an enclosed children's reading room under the amphitheater.

The amphitheater itself is a bustling place: a video screen under the glass wall along 53rd Street is fitted with headsets so that people may gather and watch events. They may also eat lunch (yes, food is allowed here!), or attend performances, lectures, and films, sans headsets, after hours. The prominence of this space signals clearly that the branch is more of a community center than a traditional library.

While the old Donnell was immensely popular for its world-languages center and its media and children's collections—now dispersed in the NYPL system—it hadn't aged well. Its interiors, bathed in a haze of fluorescent lighting and filled with battered wood furniture, will not be missed. Its successor—sleekly crisp and smartly detailed with laminated-glass, oak, and metal surfaces—constitutes a serious upgrade in ambience. Given the challenges of its program, space constraints, and basement environment, the architect has deftly delivered an inviting civic place that is unexpectedly filled with light. ■

credits

ARCHITECT: TEN Arquitectos – Enrique Norten, principal; Andrea Steele, partner in charge; Joe Murray, project manager; James Carse, Wook Kang, Erik Martinez, Ekta Desai, Andrew Deibel, Sebastian Gutierrez, Harry Byron, Hannah Lee, design team

ENGINEERS: WSP Cantor Seinuk (WSP Group) (structural); Cosentini Associates (m/e/p, LEED, IT, AV)

CONSULTANTS: Lally Acoustical Consulting (acoustic); Horton Lees Brogden Lighting Design (lighting)

CONTRACTOR: Turner Construction

CLIENT: New York Public Library

SIZE: 28,000 square feet

COST: withheld

COMPLETION DATE: June 2016

SOURCES

METAL PANELS: VMZinc

METAL/GLASS CURTAIN WALL: Pilkington Planar

INSULATED GLAZING: Panelite

ACOUSTICAL CEILINGS: RPG Ceilings, Lindner

SOLID SURFACING: 3Form

SPECIAL SURFACING: Get Real Surfaces

CARPET: FLOR

FURNITURE: Vitra, Herman Miller

RA Office | Palma de Majorca, Spain | OHLAB

Mirror Image

A new contemporary workspace reflects the past and future vision of a family-owned jewelry business.

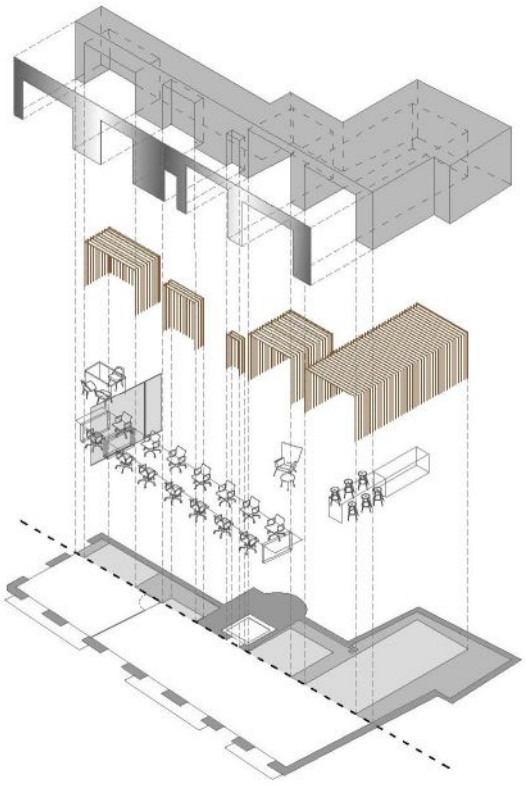
BY ANA MARTINS

PHOTOGRAPHY BY JOSÉ HEVIA

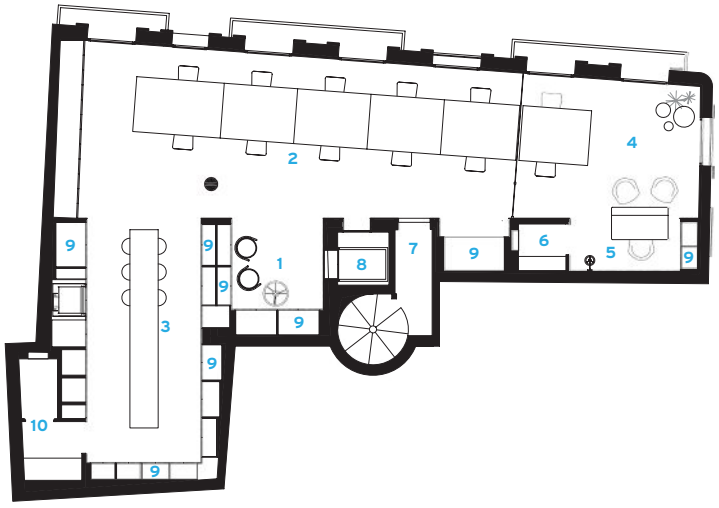
Founded in 1879 by German entrepreneur Guillermo Krug, the Relojería Alemana's first jewelry store still stands on a corner of the Carrer del Colón, amid the labyrinthine tangle of cobbled lanes and alleyways that make up the quaint historical district of Palma de Majorca, Spain. Owned and operated by the Fuster family since 1922, the shop occupies the first two floors of a residential-style six-story building. Above it, tucked among the remaining four stories, along with the company's workshops, a new office designed by the Palma- and

SEEING DOUBLE A long, mirrored-stainless-steel wall blurs the boundaries between the workspace and more social areas, inviting staff to bring a variety of tasks into these informal areas.

OPENING DOORS
The architects concealed 215 square feet of storage space, restrooms, and other workplace necessities behind ribbed oak wood panels that line the walls of the niches (left). The communal worktable (opposite) emphasizes the brand's status as a family business, with staff and directors working as a team in a close-knit environment.



EXPLODED AXONOMETRIC DIAGRAM



FLOOR PLAN

0 10 FT.
3 M.

1 ENTRANCE LOBBY
2 EMPLOYEE WORKSTATIONS
3 KITCHEN
4 BOARDROOM
5 DIRECTOR'S OFFICE
6 PRIVATE RESTROOM
7 STAIR ENTRANCE
8 ELEVATOR
9 STORAGE
10 STAFF/VISITOR RESTROOM

Madrid-based studio OHLAB demonstrates the owner's commitment to the 21st century and contemporary design.

The top-floor office, which opened in November of 2015, is a surprising contrast to the classical, ornamental interiors of the store below. OHLAB's cofounders and partners Jaime Oliver and Paloma Hernaiz, who have been working with Relojería Alemana for nearly five years, devised a simple concept that responds to both the client's comprehensive brief—which even covered the square footage of storage space—and an irregular floor plan.

Without resorting to physical partitions, the architects divided the 1,400-square-foot space into two contrasting areas through a clever use of color and materials. They located the open, rectangular workspace along a continuous span of the building's facade. Then they carved four wood-lined niches into the opposite wall, offsetting the irregular configuration of the rear elevation. This allowed Oliver and Hernaiz to bring natural light into all the areas, as well as to stretch functionality.

OHLAB'S previous designs for Relojería Alemana stores in nearby Port Adriano (2012) (RECORD, September 2013, page 94) and Paseo del Borne (2013), also in Palma, refreshed the image of the 135-year-old brand, positioning it for today's market. In the office, the wall that separates the work and informal areas is clad in chromed stainless steel with a mirror finish, a direct nod to these award-winning boutiques. "We really wanted to bring a striking element that was part of the two stores," Hernaiz says. "The mirror works perfectly for practical as well as conceptual reasons." Indeed, the mirrors not only make the office feel bigger but help reflect light.

In-depth research into the modern workplace, coupled with the familiarity of the brand, allowed the firm to enrich the client's mandate with outside-the-box solutions. For instance, instead of being a tedious office essential, the desks are a focal point. The architects distributed 14 workstations on one 37-foot-long by 4-foot-wide communal table that extends into the director's boardroom, where it becomes a meeting table. A glass wall separating the two functions provides privacy for meetings while allowing for visual continuity.

The design team balanced the neutral, open space for focused work with informal areas. "At the beginning, the client was skeptical about the amount of space we were giving to the kitchen," Oliver says. "Now they understand. Employees use the kitchen counter for different types of work and informal meetings." Besides the kitchen, the niches house the entrance and reception area, a walk-in vault, and the director's office, which has an adjacent private restroom.

Like much of OHLAB's work, nothing was left to chance in this small-scale project. "Besides the fact that we love industrial design, the advantage of designing bespoke elements is that we maintain full control of the project," Hernaiz says. This control extends to the custom workspace lighting (an aluminum fixture with LED strips), the kitchen

DESIGN BAY
The entrance cum waiting area features Thonet armchairs and a Santa & Cole Tripode G5 standing lamp, which contribute to a welcoming and comfortable atmosphere.

counter, restroom sinks, and the oak wood panels that line the cove walls and ceilings. These panels consist of wood ribs that disguise the door openings throughout the walls, and conceal the lighting and ventilation systems in the ceiling, resulting in a clean, continuous finish. Similarly, contemporary furniture was carefully selected to complement the design. Kitchen stools by E-15, Eames Vitra office chairs, and a Matthew Hilton desk produced by Portuguese company De La Espada contribute to a playful but practical space.

Just as the architects' earlier schemes for the Relojería Alemana boutiques looked to redefine the traditional store and dissolve barriers between outside and inside, and customer and staff, so the new office looks to redefine the traditional workplace and dissolve barriers, this time between life and work, and staff and employers.

Oliver and Hernaiz always respond thoughtfully to their clients' needs, while also challenging them in positive ways. According to the partners, "The name of our studio is no coincidence." Their "lab" aims to find each project's specific design language instead of furthering its own individual style.

OHLAB is helping Relojería Alemana redefine its future while honoring its past. It is now working on revamping the workshops and original store—integrating the brand's 21st-century image within company headquarters. Construction is set to begin in 2017. ■

Based in Portugal, freelance journalist Ana Martins writes about architecture and design.

credits

ARCHITECT: OHLAB / Oliver Hernaiz Architecture Lab – Paloma Hernaiz, Jaime Oliver, partners in charge; Rebeca Lavín, Marina Esteban, design team; Jorge Ramón, project management

GENERAL CONTRACTOR: Lagares

CLIENT: Relojería Alemana

SIZE: 1,400 square feet

COST: withheld

COMPLETION DATE: March 2015

SOURCES

WINDOWS: Schüco (aluminum frames)

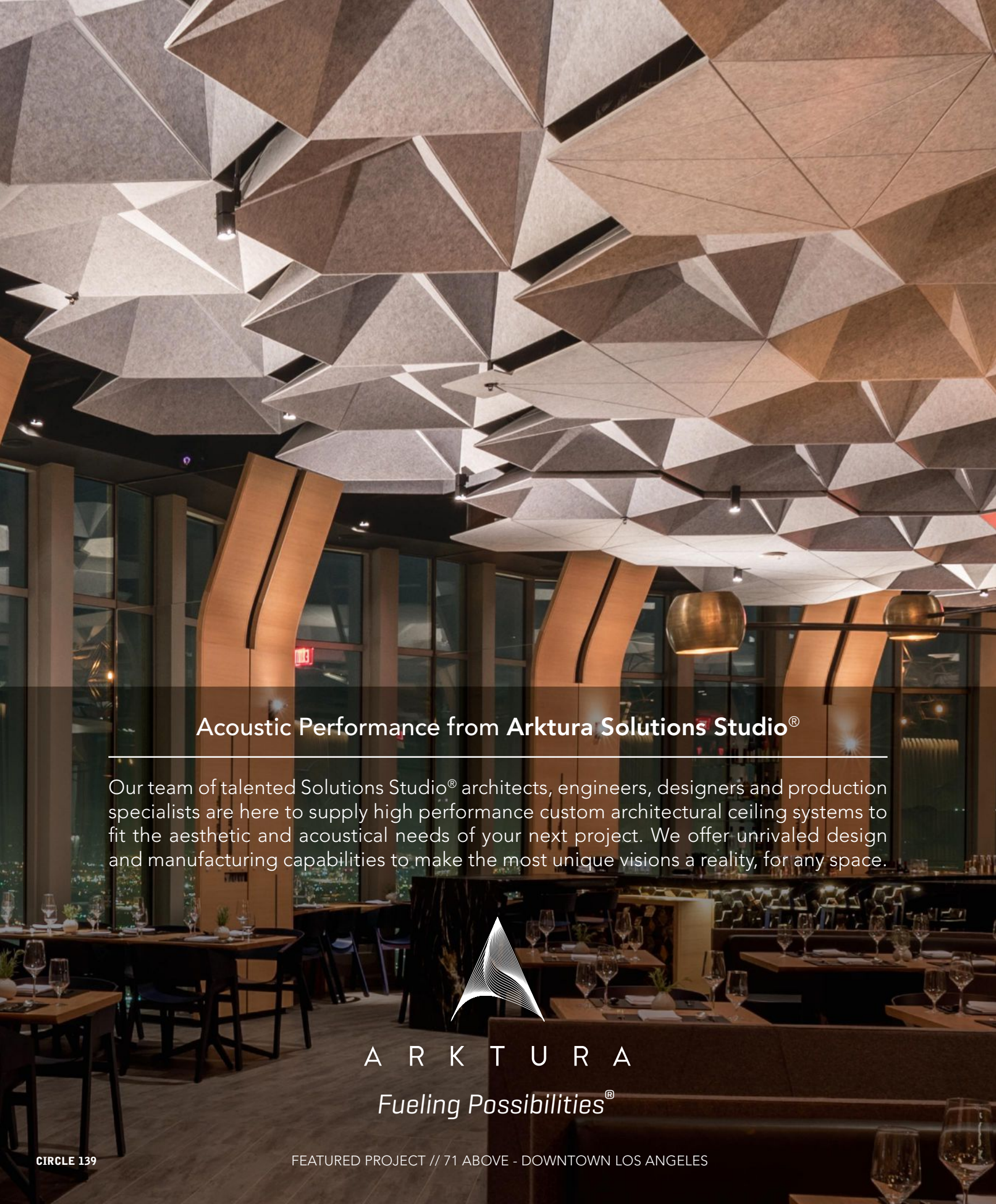
WALL: The Inox in Color (mirrored stainless steel)

CHAIRS: Kartell, Thonet, Vitra, E15

TABLES: Viccarbe, De La Espada

LIGHTING: Santa & Cole, Louis Poulsen

ELEVATOR: Malift Ascensores



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CIRCLE 139

FEATURED PROJECT // 71 ABOVE - DOWNTOWN LOS ANGELES

ZIP System® Sheathing and Tape Transforms Multifamily Apartment Project

Missouri architect 'would never recommend going back to housewrap'

Mike Reardon was attending a lunch-and-learn program for builders and architects in 2014 when the presenter began using "innovative" and "integrated" in the same sentence to describe an alternative to housewrap. It was a lightbulb moment for the Missouri architect and a turning point in how he would approach weather-resistant barriers for his firm's multifamily projects.

"Housewrap issues are a constant challenge on job sites," said Reardon, project manager for M.W. Weber Architects, an architectural design firm that specializes in multifamily, commercial and retail projects. "Housewrap is hard to install and can make dry-in difficult. This is not what you want on a job site.

> **"The contractor for our next apartment project was initially sold on housewrap, but once we demonstrated how ZIP System® sheathing and tape installs quicker, he was convinced."**
>
> – Mike Reardon, M.W. Weber Architects

"In addition," he continued, "I was adding square footage to my own home at the time and was using housewrap. I was experiencing firsthand just how difficult it can be, in terms of usability and making a project airtight."

ZIP System® sheathing and tape is an innovative structural roof and wall system with an integrated water- and air-resistant barrier that streamlines the weatherization process, while providing a continuous air barrier to reduce air leakage. Following the lunch-and-learn presentation on ZIP System sheathing and tape, Reardon was convinced the system could prevent the infiltration of air and water better than housewrap.

"I knew right away I wanted ZIP System sheathing and tape for our firm's projects, and it didn't take much to convince people to switch," he said. "The contractor for our next apartment project was initially sold on housewrap, but once we demonstrated how ZIP System sheathing and tape installs quicker, he was convinced."

Bramblett Hills Apartments is a luxury apartment complex in O'Fallon, Missouri west of St. Louis. The project includes 218,000 square feet of ZIP System panels in 204 apartments in 17 three-story buildings, 87 garages and a clubhouse.

Bramblett Hills Apartments includes 218,000 square feet of ZIP System® panels.

"ZIP System® sheathing and tape transformed the Bramblett job site with a two-step installation process – install the panels and tape the seams," Eric Gowin, Contegra Construction. "Taping became a one-man job, and that's not possible with housewrap. We have an aggressive construction schedule – completing a new building every 30 days – and this schedule would not be possible without using products designed to perform."

Reardon said another benefit to using a structural sheathing system with built-in moisture protection is that it can be put in place regardless of the time of year. It's a promise the manufacturer, Huber Engineered Woods LLC, backs with a 180-day Limited Warranty.[1]

"ZIP System® products do not appear to be negatively affected by weather during or after installation," he said. "Once the panels are in place the structure is airtight, which is critical to preventing mold and moisture from penetrating the building. I would never recommend going back to housewrap."

Installers pre-assembled ZIP System® sheathing panels and tape before installing on exterior walls and roofs.

With a built-in water resistive barrier, ZIP System® sheathing and tape saves installation time by eliminating housewrap.

Tim Breece, president of Propper Construction Services, which along with TriStar Development are the owners of the project, said faster dry-in times and more predictable construction schedules are the hallmarks of ZIP System® sheathing and tape. Propper also plays a secondary role as construction managers over the development.

"ZIP System sheathing and tape is more reliable than housewrap," Breece said. "The system's water-resistant capabilities and its ability to hold up under extreme weather conditions are especially important to us.

"The continuous air barrier also is a plus, as well as fewer man hours needed to install the system," he added. "The seam tape is an obvious plus too, especially given how unpredictable Mother Nature can be in the Midwest."

Bramblett Hills is scheduled for completion in August 2016, and Breece is already looking ahead to his next project using ZIP System sheathing and tape. Propper Construction has more than 450 multifamily units under construction in the St. Louis area.

"ZIP System sheathing and tape has been a great problem-solver for us," Breece said. "It is almost foolproof to install and its ease of installation keeps our projects moving forward with no callbacks. It would be an understatement to say we are bullish about using the system in other multifamily projects."

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1. Limitations and restrictions apply. Visit ZIPSystem.com for details.

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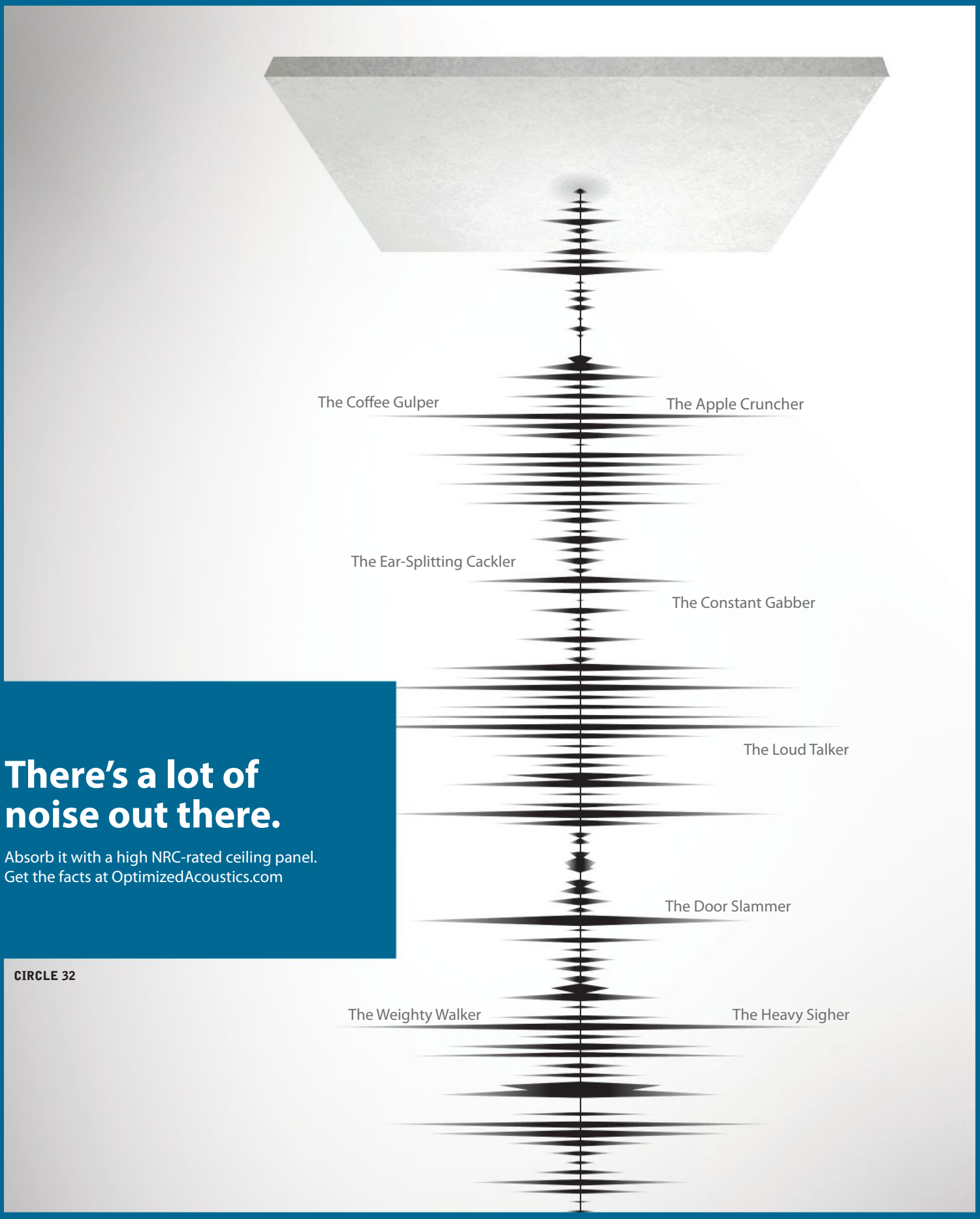

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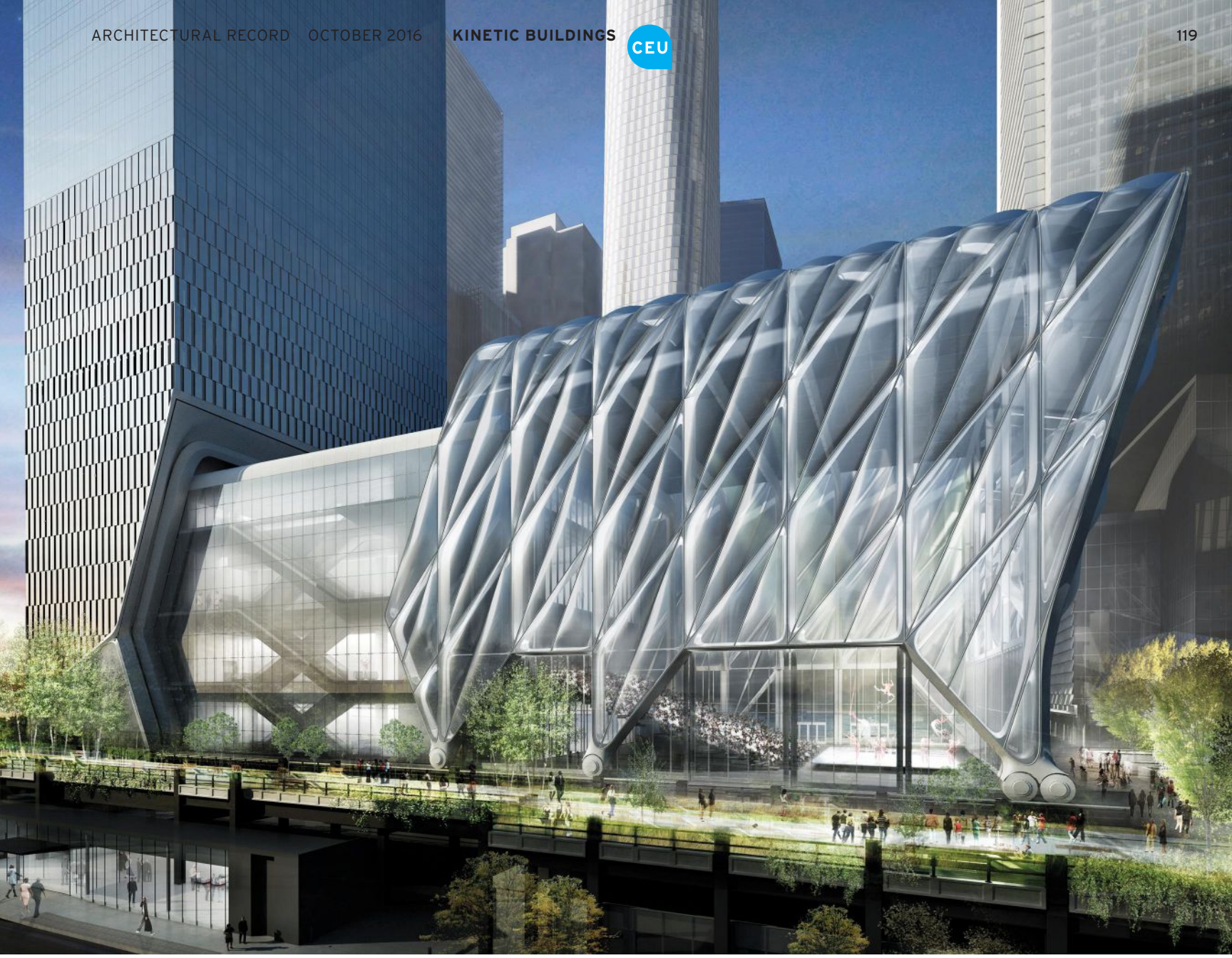


IMAGES: COURTESY DILLER SCOFIDIO + RENFRO IN COLLABORATION WITH ROCKWELL GROUP

Movable Feasts

Dynamic structures with large-scale operable elements adapt and transform, responding to changing needs.

