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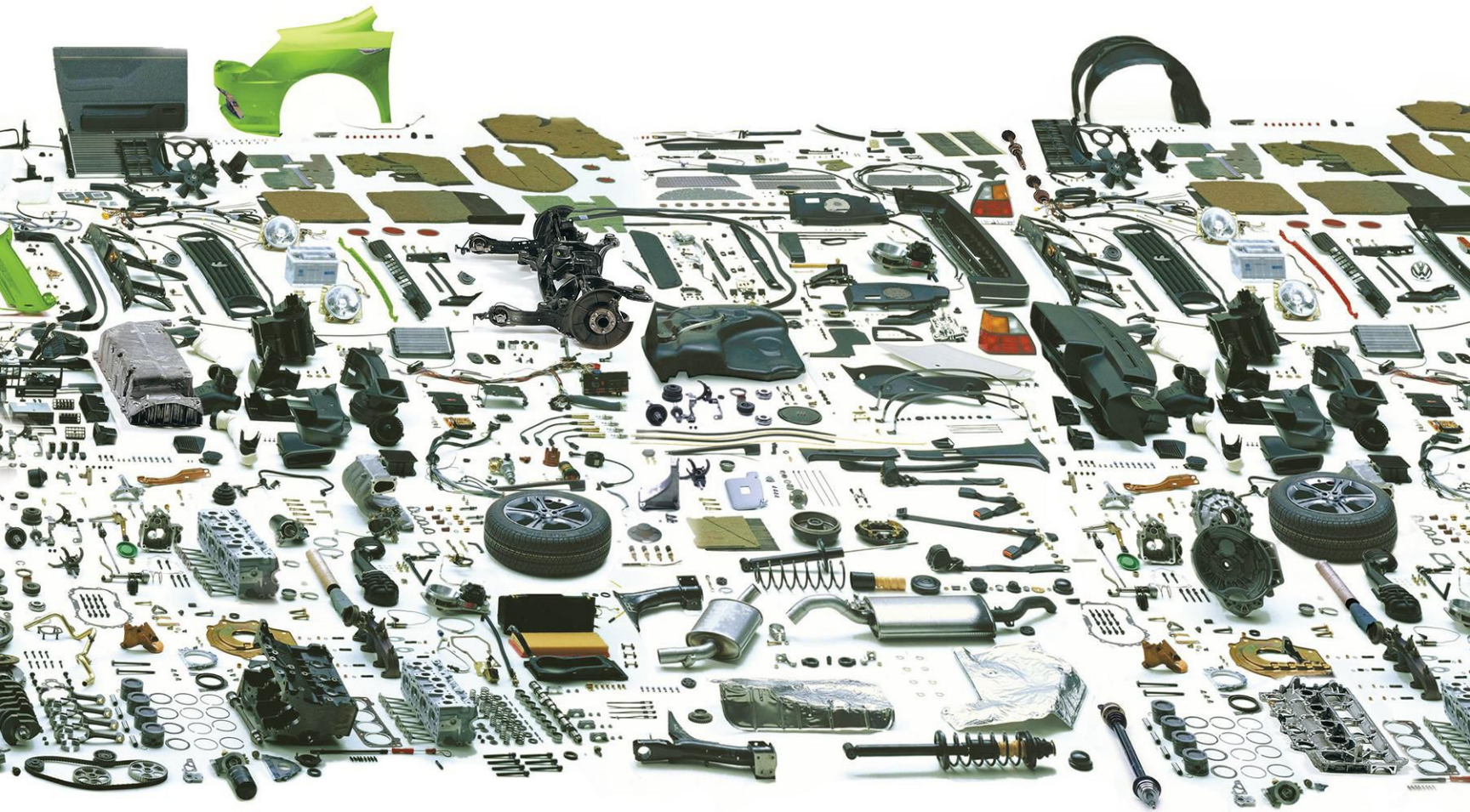
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Design Architect: Renzo Piano Building Workshop  
Architect of Record: Davis Brody Bond LLP  
Structural Engineer: WSP/Parsons Brinckerhoff  
Photograph: Frank Oudeman



# Shaking Bad

In New York, passing subways can shake entire buildings, but that wasn't an option for Columbia University's new **Jerome L. Greene Science Center**. Home to sensitive laboratory and imaging equipment requiring exceptional stability, the design by **Renzo Piano Building Workshop** relies on a steel structure to reduce floor vibrations to a miniscule 2,000 mips. Even as the elevated No. 1 train roars past, this helps ensure that nothing distracts from the scientific advances being made within the center's unshakable walls. Read more about it in **Metals in Construction** online.

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# Page Turner

Queens' new **Elmhurst Community Library** serves one of the most diverse and vibrant communities in New York. Designed by **Marpillero Pollak Architects**, the LEED Silver-rated facility features two structural glass-encased reading rooms that allow light to flood in during the day and offer glimpses of the state-of-the-art library setting at night. Erected by **W&W Glass**, its glazed features have become beacons for the community, drawing its knowledge-hungry members to the wealth of information within. Read more about it in **Metals in Construction** online.

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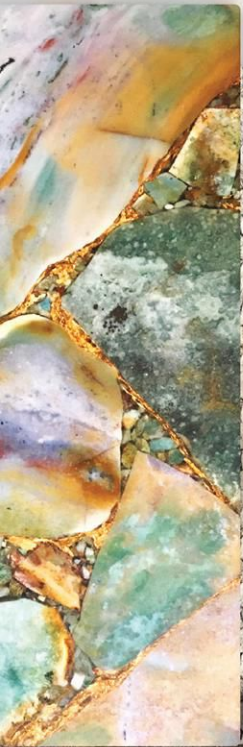
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THIS PAGE: KVADRAT FLAGSHIP SHOWROOM, BY RONAN AND ERWAN BOURULLEC. PHOTO BY MICHEL GIESBRECHT.

COVER: A COMPOSITE IMAGE OF MILSTEIN HALL'S OPEN STUDIOS AT CORNELL UNIVERSITY, BY OMA. PHOTO BY BRETT BEYER.

See expanded coverage of Projects and Building Type Studies as well as Web-only features at [architecturalrecord.com](http://architecturalrecord.com).



## FIRE HOUSE DESIGNED WITH MASONRY ACHIEVES LEED PLATINUM STATUS

The Phoenix Fire Department Station 59 was designed to provide rapid response while protecting firefighters and support staff from extreme heat, diesel fumes, biological hazards and noise. The building also had to be low-maintenance. Among the ways its designers, LEA Architects of Phoenix, AZ, accomplished all of this - and earned the City its first LEED Platinum building in the process—was through use of solar photovoltaic (PV) panels, solar hot water, concrete masonry systems, shade canopies, exhaust and ventilation systems, and a functional layout that lets the natural materials of the building help provide its own shade.

The primary mission of Phoenix Station 59 is to serve the nearby Freeport Industrial Center, which is home to a very large fuel farm. Built in 2012, the 15,000 sq. ft., four-bay fire station is located about a mile and a half away from the Center. A separate, 6,000 sq. ft. storage building on this 3.5 acre site shares the station's sustainable architectural theme and houses its own four apparatus bays, foam storage, and other specialized materials and equipment used for fighting fuel fires.

Although located in an industrial area, Station 59 is in a desert climate, with daily summer averages of 110 to 115 degrees.

"It was important to mitigate the heat on the interior of the building," says Enyart. "We chose masonry on the interior for its thermal mass properties. When the material gets cold, it tends to stay cold, reducing the strain on the air conditioning system."