By Joann Gonchar, AIA

TRAVELING SHOW The Shed, a multidisciplinary arts venue under construction in Manhattan, consists of a fixed building enclosed by a glass cable wall and an ETFE-clad diagrid shell that can be moved to cover a plaza.

BUILDINGS ARE generally designed to be permanent, immutable structures. But this is not always the case. In the early 1960s, the British architect Cedric Price proposed a "Fun Palace" to be built on the banks of the Thames in London. It was to be ever-changing, with moving and reconfigurable walls and floors. Price's vision was never realized, but a modern-day transformable structure inspired by his ideas and known as the Shed is taking shape in New York, on Manhattan's far west side, where the High Line meets Hudson Yards. The 200,000-square-foot interdisciplinary arts space, designed by Diller Scofidio + Renfro (DSR) with Rockwell Group, is devised to operate in a variety of modes. Slated to open in spring 2019, the $425 million venue consists of two primary components: a six-level fixed building that houses two galleries, a 500-seat theater, and a rehearsal room, among other elements; and an outer shed or shell that slides to shelter an adjoining 21,000-square-foot plaza and create a multipurpose 120-foot-tall, column-free hall.

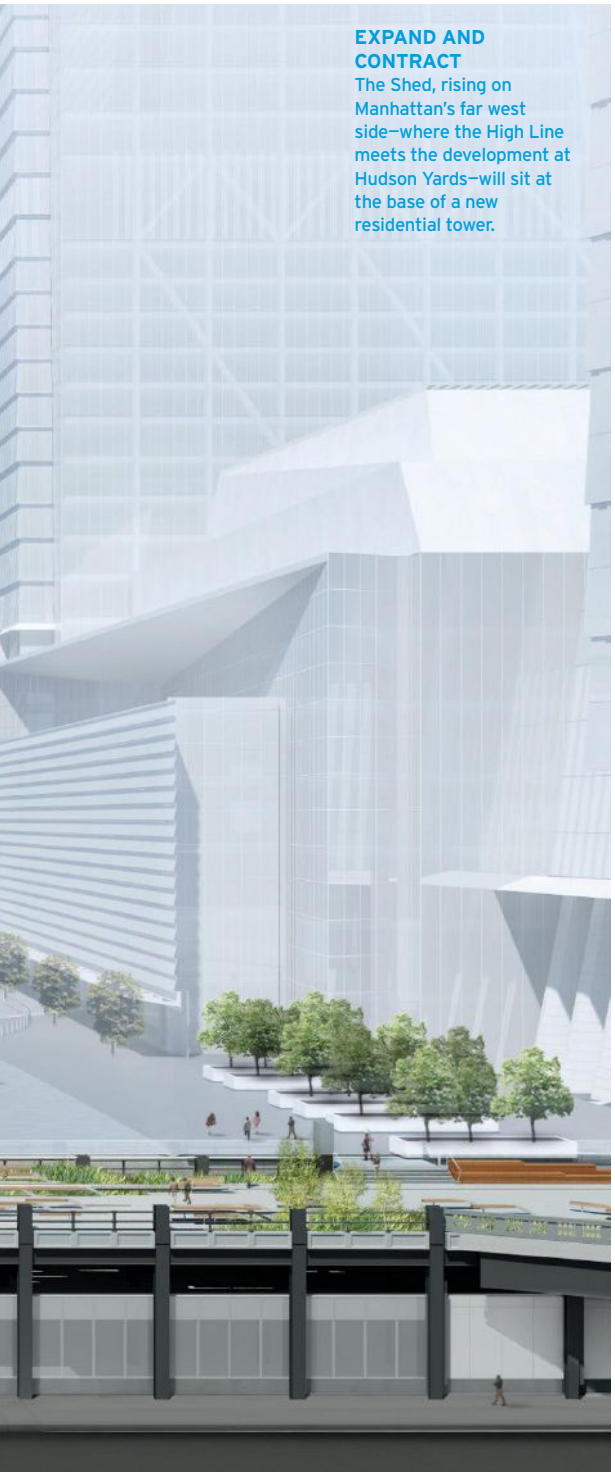
The venue's stationary structure has a conventional steel frame with 100-foot-long clear spans and is enclosed within a glass cable wall. The movable shell, meanwhile, comprises an exposed steel diagrid frame clad in translucent pillows made of the strong but lightweight plastic, Ethylene tetrafluoroethylene (ETFE). Integrated within this cagelike structure are equipment and services, such as power, lighting, theatrical rigging, and ducts, to create what Liz Diller, DSR founding part-

ner, calls an "open infrastructure."

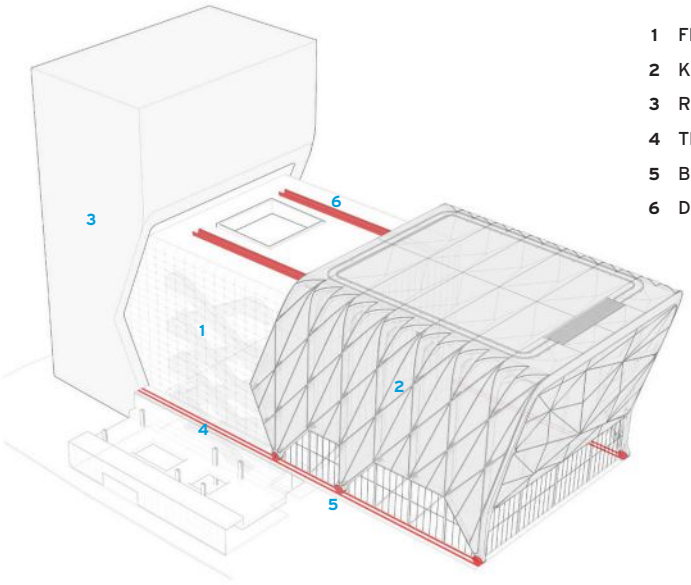
The shell, whose primary steel weighs 2,400 tons, will travel via a system based on gantry crane technology common in shipping ports. A rack-and-pinion drive moves the shell forward and back on 6-foot-tall bogies, or wheels, that run in tracks at plaza level. It will take about five minutes to completely extend the shell, according to Diller, raising the possibility that its movement could be incorporated into a performance rather than merely in preparation for one. The building is inherently "performative," says David Rockwell, Rockwell Group founder.

But before deployment, the Shed's managers must conduct a multistep safety protocol to make sure that the path of travel is clear of obstructions—checking areas that include the plaza, the bogie tracks, and the space directly below the theatrical rigging. The location of the drive system—on the roof of the fixed building—keeps it secure, since the public has no access. The friction and inertia forces from the drive are transmitted through the fixed building's steel frame, explains Scott Lomax, principal at Thornton Tomasetti, the project's structural engineer. Its elements have been sized to accommodate these forces, he says.

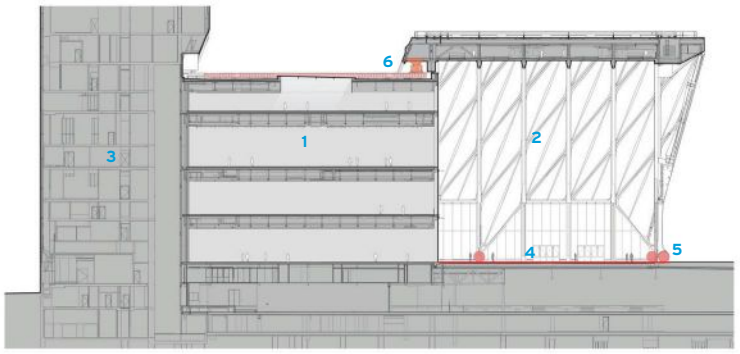
To deal with the environmental-control issues associated with temporarily enclosing



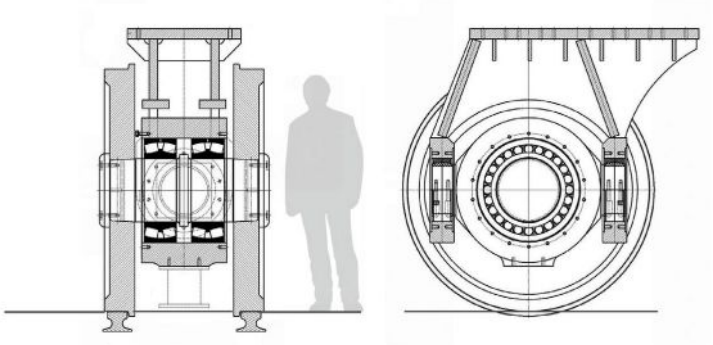
EXPAND AND CONTRACT
The Shed, rising on Manhattan's far west side—where the High Line meets the development at Hudson Yards—will sit at the base of a new residential tower.



THE SHED—DEPLOYED: AXONOMETRIC DIAGRAM



THE SHED—DEPLOYED: SECTION



THE SHED—BOGIE: SECTION

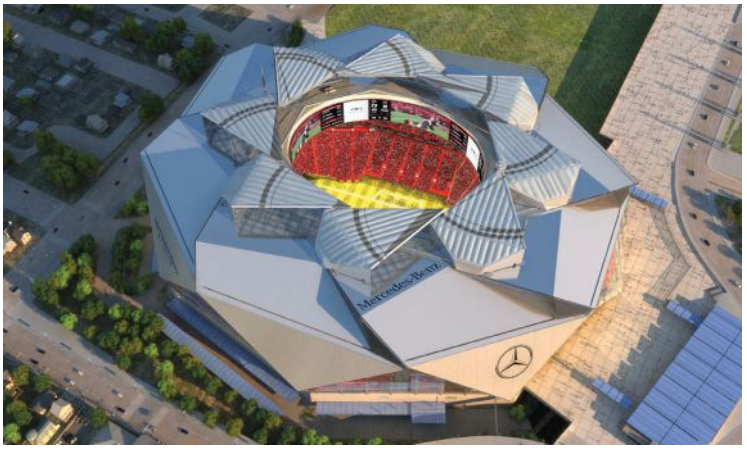
IMAGES: COURTESY DILLER SCOFIDIO + RENFRO IN COLLABORATION WITH ROCKWELL GROUP

outdoor space, the project team designed the plaza as a radiant floor that can be heated for winter events. In warm weather, the space under the deployed shell will be conditioned with cool air delivered through low-level ducts. Blackout shades can also be extended to make the hall suitable for multiple types of programming. The goal is a responsive, versatile building that can accommodate different media, showcase work at a variety of scales, and adapt to changing technologies. "What art will look like in the future is an open question," says Diller.

Of course, large-scale kinetic elements in the form of retractable roofs have long been a feature of stadia and ballparks for professional athletic teams. The operable coverings permit play in inclement weather and allow facilities to be used for multiple sports, as well as for other types of events including concerts or trade shows. They can also help facilitate the growth of natural turf.

One venue with a particularly unusual operable roof is the new facility designed by 360 Architecture (now part of HOK) for the National Football League's Atlanta Falcons. The $1.5 billion Mercedes-Benz Stadium, now under construction and on track for completion next summer, will have an operable roof comprised of eight ETFE-pillow-clad triangular

GRAND OPENING
The oval opening over the field at the Mercedes-Benz Stadium in Atlanta will have eight ETFE-clad petals that appear to rotate to open (bottom, left) and close (bottom, right) the roof. In reality, they each move on a straight line.



"petals." These retract, much like the leaves in a camera shutter, to reveal a 380-foot-long and 305-foot-wide oval opening overhead.

The designers and owners envision that the roof will be open most of the time during NFL games, since the Atlanta weather in football season is mild. Bill Johnson, the HOK design principal leading the project, hopes the pool of sunlight that will move around the artificial-turf field during daytime play will bring to mind the Pantheon in Rome. "It was the inspiration," he says.

It might seem presumptuous to compare a professional-sports venue with one of the most revered works of antiquity, but the stadium is an engineering feat in its own right. The roof includes an outer fixed portion clad in metal and membrane that is folded and faceted to create something that resembles an eight-pointed pinwheel in plan. Its structure is a two-way system of steel trusses that span 730 feet between reinforced-concrete mega-columns positioned just outside the stadium's seating bowl. This fixed-roof assembly includes backspan members intended to support the upward forces created by the retractable petals, which each weigh as much as 450 tons. They cantilever up to 200 feet—a dimension similar to the length of a city block, notes Erleen Hatfield, a partner at BuroHappold, the

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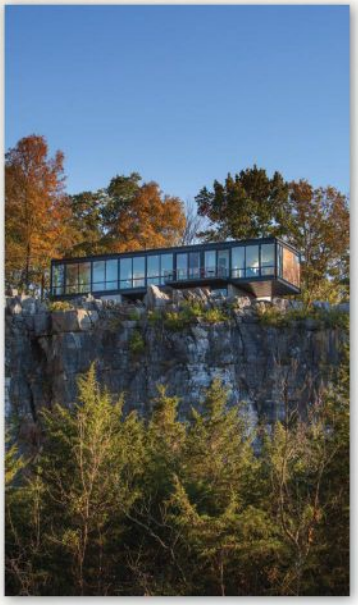
My vision...

was to create a home simultaneously separate from and intertwined with nature.



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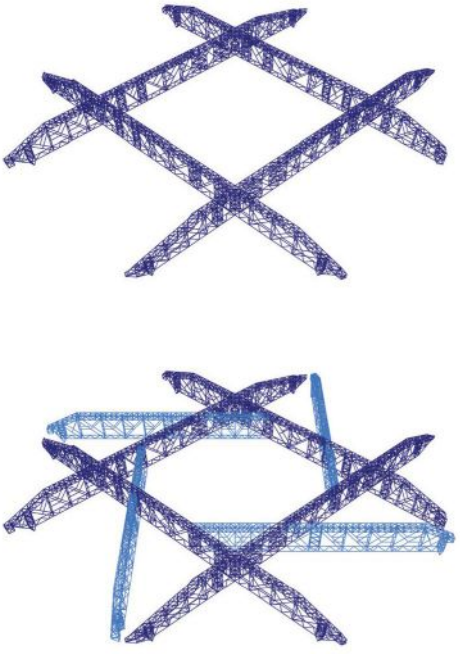

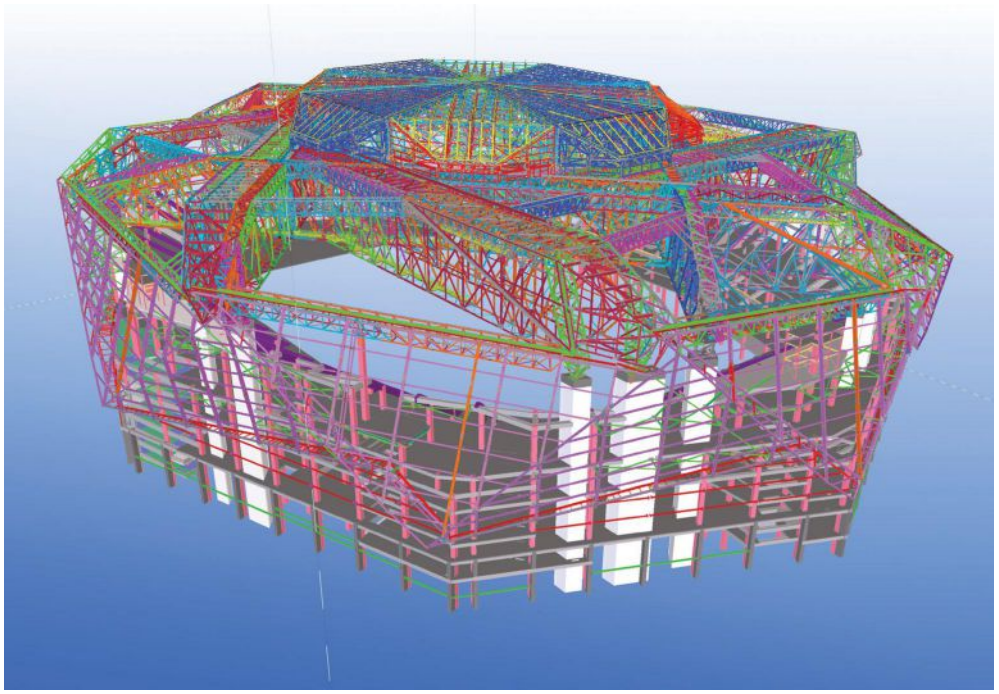

STRUCTURAL GYMNASTICS The Mercedes-Benz Stadium's fixed roof framing (top three diagrams, left) consists of a system of trusses that span more than 730 feet between megacolumns (above) and support the retractable petals (bottom, left), which cantilever as much as 200 feet over the oval aperture when closed.

project's structural engineer.

The roof scheme bears the mark of the kinetic design consultant Chuck Hoberman, who was involved in the project's early phases: although the petals appear to rotate as the roof opens and closes, they move together at a diagonal but straight line. Each travels on a pair of rails set 40 feet apart and supported by the fixed-roof structure. But because of the opening's oval shape, the petals have different dimensions and weights. This not only made structural analysis more difficult, but it also meant that the petals travel at different speeds, creating an added challenge for synchronization and coordination.

And if the roof system is not complicated enough, it will also support a 58-foot-tall and 1,100-foot-long video scoreboard that wraps the perimeter of the roof opening. This configuration, an alternative to the typical Jumbotron, allows the Falcons' fans to see the clouds and the sky, but, at 940 tons, it is almost 5 percent of the weight of the entire roof, says Hatfield.

The nodes where steel elements came together are particularly complex. So, to facilitate their coordination, Thornton Tomasetti shared its 3-D model with the steel fabricator, ultimately checking the shop drawings in a digital environment. Hatfield says the process was a significant time-saver. She believes that it is the largest project ever to implement 3-D review for its steel package.

The roof isn't the only moving or adaptable element at Mercedes-Benz. To reduce the stadium's capacity for events such as soccer matches, corner sections of the stadium bowl retract, while upper portions can be closed off with a motorized curtain. The aim is to minimize conversion time, says Scott Jenkins, the facility's general manager.

Compared with Mercedes-Benz, the new roof over the Arthur Ashe Stadium at the Billie Jean King National Tennis Center in Queens, New York, appears almost straightforward: the slightly domed 236,600-square-foot canopy contains two 500-ton rectangular panels that separate to frame a 250-foot-square slice of the sky. Designed by the Detroit-based architecture firm Rossetti, the new roof is the United States Tennis Association's response to rain delays that in recent years had regularly plagued the U.S. Open Tennis Championships held in the late summer at the Flushing Meadows complex.

But devising and constructing the $150 million shelter for the almost 24,000-seat venue was not so simple. The primary complicating factor: the original 1997 stadium, which was also designed by Rossetti, had not been conceived to support a roof. So the new element would need to be wholly independent of the original's precast-concrete seating bowl and steel structure. What's more, the team was hampered by the marshy site, which had been used as an ash dump. Ahmad Rahimian, the U.S. director of building structures for WSP, the project's structural engineer, sums up the challenges as "poor soil, long spans, and a tight budget."

Rossetti principal Jon Disbrow refers to the solution as "an umbrella," but one that straddles the existing stadium. It is supported on eight steel columns—each with two branchlike braces—placed just outside the corners of the existing building's octagonal footprint. The columns, which sit on top of piles as deep as

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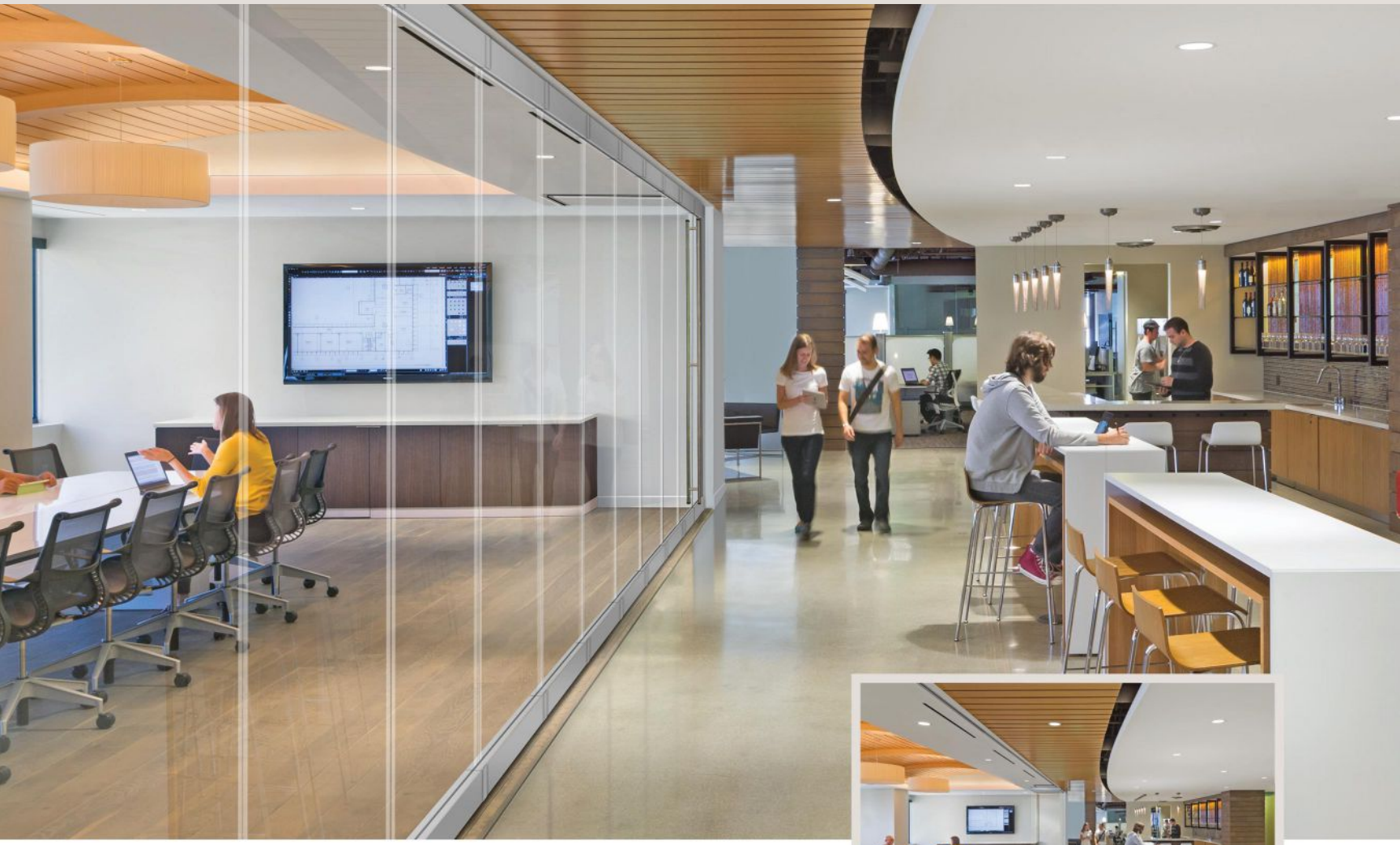

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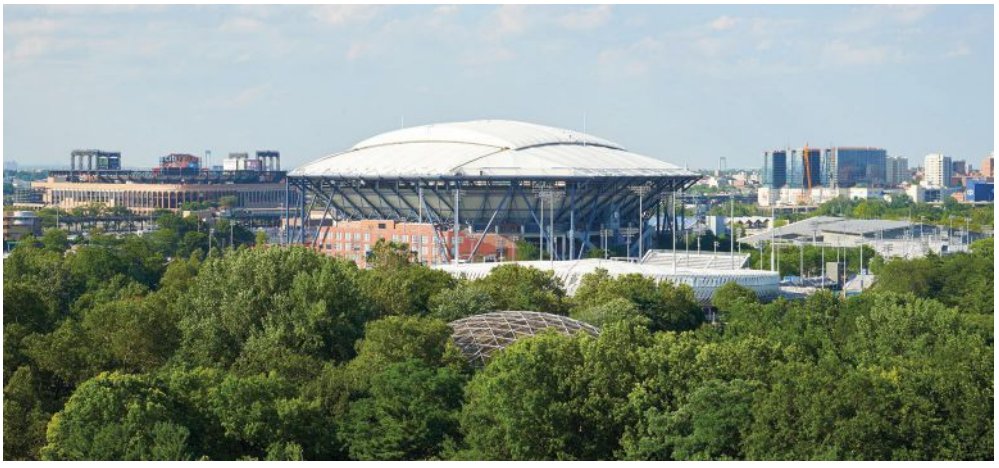

HAT TRICK The new operable PTFE roof over the Arthur Ashe Stadium (above and left) in Queens, New York, is completely independent of the 1997 structure beneath it. The roof can be opened or closed in about six minutes.