The Echelon Integra® Wall System was used structurally throughout the building. Echelon's Trenwyth® Trendstone® ground

face concrete masonry units (CMUs), which features a terra cotta flash, complemented the desert landscape. The Integra Wall System was chosen

because it offers the benefits of a conventional masonry wall system, while at the same time providing superior thermal performance properties. For optimum thermal performance, a proprietary polyurethane, specifically blended for use in the Integra Wall System, was also used.

"By adding insulation in the walls, we earned more LEED credits, too. It's a very well-insulated building," says Enyart. He noted they also received LEED Regional Material credits because the masonry was produced only two miles away from the job site.

"We also chose the Integra wall system to contribute to the safety of the station as a non-combustible building; noise mitigation was also a value-added component of the masonry systems we selected." adds Enyart.

The combination of the non-flammable concrete and metal surfaces in Phoenix Station 59 create an environment safe from fire and biological contaminants. The low-maintenance, convenience and design aesthetic make the Firehouse 59 a more welcoming place to spend long days and nights.

Larry Enyart, FAIA, LEED Fellow Principal, LEA Architects  
Lawrence (Larry) Enyart is founding principal and design architect at Lawrence Enyart Architects (LEA), which he owns with his son, Lance Enyart, AIA, LEED AP. Among the firm's core values is designing for sustainability with numerous LEED Certified projects in their portfolio.



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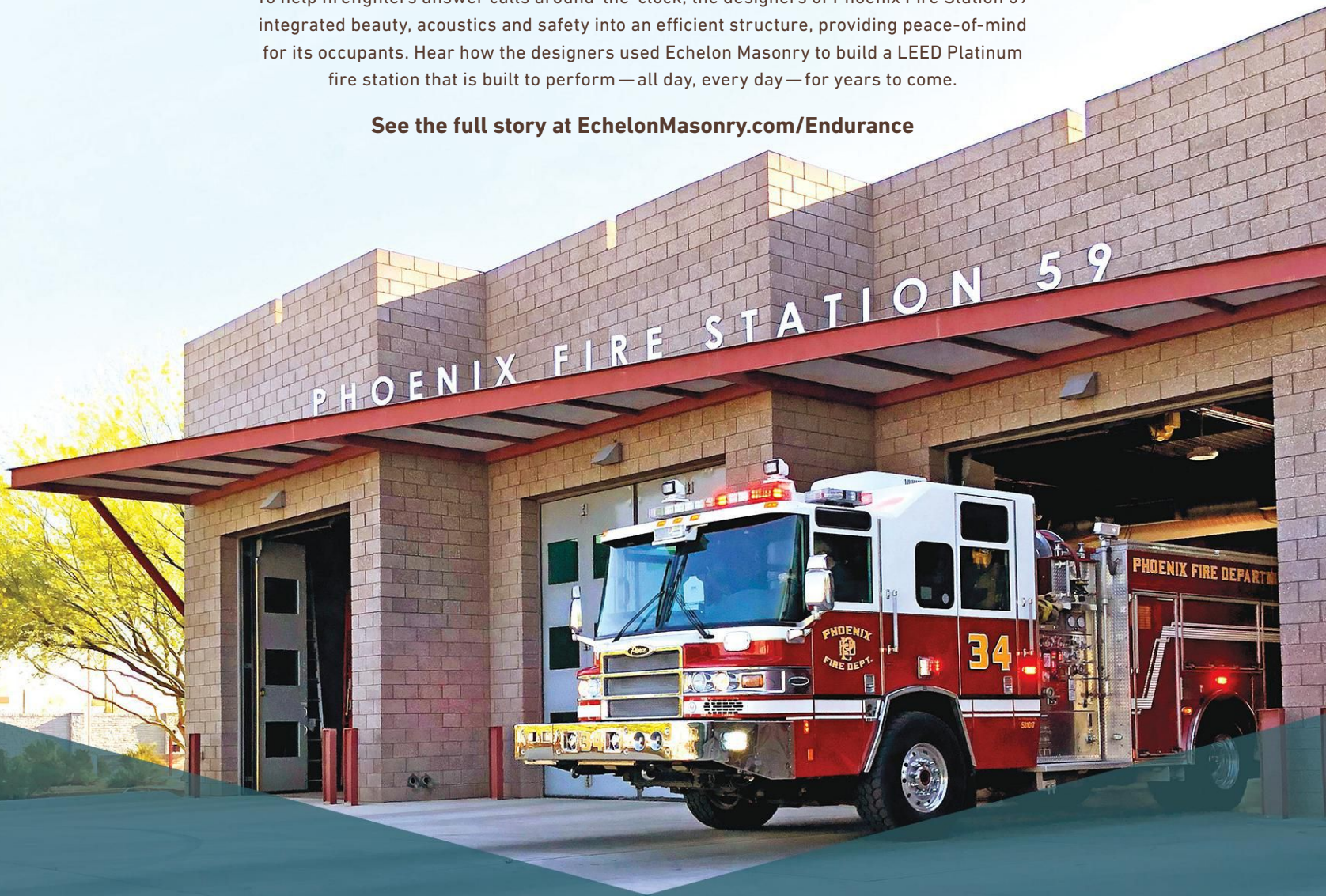
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# MISSION CRITICAL

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To help firefighters answer calls around-the-clock, the designers of Phoenix Fire Station 59 integrated beauty, acoustics and safety into an efficient structure, providing peace-of-mind for its occupants. Hear how the designers used Echelon Masonry to build a LEED Platinum fire station that is built to perform — all day, every day — for years to come.

**See the full story at [EchelonMasonry.com/Endurance](https://EchelonMasonry.com/Endurance)**



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A panel of architects and designers will judge the submissions on the basis of innovation, usefulness, and aesthetics. Winners will be published in the December 2018 issue of RECORD.

*Pictured: Lighting product winner, 2017, Halo pendant series by Matthew McCormick Studio*

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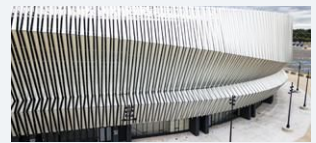
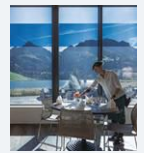
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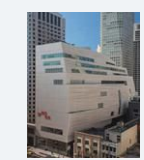
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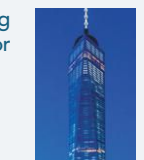


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## The Future of Practice

Despite the strong economy, firms face challenges and the need to evolve with technology.

**WHAT A GREAT TIME** to be an architect: the economy, despite occasional bumps, has been strong; billings are solid; net revenues have returned to the same levels as before the Great Recession; firms are busy, and many are expanding.

But underneath that rosy picture are uncertainties and a sense of unease. The rapid evolution of technology continues to threaten the bread-and-butter of traditional practice. Revenues may be stable, but fees have not rebounded to pre-recession times. Competition for jobs is fierce, with firms' undercutting each other on pricing. Clients expect more service but don't necessarily pay for it. And another kind of competitor looms on the horizon: big start-ups like WeWork and Katerra are encroaching on the business of design practices—and luring young architects with salaries beyond what most firms can pay. WeWork has more than 700 designers on staff and has just brought in Bjarke Ingels, founder of BIG, as chief architect (page 36). Katerra, which is revolutionizing the delivery system of buildings, from architecture through finished construction, recently raised almost \$1 billion from one investment fund and soon plans to announce a major acquisition in the design realm. "Architects have to wake up before architecture is taken away from us," says Tomas Rossant, a partner at Ennead in New York.

For this special issue of RECORD, we took a CT scan of practice today: the magazine's reporters examined firms across the country of varied sizes, from Small to Extra-Large. What we found among the architects we interviewed was deep devotion to their work, a strong idealism about design's ability to make the world a better place, and a powerful belief that architectural thinking is essential and can never be replaced by machines. But those positive attitudes were tempered by real concerns.

Small practices (77 percent of U.S. firms are nine people or fewer, but we used 25 and fewer as our criterion) showed they are nimble, foster close client relationships, and know how to be inventive on tight budgets. They also struggle with finances and fear the next, inevitable economic downturn. Midsize firms (from 25 people to 100) tend to have more diverse project portfolios yet also develop bench strength in certain building types; they are sized to take on a lot but feel competitive pressure from both small and large practices. And both Medium firms and their Large cousins (100–600 people) are vulnerable to takeovers from Extra Large practices. Those XL firms (600 people and up) have multiple offices in the U.S. and abroad, but even as they expand globally, they stay focused on the various local contexts where they are based, and bring a wide range of services and adaptability to their practices. Of course, they—and many of their large-firm counterparts—have heard the drumbeats of change and are scrambling to adapt to evolving technologies and the growing needs of clients and communities, especially around issues like climate change. A number of practices have created branches that are engaged in research and in



developing their own digital tools.

Architects have always innovated—in structures, materials, and design and construction processes. But the speed of change today is calling for not just innovation but a disruption of conventional practice. On the business end alone, offices are likely to fail if architects don't figure out how to alter their value proposition, argues Phil Bernstein, associate dean at the Yale School of Architecture, who teaches professional practice (page 133). Meanwhile, a number of firms—including KieranTimberlake, Ennead, NBBJ, and SOM—are leading the way in redefining what an architectural practice can be, and, in this issue, we explore their strategies as disruptors of tradition (page 138).

While the profession must evolve along with technology, design thinking remains the unique tool that architects bring to everything they touch—not only to their own projects and the way they operate their practices but to the creative ideas they can bring to urgent problems. "The architectural voice can become instrumental in the many political and cultural conversations that are affecting the world today—climate change, health, education, food, and the state of the city, to name a few," says Nader Tehrani, a founder of NADAAA and the dean of architecture at Cooper Union. Architectural practice may be at a deflection point, but architects have never been so critical to the future.

*Cathleen McGuigan*  
Cathleen McGuigan, Editor in Chief



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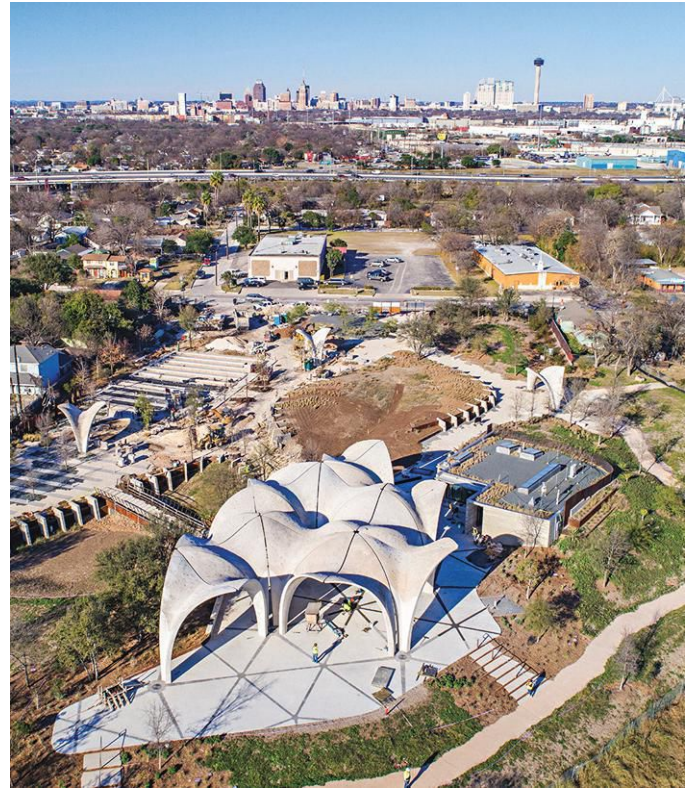
# for the RECORD

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



## DELICIOUS DESIGN

The James Beard Foundation honored In Situ at SFMOMA for Outstanding Restaurant Design. A project of San Francisco-based firm Aidlin Darling Design, Record covered the eatery in September 2016. [INTERIORS]



## FLY-BY FOOTAGE

Visit our website to take a virtual tour of opening day at Confluence Park [page 51] in San Antonio, Texas. Shot by a drone, the video shows the project's riverside site and the pavilion's unique footprint. [LANDSCAPE]



## NEW VIEWS OF MIES'S MCCORMICK HOUSE

An exhibition opening June 10 at the Elmhurst Art Museum in Chicago examines the history and influence of the McCormick House by Mies van der Rohe. Read our online review of the show, which Columbia University's Barry Bergdoll curated. [NEWS]



## ON THE ROAD AGAIN

On April 26, Record on the Road stopped in Boston, where editor in chief Cathleen McGuigan spoke with Kishore Varanas of CBT, Michael Liu of The Architectural Team, and Katie Faulkner of NADAAA about designing mixed-use developments.

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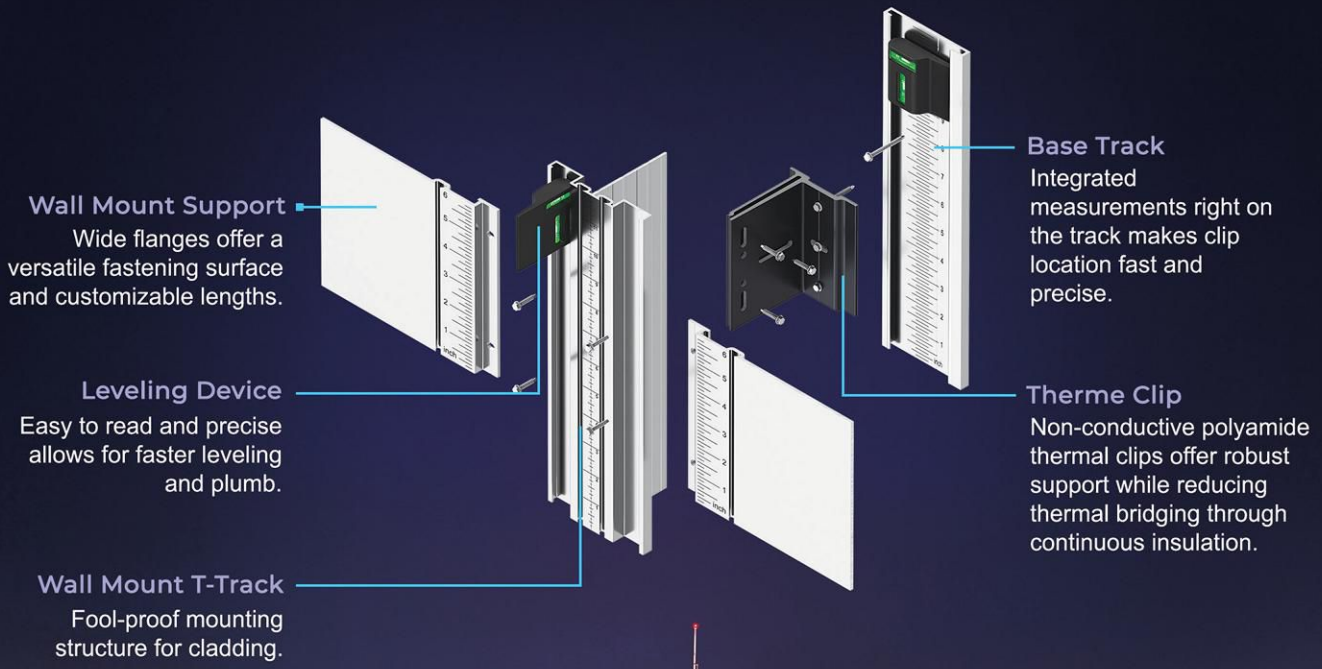
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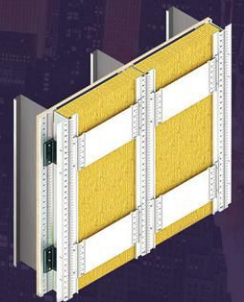
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## perspective

*Architecture is the only profession that actually deals in joy and delight—all the others deal in doom and gloom.*

—British architect **Will Alsop**, who died in May at the age of 70, speaking to the Observer in 2007.