200 feet, hold up four nearly 500-foot-long trusses, two spanning in each direction. These in turn support a network of steel joists and bracing, over which a membrane of Polytetrafluoroethylene (PTFE)—a lightweight material resistant to heat and UV degradation—is stretched.

The new roof was built without disrupting the U.S. Open schedule. It was constructed, starting in late 2013, in three discrete phases, each conducted in the 11½-month period between tournaments: first the foundation work,

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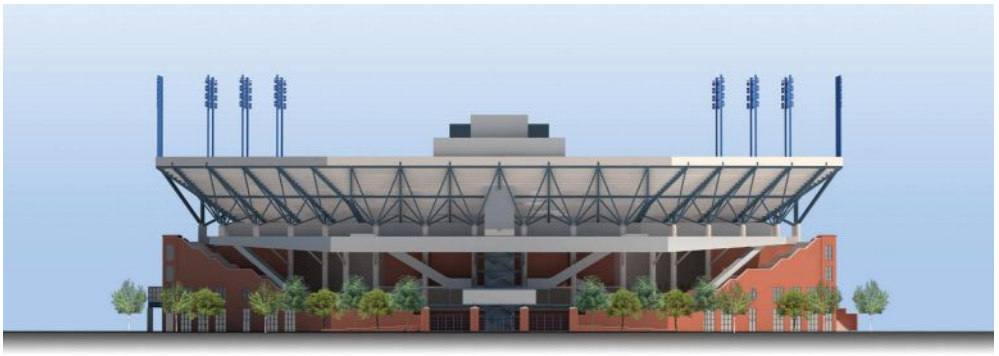

ARTHUR ASHE STADIUM–ORIGINAL SOUTH ELEVATION

ARTHUR ASHE STADIUM–NEW SOUTH ELEVATION

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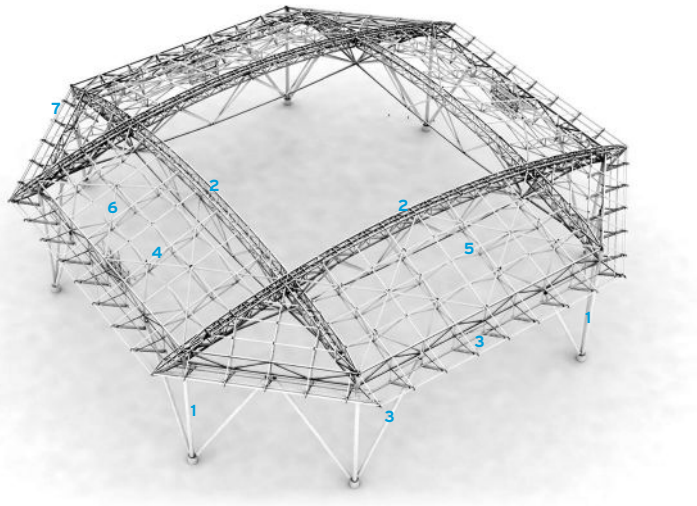
1 COLUMNS
2 PRIMARY LONG-SPAN TRUSS
3 SEISMIC SYSTEM
4 RADIAL JOIST
5 CIRCUMFERENTIAL WING TRUSS
6 DIAPHRAGM BRACING
7 GUTTER FRAMING



ARTHUR ASHE STADIUM–FRAMING DIAGRAM

then the primary steel structure, and finally, this summer, the retractable-roof components and PTFE skin.

Now that the new roof is in place, it looks as though it was always intended to be there, adding a bit of interest to the stadium's slightly stubby profile. But one aspect of the newly covered stadium that not everyone is pleased with is its acoustics. Some players at this summer's Open reportedly complained that the roof amplifies the noise made by the spectators, making it hard to concentrate. As part of Rossetti's design, perforated metal panels backed with mineral wool were installed at the roof's perimeter to dampen reverberation, according to Disbrow. He says that additional measures could be implemented, but so far the USTA hasn't asked the firm to do so.

Although acoustics may still need to be addressed, the new canopy does work admirably in a variety of modes and conditions, as any adaptable building should. Even in the open position, the majority of the venue's seats are in shade, shielded by the fixed roof's PTFE skin, which blocks 90 percent of visible light. So even though the new lid was conceived primarily as an umbrella, it also serves as a parasol, allowing fans to enjoy tennis at Arthur Ashe, rain or shine.

The completions of Mercedes-Benz and the Shed are still in the future. It is not yet clear if the highly mechanized buildings will function as flawlessly as their designers predict. Or, more to the point, if they will readily adapt to needs that have yet to be identified. But Jenkins at Mercedes-Benz is confident. He says the roof has been mocked up and thoroughly tested and that its controls are straightforward. But he does concede that "until we actually operate it, we won't know what we don't know." His project and others could be just the beginning of a future for flexible architecture that may be even more fun than Cedric Price dreamed long ago. ■

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1 Discuss the design, construction, and operational challenges presented by buildings with large-scale kinetic elements.

2 Describe three such current projects and explain the mechanisms that allow their kinetic elements to move.

3 Explain the structural solutions presented by these projects.

4 Explain the indoor environmental-control solutions presented by these projects.

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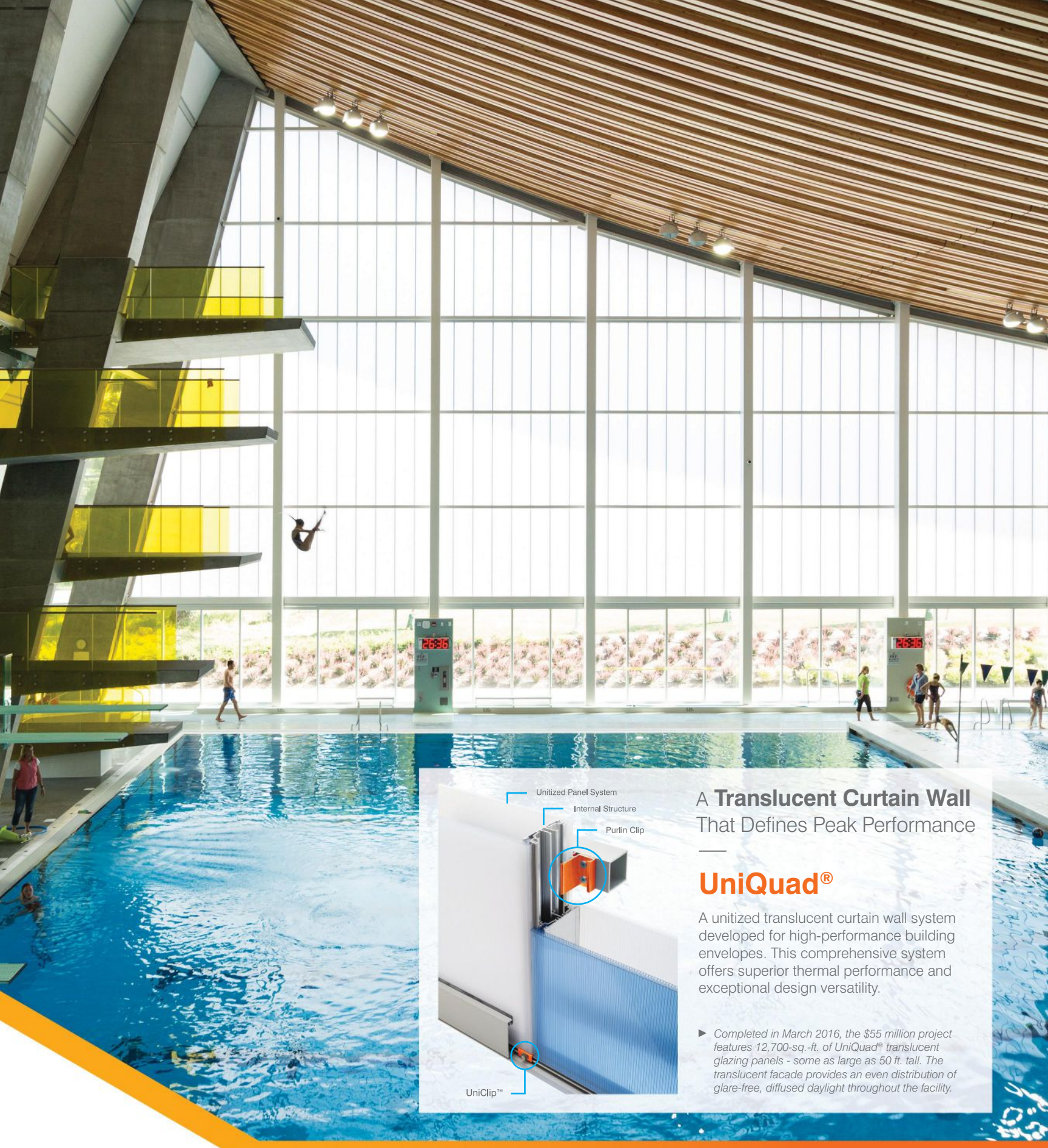

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Contrasting textures and bursts of color inform this select group of residential projects. But sunlight and natural materials play important roles too.

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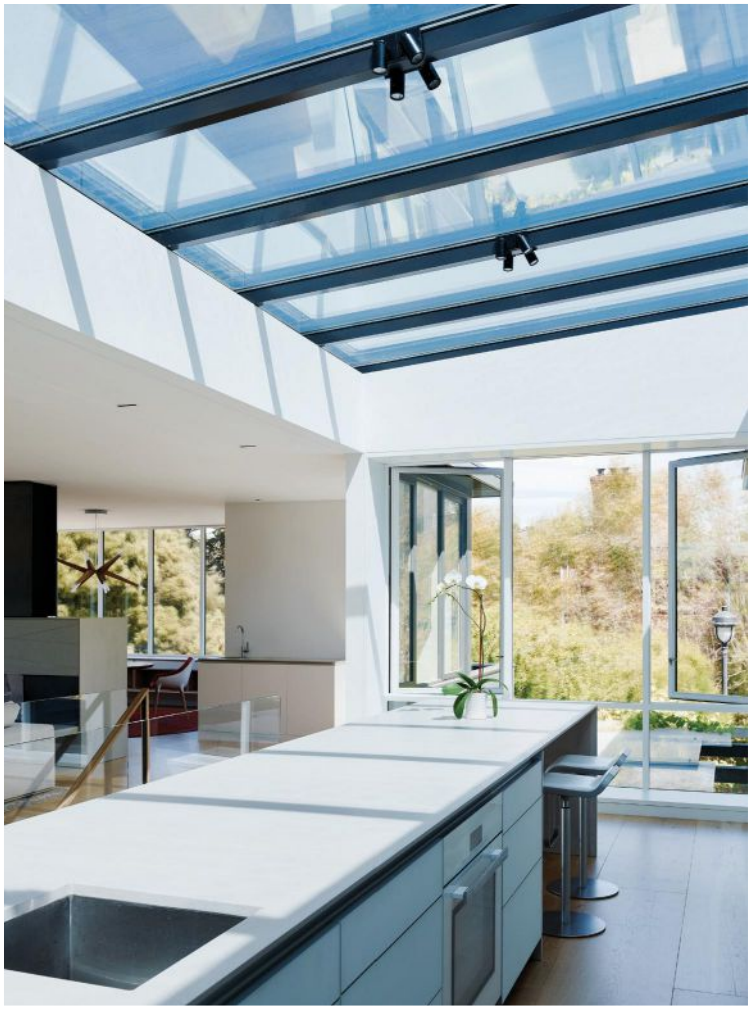

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Spruce Street Residence San Francisco
Architect **John Maniscalco Architecture**

SOME YEARS AGO, San Francisco architect John Maniscalco came across one of those opportunities that demand a certain stamina: an aging two-story house was available for a relative bargain price but required lengthy negotiations with the city's historic-preservation board in order to overhaul. But its location—directly bordering the national parklands of the Presidio—was ideal for his family's vision of "a country house in the city," as he describes it. Indeed, the resulting 5,400-square-foot residence emphasizes connection to the outdoors to a degree that would be notable even in a rural setting.

To take advantage of the expansive views, the architect flipped the floor plan, putting the bedrooms on the ground floor and moving the common spaces up to the second level. The kitchen, which functions as both the light core and the spatial core of the house, opens to the sky above with its 24-by-12-foot glass ceiling. A 17-foot-long kitchen island, with a prep sink at one end and casual seating for six at the other, defines the space. A separate counter with a large sink and double dishwasher overlooks the rear garden, providing an intimate view of lush greenery.

Because the kitchen is open, and flows into the living room, the architect chose finishes that were appropriately muted. A backsplash of Calacatta Vagli lends a natural tone to the space. The pale gray countertops are polished fiber-reinforced concrete and elegantly taper to a ½-inch edge. Custom cabinetry has fronts of white back-painted

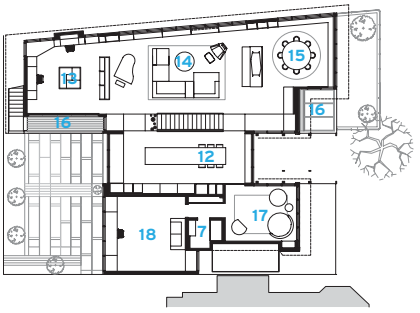
BRIGHT IDEA
Etched-glass surfaces create a soft, muted effect and are also highly durable. Light enters from multiple points (opposite), including above, creating an atrium-like space.

SPA TREATMENT A rainshower head suspended from the skylight enhances the illusion of being outdoors. Water collects around a quartz platform and drains through the rocks into a shower pan below.

glass with softly etched surfaces, which are echoed by ovens with white glass fascia. Inspired by his MacBook's casing, Maniscalco chose brushed aluminum trim in lieu of stainless steel for a quieter, less reflective appearance. "If you squint, the entire palette melds together," he says.

On the ground level below is a spa-like, all-white master bath, which, like the kitchen, is illuminated by a skylight, this one over the shower and freestanding solid-surface tub. A large glass pivot door opens to the adjacent garden, rendering an arrangement close in feeling to an outdoor shower. Walls here are clad in tiny honeycomb tile with a raised pattern, which sparkles in the early morning light. To create yet another connection between the indoors and outside, a drainage strip around the perimeter of the shower and bath area is filled with the same white rocks used in the landscaping outside. The vanity with integrated sink and the flooring are all made from white engineered quartz, imbuing the room with a sense of seamless purity. "I wanted it to be minimal and extremely serene," says Maniscalco. —*Lydia Lee*

FIRST-FLOOR PLAN



SECOND-FLOOR PLAN

0 16 FT.
5 M.

1 ENTRANCE
2 COURTYARD
3 MASTER BEDROOM
4 MASTER BATHROOM
5 CLOSET
6 BEDROOM
7 BATHROOM
8 WALKABLE SKYLIGHT
9 MEDIA ROOM
10 LAUNDRY
11 GARAGE
12 KITCHEN
13 HOME OFFICE
14 LIVING ROOM
15 DINING ROOM
16 ROOF DECK
17 SITTING ROOM
18 MUSIC ROOM

credits

ARCHITECT: John Maniscalco Architecture
ENGINEERS: Holmes Culley (structural)
GENERAL CONTRACTOR: Dromhus General Contractors
CLIENT: John Maniscalco and Mary Tesluk
SIZE: 5,400 square feet
COST: withheld
COMPLETION DATE: February 2014

SOURCES

CABINETRY: Sozo Studio (kitchen and bathroom)
DIMMING SYSTEM: Lutron
DOORS: Dynamic Windows and Doors
HARDWOOD FLOORS: Dinesen
LIGHTING: Aion (interior); BK Lighting (exterior); Lucifer and iGuzzini (downlights)
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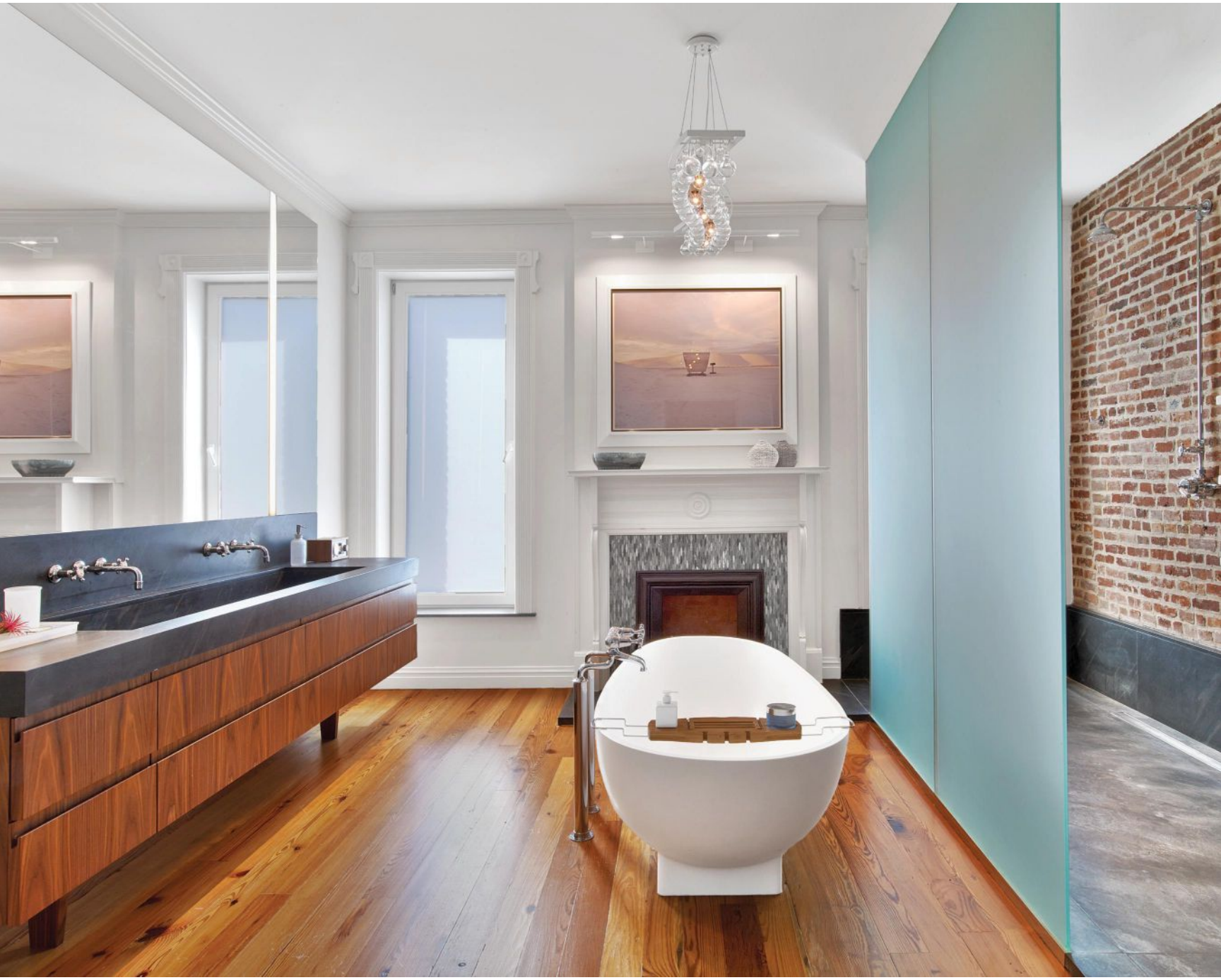


Park Slope Brownstone
Brooklyn, New York
Architect **Matthew Baird**

WHILE LIFE as a family revolves around spending time together, it also necessitates moments of peace and quiet. So when a young couple with children bought a four-story brownstone in Brooklyn, New York, they asked their architect, Matthew Baird, to transform the entire third floor into a master suite. The Manhattan-based Baird did just that, changing the spare bedroom into a spalike bathroom where modern amenities complement historic flourishes.

Baird used the room's inoperative fireplace as the focal point of the design, initially hoping to offer his clients the ability to wash up in front of a crackling blaze. But when the unit's repair proved too complicated, the team opted to brick up the firebox, refurbish the surround with mosaic tiles, and add a Pietra Cardosa hearth. They placed a freestanding oval tub perpendicular to the fireplace, installing a bubblelike LED chandelier above the soaker to illuminate the space. Then they added a mirrored vanity with flush vertical LED strips to the tub's left, flanking the trough sink with a pair of polished chrome taps.

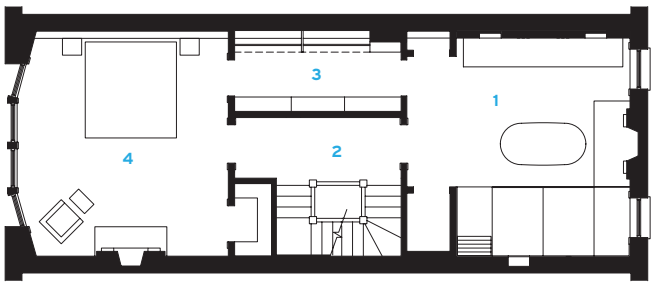
PHOTOGRAPHY: © ERIC LAIGNEL

IN THE MIX By using similar color palettes, Matthew Baird united opposing materials and textures in the third-story bathroom, which was formerly a bedroom (opposite). Unadorned brick adds a rustic edge to the bathroom's double shower, which is fitted with Barber Wilson fixtures, Boffi floating shelves, and a Pietra Cardosa floor and knee wall (left).

A large double shower occupies the opposite side of the room, separated from the bath area by a frosted-glass partition. Two polished-chrome mixers on the exposed-brick wall provide a vintage feel, while a Pietra Cardosa shower floor, pitched and extended up the wall's base, echoes visual themes elsewhere in the room.

The design team retained many of the space's original materials. For example, rather than replace the existing wood floors with marble (which "would have been a shame," Baird says), they patched its damaged areas with matching salvaged heart pine, and then sanded and refinished the surface with water-resistant polyurethane.