## Powerful Memorial to Lynching Victims Opens in Alabama

BY GLENNY BROCK

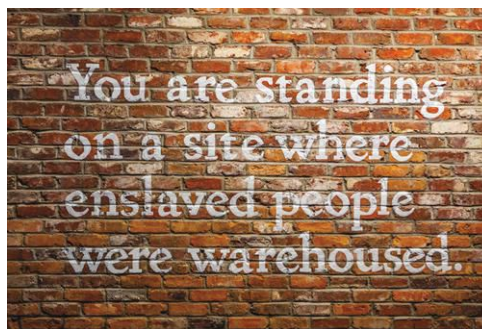
ON OPENING DAY at the Legacy Museum in downtown Montgomery, Alabama, visitors were not told to silence their cell phones but rather to power them off and put them away. “Take in your experience, take in your experience,” one museum staff member said.

He kept repeating the exhortation as throngs of visitors entered the lobby. In a high-ceilinged room with photo displays, wall text, and three video screens, the most compelling visual was a single sentence painted in white on an exposed brick wall: “You are standing on a site where enslaved people were warehoused.”

Such exquisite candor is the most distinctive feature of the new museum, as well as of the nearby National Memorial for Peace and Justice. Both sites opened on April 26, 2018, after nearly a decade of work by the Equal Justice Initiative (EJI), a Montgomery-based nonprofit that provides legal representation to indigent defendants and prisoners.

Exhibit design may seem beyond the purview of attorneys, but the interactive displays stand as vivid renderings of EJI research on the history of racial injustice in the United States. The building on Commerce Street is a former warehouse two blocks from a slave auction site: humans were held there before they were sold to other humans. The permanent exhibit is titled “From Enslavement to Mass Incarceration.”

Amid sculpture, photography, and high-tech video projection, one of the marvels inside the museum is a display of dirt—hundreds of pounds of soil, stored in dozens of glass containers on shelves that stand 8 feet tall. The shocking showcase looks like a giant spice rack, but instead of cinnamon, pepper, and nutmeg, the clear jars are filled with soil from places like Paris, Texas; Brierfield, Alabama; and Gulfport, Mississippi. The variety of colors is captivating—some samples look like cocoa, some like mud or Silly Putty. Each mound of dirt was collected by a volunteer who went to the site of a lynching.



In the field around the pavilion, a duplicate set of Cor-Ten monuments bearing victims' names wait to be claimed by the counties they represent (above). Haunting words on the brick wall of the museum lobby set a somber tone (left).

According to a report EJI produced in 2015, more than 4,000 African American men, women, and children were killed in lynchings between 1880 and 1940. That number becomes painfully easy to visualize at the National Memorial for Peace and Justice, where their names are emblazoned on 800 columns of Cor-Ten weathering steel—one for each U.S. county where a public murder took place.

Boston-based MASS Design Group partnered with EJI to create the nation's first national memorial to the victims of lynching. Gravel pathways zigzag across grassy slopes in the

six-acre park, sending visitors on a slow walk past rough-hewn concrete walls and a haunting sculpture of an anguished family in chains. As the gradient of the footpath changes, the incline of the walls also changes, leaving the visitor with the disoriented feeling of growing taller, then shorter again. The sensation is redoubled by the time you are under the roof from which all the columns hang. As you enter the memorial, you can stand beside the 6-foot columns, walk around them, and touch them. But as you walk farther, the path slopes downward until the columns loom overhead and you have to crane your neck to read the victims' names. In a vast passage with timber walls, there are placards with individual lynchings narrated in single sentences and a stone wall with a dedication that reads, in part, “We will remember.”

Beyond the sheltered structure is an expanse of grass that resembles a burial ground; laid out



in rows are duplicates of all 800 hanging columns. They look like flat, rusty caskets, the patina of each in brilliant contrast to the green lawn beneath it. The idea, according to EJI founder Bryan Stevenson, is that counties all over the U.S. will claim the monuments, removing them from the Montgomery memorial and installing them in the locations named.

The inclines bring to mind the Vietnam

Veterans Memorial in Washington; the layout of the memorial columns evokes the Holocaust Memorial in Berlin, but the honest materials at the National Memorial—weathering steel and American hardwoods—confer a singular power on the place.

According to Sherrilyn Ifill, president and director-counsel of the NAACP Legal Defense Fund, it's a site of psychic excavation. "You're



Each of the 800 coffin-sized monuments represents a county where a lynching took place and is inscribed with the names of victims murdered there (above, both).

unearthing a history that was covered over and buried," Ifill said. "We have to take the dirt off of it and be brave enough to look at it." ■

*Glenny Brock is a writer and educator based in Birmingham, Alabama.*

PHOTOGRAPHY: © BOB MILLER/STRINGER (LEFT); EQUAL JUSTICE INITIATIVE (RIGHT)

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# Bjarke Ingels Joins WeWork as Chief Architect

BY ERIN HUDSON

**THE RUMORS** are true: WeWork, the company known for its flexible co-working space, has an agenda far beyond offices.

The company made it official last month by bringing Bjarke Ingels on board as “chief architect”—an executive-level position compensated in equity rather than with a salary. The move confirms conjecture about the strategy of the co-working giant, which has been gradually rolling out a series of new projects over the past few years, including a primary school called WeGrow—which Ingels’s firm is designing—and two rental “co-living” buildings in New York and the D.C. area.

“The overall idea is really to focus on buildings for now,” Ingels tells *RECORD*, “then take it to campuses and neighborhoods, then entire cities.” The Danish architect says his new role entails defining the character and nature of such projects. More ground-up construction is on the horizon, but further details are unclear.

As chief architect, Ingels will work with WeWork’s in-house design team to build internal capacity and hire other external architects for company projects—a role he’s relishing already: “To be in a situation where I can actually give commissions to some of the colleagues whose work I admire is very exciting,” he says.

It sounds like an architect’s dream, to work with a single client who controls most aspects of the project in-house—especially when that client has an eye toward building a global empire. But there’s more to WeWork than a

hegemonic dream driven by more than \$6 billion of investors’ money. Though Ingels’s new role at WeWork is big news, it’s not a complete shift for the company; good design has been part of WeWork’s mission from the beginning.

The importance of design was the seed that grew into Ingels’s new position and was first planted about a year ago when Ingels, after meeting with WeWork for a commission still under wraps, had a series of conversations with the company’s CEO and cofounder Adam Neumann.

“They were getting increasingly involved in more significant renovations, additions, ground-up buildings, even campuses,” says Ingels. “[Neumann] wanted to have architecture and design play a more essential role in where they were going.” Naturally, Ingels wanted in—and the feeling apparently was mutual.

“We’re a design-first company,” says WeWork’s head of design, Federico Negro, an architect who trained at Parsons’ School of Constructed Environments, and the University of Illinois. “Building the best design team we can is central to our core business, so having someone like Bjarke come in and do this just makes sense on all levels.”

It’s a fact that could be missed among headlines speculating about the company’s valuation, its potential IPO, or its CEO’s affinity for tequila. WeWork’s lesser-known cofounder, Miguel McKelvey, is also an architect by training, and the company’s first acquisition back in 2015 was of an architec-



WeWork CEO and cofounder Adam Neumann and architect Bjarke Ingels (left and right, above) envision a future in which the company creates more than office buildings. An in-house design team led the renovation of an Art Deco atrium in Paris for WeWork La Fayette (bottom).

tural and building-systems consultancy called Case, which Negro and two others had founded in 2008. Following the deal, Negro and his partners became WeWork employees heading up various groups within the company.

Negro now oversees WeWork’s in-house design team, which numbers about 700 as of press time but is rapidly expanding, with studios in New York, San Francisco, London, Bangalore, Shanghai, Tokyo, and Buenos Aires. The design team includes muralists, electrical engineers, product designers, interior designers, and fire and life-safety experts as well as architects.

By 2020, Neumann says the team will be designing “the cities we live in.” A recent economic-impact report by the company and HR&A Advisors claims that, in New York alone, businesses housed in WeWork offices generated an estimated \$16.7 billion, based on data from the third quarter of 2017.

“I really see WeWork as a scaling device,” says Ingels, who views the company’s growth trajectory as “almost doing in the physical world what a lot of other technology companies have done in the digital world.”

Ingels will remain at the helm of his firm, BIG (Bjarke Ingels Group), which will continue its normal operations for the foreseeable future—though probably with a few more WeWork commissions on the boards, such as the company’s recently announced new Manhattan headquarters. ■





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## New Zero Code and Zero Net Carbon Certification Target Greenhouse Gas Reduction

BY JOANN GONCHAR, FAIA

**EARLIER THIS SPRING**, two sustainable-building organizations each announced separate initiatives to slow global warming: Architecture 2030 released a Zero Code, while the International Living Future Institute (ILFI) launched a Zero Carbon Certification program. The efforts share the goals of accelerating development of renewable generation capacity and reversing the upward trend in the built environment's greenhouse-gas emissions, which have been rising by nearly 1 percent per year since 2010. "We've got to begin to bend that curve downward," says Ed Mazria, Architecture 2030's founder and CEO.

The Paris climate agreement is behind this new attention to CO<sub>2</sub>, according to green-building experts. Despite the pending withdrawal of the U.S., the accord's goal of mitigating emissions as a way of keeping the global temperature rise in check "has shifted the conversation from energy to carbon," says Ralph DiNola,

CEO of the New Buildings Institute (NBI), a nonprofit that aims to improve building performance and is a frequent collaborator with both Architecture 2030 and ILFI.

Although there are numerous nuanced definitions for the term "zero net energy," at its most basic level, it refers to a building in which the total amount of energy used, on an annual basis, is equal to the amount of energy created on-site from renewable sources. But a building can qualify as zero net carbon by satisfying its annual energy de-

*To achieve zero net energy at the Bullitt Center, a Living Building in Seattle designed by the Miller Hull Partnership, the architects extended the rooftop PV array to overhang the public right-of-way. The move required permission from the city.*



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mand from renewable sources that are located either on- or off-site.

Mazria contends that a goal of zero net carbon is especially appropriate for cities, where there is rarely sufficient roof space or correctly oriented and unshaded facade area for solar panels, the most common on-site energy source for aspiring zero net projects. Brad Liljequist, ILFI zero energy director, concurs that a requirement for only on-site renewables is not suited to all projects. Such a restriction “can work at cross purposes to good land use, mobility, and density.”

The Zero Code, which is applicable to new commercial and institutional buildings and mid- to high-rise housing, is written in code-adaptable language. This approach is intended to allow cities, states, and other jurisdictions to easily adopt the guidelines, either as an incentive program or as a compulsory provision of the building code. Meanwhile, the ILFI certification targets both new and existing construction and a wide variety of building types, including single-family houses. Liljequist anticipates that the voluntary program will appeal in particular to corporations that want to demonstrate climate leadership. He says he has already had conversations with a Fortune

500 company considering certification of its real-estate portfolio.

In addition to the Zero Code, Architecture 2030 has also released a 33-page technical-support document to evaluate the various options for purchasing renewable power.

**“Zero Code provides a way to think about renewables, whether they are on the building or elsewhere, in a larger context,” says Mark Frankel, NBI technical director.**

Among the many possible procurement methods are direct ownership of a remote generation source, renewable-energy investment funds, and renewable-energy credits—all of which have different practical and environmental implications. Making sense of this

“confusing space” for design teams, owners, and other stakeholders is the Zero Code’s main contribution, says Mark Frankel, NBI technical director. “It provides a way to think about renewables, whether they are on the building or elsewhere, in a larger context.”

ILFI takes a more streamlined approach, according to Liljequist. It requires the purchase of new renewable-power production and mandates that the renewables be legally attached to the project for a minimum of 15 years. “The instruments for renewable power are rapidly evolving,” he says. “We didn’t want to get too tied down.”

Kate Simonen, founding director of the Carbon Leadership Forum, a collaboration between industry and academia based at the University of Washington in Seattle, characterizes the difference between the ILFI and Architecture 2030 efforts: one is intended as a means for establishing policy, while the other is a tool for justifying a claim. Both, however, “can be implemented in the absence of federal leadership.” The U.S. pullout from the Paris accord notwithstanding, buildings are still a major contributor to climate change, she says. “We need to ramp up our efforts to transform the market.” ■

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## [ NEWSMAKER ]

**Kenneth Frampton**

BY CYNTHIA DAVIDSON

**ARCHITECT, HISTORIAN, critic, and educator** Kenneth Frampton is this year's recipient of the Golden Lion for Lifetime Achievement,

awarded at the May opening of the 16th International Architecture Exhibition of the Venice Biennale. His well-known essays and books include *Modern Architecture: A Critical History* (1980), now in its fourth edition, with a fifth under way. Born in the UK in 1930, he studied at the Architectural Association in London, then worked in the city as an architect for Douglas Stephen & Partners in the early



1960s. In 1962, Frampton also became the technical editor of the journal *Architectural Design*, a move that foretold his later commitment to writing. In 1965, he began teaching at the Princeton University School of Architecture and in 1972 joined the faculty of Columbia University's Graduate School of Architecture, Planning and Preservation in New York. Critic Cynthia Davidson spoke with Frampton in his Columbia office about his life's work.

The Golden Lion typically goes to a practicing architect. But Yvonne Farrell and Shelly McNamara, curators of this year's Biennale, praised you for arguing for a "humanistic" component "throughout all of the various 'movements' and trends often misguided in architecture." Have you been prevailing against the misguided?

I've approached my work through the question of the Modern movement, which from 1918 to 1938 had a certain vitality bound up with modernization—with the idea of the redistribution of wealth and of the welfare state as integral parts of the Modern project. Most of the discussion today is not about that. It's very complex, of course, because of the talk about feminism and racism and, quite rightly, about the misdistribution of wealth in the United States, but criticism of capitalism is less common. The very aggressive phase of global capitalism that we have entered is a very ruth-

less landscape, and the techno-sciences, our pride and joy, are the one thing we seem to have lost all control over.

**Why is writing important in architecture?**

What's important is critical discourse. Once the culture of architecture is no longer a discourse, it has no continuity—it just becomes a technical provision of built form; there's no other meaning or significance that you can attribute to it. I have certain regrets about not continuing as an architect, but I got

a lot out of being involved with the discourse about the history of the Modern movement.

You often use the word "critical" to frame your work—critical regionalism, critical history, comparative critical analysis. What does it mean to you?

The first edition of *Modern Architecture* has this beautiful Walter Benjamin quote about the angel of history. It's an unbelievable idea. The angel cannot close his

wings because there's a storm blowing—this storm we call progress. The idea of the critical basically comes from that.