The overall result is a harmonious collage of contrasting textures in a space unconventionally large for a historic building. "The whole design became a dialogue between old and new," says Baird of the effort. "It makes the space feel more like a living room," a place you'd want to rest and linger.
—*Janelle Zara*



FLOOR PLAN

1 MASTER BATH
2 HALLWAY
3 CLOSET
4 MASTER BEDROOM

credits

ARCHITECT: Matthew Baird – Matthew Baird, principal; Bradley Kaye, project architect

INTERIOR DESIGNER: JMorris Design – Jennifer Morris, principal

ENGINEER: A Degree of Freedom (structural)

CONSULTANTS: Doris Kan (environment); Quality Control Laboratories (special inspection)

GENERAL CONTRACTOR: Downtown Renovations

SIZE: 240 square feet

COST: withheld

COMPLETION DATE: January 2015

SOURCES

BATH FITTINGS AND FIXTURES: Barber Wilson

BATHTUB: Barclay Products

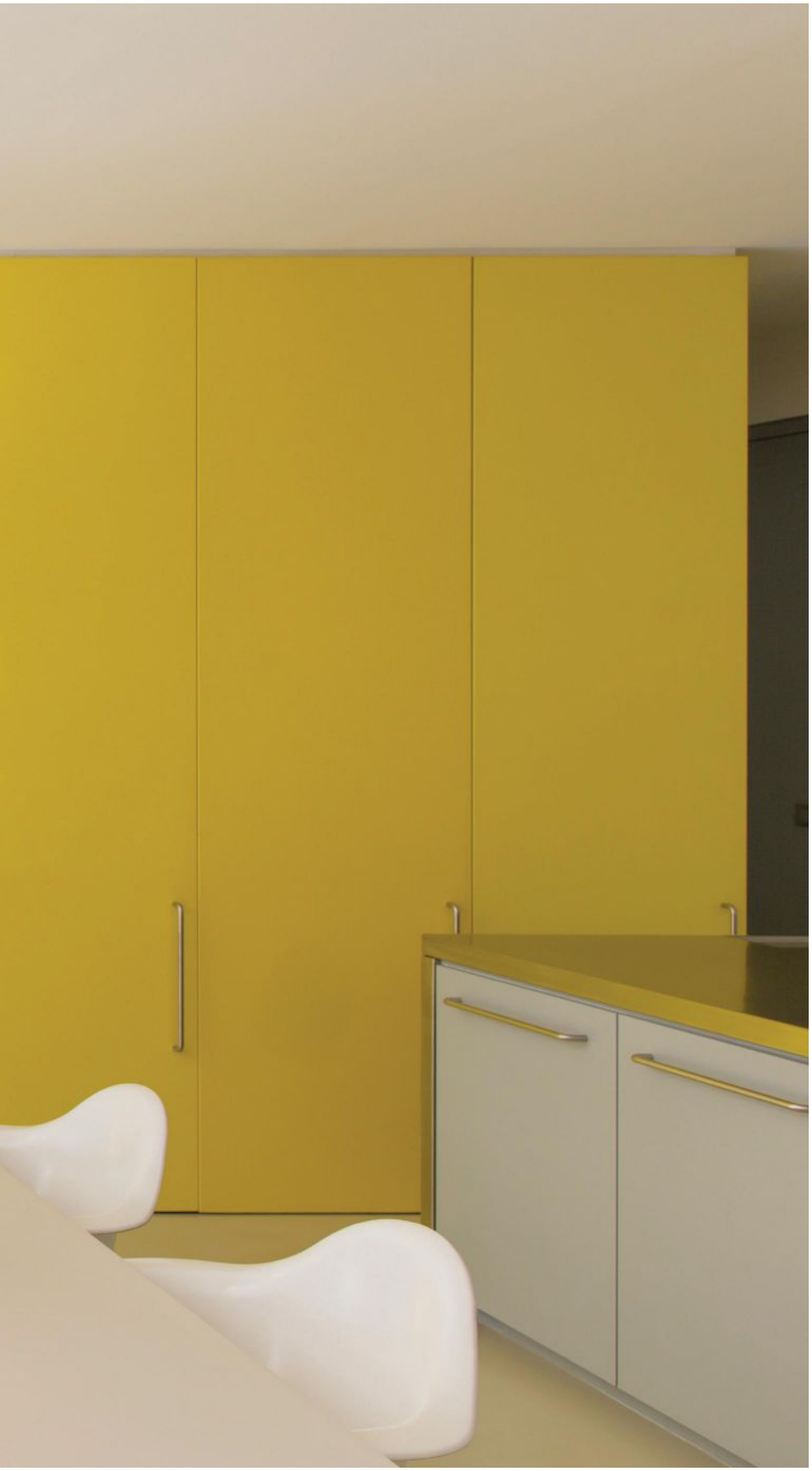
CABINETRY AND VANITY: McKeever Woodworks

LIGHTING: Lightolier (recessed lights); Modulightor (pendant)

SINK: Mondial Tiles

TILE: Artistic Tile (fireplace); Stone Source (floor and wall)

TOILET: Duravit



30 Adelaide Street Sydney
Architect **Ian Moore Architects**

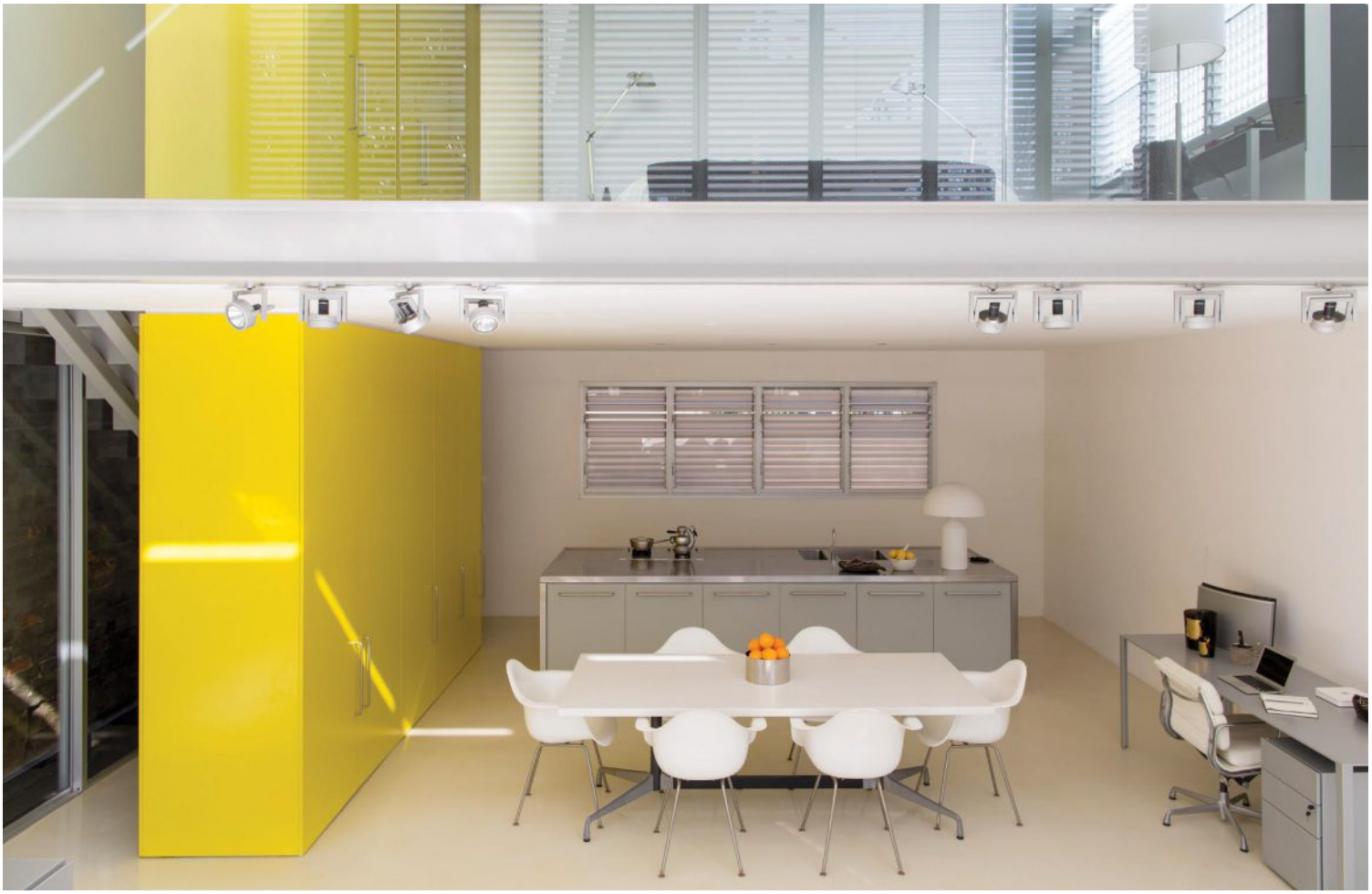
WHEN DOES a kitchen become an art gallery? When it includes a boldly colored architectural volume that looks like a Donald Judd sculpture. Such a unit catches the eye in a townhouse designed by Ian Moore Architects in Sydney's Surry Hills neighborhood.

The vibrant yellow, custom-built joinery unit visually and physically connects the first-floor kitchen with the mezzanine bedroom. Measuring roughly 10 feet long by 2½ feet wide by 9 feet high (on each floor), the cupboard conceals kitchen storage, laundry facilities, and an integrated fridge and freezer on the lower level; it serves as the bedroom's closet above.

The New Zealand–born, Sydney-based Moore is known for using strong primary hues to divide and demarcate space. "The storage element is a piece of furniture, distinguished from the white structural shell by its coloring," he says. "The yellow also works well with the house's anonymous gray exterior." Aside from that bright hue, the three-story home's palette is minimal, including eggshell epoxy floors, white walls and ceilings, and silver anodized aluminum windows.

Key to the striking kitchen is its balance between looks and practicality. A central island offers generous space for cooking and entertaining; it also affords views over the open-plan living/dining area and through to the sunny courtyard. Its stainless-steel work surface features dual integrated sinks, two burners, and a wok ring, with an oven below. Gray polyurethane-lacquered cabinets on both sides feature

OUT OF SIGHT Furniture in the open-plan kitchen/dining/living area was chosen for its visual lightness (left). Copious cabinets in the large kitchen island hold plates, utensils, wine, and cookbooks (above).



ALL-IN-ONE Connecting the airy double-height space, the custom yellow storage unit conceals a fridge and laundry facilities below and serves as a bedroom closet above. It also holds the upstairs bathroom's plumbing.

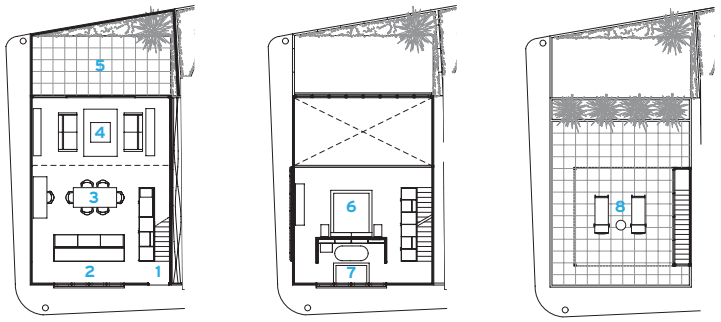
large, ergonomic D-shaped handles.

Louvered windows encourage natural ventilation, so no extractor fans or air-conditioning are required. Flexible LED spotlights and downlights illuminate kitchen surfaces, with softer focus provided by the '70s-era countertop Atollo lamp. More vintage touches include a white Eames dining table and chairs.

The kitchen renovation was part of Moore's 2015 restoration of this one-bedroom house, which he designed in 2001. The home had been unsympathetically altered by a later occupant, and the current owner, a photographer, commissioned Moore to reintroduce the original design. He also asked him to furnish the home in keeping with its architectural language.

To that point, the architect chose the dining- and living-area pieces to enhance the airiness of the interior. "It's about reducing clutter and doing away with walls and doors to maximize space and light," says Moore of his design ethos. The result is a sun-kissed success story.

—*Sophie Davies*



LEVEL-ONE PLAN LEVEL-TWO PLAN ROOF PLAN

1 ENTRANCE
2 KITCHEN
3 DINING
4 LIVING
5 COURTYARD
6 BEDROOM
7 BATHROOM
8 ROOF TERRACE

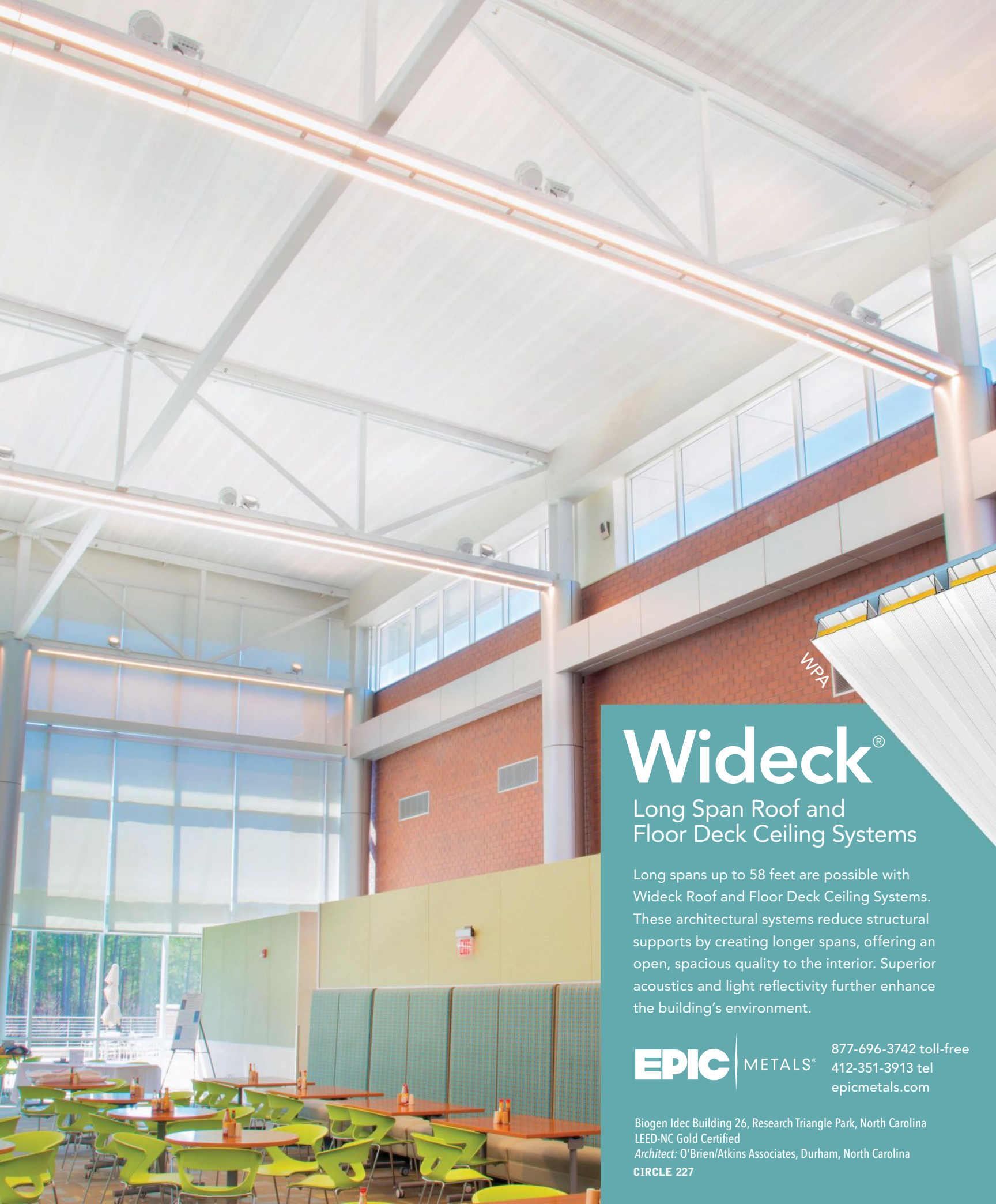
0 12 FT.
4 M.

credits

ARCHITECT: Ian Moore
GENERAL CONTRACTOR: Zandt Building
CLIENT: Iain Mackenzie
SIZE: 1,200 square feet
COST: $150,472
COMPLETION DATE: September 2015

SOURCES

ALUMINUM-FRAMED WINDOWS AND DOORS: Cabral
CLADDING: James Hardie
FURNITURE: Jean Nouvel for Unifor (office); Charles and Ray Eames for Herman Miller (dining)
HARDWARE: Madinoz
KITCHEN FAUCET: Vola
LIGHTING: Kreon (downlights and spotlights); Flos (ambient lighting)
LOUVER SCREENS: JWI



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NEW GENERATION LEADER:
Amale Andraos, Dean of the Columbia Graduate School of Architecture, Planning and Preservation and co-founder of the firm WORKac

ACTIVIST: **Roberta Feldman**, professor of architecture at the University of Illinois in Chicago and an architectural community activist

INNOVATOR: **Jenny Sabin**, Principal, Jenny Sabin Studio and assistant professor in the department of architecture at Cornell.

EDUCATOR/MENTOR:
Donna Robertson, professor and former dean, College of Architecture, Illinois Institute of Architecture

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4:00 pm to 5:30 pm . . . . . Symposium
5:30 pm to 7:30 pm . . . . . Reception and Awards

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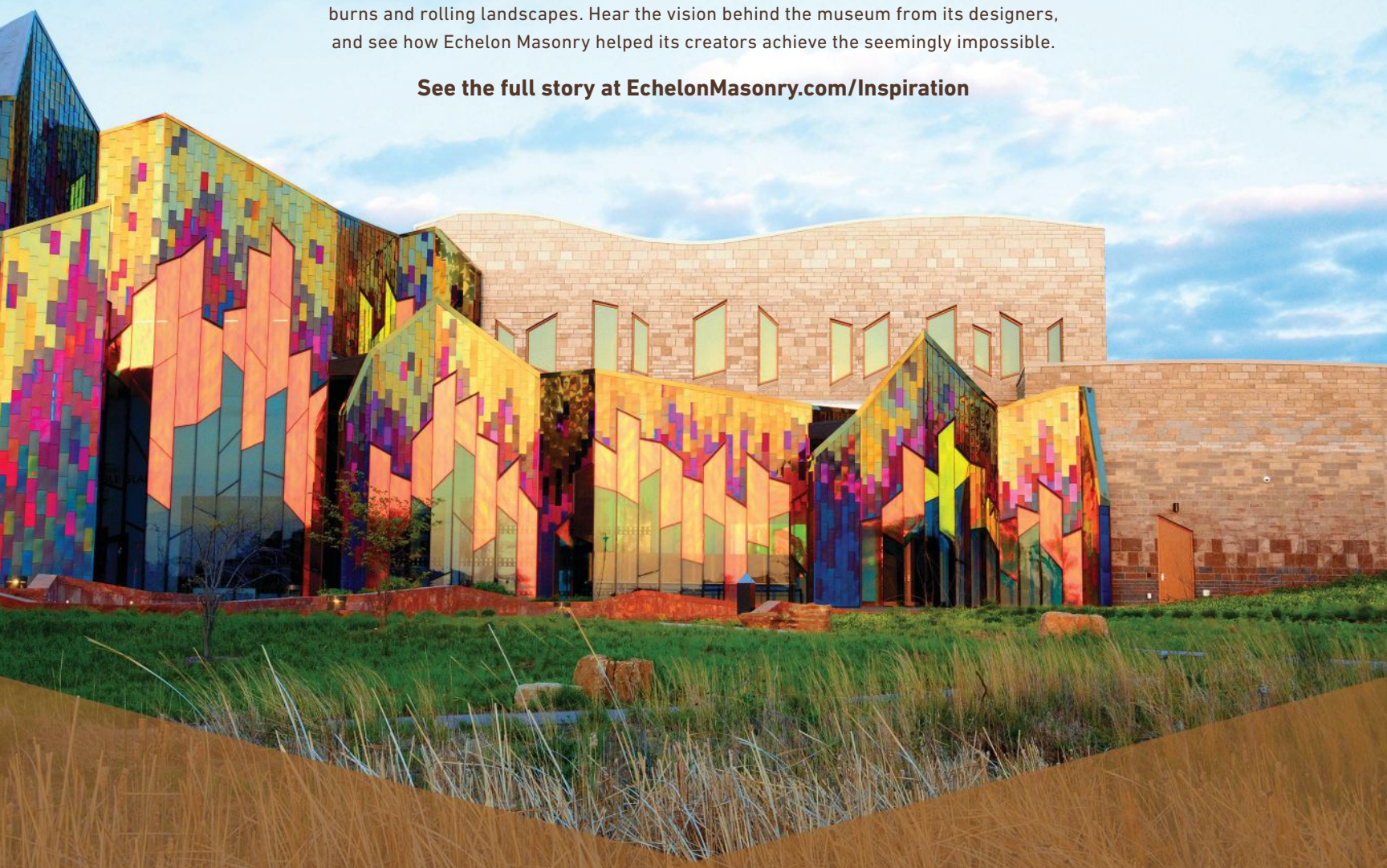

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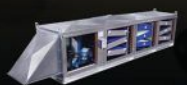
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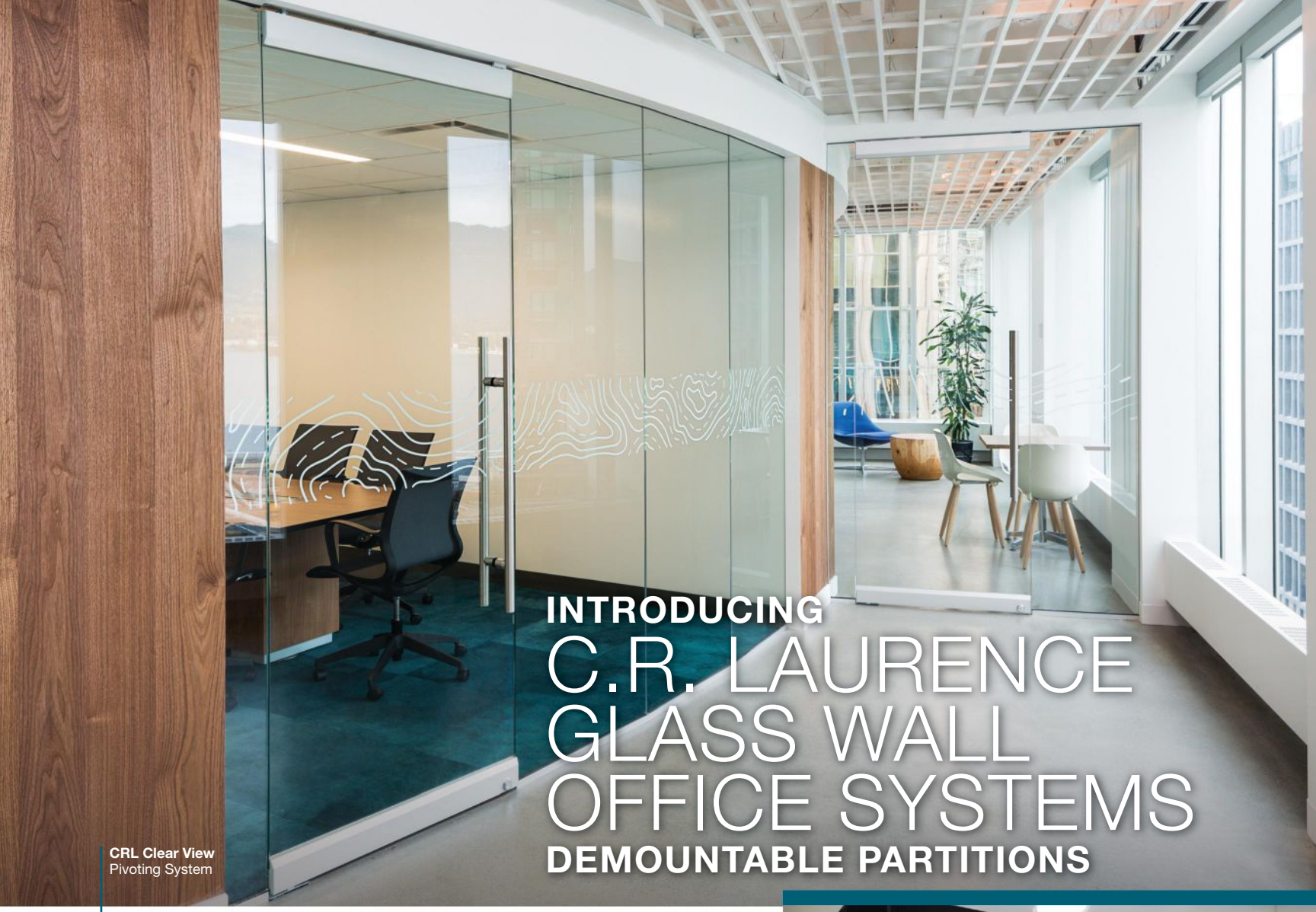