**It also sustains your recent book on comparative analysis.**

At Princeton, I decided to get the students to analyze buildings. Then I realized, if you analyze just one thing, you understand more about the thing, but that's it; there's no tension built into the method. But you reveal sameness and difference and the layering of architectural expression when you compare two works that are from different points of view, answering more or less the same problem. I called it *A Comparative Critical Analysis of Built Form*. Ironically, when Lars Müller agreed to publish the work, he said he couldn't sell a book with a title like that. So he invented the title [*A Genealogy of Modern Architecture*].

At some point, I stopped using that method, because the references all changed. I feel very strongly the speed of change and the way the field of architecture is disturbed by the speed of change.

**Architecture doesn't move very quickly.**

Not at all. I often say to students that it's a kind of anachronistic preoccupation, but that is its strength, in a way. The idea of architecture on the cutting edge is not too convincing.

Cynthia Davidson is the editor and founder of *Log*, a magazine on architecture and the contemporary city.

**Housing Northwestern Arkansas Names Competition Winners**

The Fay Jones School of Architecture and Design at the University of Arkansas selected schemes by Digsau (Philadelphia), Merge Architects (Boston) (more about both on page 118), Kevin Daily Architecture (Los Angeles), and 5468796 Architecture (Winnipeg, Manitoba) as winners of an affordable-housing design competition.

**Cooper Hewitt, Smithsonian Design Museum Announces 2018 National Design Awards**

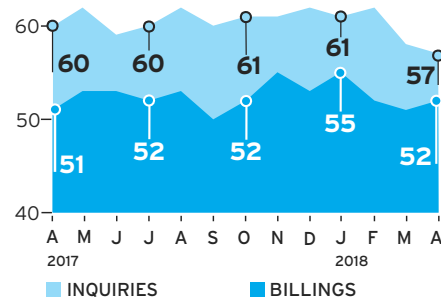
New York-based Weiss/Manfredi received the Architecture Design Award, while Oppenheim Architecture in Miami won honors for Interior Design. Now in its 19th year, the program celebrates excellence in multiple disciplines.

**International Living Future Institute Certifies Six New Living Buildings**

ILFI has certified six new Living Buildings, including the Frick Environmental Center in Pittsburgh by Bohlin Cywinski Jackson, the R.W. Kern Center in Amherst, MA, by Bruner/Cott & Associates, and ArchNexus's R Street offices in Sacramento, CA, bringing the total to 21.

**American Academy of Arts and Letters Recognizes Architects**

The society honored Croatian-Chilean architect Smiljan Radic, Allied Works Architecture principal Brad Cloepfil, Boston-based firm MASS Design Group, and architectural publisher William Stout with architecture awards this year for their contributions to the profession.

**Billings Rise for Seventh Month**

New AIA data show that architecture-firm billings rose for the seventh consecutive month, with growth increasing modestly from March. The Architectural Billings Index rose by 1 point, to 52. (Scores over 50 indicate an increase in billings.) The project inquiries and design-contracts indices both eased slightly, to 56.7 and 50.1 respectively. AIA chief economist Kermit Baker characterizes business conditions so far this year as "healthy."

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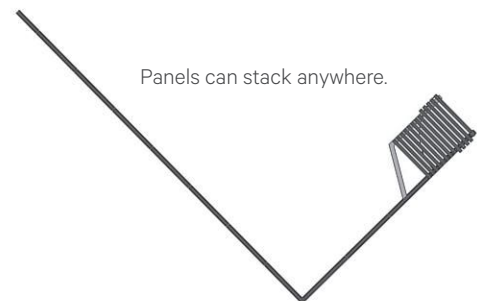


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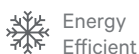
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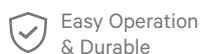
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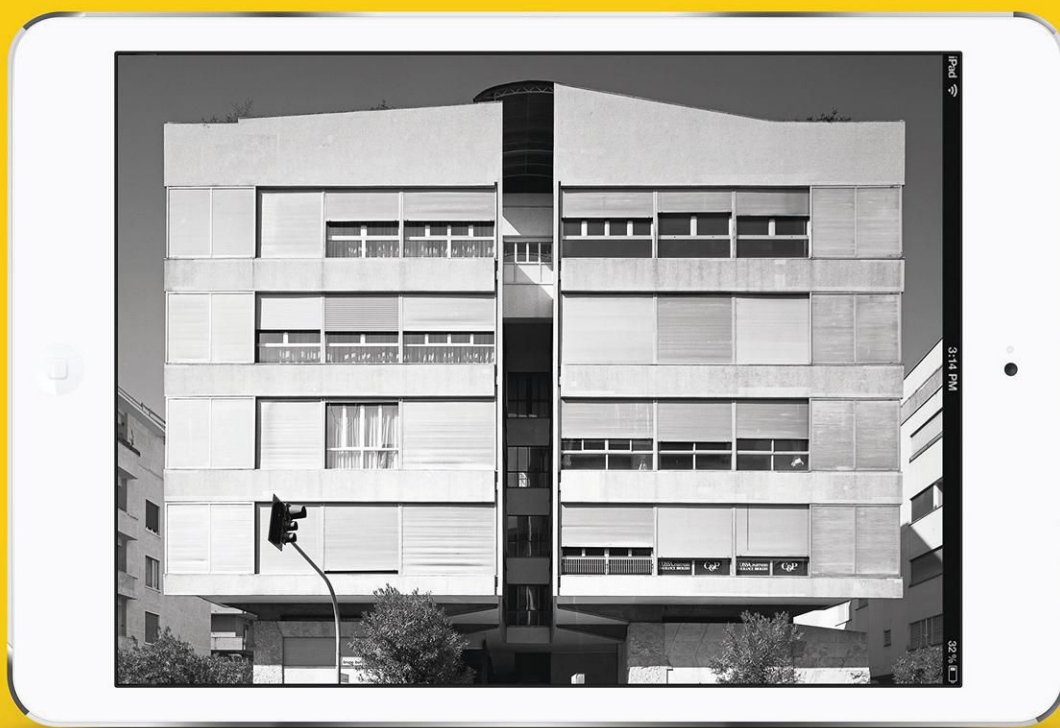
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A STRIKING HOUSE IN THE ARIZONA DESERT OFFERS AN ARRAY OF INDOOR AND OUTDOOR SPACES IN HARMONY WITH ITS SETTING. BY PILAR VILADAS



PHOTOGRAPHY: © BILL TIMMERMAN

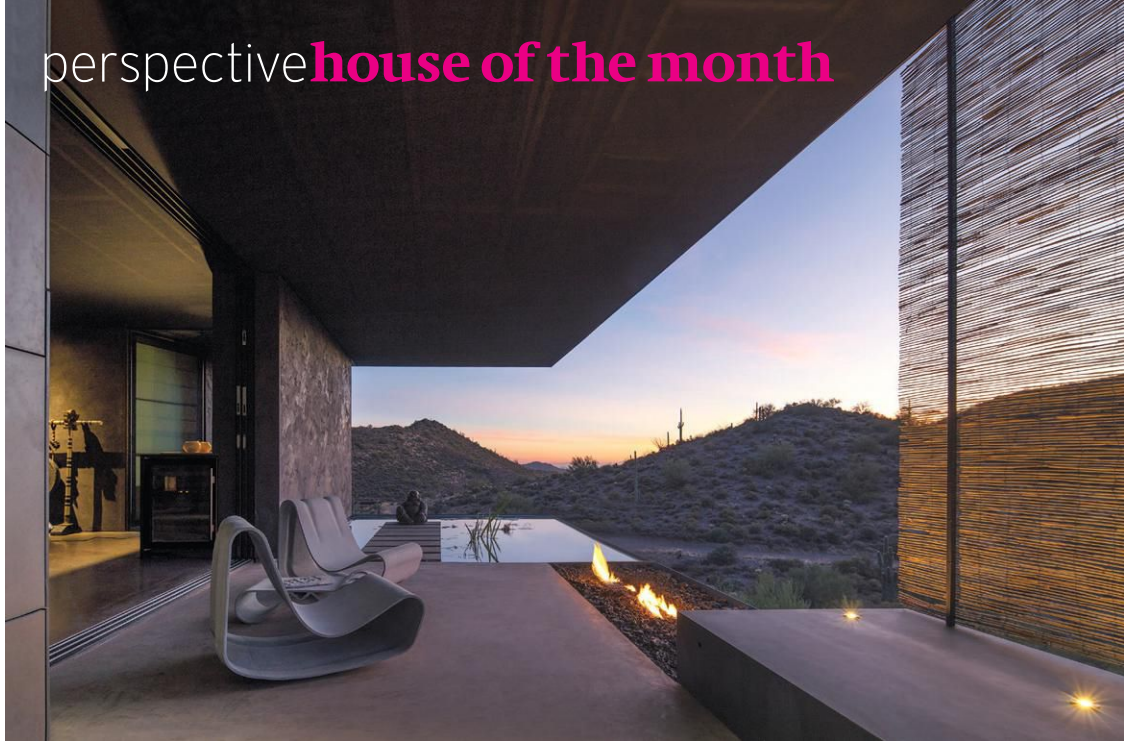
The house is composed of three distinct layers that include a masonry base, the main level, or “dispersed core,” and a thick, stainless-steel-faced canopy (top). A sharp cleft through the roof and base structures marks the entrance (above).

**THE PHOENIX-BASED** architect Wendell Burnette is known for designing buildings with a keen sense of place, whether it’s a galvanized zinc box of a house that sits on a flat Wisconsin crop field or the house shown here, on a five-acre site in a desert valley north of Cave Creek, Arizona. Designed as an empty-nest home for Keith and Kim Meredith, the distinctive structure defines, Burnette says, “the core concept of how we live in the desert.” His clients, whom he describes as “into Eastern philosophy, paring down, and being close to nature,” had no interest in a conventional house. Since their children are grown, the residence has only one bedroom and a fairly small, flexible living/dining/cooking area, as well as outdoor cooking/dining, exercise, and seating spaces. Sometimes, Burnette says, the indoor and outdoor spaces “are completely seamless.”

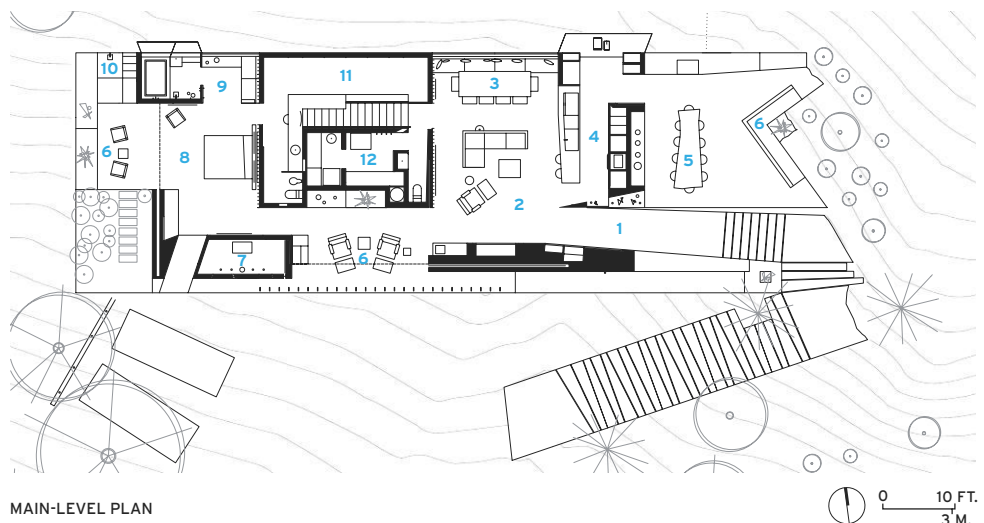
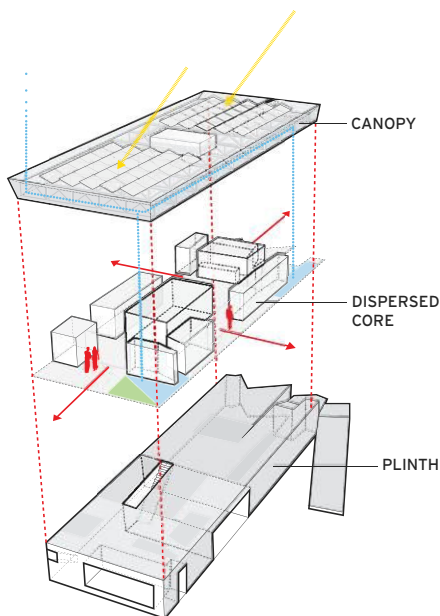
Burnette took the site’s most prominent feature—an outcrop of pink schist that runs along the east edge of the site—and extended it conceptually with a “plinth” of plaster-clad masonry that forms the base of the 3,125-square-foot house (and contains the lower-level garage, library, and exercise spaces, among others). Next, what Burnette terms

“a dispersed core” is made up of a cluster of solid forms, with wood structures that are clad variously in steel, stucco, and resin-infused paper. These forms define the entry, which incorporates a steel-mesh aviary that greets visitors with the sound of birdsong, and the living areas on the house’s east side—including an indoor porch with a fireplace where the Merediths like to sit with a bottle of wine (the space doubles as a solar heat collector in winter). This also minimizes the amount of perimeter glass. On the west side are the dressing room, bathroom, soaking-tub room, meditation room, and bedroom. The bedroom faces west, Burnette explains, to avoid the direct light of sunrise for “a more gentle process of waking up.” Above it all is the “canopy,” a 3,000-square-foot roof structure that contains photovoltaics (which allow close to net zero energy consumption), mechanical equipment, and water-harvesting features. Its depth and bulk are balanced by a mill-finished stainless-steel fascia that reflects the landscape and sky and which splits open to mark the house’s entrance. The canopy’s underside, from edge to edge, is a continuous expanse of black theatrical fabric with sound insulation behind it; this indoor-outdoor fabric ceiling, which is also pierced by thin skylights, is relatively low because of building height restrictions in the area.

The plan of the house, which, Burnette says, “is about small spaces pinwheeling to frame different views, not one big room for one big view,” was influenced by desert architecture in places like North Africa. “The program has different orientations for different times of day,” he adds, “and you move with those rhythms.” ■



The roof canopy’s deep overhang offers covered outdoor space along the south and west sides of the house, including this terrace off the master bedroom (above). The expansive glazing by the dining table brings the landscape into the main living area (left).