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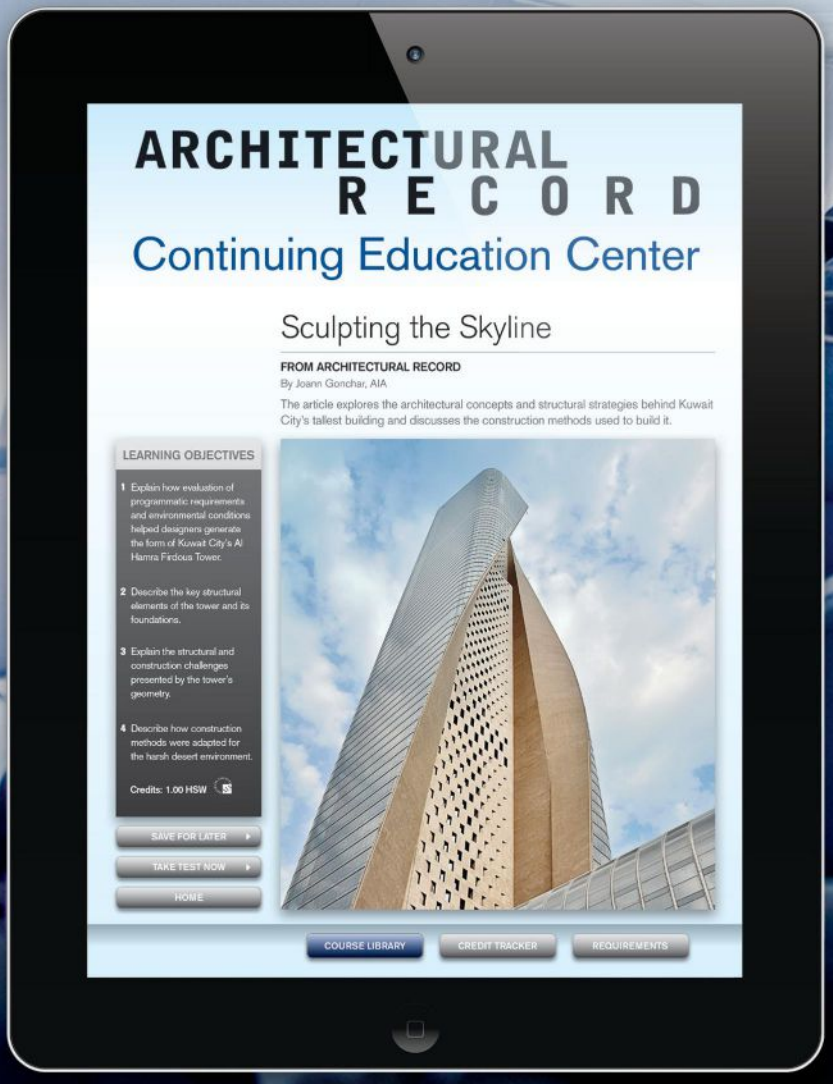

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Designing for Sustainability

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PM PRODUCTS AND MATERIALS
RE RESIDENTIAL
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SU SUSTAINABILITY

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The Bullitt Center in Seattle is regarded as the "greenest commercial building in the world" and incorporates numerous sustainable design features into a holistic design.

Designing for Sustainability

Six strategies to help meet the new LEED v4 green building standard

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

The green building movement has become fully entrenched in design and construction, not just in this country but around the world. According to the U.S. Green Building Council, more than 79,000 projects are participating in the Leadership in Energy and Environmental Design (LEED) program across 160 countries and territories, comprising more than 15 billion square feet. USGBC estimates that nearly 5 million people experience a LEED building every day. Further, the ongoing rate of green building growth is reported at a staggering 1.85 million square feet per day being added to the list. What might have been seen as a fad or trend a few decades ago is now firmly part of the definition of a well-designed building. Owners and clients have come to expect that architects know and understand the principles of green and sustainable design, and they expect their buildings to perform accordingly—whether they pursue certification or not.

In light of this evolution, the LEED program has evolved with it. The original LEED rating system was replaced by LEED 2.0, while both have been sunset and replaced by LEED 2009, which itself will sunset for new registrations on October 31, 2016. This means that starting on November 1, 2016, the only option for registering new or renovated buildings, existing buildings, neighborhoods, or homes under the LEED program will be under LEED version 4 (LEED v4). This may sound like little more than an administrative detail, but in fact, this latest version of the hugely popular green building rating system has raised the bar on performance. Those who have used it already have noted that buildings designed to reach Gold or Platinum

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Learning Objectives

After reading this article, you should be able to:

1. Identify the integrated nature of green and sustainable building design as called for in LEED version 4.
2. Assess the ability of permeable paving products to contribute to sustainable site design.
3. Explain the significance of the building envelope and mechanical systems working together to achieve energy efficiency optimization while still providing daylight and views.
4. Explore ways to select sustainable products and materials that are beneficial to building performance as well as human health and indoor environmental quality.

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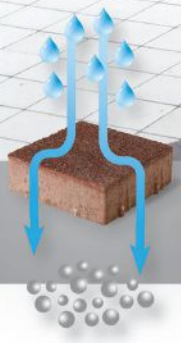

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certification under previous versions might find that they would only qualify at a lower level under LEED v4 unless they made some green design and construction upgrades. The changes reflect not only an increase in performance but the ability to be more applicable in countries around the world.

In light of the above, design teams are searching for proven strategies to enhance their green and sustainable projects. It is no coincidence that the construction industry has responded with evolving materials, products, and systems becoming available to meet that need. In this course, we will look at six different examples of updated choices that architects can design and specify into projects in the quest for higher-performing green and sustainable buildings of all types.

MANAGING RAINWATER RUNOFF

In the Sustainable Sites (SS) category of LEED, there are a number of prerequisites and credit options for minimizing the impact of construction and helping natural conditions flourish. One of the credits here that has always carried a lot of point potential is the management of rainwater, in particular reducing or eliminating rainwater runoff. By this way of thinking, rainwater is seen as a natural, on-site resource that is part of the site's hydrology rather than a waste product to be collected and piped away.

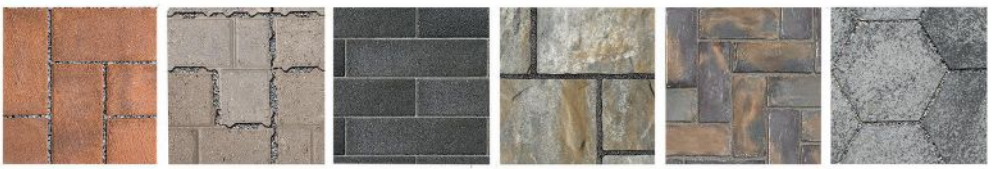
The design issue that usually comes into play in this case is the size, makeup, and location of paved areas, whether asphalt or concrete, for vehicle or pedestrian access, parking, and movement. Such pavement is commonly impervious to rainwater, meaning that it needs to be designed to slope, drain, and collect the rainwater somewhere else. Collection is commonly done by spending a fair amount of money on underground structures, such as storm drainage basins, piping, and culverts to move the water elsewhere. Movement could mean piping it to an on-site retention pond, an underground storage tank, or connecting to a public storm drainage system. Overall, the whole system needs to be sized to accommodate a worst case flood event since rapid rainfall will produce rapid flowing runoff and other problems if it can't be accommodated fully.

Of course, there is an alternative. None, or at least less, of this expensive underground equipment would be needed if the rainwater were allowed to percolate naturally into the earth the way that it probably had done for centuries before the paving showed up. This natural infiltration has less environmental impact not only on the immediate site, but on the ultimate site where water is channeled since lower volumes and rates of flow of water are less likely to create runoff, erosion, and flooding problems. The green building method to achieve this, when paving is needed, is to use a system that allows water to permeate through into the soil. In some locations, that might include porous concrete or porous asphalt, but conditions need to be right for those products, and a local supplier needs to be available. A more predictable and aesthetic solution is to use open-cell permeable pavers that can handle pedestrian or vehicular traffic or both.

The construction industry has provided a wide range of paver products for permeable installations, with many stock options as well as custom color and finish design choices. There are also many more styles available, ranging from traditional to contemporary and everything in between. There are finishes that are stain resistant, some that look like granite, and others that are solid or mixed colors with a tighter finish on the surface that is more durable and color fast. This allows the designer to match a visual aesthetic with the sustainability traits of a permeable surface. Ultimately, this all means that design professionals don't have to compromise on their design vision just because they are choosing a permeable pavement.

A permeable paving system can be used in many combinations as part of a green initiative. For example, it can stand on its own as a permeable surface, it can work in conjunction with other features such as bioswales or detention basins, or it can be designed as part of a rainwater/stormwater harvesting system. Any of these systems can be created in pedestrian, vehicular, or even heavy-duty vehicular applications. Many permeable products can also be mechanically installed, which offers an incredible labor savings since 10,000 to 12,000 square feet per day can commonly be installed with just two people. Of course, as permeable installations continue to increase in popularity, they must also be maintained properly to be effective and to look good in the long term. Proper maintenance will ensure the full, long-term life cycle of the permeable system, which allows its true value to be realized.

Images courtesy of Unilock



Permeable pavers have become available in a wide range of finishes, styles, and appearances, making them suitable for a wide range of site designs.

Photo courtesy of Unilock

Permeable pavers can be used successfully for walkways, parking areas, and vehicular access, while still allowing rainwater to enter into the ground naturally and controlling runoff effectively.

What do clients say about this approach? Mr. Brian Smith, director of strategic project development at the Cleveland Clinic (image available online), says, "Our permeable paver installation was exactly the right solution at the right time. Although the realities of vehicular parking can sometimes dominate design, the permeable paver solution allowed us to construct parking lots that blend in with the site and do not present themselves as a 'sea of asphalt'. From both the environmental viewpoint as well as aesthetics, we are very pleased with our investment in, what has turned out to be, a very large permeable paver parking lot." He adds, "We look forward to the financial returns as well, as we anticipate our life-cycle maintenance costs to be well below those associated with an asphalt lot."

FENESTRATION DESIGN

The Energy and Atmosphere (EA) category of LEED has always been a major focus of any green building, with up to a third of the possible points available here (33–35 out of a possible 110 in LEED v4). While the USGBC points out that energy should be approached holistically addressing energy use reduction, energy-efficient design strategies, and renewable energy sources, it also emphasizes that it starts with a focus on architectural design that reduces overall energy needs to begin with. This includes design factors, such as building orientation, glazing and fenestration selection, and climate-appropriate wall and roof assemblies. All of these factors can be assessed and analyzed to reveal their impact on energy use in a building, most typically in a computer-simulated energy model, which looks at all of the specific details of a particular building to provide a view of the amount of energy required to operate the building throughout a typical year.

Among the things that can most significantly impact a building's energy use is the amount and type of windows or other fenestration features in a building. The reason is found in the fact that, while windows are a great and

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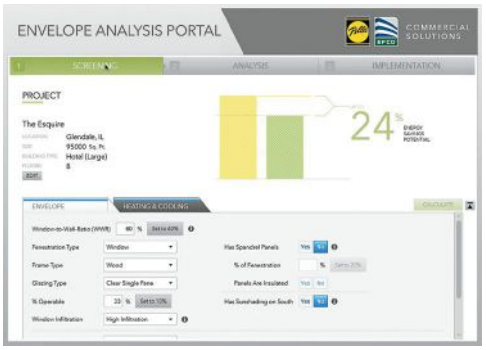


Software applications, like the one pictured above, help building analysis teams to input a wide range of variables and conditions in new building designs or existing buildings. This information can then help finalize window selections from numerous options, such as those shown here, as part of an overall strategy to optimize energy performance in a building.

desirable asset for any occupied building, they cannot provide the same energy efficiency performance as an insulated wall. The design challenge on any building, then, is to experiment with the amount of glazed area compared to the insulated wall area (i.e., the window-to-wall ratio) to balance all design criteria while selecting windows that are as energy efficient as possible or practical. This usually requires an iterative process of some trial-and-error variations and options to determine how to optimize a building façade for energy efficiency. Using a computer software tool for that purpose is not only revealing in terms of making a final, informed, design decision, it is probably the only way to do it in a time-efficient manner.

For this type of focused analysis, window manufacturers offer free, customized software and services to help architects and others achieve that optimization. To use this resource, the architect provides the parameters of the building and selects options for windows/glazing systems as part of an overall envelope analysis. These include window area, window-to-wall ratio, glazing types and details, and air-sealing levels. This is an important analysis on any project but especially on the renovation of existing buildings, particularly if the building is being converted from one use (i.e., warehouse, school, etc.) into another, such as multifamily housing, as has become very popular in many areas. In renovation projects, replacing an old, leaky single-pane window with a window that has the latest in thermal performance technology can greatly improve occupant comfort and reduce utility bills. It is also important to pay special attention to sealing up the interface between the window and surrounding condition. Reducing air infiltration at the window perimeter will not only contribute to improved occupant comfort, it can dramatically reduce energy usage.

By working with window manufacturers in this way, multiple options of different window systems in a given building envelope can be analyzed, compared, and assessed. For example, Doug Phelps, director of commercial business development for Pella EFCO Commercial Solutions, points out, "Using envelope analysis, we're able to analyze and run 'what-if' scenarios to compare potential envelope improvements in terms of energy savings, occupant comfort, and building aesthetics. Every project has specific goals, and we are able to support the project team with flexible, real-time analysis."

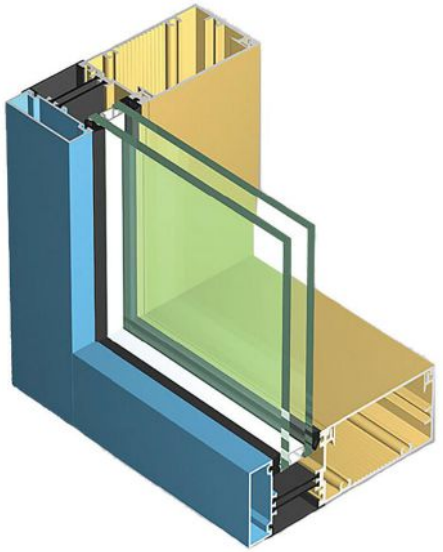
FINE-TUNING FENESTRATION SPECIFICATIONS

Once the best amount of fenestration is determined, attention can turn to the details of that fenestration. In the case of commercial and institutional buildings, the window or fenestration products (e.g., curtain wall, storefront, etc.) often rely on aluminum frames for durability and size customization. The problem with aluminum, however, is that it is a very good conductor of heat, making it a poor choice for thermal energy performance. To overcome that limitation, a thermal break is required to stop or at least slow the flow of heat through the fenestration frame. This is achieved by separating the inside portion of the aluminum frame from the outside portion around the entire perimeter of the unit. In order to maintain its structural integrity, the two halves of the unit still need to be joined, just not with heat-conductive metal. Rather, an alternate material with low heat conductivity is used with enough rigidity to be effective but enough porosity to reduce heat flow. This thermal break approach has been used for decades, but, like most manufactured building products, there are options and variations in performance.

There are two primary thermal break methods available globally. The first is a polyurethane: pour and debridge (P&D) system, which takes the approach of creating a chemical bond between the aluminum frame members. The basic assembly process for a P&D system involves filling a connected aluminum frame with a liquid polyurethane, allowing for curing of the liquid, then cutting away a channel in the metal (debridging) to create the metal separation and thermal break.

The second primary method is to use a polyamide system of connecting strips using a purely mechanical connection. Polyamide is essentially a high-strength, low-conductance nylon that has a similar coefficient of expansion and contraction as aluminum. Some bio-based, renewable alternatives are made from castor oil, extracted from the seeds of the castor oil plant. The basic assembly process for these systems involves crimping into place two polyamide extrusions between the aluminum inner and outer frame pieces to form a composite profile. The composite is then shear tested to ensure structural integrity. Globally, polyamide systems represent the majority share of thermally broken frames. Also note that wider is better in terms of metal separation and thermal performance. This is a strategic approach taken by many manufacturers in today's fenestration

Image courtesy of Technoform Group



Polyamide thermal breaks are installed between the inside and outside portions of a fenestration frame to overcome the thermal bridging issue of the metal frames.

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market to offer a good, better, best system of solutions, where the same aluminum profiles can be used and wider polyamide strips can be inserted to significantly improve performance. As an example, Mike Turner, vice president of marketing and technical services at YKK AP America Inc., says, "Our company integrates polyamide pressure plate systems into our curtain wall system to deliver advanced thermal performance on projects with low energy goals."

With the window or fenestration frame optimized, attention can turn to the details of the glazing itself. Whether used in new or renovation projects, glazing needs to provide a number of different qualities. From a performance standpoint, it can be optimized for daylighting, solar heat gain, or controlling thermal energy loss. This is often achieved not only by the properties of the glass, but through different coatings and tints that can be applied to the glass. Of course, we are well beyond the days of using only single-paned glass in building facades. Instead, multiple-paned insulating glass units (IGUs) are commonly made from different types of glass with different surfaces coated to achieve the desired results. Double-paned glazing has become routine, triple glazing is much more common, and even quadruple glazing is readily available.

This is where another significant detail comes into play for optimizing energy performance. IGUs are manufactured using a spacer that runs between the layers of glass and around the entire perimeter of the glass panels. That spacer is secured in place with a primary sealant adhering the glass completely to the spacer. A secondary sealant, most commonly silicone, is then used outside of the spacer, again around the entire perimeter. Since these spacers can actually represent on the order of 10 to 30 percent of the entire glazed area, reducing the heat transfer through the spacers, just like through the frames, can be significant.

Traditionally, IGU spacers have been made from a single material, such as aluminum, and shaped in the form of box. However, this type creates some notable challenges to performance. Since the aluminum conducts heat, there is not only a lack of any thermal break between the glass panes, it actually creates a thermal bridge around the entire perimeter of the glass. This ends up creating glass edges that are cold—notably colder than the center of the glass where there is no spacer. These colder edges can often be the cause of condensation forming around the perimeter of the glazing, which can potentially cause damage or grow mold. This potential for compromised spacer performance is part of the reason that high-performance fenestration addresses the total performance of a glazing unit, not just the center of the glass.

Recognizing the limitations and problems of traditional, cold-edge spacers, alternative spacers have become available that use improved technology to achieve a genuine "warm edge" that is close to the temperature of the rest of the glass. These warm-edge spacers use materials with lower heat conductivity than aluminum, such as hybrid combinations of foams and plastics strengthened with thin stainless steel. The important point is that this enhanced spacer forms an effective, insulating thermal break such that heat is not conducted through it as in a cold-edge spacer. From an energy standpoint, this improves the U-factor not only of the spacer, but also of the glass and the overall fenestration product. Warmer edges also mean better condensation resistance, which helps with the prevention of moisture accumulation and possible mold growth.

OPTIMIZING HEATING, VENTILATION, AND AIR-CONDITIONING SYSTEMS

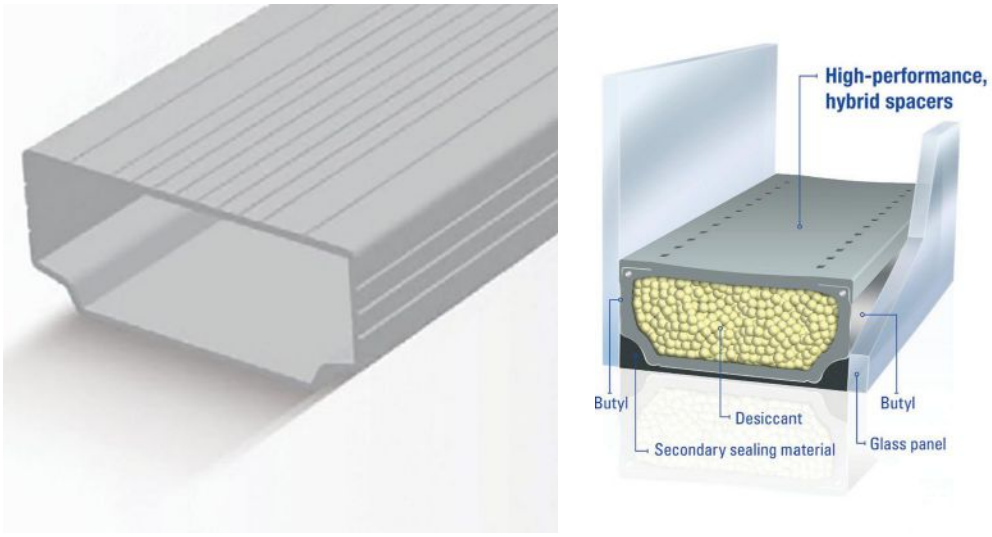
Once all aspects of the building envelope are optimized, then selection of the equipment to provide heating, ventilation, and air-conditioning can take place. Traditional rules of thumb and even traditional system choices no longer apply in high-performance buildings that have very energy-efficient building envelopes. Instead, the HVAC systems need to be selected, sized, and installed in a manner that is consistent with what should be a dramatically reduced cooling and heating load. This is important for the most efficient and energy-saving operation of the building, but it is also important for the demonstration of energy use for LEED Energy and Atmosphere credits. Typically, earning points for energy use reductions is based on a computerized energy model. The right information needs to be entered into that model consistent with the building choices made and specified for the HVAC equipment and operation.

One type of system that has become appropriate to consider in many high-performance buildings is a heat pump that can be sized for individual spaces or zones or be connected to a multi-zone distribution layout. Further, to boost efficiency, the use of variable refrigerant flow (VRF) zoning systems has become increasingly popular. These systems control temperature by varying the amount of conditioned refrigerant supplied to a space rather than varying the amount of air as has otherwise been common.

VRF zoning systems use small refrigerant piping to deliver refrigerant directly to the zone that needs to be conditioned, providing more efficient and accurate temperature control in every zone. Because of the small piping and equally small, localized ductwork, VRF systems allow architects to design buildings without having to work around bulky trunks of ductwork. Further, technological improvements have made a two-pipe simultaneous cooling and heating system available, which significantly reduces the amount of refrigerant piping required, and makes the systems easier to design and install compared to a three-pipe configuration.

Unlike traditional HVAC systems that operate in a full-on or completely off cycle, VRF systems vary the compressor speed to provide the cooling or heating needed to maintain the set-point temperature. This technology and the use of effective zoning allows the units to operate very efficiently. As an added means of human comfort, zoning the system allows building occupants to control the temperature in their own space, which can lead to greater satisfaction with

Images courtesy of Technoform Group



Traditional IGU spacers (left) do not prevent thermal bridging across the glass panes, thus creating "cold edges". By contrast, high-performance, hybrid spacers (right) produce "warm edges" by creating an insulating thermal break between the panes of glass.

You have a choice.

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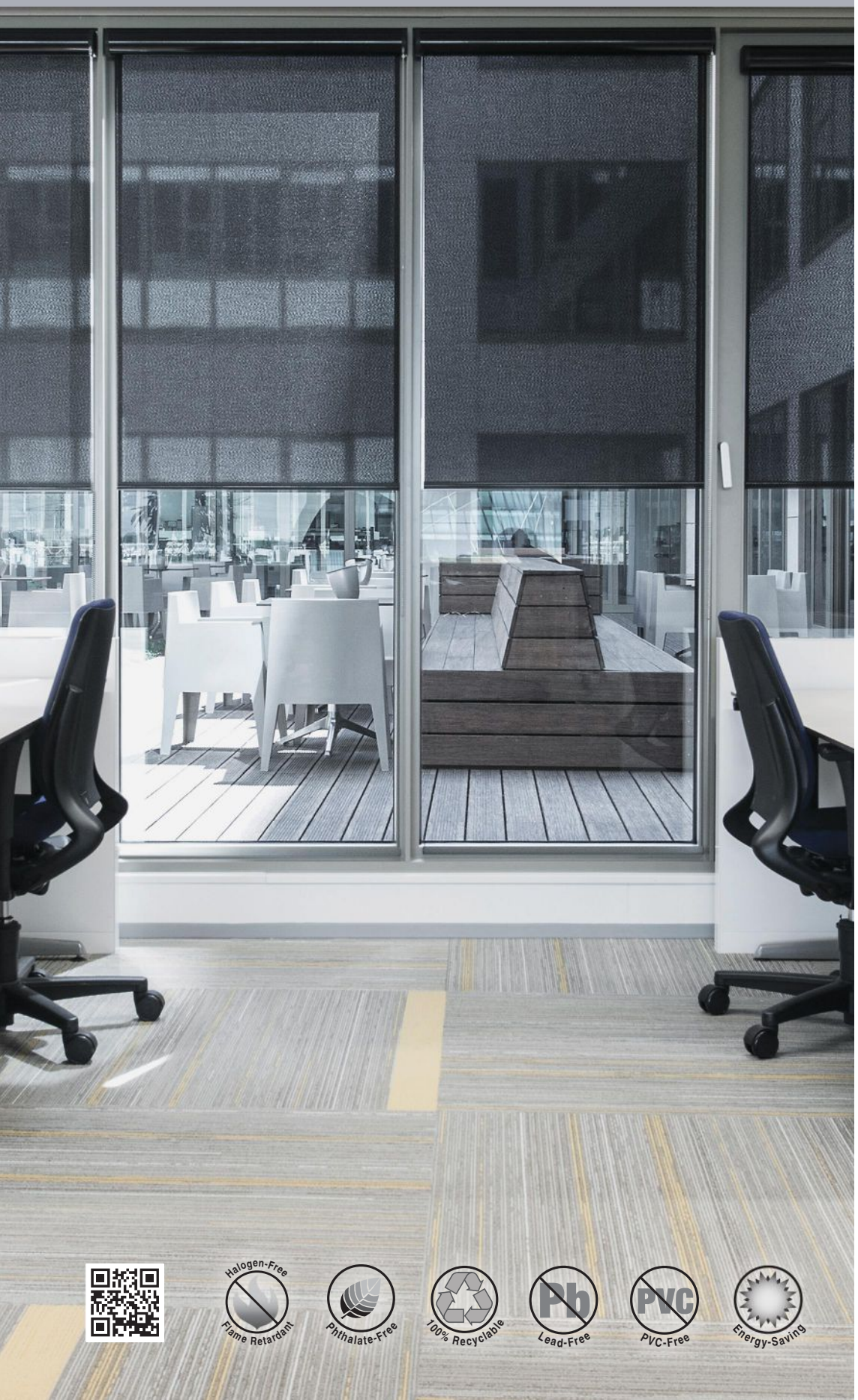

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Variable refrigerant flow (VRF) heat pumps offer designers of highly energy-efficient buildings a suitably sized and equally efficient HVAC system option.

indoor temperatures. In recent years, these systems have evolved notably, with the latest VRF systems being the most efficient yet—improving energy efficiency by up to 54 percent over prior generations. They also offer a significant reduction in the required system refrigerant charge without impacting the efficiency of the system or comfort of occupants. Of course, all such systems will incorporate LEED-appropriate refrigerant management strategies.

Some people have incorrectly assumed that VRF zoning systems are significantly more expensive than traditional types of HVAC systems. However, when total life-cycle costs are considered, VRF is comparable to many traditional types of HVAC. The system design and installation are simplified, including reductions in the need for ductwork and, in some cases, the elimination of it. These systems also require minimal maintenance and long-term durability. Their efficient operation helps reduce energy costs when the building is occupied. Overall, VRF systems can save building owners significantly over the life of their HVAC system and building.

INCORPORATING SUSTAINABLE MATERIALS

LEED v4 has always included a significant portion of the rating system focused on the sustainable nature of Materials and Resources (MR). Earlier versions of LEED looked at some specific requirement to achieve points, such as the lack of ingredients harmful to human health (i.e., volatile organic compounds, or VOCs) and the embodied energy found in the travel distance between manufactured materials/products and the project site. LEED v4 takes a broader approach and seeks information about the full life cycle of materials and products, including extraction of raw materials, processing, transport, use, maintenance, and disposal/recycling. The specific credits in this MR category seek to reduce the embodied energy, environmental impact, and human health impacts of materials and products used in buildings. Each credit requirement helps identify a specific action that fits into the larger context of a life-cycle approach to reducing impacts.

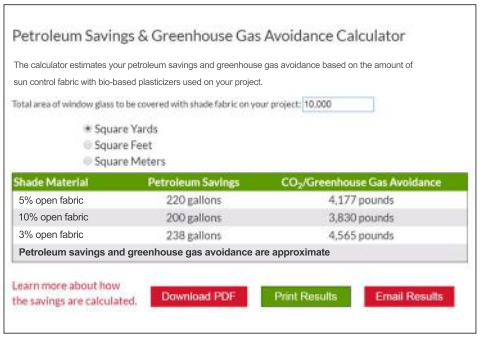
The broader LEED v4 approach means that documenting creditworthiness in this category has changed notably. The design team is not expected to analyze every material or product, but those that produce them are. Hence, product manufacturers, trade associations, and independent agencies have the responsibility of producing reliable life-cycle information that the design teams can use to specify sustainable products and demonstrate LEED point eligibility. This becomes embodied in documents such as environmental product declarations (EPDs) or raw material sourcing and material ingredient information. In some cases, independent certifications are acceptable from other organizations that operate programs such as GreenScreen, Cradle to Cradle, or the European REACH program.

To demonstrate how this category might play out on a project, let's use an example product. Imagine a sustainable building with a fair amount of glazing with the sunlight being controlled, in this case, by some interior-mounted sun control fabrics. This is a common choice, using motorized rollers to allow the fabric to act as a movable shade for solar heat and glare reduction, while still allowing natural daylighting and enhancement of outward views. That shade constitutes a significant area of material that is not only part of the indoor environment, but also a part of the environmental footprint of the building.

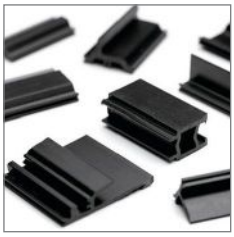
In looking to use this product as part of the MR credits for a LEED v4 building, it is worth realizing that the manufacturer of the shade material or the fabricator who weaves it probably doesn't work directly with architects on their specific projects. Rather, they produce the fabric and formulate it into a usable format, while other companies create the complete shade systems that are then selected and specified by designers. It is incumbent on these manufacturing companies, then, to disclose the relevant information about their manufactured materials, their fabrication processes, and other technologies that go into the makeup of the completed products. In our solar fabric shade example, this might include disclosing the use of things like bio-based or petroleum-based plasticizers, antibacterial additives, recycled content, and recyclability at the end of its useful life. It might also include evidence of environmental certifications such as Cradle to Cradle and GREENGUARD.

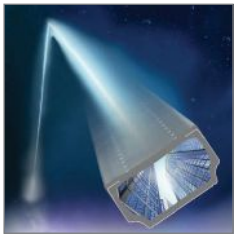
Manufacturers who have had their products and materials regularly used on LEED projects are likely already on board with providing this information in formats that are becoming more standardized, such as EPDs. Bill Strickland, senior national market manager of Phifer sun control products, comments, "We entered this market in the 1980s and now have multiple products available with unique and innovative sustainable features that can be documented and certified." Other companies may not be as experienced or fully up to date in providing sustainability information about their products. That means demonstrating LEED credit eligibility will be easier for some products than others. It also means that it will be important to follow the LEED-accepted process to break out the different elements and pieces of a system to optimize the sustainability of materials specified.

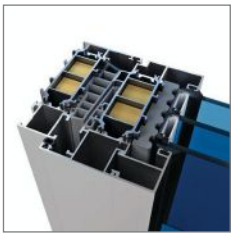
Images courtesy of Phifer Incorporated



Pictured above is an example of environmental disclosure information for a solar shade fabric used in a sustainable building.







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Continuing our solar shading example, once some potential products and materials are selected for consideration, they can then be compared based on the information provided by manufacturers. Some may be found to be free of PVC, making them attractive, but others may also be recyclable and made of recycled content, making them even more attractive and potentially more sustainable. Still others may include bio-based alternatives to petroleum and even document the calculations for how much greenhouse gas emissions are avoided by their material. That could be significant in terms of achieving a higher level of building certification, such as LEED Gold or Platinum, but could also help with more basic levels, such as LEED Certified Bronze or Silver. Of course, all of the materials and systems assessed still need to meet the core requirements of solar heat reduction to help with energy use optimization plus management of glare and views for indoor environmental quality. That is what holistic design is all about—every product or material in a building is there for a purpose that touches on other things in the building, making them related either in physical terms or operational terms. Good sustainable design is all about selecting the best combination of those products and materials to satisfy their intended purposes, while also falling within the parameters of minimizing the environmental, embodied energy, and human impacts.

GLAZING FOR DAYLIGHT, VIEWS, AND OCCUPANT COMFORT

Indoor Environmental Quality (EQ) is a LEED category that addresses human health and comfort in numerous ways, including thermal, visual, acoustic, and general health factors. One of the key elements of any interior space is the presence of natural daylight. Not only does it provide a sense of connection to the outdoors, it can reinforce our body's natural circadian rhythms, and create much more inviting and pleasant spaces overall. Further, if designed in conjunction with proper controls, it allows for additional energy savings by switching off electric lights.

There is, of course, a challenge to address in naturally daylit spaces, namely the changing nature of the sun's intensity and position across a day or the seasons. Too much direct sunlight at any point may result not only in excessive unwanted heat gain (which impacts energy performance), but also glare and discomfort on the part of the people in the space. Too little light, or light in the wrong location, and areas can appear under-lit and less than inviting. The solution to these challenges is found first in the design of the daylighting building features. The amount of unfettered daylight that is allowed to enter the building is a function of basic design decisions, such as building location, building shape, compass orientation, and glazing location. Exterior walls and roofs with glazed openings that orient toward the sun are the initial elements that need to be studied to see where and to what extent the daylight can potentially be effective.

Photos courtesy of SageGlass/Jeffrey Totaro, 2015

Electrochromic glass can change from clear (left) to become tinted in single or separate zones (four zones with different tint levels, three of which are within a single pane, shown on right) to suit changing daylight conditions.

The second key factor in daylighting designs is the means to control the amount of sunlight that is allowed through the glazing. In any given glazing condition, there will be times when having clear glass will be preferred to let most of the available daylight in. Then there will be other times when shaded or tinted glass will be preferred to block some or all of the sunlight with its corresponding heat and glare. Since most glazing can only be produced in one "static" condition of relative clarity or tint, some separate movable products, such as adjustable blinds or shades, are often installed to suit the changing daylight needs. However, an elegant and cost-effective alternative is to use "dynamic glazing," which can change from clear to different shades of tinting through the use of specially coated glass that responds to a small electrical voltage. This coated glass is called electrochromic glazing (EC) and has been used very successfully in projects around the world.

With EC, the adjustability of the tinting gives architects the design flexibility that they need to relieve the tension between creating energy efficient buildings and having sufficient glass for the occupants to enjoy a daylit, comfortable space with expansive views to the outside. Because the solar and glare control is built into the glass itself, there is freedom to design more elegant, complex façades without taking a penalty on energy or comfort, and without the need for separate blinds or shades. Under USGBC LEED v4, electrochromic glazing can help provide sufficient glazed area to meet the daylight targets, yet control the glare so that the space is not over-lit or plagued by glare. It can also simultaneously help to achieve high energy performance by restricting solar heat that would otherwise increase air-conditioning loads or allow natural daylight to replace electrical lighting demand. All of this is further achieved by creating "zones" in the glass to allow more tinting in targeted portions of glass that may be more problematic for glare, with less tinting in other areas to admit more daylight where glare is not an issue. Zoning of the glass helps further optimize the balance between daylight, energy use, views, and light color.

CONCLUSION

The bar has been raised again on sustainability, but the availability of solutions to meet higher standards has also been raised. The techniques and strategies discussed here can help create greener, more sustainable buildings to achieve LEED certification at any level. In some cases, they can also help achieve exemplary performance and be awarded points for innovation. More importantly, they can help design and construction professionals create buildings that are good for people, planet, and profitability in both the short and long term.

Continues at ce.architecturalrecord.com

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

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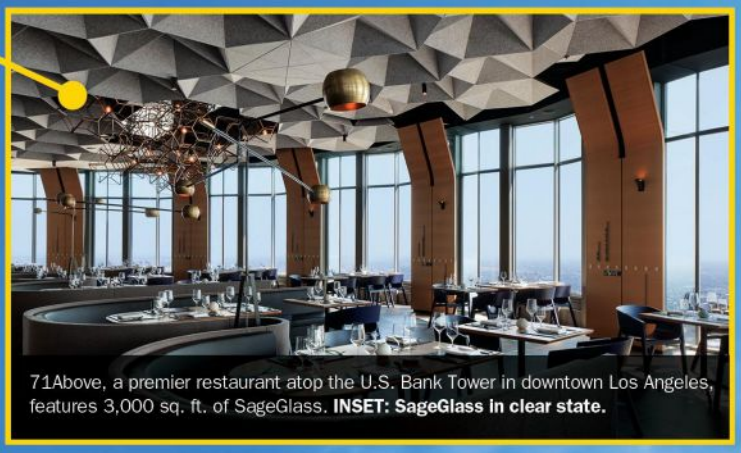
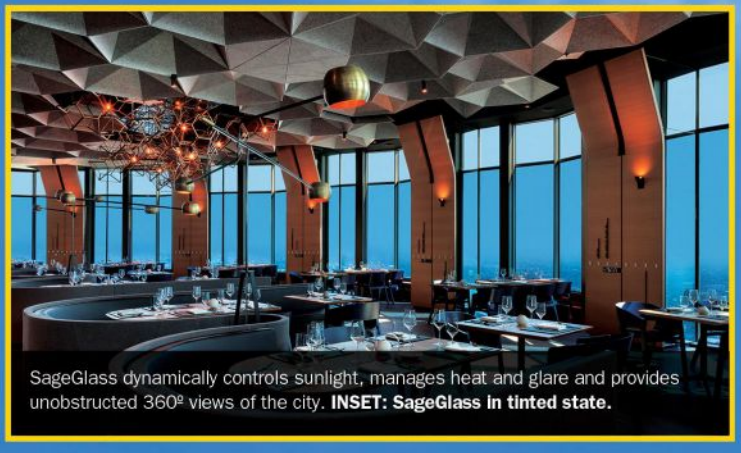


71Above, a premier restaurant atop the U.S. Bank Tower in downtown Los Angeles, features 3,000 sq. ft. of SageGlass. **INSET: SageGlass in clear state.**



SageGlass dynamically controls sunlight, manages heat and glare and provides unobstructed 360º views of the city. **INSET: SageGlass in tinted state.**

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PRODUCT REVIEW

Designing for Sustainability

EFCO Corporation

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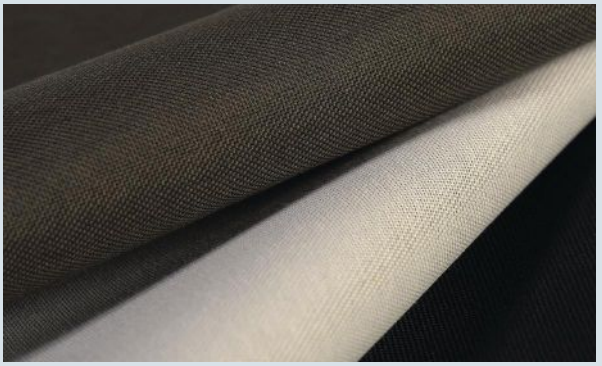

SheerWeave® Style 8000: Cradle to Cradle Certified™ Bronze

This interior roller shade fabric for commercial buildings is used for solar heat and glare reduction where environmental and sustainable features are priorities. Its unique design, composition, and Cradle to Cradle Bronze certification provide a solution for roller shade projects in which the most stringent environmental and sustainable standards must be met.

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PRODUCT REVIEW

Designing for Sustainability

SageGlass

Photo courtesy of SageGlass

SageGlass®

SageGlass® is advanced dynamic glass that can be electronically tinted or cleared to optimize daylight and improve the human experience in buildings. SageGlass enables you to control sunlight and glare without blinds or shades, maintaining your view and connection to the outdoors and significantly reducing energy consumption.

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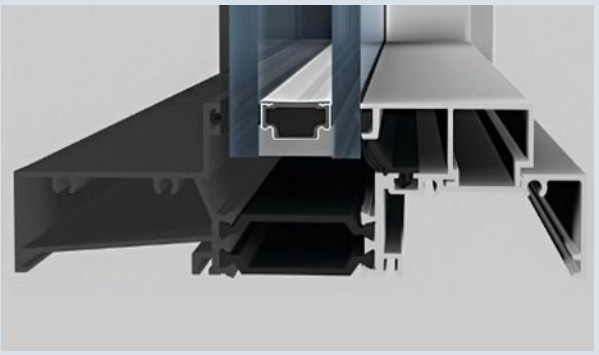
Technoform Group

Image courtesy of Technoform



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Technoform specializes in the development and manufacture of components that improve the thermal efficiency of the window system. Technoform Bautec produces high-precision polyamide insulation profiles for aluminum windows, doors, and facades. Technoform Glass Insulation produces a warm-edge spacer to reduce heat transfer and maximize protection against gas leakage and moisture penetration.

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Floor squeaks can be a sign of construction problems. Overcoming them and creating a quality finished project requires attention to all aspects of a floor system.

Overcoming Structural Floor Squeaks in Wood-Framed Construction

Finished floors only perform as well as the subfloor beneath them

Sponsored by Huber Engineered Woods LLC | *By Peter J. Arsenault, FAIA, NCARB, LEED AP*

Wood-framed buildings are quite well understood by architects, carpenters, building code officials, and others, so why are there so many squeaky wood floors? The concepts of platform framing have remained the same for decades. Even though material choices have changed, the basic principles haven't. Of course, dimensional framing lumber has gotten smaller in actual dimensions, floor spans have tended to increase, and the availability of high-quality wood has decreased, all of which could be contributing factors. In response, engineered wood products have filled the void by providing consistently strong, stiff materials in the form of trusses, laminated veneer lumber oriented strand board, plywood, I-joists, and other advanced products. Fasteners and adhesives have also gotten better with some notable engineering improvements. Could it be a labor problem? With labor shortages crunching time availability on jobs and a lack of experienced tradesmen in general, perhaps the floor framing system is being rushed and quality control is suffering. Perhaps it is a combination of all of these things in different degrees in different projects. Whatever the reason, squeaking wood floors are a problem for owners, occupants,

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Learning Objectives

After reading this article, you should be able to:

1. Identify the durability and safety characteristics of high-performance wood-framed floor systems with superior strength and stiffness attributes.
2. Investigate the multiple components of a wood-framed floor system, and the ways that they all contribute to improved performance and the elimination of movement and floor squeaks.
3. Assess the functional contributions of engineered wood subflooring as it relates to structural strength, fastener retention, water resistance, and overall stiffness.
4. Design and specify wood-framed floor systems that perform as intended, and reduce or eliminate squeaks that are harbingers of other issues.

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contractors/builders, and architects because they scream an impression of poor quality and problems with the construction. Consideration of best construction practices and advanced material options from frame to finish can help designers specify solutions to help mitigate the potential for squeaks and related problems.

FLOOR SQUEAKS AND WHY THEY MATTER

What causes a floor to squeak? Fundamentally, two pieces of material need to move or rub against each other, creating friction that emanates as sound. Those materials can be wood against wood, as in subfloor panels rubbing against floor joists, or wood against metal, as in fasteners or ductwork rubbing against floor trusses. It is this differential movement between different components or materials that commonly causes squeaks in wood-framed floor systems. More significantly, it reveals that something may not be performing as intended. Minimizing or eliminating this movement will minimize or eliminate the squeaks and perhaps the underlying problems.

The biggest reason to design against floor squeaks is to help achieve long-term durability of the floor and help mitigate owner or occupant complaints or concerns with quality. Floor squeaks are often referenced as a common reason for callbacks.[1,2] If the results aren't satisfactory, owners can seek retribution and even litigation against contractors, architects, developers, and anyone else involved. Are those claims justified? Sometimes, yes. The squeaks can be a sign that the structure is deflecting more than it should. That might be a design error from undersized structural floor joists or trusses. Or it might also be because the subfloor wasn't of adequate strength and stiffness or installed properly to be fully attached to the floor framing as required by the structural design. Or perhaps everything is fine with the design and installation but the materials were damaged and weakened from wet conditions during construction. All of these conditions are common in the framing of a structural wood floor, and if they aren't addressed early, they can lead to longer-term and bigger problems, such as structural sagging, separation of components, or degradation of materials.

Of course, there may be other signs of problems that are not readily visible in the structure but quite evident in the finish flooring. If the subfloor system is inadequate or compromised for any reason, then the finish flooring could be affected. This may be less noticeable where carpet is used, but it can be very noticeable if hardwood flooring, laminated or engineered wood flooring, or brittle finishes such as tile or stone are used. Movement in the subfloor usually telegraphs as movement in the finish flooring, and those products aren't designed to endure that. Manufacturers of wood, tile, or stone floor products will usually indicate the conditions that are required for their flooring to be installed over and will not take any responsibility or honor a warranty if those conditions aren't met. This just reinforces the point that is true in many parts of construction—there is no point in putting a high-quality, often costly finish material over an inadequate substrate. In the case of floors, a quality flooring material should be installed over a quality subfloor system. This is a very reasonable first step to help design quiet floors and protect against liability claims.

How do we overcome the challenges and achieve the needed quality of construction? We need to look at all of the components of a subfloor assembly and the interface with the finish flooring. Selecting products and systems that are reliable and carry quality assurance recognition is a good first step. In addition, understanding the installation of the materials and specifying an assembly that reduces risk of rework while helping applications move swiftly can all be a real asset during construction. In the following sections, we will look at each individual component of a floor assembly. Keep in mind though that any project needs to be designed holistically to minimize the opportunity for performance issues or installation problems.

FLOOR FRAMING

It would seem that of all the elements of a wood-framed floor system, the floor joists or trusses should be the most basic and easiest to address. After all, allowable spans for individual members have been standardized to the point that they can be looked up in printed tables in building codes or manufacturers' literature. This is true whether it is for dimensional lumber identified by wood species (i.e., 2-by-8, 2-by-10, 2-by-12) used as floor joists, for open-web manufactured floor trusses, or for engineered I-joists of different sizes. Those tables even allow for different standard spacing of joists or trusses (i.e., 16, 19.2, 24 inches on center) and different live load levels (i.e., 30, 40, 50 psf). Having this range of choices is good and can allow for greater creativity and design freedom. However the designer's role requires that, when selecting the appropriate size and type of floor framing member, he or she uses the correct criteria that matches the design conditions. It also requires that those criteria are clearly indicated on the construction documents so the correct framing members and spacing are constructed.

It is reasonable to follow the basic selection process just described, but in the context of contemporary construction, it may also be prudent to acknowledge that some things are not perfect in wood floor framing. Dimensional lumber, for example, is not always in the ideal condition either when shipped or after installed, such that it may become warped, bowed, or cupped. From a structural load bearing perspective, it may still be fine, but from the perspective of eliminating floor squeaks, it may not be. If irregularities in the lumber cause gaps between floor joists and adjacent framing members, such as sole plates and beams, then there is the potential for movement between them. That movement and rubbing could not only cause squeaks, but it also add additional stresses to the framing, causing other issues over time.

The choice of the type of framing member can also make a difference in the ability to overcome floor squeaks. For example, the subflooring needs to rest on top of the floor framing members not just in the middle of the subfloor

A quality finished floor and living space requires that a quality subfloor system is constructed first to achieve structural integrity, avoid floor squeaks, and protect against costly problems.

panels but at the joints between the panels. The narrower the framing member, the less surface area for the joint connections to be made. That can be further compounded if a narrow joist is bowed or warped, such that the edges of two adjacent subfloor panels are not equally supported because the joist is not straight. In any of these cases, a compromised joint or connection between subfloor panels because of the framing member can lead to an irregular condition that is prone to movement and squeaks afterward.

There can be other issues with floor framing members that need to be addressed, too. For example, it is common to use prefabricated, metal floor joist hangers to secure the ends of dimensional lumber or engineered joists to beams or other framing. These joist hangers have multiple holes for fasteners, and the intent is that they all actually receive fasteners—both into the joist and into the connecting member. The consequence of leaving any of those holes open (i.e., missing fasteners) is that the connection is not as strong as designed, which can lead to movement of the members. That movement can be a rotation of the joist or a movement of the hanger, either of which can cause a floor squeak and loosening of the hanger.

One final item to consider is the presence of mechanical, electrical, and plumbing (M/E/P) lines that may be traversing through the floor framing. While nice, orderly penetrations can be designed and documented on drawings or neatly indicated on manufactured products, field conditions may not always be so perfect. Holes and openings cut in the wrong location or in too large a size can compromise the structural integrity of the framing member. That can create another source of movement in the member, which can then rub against those M/E/P lines and cause squeaks. If the building design calls for M/E/P lines to run through the floor framing, then they need to be addressed and designed properly. Open-web trusses are ideal if there are a lot of lines that can fit readily in the web openings. Solid web joists or dimensional lumber joists need to be inspected in the field to be sure that any drilled openings are structurally appropriate and don't include contact with M/E/P lines. That means they need to be supported independently in a manner that will reduce or eliminate the potential for squeaks.

SUBFLOOR PANELS

Floor framing is only part of the floor assembly—the subfloor is also a part of the structural system. In fact, if you read the fine print in most of the framing member tables already discussed, you will discover that they rely on the presence of a structural panel on top of the framing members. That is because, when fully attached with glue and fasteners, the framing and subfloor act together as a continuous structural system. They become stronger together than they would be on their own (i.e., greater than the sum of their parts) based on "composite action." In structural engineering terms, composite construction exists when two different materials are bound together so strongly that they act together as a single unit from a structural point of view.

Structural floor framing elements, whether joists or trusses, need to be selected to work successfully with subfloor structural panels.

Common subfloor panels include plywood and OSB, which can warp, buckle, or expand when wet. Specifying high-performance engineered wood panels for subfloors can help protect against moisture damage during construction and help keep floors flat and stiff to prevent squeaks over time.

Historically, the traditional method of providing subflooring was to install solid boards at an angle to brace floor joists and receive the finish flooring. In the mid 1900s, that method was gradually replaced with engineered plywood that relied on alternating layers of thin layers of wood glued together. The grain direction in the layers alternated to maximize dimensional stability in the panel and to reduce movement between panels. Later, engineered oriented strand board (OSB) was developed as a cost-effective alternative that relied on using small strands of wood in resin instead of full layers. The alternating orientation of the strands achieved similar structural qualities when compared to plywood but also had some practical limitations.

One of the latest advancements in subfloor materials are high-performance engineered wood panels. For example, one such product has obtained a third-party evaluation doumenting greater strength and stiffness compared to either plywood or OSB by virtue of their engineered design and makeup.[3] That means they are less likely to bend, deflect, or warp when used and installed properly. The enhanced material composition of the high-performing engineered panel allows for precisely milled and extremely durable tongue-and-groove edge profiles that allow for easy installation. They also employ advanced moisture-resistant resins throughout the panels, which makes them less susceptible to moisture damage—a notable problem in plywood and OSB. They have even been tested to provide superb fastener-holding power to help keep floors flat and quiet. As an essential component at the core of a wood-framed floor system, let's look at how these state-of-the-art subfloor panels can improve construction quality and help eliminate floor squeaks.

High-Performance Engineered Panels During Construction

There are two ways that using stronger, moisture-resistant, high-performance engineered subfloor panels can make a notable difference in the quality of the finished project. The first is during construction. The tongue-and-groove profile design is different from plywood or OSB tongue-and-groove profiles, which can be more wedge-like, requiring the use of a sledge hammer to essentially friction fit the panels together. By contrast, high-performance panels fit together easily without requiring a sledge hammer since the profiles can be fabricated more precisely. This means that it is not a friction fit, and therefore the panel does not accumulate internal stresses that

Common tongue-and-groove joints in plywood and OSB (left) are usually friction fit and require field determination of the proper gaps recommended by the APA – The Engineered Wood Association. High-performance engineered subfloor panels have a more precise joint (right) that is not friction fit and can include an integral spacer as part of the profile.

can lead to squeaks and pops. The other feature of high-performance panels is that the tongue-and-groove profile can be made with an integral gap spacer. The Engineered Wood Association (formerly the American Plywood Association, but still known as APA – The Engineered Wood Association) recommends that all engineered panels, including OSB, plywood, and high-performance panels, maintain approximately a ⅛-inch gap between panels to prevent buckling and accommodate any unwanted movement. The ability to achieve that gap with a sledge hammer on-site is inconsistent at best, while achieving it with an integral spacer makes it much more predictable and likely to be done properly.

The other notable difference during construction when using high-performance panels is the ability to resist water damage. One of the key limitations of plywood and OSB is that moisture or rain exposure can create buckled or swollen seams since the panel edges are prone to absorb water and expand or delaminate. This can create an uneven subfloor that can lead to squeaks, finish floor issues, or other problems. The common field fix is to sand down the subfloor joints after the building is closed in and dry. That approach deals with the surface but not any internal damage to the subfloor or its ability to continue to perform as intended. The better solution is to specify from the beginning a subfloor that can withstand water from rainstorms, freezing/thawing, etc. High-performance engineered panels have been tested and shown to do that quite well, with up to a 500-day exposure warranty available. This means that the edges are much more likely to remain flat and smooth without inducing any stresses or irregularities to cause movement or squeaks. It also means that its strength and fastener holding power can be maintained through wet and dry construction cycles.

High-Performance Engineered Panels in Use

The second and most notable timeframe where high-performance engineered panels can make a difference is during the life of the building. Since they are rated for both strength and for stiffness, they are less likely to sag between framing members once they are fully loaded with people, furnishings, and equipment. It also means they are less likely to "bounce" when people walk across them. That can be important in many areas of construction but particularly around interior partitions. The up-and-down movement of a subfloor that lacks adequate stiffness can create some unwanted stresses where a partition is restricting that movement. Those stresses could get transferred not only to the partition but to the finish flooring around it, as well with unwanted consequences.

Subflooring can get wet during construction and cause problems along the edge. In the comparison (bottom) of high-performance engineered panels on the right and plywood on the left, each board was soaked in one inch of water, colored with red food dye, for 3 hours. Results show progress through the 3-hour test.

The main distinction between different products and their engineered performance over time often comes down to the thickness of the material. Therefore, standards have been developed on how to classify and identify the acceptable thicknesses of engineered wood products of all types. Toward that end, a performance standard known as PS-2 has been developed. This standard, initiated by APA – The Engineered Wood Association, has been developed under the Procedures for the Development of Voluntary Product Standards for the U.S. Department of Commerce and published by the National Institute of Standards and Technology (NIST). The first edition of PS-2 was published in 1992, while the most current version is PS2-10, published in 2010. The goal of this standard is to establish structural criteria for assessing the acceptability of wood-based structural use panels for sheathing and single-floor applications. Specifically, it lists the minimum and maximum panel thickness tolerances for engineered panels. Those tolerances are within 1/32 inch (0.8 mm). Different manufacturers can rely on third-party testing to verify their actual product thickness and the consistency that they maintain to provide panels in any of the performance categories that they produce.

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While every project is unique, there are five best practices that can reliably position a space to achieve daylighting success.

Photo courtesy of Lutron Electronics

Top Five Tips for Successful Daylighting Design

Equip every project to meet its own unique performance goals

Sponsored by Lutron Electronics | *By Jeanette Fitzgerald Pitts*

Good daylighting design is difficult. Even the premise of successful daylighting seems to border on the nearly impossible: design a building to manage the largest and most dynamic energy source in the universe so that the structure will protect occupants and the interior from experiencing glare and solar heat gain throughout the day, while maximizing the amount of ambient daylight allowed onto the floorplate, when it is available.

Despite its challenging nature, good daylighting design is in demand. This trend is motivated, in no small part, by the fact that study after study, many conducted by the Heschong Mahone Group, continue to prove that daylight benefits both the occupants and the operational bottom line of the built environment. Daylight can save energy and reduce operating costs, because electric lights can be dimmed or turned off when sufficient daylight is available. Access to daylight and views also improves the health, well-being, and productivity of the people inside. If a space is designed to accomplish work, educate, or heal, then bringing daylight into the space has been shown to make people work harder, learn more quickly, and heal

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Learning Objectives

After reading this article, you should be able to:

1. Identify and prioritize the daylighting performance goals of a space, including: controlling glare, saving lighting energy through daylight harvesting, preserving outdoor views, and mitigating solar heat gain.
2. Compare and contrast the performance of solar shades, louvered systems, and electrochromic glass in achieving various daylighting objectives.
3. Explain why automated controls enable a space to save more lighting energy than manual controls.
4. Specify solar shade fabric that best fits the glare control, energy savings, view preservation, and thermal management needs of a space.

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faster. These results have left building owners of all types clamoring for daylight inclusion.

In response to all of this daylighting enthusiasm, the market has been flooded with new technologies and solutions designed to successfully incorporate daylight into the built environment. But not all of these systems are created equal, and designers face the monumental task of sifting through the mountain of options to match the unique needs of their project with the right daylight management solution.

Unfortunately, there are a lot of misconceptions in the industry that often lead designers to select the wrong daylighting system or write an insufficient specification, leaving angry building owners to deal with subpar daylighting performance. Common mistakes include: specifying static daylight solutions to manage a dynamic daylight source; selecting products that rely on unreliable manual manipulation; and basing material selection solely on aesthetics, without considering performance.

While every project is unique, differing not only in the type of daylight available at the site but also in the specific daylighting objectives that must be met, there are some best practices that can reliably position a project to achieve daylighting success. Incorporating these five tips into a project's design will enable a space to maximize the presence of ambient daylight when it is available, preserve the view to the outdoors, and protect the interior space from glare and solar heat gain. Here they are.

Photo courtesy of Lutron Electronics

There are four primary daylighting objectives: preventing glare, preserving outdoor views, reducing electric light use, and mitigating solar heat gain.

TIP #1: DEFINE AND PRIORITIZE DAYLIGHTING PERFORMANCE GOALS

With daylighting design, the best place to begin is to identify how the owner would like to see the building use daylight once the project is completed. There are four primary daylighting objectives. They are: preventing glare, preserving outdoor views, reducing electric light use, and mitigating solar heat gain. Identifying which objectives pertain to a particular project and prioritizing them is an important step in defining the necessary performance of the selected daylighting system.

Prevent Glare

Preventing glare and excessive brightness from destroying the balance of the interior visual environment is perhaps the most critical task that daylight management systems must accomplish. Glare occurs when an element in the visual field, either a light source or the reflection of a light source, is significantly brighter than the surrounding visual atmosphere. When the difference in illuminance levels within the visual field is too great, the eye cannot effectively adapt to the extreme brightness in its view and discomfort occurs in the form of headaches and eye strain, which lead to fatigue. The key to preventing glare in a space is to keep the illuminance ratios of the interior balanced within the scope of what can be effectively used and managed by the human eye. In RP-5-13: Recommended Practice for Daylighting Buildings, the IES recommends that, "illuminance ratios of task to surrounding areas be kept below 1:3 for adjacent areas (30-degree cone) and 1:10 for remote areas (60-degree cone)."

Maintaining this illuminance ratio is a constant problem when daylight is allowed into the interior because the sun is a powerful light source and daylight has the potential to become incredibly bright. The intensity of daylight can range from 500 to 2,000 foot-candles (fc) on an overcast day, and direct sunlight can reach up to 10,000 fc when the sky is clear. In a typical office setting, the range of useful daylight levels is considered to be between 10 fc and 200 fc at the work plane. This range of daylight supports the balanced illumination ratios recommended by the IES and will not disrupt the visual environment or the people working there. Looking at the range of possible daylight intensity and the useful range of daylight that is acceptable at the workspace, some type of daylight management system will be required to reduce daylight levels sufficiently at the window on even overcast days. Systems

Photo courtesy of Lutron Electronics

Different types of space can tolerate different levels of potential glare. Lobbies and social spaces may prioritize access to views over glare control.

that only control direct sun are insufficient for providing the comfort necessary for most office tasks. This highlights the need for window coverings beyond fixed shading devices, such as overhangs and fins.

Glare control is the most common objective of a daylighting system. However, different types of space tolerate different levels of potential glare. Spaces where vision-critical tasks are performed, such as office spaces, conference rooms, and classrooms, have a low tolerance for glare because it would disrupt the function of the area. Transitional spaces, such as hallways and stairways, can accept a higher level of potential glare as long as it doesn't create a safety concern. Lobbies, break rooms, and other social spaces also have a higher threshold for potential glare because a brighter atmosphere would not negatively impact the casual interactions that occur there.

When determining the goals of the building, be sure to evaluate glare-reduction needs in individual spaces. This will impact the type of daylight management system that is right for the project and enable the designer to offer a more tailored solution that best fits the needs of every space.

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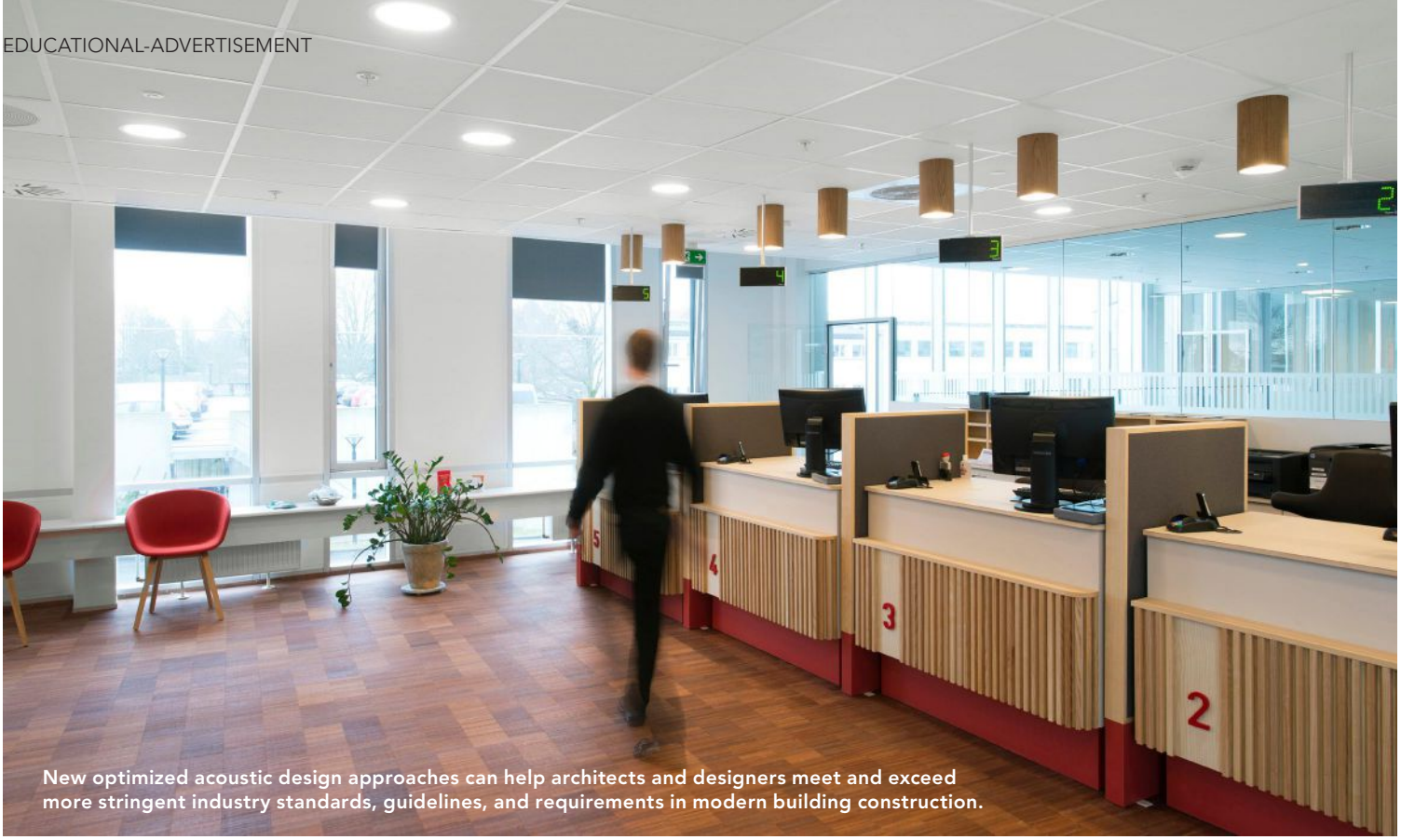
***Jeanette Fitzgerald Pitts** has written dozens of continuing education articles for* Architectural Record *covering a wide range of building products and practices.*



New optimized acoustic design approaches can help architects and designers meet and exceed more stringent industry standards, guidelines, and requirements in modern building construction.

All images courtesy of ROCKFON

Optimizing Acoustics for Effective Sound Design and Performance

High NRC-rated ceiling panels provide high-performance sound-absorption solutions—maximizing building function, occupant well-being, and compliance with building standards

Sponsored by ROCKFON | *By Robyn M. Feller*

Anyone who has ever tried to work in a busy office or get some sleep during a hospital stay knows that the noise surrounding us—whether it's your coworker's exuberant laugh or machines beeping down the hall—can affect our mental and physical well-being, not to mention productivity and general state of satisfaction with our environment. As awareness of the impact noise has on our daily lives increases, it's only logical that building standards and guidelines are becoming more stringent when it comes to acoustic requirements. In order to meet many of these higher-performance criteria, architects and designers need to make a concerted effort to consider how every structure, surface, fixture, material, and even gap plays a role in the way sound is experienced. For the best results, this means focusing on the true strength of acoustic ceiling panels: noise absorption.

Designers and architects are now tasked with the challenge of navigating the wide range of ceiling panel solutions available in the marketplace. Although some products attempt to absorb and block noise, there is actually a misconception that ceilings alone can block sound between rooms. The reality is, modular acoustic ceilings by themselves do not have enough mass to block sound. Additionally, ceiling systems will always have substantial noise leaks—created by installing light fixtures and air devices—making them even less effective at blocking sound.

In this course, we will look at the effects of noise, how to determine the type and level of noise mitigation required for a given project, as well as look at the factors that go into meeting and exceeding new industry standards, guidelines and requirements through the latest optimized acoustic design approaches.

WHY ACOUSTICS MATTER

It is no surprise that noise affects physical and mental health, productivity, and overall well-being. The first step toward an optimized acoustic experience is to understand its importance for our daily lives.

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Learning Objectives

After reading this article, you should be able to:

1. Assess the impact of noise on physiology, comfort, health, mental capacity, behavior, and productivity.
2. Describe the myths and truths in the design world as they relate to acoustic building practices.
3. Recognize how ceiling panels with high noise reduction coefficient ratings (NRC), such as those made of stone wool, can lead to compliance with the building standards, guidelines, and rating systems from multiple perspectives.
4. Explain the mechanics of optimized acoustic design and differentiate between optimizing absorption and optimizing blocking using modular, suspended, acoustic ceilings, and other architectural components.

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Impact of Noise on Physiology, Comfort, and Health

The National Institute for Occupation Safety and Health asserts that ambient noise levels affect people's health by increasing general stress levels. Continued exposure does not lead to habituation; in fact, the effects worsen. More specifically, according to the World Health Organization:

Noise seriously harms human health by causing short- and long-term health problems. Noise interferes with people's daily activities at school, at work, at home, and during leisure time. It can disturb sleep, cause cardiovascular and psychophysiological effects, hinder work and school performance, and provoke annoyance responses and changes in social behavior.[1]

The clinical manifestations of stress occurring with noise, that is, negative physical impacts on the human body from noise, are numerous and should not be taken lightly. They include:

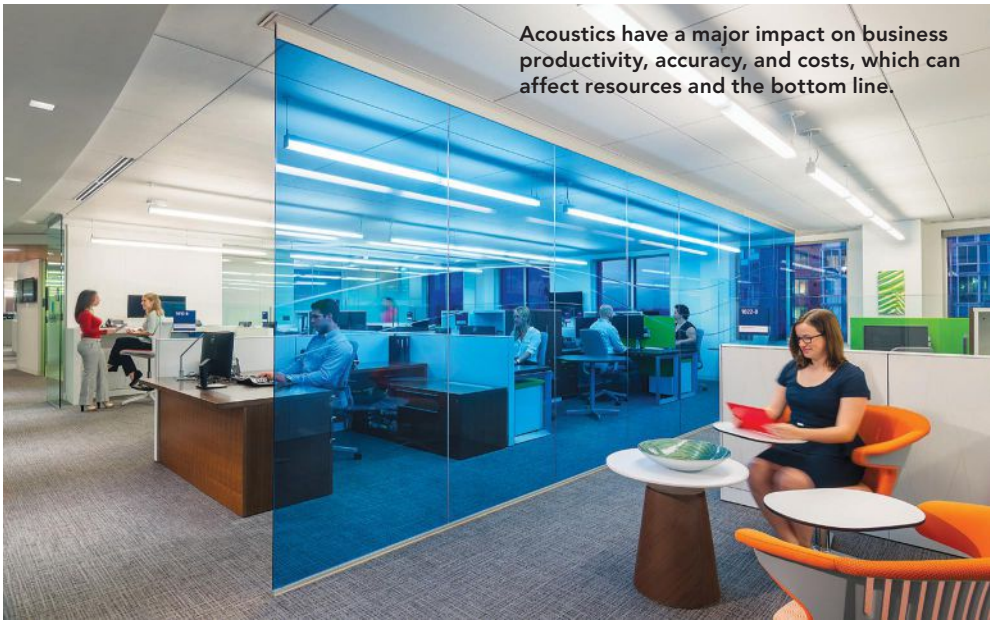
- Increased heart rate
- Elevated blood pressure
- Dilation of pupils
- Increased respiration rate
- Increased muscle tension
- Fatigue and nausea
- Heart attacks
- Increased ulcer formation
- Intestinal motility changes
- Increases in adrenaline

The effects go beyond the physical. Additionally, the negative mental and behavioral effects of noise include:

- Increased aggressiveness
- Impatience and nervousness
- Decreased helping behaviors
- Lowered attention span
- Decreased problem solving
- Memorization problems
- Comprehension problems
- Neurotransmitter deficiencies
- Interpersonal problems
- Social behavior problems

Impact of Noise on Productivity and the Bottom Line

With all that in mind, it is essential to recognize the potential productivity and financial impact of bad acoustics. While some people still view noise as only a minor, short-term annoyance, appreciating the major impact of acoustics on business productivity, accuracy, and costs can affect resources in a big way.



Acoustics have a major impact on business productivity, accuracy, and costs, which can affect resources and the bottom line.

The numbers speak for themselves. Studies have shown that 90 percent of business operation costs are tied to staff or employees, compared to only 1 percent for energy usage. Those employees spend 62 percent of their time needing to do quiet work. In other words, good or bad acoustics affect 90 percent of an organization's resources 62 percent of the time.[2,3]

ACOUSTICS IN BUILDING POST-OCCUPANCY SURVEYS

As we begin to assess the progress made in attenuating negative impacts of noise in buildings, the question to ask is, "How have we done over the past 10 years as an industry?" To find the answer, we can evaluate the data from post-occupancy building surveys to determine if the past acoustic design approach has been providing adequate results.

The Center for Built Environment at UC Berkeley (CBE) has the most extensive ongoing building occupant survey database in the world, giving us the resources to determine whether or not the industry needs to change direction. The CBE published a status report in 2012, which looked at almost 53,000 occupant surveys for 351 buildings over a 10-year survey period. What the data revealed was that overall, occupants were somewhat satisfied with their buildings, with a satisfaction rating of almost 1 (on a scale from -3 to +3) from dissatisfied to satisfied.

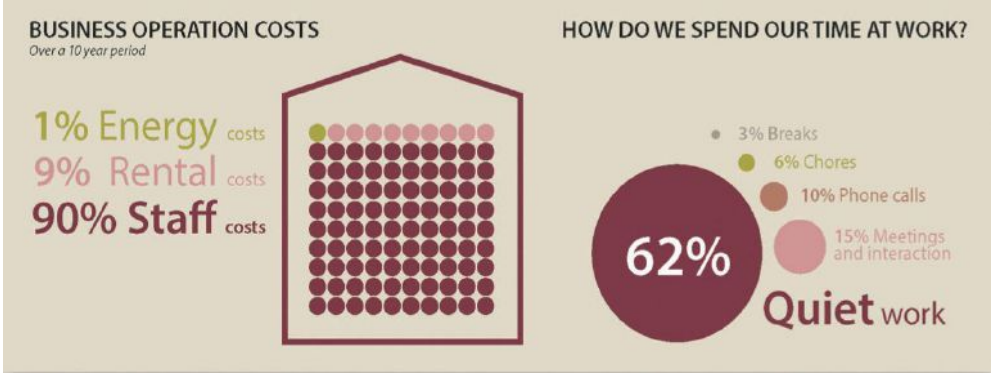
While certain categories get high ratings for satisfaction (e.g., ease of interaction, amount of light, comfort of furnishings, cleanliness), there are a few metrics that are anchoring the satisfaction ratings down. The surveys show the highest levels of dissatisfaction surround privacy, temperature, and noise level.[4]

With this data in hand, it's hard to conclude that the industry should continue the same acoustic design approach in future buildings, compelling us to look at options for a better route to optimal acoustic design.

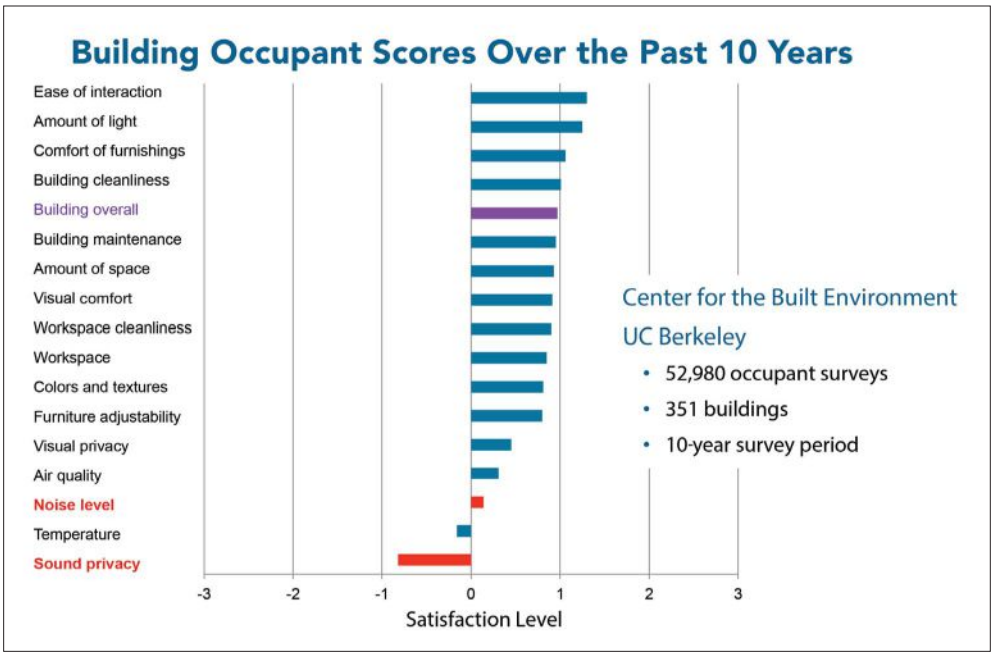
OVERVIEW OF ACOUSTICS STANDARDS AND GUIDELINES

In recent years, there has been a noticeable increase in standards, guidelines, and building rating systems with acoustics sections in them, governing what architects need to do, and making acoustics and noise control more important within the context of the whole building design.

For an increasing number of project types, you may not have the choice whether or not you're going to take a different acoustic design approach in the future. The main trend we're seeing in the standards, guidelines, and rating systems is more stringent acoustic requirements, both in absorption and blocking/isolation.



Sources: "Health, Wellbeing and Productivity in Offices: The Next Chapter for Green Building." World Green Building Council. 2014. Brill, Michael et al. Disproving Widespread Myths About Workplace Design. *BOSTI Associates. 2001.*



Source: Frontczak, M. et al. "Quantitative relationships between occupant satisfaction and aspects of indoor environmental quality and building design." Indoor Air Journal. *Center for the Built Environment UC Berkeley. 2012.*

CODES, STANDARDS, GUIDELINES, AND BUILDING RATINGS SYSTEMS WITH ACOUSTICS CRITERIA BY BUILDING TYPE

Schools
- American National Standards Institute (ANSI)/Acoustical Society of America (ASA) S12.60 Classroom Acoustics
- Collaborative for High Performing Schools (CHPS) National Core Criteria 2013
- Leadership in Energy and Environmental Design (LEED) v4
- Green Building Initiative (GBI) Green Globes

Health Care
- Facility Guidelines Institute (FGI) guidelines
- Evidence-Based Design (EBD) – The Center for Health Design
- LEED v4
- GBI Green Globes

Offices
- The WELL Building Standard
- LEED v4

Note: A number of industry associations have acoustic standards or guidelines—or contribute to their development—that are universal over all building types. These include: ANSI, ASA, Institute of Noise Control Engineering (INCE), National Council of Acoustical Consultants (NCAC), LEED, and FGI.

Overarching Trends

Most of these current codes, standards, guidelines, and building ratings systems that include acoustics sections are building-type specific (see sidebar), and an optimized acoustic design approach can lead to compliance from multiple perspectives, specifically in the following areas:

- Helping to meet maximum permissible reverberation times or minimum NRC ratings
- Helping to attenuate exterior noise that has transmitted through the building envelope
- Helping to attenuate mechanical, electrical, plumbing, fire protection (MEPF) system noise that has entered the occupied rooms of the building
- Helping to control sound transmission between rooms

While in general there are differences in the requirements among various building types, let's now take a closer look at three of the main trends we're seeing in all of the acoustic standards, guidelines, and building rating systems.

1. Many more building types now have some sort of acoustic criteria or performance metrics applied to them. As noted in the sidebar, these include offices, schools, health-care facilities or sustainable buildings, etc.

2. As absorption requirements are becoming more stringent, ceiling products, such as stone wool ceiling panels with high noise reduction coefficient ratings (NRC), are a primary way for the building to comply with the latest acoustics criteria. NRC is a measure of how much noise is absorbed by a ceiling or other interior finish. The higher the NRC, the less noise propagation and disturbances there will be. When lower NRC ceiling panels are used (below 0.70), additional sound absorption on the floor and walls might be needed—an avoidable cost. (We will discuss this in more detail later in this article.)

The other way that the need for increased absorption is expressed in the standards is shorter reverberation time (RT_{60}), which is the length of time required for reflected sound to decrease 60 dB or a loud sound to become inaudible as it dissipates in the room. You achieve shorter RT_{60} through higher NRC values, resulting in better speech intelligibility. In other words, the room reflects sound less when you have higher absorption that results in greater speech intelligibility, lower noise levels, and better sound privacy.

3. We are also seeing higher blocking required in the standards. With the more stringent standards, higher sound privacy between enclosed rooms is required. Typically, you'll see this expressed as sound transmission class (STC), which is a measure of how much noise transmits through the walls (or other assemblies). The higher the STC value, the more privacy you'll experience. To meet the higher sound-privacy requirements, full-height walls or plenum barriers must be used. The old practice of stopping the wall at the ceiling level and relying on the ceiling to block noise transfer does not comply with the new, higher requirements in the standards. In a nutshell, in the past, when both absorption and blocking criteria were less stringent or not defined at all, stopping the wall at the ceiling and relying on less-absorptive ceiling panels to block noise was more common. Now that the acoustic standards apply to more types of buildings and both the absorption and blocking criteria are more stringent, that old design approach fails to meet both the absorption and blocking criteria. In other words, a total failure.

What About CAC?

Another question we need to ask is, "Where is ceiling attenuation class (CAC) in all of the new acoustics standards, guidelines, and ratings systems?" The basic answer is, it's not used. CAC is a measure of how much noise transmits through the ceilings over a partial-height wall, via a common plenum. CAC is associated with a subpar acoustic design approach because when you don't run the wall past the ceiling plane to block sound, you are relying on the ceiling alone, which doesn't produce good results. This is why we are not seeing CAC as a performance metric and it's not used in most current standards, guidelines, and ratings systems.

DEBUNKING MYTHS AND TELLING TRUTHS

Some designers still stop the walls at the ceiling level, creating a plenum above, and then poke the ceiling system full of holes with return air grilles, supply diffusers, lights, speakers, sprinklers—the list goes on and on. Sometimes they even sacrifice

As standards and guidelines have become more stringent, more building types need to meet acoustics criteria or specific performance metrics.

ceiling panel absorption performance (NRC) for slightly higher blocking performance (CAC). This is called the "old compromise."

Let's explore some myths behind the old compromise as they perpetuate the dissatisfaction with acoustics we see with building post-occupancy surveys. Then we'll discuss the truths.

Debunking Acoustic Myths

- It is alright to sacrifice ceiling NRC (absorption), even in open spaces, for slightly higher CAC (blocking) capacity. *It isn't.*
- Suspended modular acoustic ceilings alone can be used for effective sound blocking, providing enough noise blocking between rooms. *They can't.*
- The performance of the ceiling (CAC) can be less than the performance of the demising wall (STC). *It can't. They should be equal.*
- The lights, speakers, diffusers, grilles, etc. that penetrate a ceiling system have no significant effect or can be ignored. *Not true. Noise flanking paths through the ceiling decrease blocking capacity.*
- The ceiling panel CAC rating can also be used as the ceiling system CAC rating. *It can't. It leads to disappointment after occupancy.*

Truths: Getting to True Sound Experience

- **Truth: Sacrificing absorption (NRC) can result in noncompliance with performance metrics (standards, guidelines, and rating systems).**

NRC and RT_{60} are inversely related. As NRC increases, RT_{60} decreases, which is considered better in most cases and what we're trying to do. For instance, let's say we received a reverberation time requirement either from our consultant, a standard, or guidelines—or we happen to know what our desired reverberation time is. From there, it's a simple calculation (which we will discuss in detail later in this article) to get the minimum NRC for our ceiling. Anything below that minimum is going to result in noncompliance with the required performance level, regardless if it's a noticeable difference or not. Conversely, anything at or above that minimum is still going to result in compliance.

Additional absorption on the walls or the floors may be required to compensate for deficiency in the ceiling NRC.

- **Truth: Ceiling panels can't provide enough blocking on their own to achieve speech privacy and avoid annoyance.**

The STC rating of most walls vary from about 40 to 60 points. STC 60 is considered high, but it requires special and heavy construction. STC 40 to 50 walls are considered more commonplace for contractors as they build these assemblies every day, requiring nothing special or out of the ordinary. These STC ratings are based on decades of actual human perception and annoyance in real buildings. These are the blocking levels mandated in the standards, guidelines, and rating systems.

However, CAC ratings of most ceilings panels vary from about 20 to 40 points. That means that on a good day, the best-performing ceiling panels (CAC) might perform about the same as the worst performing walls (STC). But that's before we even start talking about all the penetrations in the ceiling system. So why the disparity? It's because what we regard as high and low STC ratings for walls is based on human perception and annoyance proven in real buildings. But that's not true with CAC. What we consider high and low CAC for ceiling panels is based only on what's available in the market.

- **Truth: Accepting lower absorption performance (NRC) for higher blocking (CAC) results in total failure.**

We discussed earlier not sacrificing NRC for CAC or blocking. To get CAC performance in the 30 to 40 range, you typically, but not always, have to drop your NRC down to as low as 0.50, 0.60 and 0.70. This means, though, you're simply sacrificing your absorption for what is still an inadequate level of blocking. As a result, you are failing to meet both the absorption and blocking requirements, going back to that idea of the "old compromise," or a total failure.

The most common wall performance required by the standards at STC 45 to 50 outperforms CAC 30 to 35 ceilings by 10 to 20 points, meaning the sound that comes through the ceilings is two to four times louder than what's coming through the wall. Once you then add in the effect of all the noise leaks resulting from lights, grilles and diffusers, the disparity grows even worse.

- **Truth: Overall, sound blocking and sound privacy between rooms is only as good as the weakest link.**

Neither the sound path through the wall or through the ceiling is more important than the other. Sound blocking provided by the ceilings (CAC) is insufficient relative to that provided by the walls (STC). The sound-blocking capacity of the ceiling (CAC) must match the sound-blocking capacity of the wall (STC = CAC), but it can't. Ceiling performance falls short of the wall performance so the ceiling cannot match the performance of the wall.

- **Truth: Noise-flanking paths through the ceiling will affect blocking capacity.**

The lights, speakers, diffusers, grilles, etc. that penetrate a ceiling system have significant effect and can't be ignored. These penetrations can decrease the performance of the ceiling system 10 CAC points and more than 20 dB in the important high frequencies, which make speech intelligible.

When ceiling manufacturers test their panel ratings for CAC, they only have their ceiling panels in the suspension grid.

Continues at ce.architecturalrecord.com

***Robyn M. Feller** is a freelance writer and editor specializing in the architecture, design, and construction industry.*
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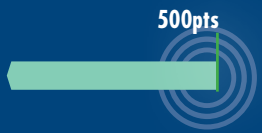

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Ⓡ Regional AD

New and Upcoming Exhibitions

Michael Sorkin Studio and Terreform: Metrophysics
Los Angeles
October 21, 2016–December 4, 2016
Architecture lives as both object and aggregation: buildings and cities. If the pursuit of an environment that is sustainable, equitable, and beautiful is common at every scale, the valence of these values varies by situation. Metrophysics foregrounds projects with meanings rooted in the urban, including buildings and sites designed with practical and polemical intent. On view at SCI-Arc, the work is from a team that operates as both a "traditional" architectural studio responding to clients, and as a research practice that formulates its own agenda of investigation and intervention. For more information, visit sciarc.edu.

Ongoing Exhibitions

Oskar Hansen: Open Form
New Haven, Connecticut
Through December 17, 2016
Hansen was a member of Team 10, the architectural group that formed the first critical voice against the modernist orthodoxy of the Athens Charter and the followers of Le Corbusier. In his open-form theory, Hansen proposed parting ways with the model of the all-knowing expert and advocated for the participation and change in hierarchy between an artist and viewer. *Oskar Hansen: Open Form* traces the evolution of this theory from its origin in his own architectural projects to its application in film, visual games, and other artistic practices. The exhibition, at the Yale School of Architecture, is divided into seven sections exploring Hansen's theories. For more information, visit architecture.yale.edu.

Authenticity and Innovation
New York City
Through January 14, 2017
This exhibition explores preservation in contemporary New York, a particularly relevant topic for a metropolis characterized by perennial change. While New York has about 1,500 individual landmarks and 139 historic districts that are overseen by the Landmarks Preservation Commission, *Authenticity and Innovation*, at the Center for Architecture, will feature 28 projects that are not officially designated as "significant" but whose reuse represents a phenomenon that could be called "preservation beyond the preservation law." For more information, visit cfa.aiany.org.

Lectures, Conferences, and Symposia

Archtober 2016
New York City
October 1–31, 2016
Archtober is New York's Architecture and Design Month, the sixth annual festival of architecture activities, programs, and exhibitions taking place during the month of October. It presents special tours, lectures, films, and exhibitions that focus on the importance of architecture and design in everyday life. The many participating organizations aim to raise awareness of the important role of design in New York and to build a lasting civic and international recognition of the richness of its built environment. For more information, visit archtober.org.

Now Next Future
Los Angeles
October 28, 2016
For this one-day conference, the AIACC is bringing together architects, designers, emerging talent, and affiliates to inspire new ways of thinking about the future of design, practice, and the built environment through examples of their work and case studies. The conference recognizes that technology is evolving at unprecedented rates and transforming our pencils into styluses—and our spectacles into virtual reality headgear. At this event, held at the UCLA Covel Commons, it will be possible to experience design from those who are pioneering these technologies in their practices. For more information, visit nownextfuture.aiacc.org.

Women in Architecture Forum & Awards
New York City
November 2, 2016
RECORD will present the magazine's third annual awards program to recognize and promote women's design leadership. The afternoon symposium will be followed by a reception honoring this year's award winners in five categories: design leader, new-generation leader, innovator, activist, and educator or mentor. Visit arwomeninarchitecture.com.

Architectural Record Innovation Conference East
New York City
November 3, 2016
Join RECORD for a single-day conference on architecture and making in the post-digital age. Innovation East (the East Coast counterpart to the summer's conference in San Francisco) will bring together imaginative and forward-looking figures to exchange ideas about the built

world of today and the future. Speakers and participants will range from architects practicing outside the discipline to principals of large firms, and from materials experts to graphic designers. Attendees will leave the conference inspired by brave and original approaches to some of the most relevant problems in the industry. Visit ariceast.com.

Competitions

Architecture at Zero 2016
Registration deadline: October 28, 2016
The competition challenge is to create a net zero energy student housing project at the San Francisco State University campus. The competition has two components. First, entrants will create an overall site plan to accommodate 784 housing units, student services, dining center, child-care facility, and parking, detailed in the Challenge Program. Second, entrants will design one building, in detail, to indicate net zero energy performance. The competition is open to students, architects, landscape architects, urban planners, engineers, and designers anywhere in the world. Up to $25,000 will be awarded to student and professional winners. Visit architectureatzero.com.

Laka Competition '16: Architecture that Reacts
Submission deadline: November 1, 2016
The architecture organization Laka invites designers from around the world to submit ideas for architecture that can dynamically respond to current needs and circumstances, focusing on designs that are socially engaged and capable of reacting to unpredictable conditions and environmental, natural, and social risks. Proposals should constitute an ideological interpretation of modern technological solutions, taking into consideration social and economic determinants. They should promote social revitalization and increased safety and freedom for their users. For more information, visit lakareacts.com.

Liberty Museum: Freedom to the People
Registration deadline: November 29, 2016
As the Statue of Liberty nears its 130th anniversary, the competition seeks to create a Liberty Museum on the site of the legendary Statue of Liberty National Monument, located on Liberty Island in New York Harbor. The aim of the competition is to reflect on the issues of civil rights and social justice in a museum specific to this cause, and transform these causes into a click-bait architectural statement that will gather the attention of people and draw the maximum number of visitors to the monument. For more information, visit archasm.in.

eVolo 2017 Skyscraper Competition
Registration deadline: January 24, 2017
Established in 2006, the annual Skyscraper Competition recognizes outstanding ideas that redefine skyscraper design through the implementation of novel technologies, materials, programs, aesthetics, and spatial organizations, along with studies on globalization, flexibility, adaptability, and the digital revolution. The competition is an investigation of public and private space and the role of the individual and the collective in the creation of a dynamic and adaptive vertical community. There are no restrictions in regard to site, program, or size. For more information, visit evolo.us.

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Good Design Is Good Business

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The editors of **ARCHITECTURAL RECORD** are currently accepting submissions for the **2017 ARCHITECTURAL RECORD GOOD DESIGN IS GOOD BUSINESS** awards program. Good design is a priority for leaders of business and industry looking to boost productivity, rebrand, and attract customers. The Good Design Is Good Business awards honor architects and clients who best utilize design to achieve such strategic objectives. Winners will be published in the May 2017 issue.

The fee is US$150 per entry and $50 for each additional project. Download the official entry form at: **architecturalrecord.com/gdgb**. E-mail questions to arcallforentries@bnpmedia.com. Please indicate **GDGB** as the subject of your e-mail.

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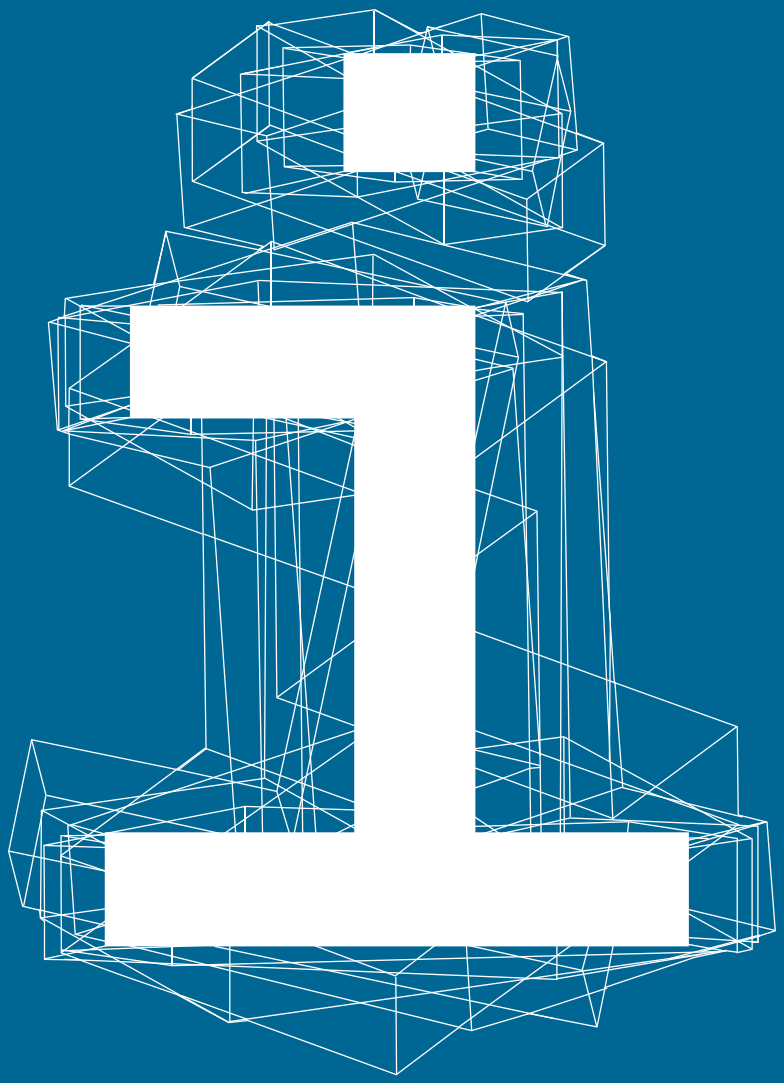

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PROJECT NULL STERN HOTEL
LOCATION SAFIENTAL, SWITZERLAND
ARTISTS FRANK AND PATRIK RIKLIN

THE SPATIAL requirements for the Null Stern (Zero Star) Hotel were simple, if wildly unconventional: no real estate, no walls, no roof. Comprising just a double bed and two nightstands with solar-powered reading lamps, the open-air, single-room inn—which is tucked away in the Alpine folds of Switzerland's Grisons canton—puts a new spin on minimalist hotel design. Swiss conceptual artists and brothers Frank and Patrik Riklin arrived at the "bed-hotel" idea after the success of a project they completed in 2009: a bedroom installation inside a fallout shelter, called *Null Stern*, that ultimately turned into an actual guesthouse, now closed. With the open-air Null Stern, the Riklin brothers sought to "push the boundaries of the hospitality experience" while showcasing the vast splendor of the Alpine topography. "The landscape becomes the wallpaper," says Frank. The spare furnishings were reused from the earlier installation and sit atop a 140-square-foot foundation of regional stone and concrete. Appearing "like Photoshop in real space," says Frank, it is as if the room were cut out of its original context and pasted onto this pastoral scene. The $260-per night "hotel," which is booked for summer and fall until 2020, is managed by residents of a nearby village and is located just a five-minute walk from a mountain restaurant, where guests can eat their meals and use bathroom facilities. In wet weather, the hotel cancels the reservation. With this innovative take on luxury lodging, "the guest is the star," say the brothers, and the hotel is Switzerland. *Alex Klimoski*

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