MAIN-LEVEL PLAN

- 1 ENTRY/AVIARY
- 2 MOVIE ROOM
- 3 INDOOR DINING
- 4 INDOOR KITCHEN

- 5 OUTDOOR COOKING/DINING
- 6 FIRE PIT
- 7 MEDITATION
- 8 BEDROOM

- 9 BATH/SOAK/LOUNGE
- 10 OUTDOOR SHOWER
- 11 WALK-THROUGH CLOSET
- 12 PANTRY

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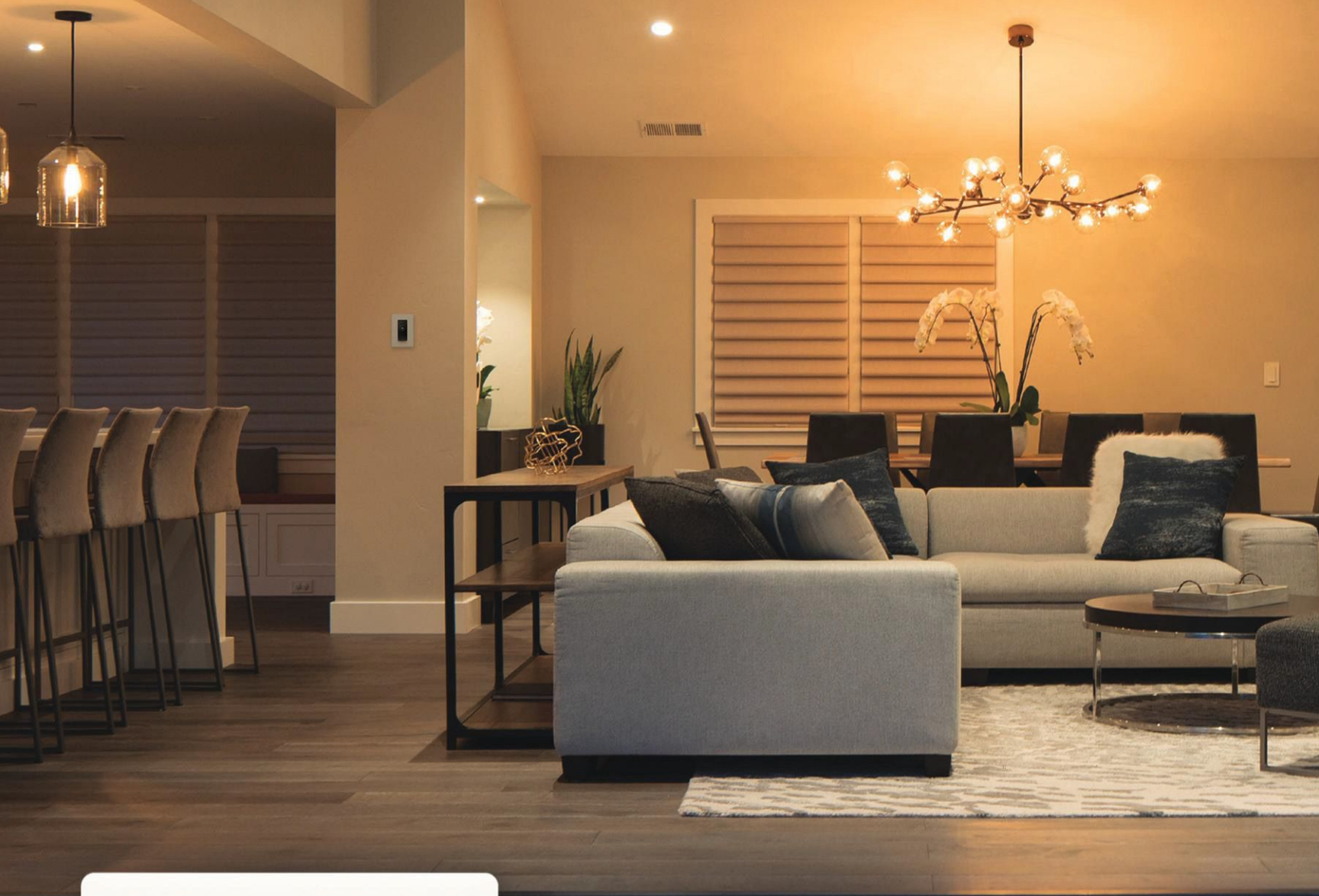
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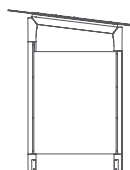
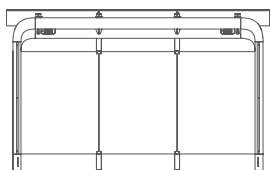
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A RIVERSIDE PAVILION IN TEXAS TEACHES VISITORS ABOUT WATER CONSERVATION BY SHOWING, NOT TELLING. BY MIRIAM SITZ



**SHADE, WATER CATCHMENT**, sustainability, and art: these strategies were the driving forces behind the design of Confluence Park, a project of the San Antonio River Foundation (SARF). A nonprofit affiliate of the municipal body that manages the local watershed, SARF sought to create a venue for educational programs and a new public amenity for the south side of San Antonio, Texas, while demonstrating principles of low-impact development.

Situated on a bluff overlooking the confluence of the San Antonio River and San Pedro Creek, Confluence Park has been a long time coming. Back in 2007, SARF purchased the five-acre plot from the city's electric utility company. It turned over two acres to the Army Corps of Engineers for a major river rehabilitation project, and, for several years, the remaining three acres served as a staging area for crews working to revitalize 13 miles of the river. Building Confluence Park began in earnest in 2013 with a master plan competition.

From the start, SARF wanted an architect to work with an artist. "We wanted integrated art, not applied art," says executive director Robert Amerman. After an RFP, the foundation selected Lake|Flato from a shortlist of four local firms in 2014. The architects' proposal included Andrew Kudless of Matsys, an interdisciplinary design practice based in San Francisco, who spearheaded the sculptural



Twenty-two separate concrete "petals," pairs of which are joined by pins at the top, form the main pavilion of Confluence Park (top). Sliding wood-slat doors open one side of the classroom to the outdoors (above).

pavilion design. Landscape architects Rialto Studio, already engaged with the foundation, became part of the team.

The three-acre park comprises one main pavilion, three smaller "satellite" pavilions, and a classroom building. The pavilions are made of concrete "petals"—two for each of the satellites, 22 for the large structure—cast on-site, using custom fiberglass forms fabricated by Kreysler & Associates in California.

The petals decrease in thickness from 18½ inches at the base to just 4 inches at the top—an accomplishment that Lake|Flato associate partner Tenna Florian credits to structural engineer Chuck Naeve, of Austin-based AEC, praising his "affinity for thinness." Pairs of petals meet some 27 feet overhead in the main pavilion (17 feet in the satellites) to form free-standing arches, unconnected to other pairs. The undersides of the petals, which touched



Small holes, 1 to 2 inches in diameter and covered with acrylic discs, perforate the upper portions of the petals, letting light in during the day and making the ceiling look like a field of stars at night. In the distance, a small satellite pavilion provides shade.

says Kudless. He recalls a SARF employee who said, "When it rains, we want people to say, 'Honey, get the kids, let's go to the park!'" Says Kudless, "That sounded crazy, but then I started to think about how plants open themselves up to water—the way an aloe plant funnels water toward its

the fiberglass forms during casting, are smooth, while the other sides, left open to the air during the process, have a rough broom finish that will weather with time and develop a different color.

The park is meant to pay tribute to water in part through "the celebration of rain events,"

roots." So, instead of shedding water, the pavilion funnels rain down into a 100,000-gallon reservoir, where it is stored for use in sewage conveyance. "The goal was to have zero water runoff from the site to the San Antonio River," says Florian, "and to demonstrate how that can be done in a well-designed way."

Near the main pavilion is a low-slung multipurpose building with classroom and visitor spaces. Its board-formed concrete walls and sod roof offer a contrast in both form and texture: where the classroom is geometric and rough, the pavilions are organic and smooth. "The idea was for it to be secondary to the petals," says Florian. "We wanted it to hunker down into the ground." The thermal mass of the semi-sunken volume helps to maintain comfortable interior temperatures (though the clients did opt to add a remotely controlled air-conditioning system). The architects also installed an 11.4 kW solar array on the landscaped roof and plan to track energy production over the next year. "We are hopeful it will operate at net positive energy," says Florian, who added that Lake|Flato will probably pursue certification through the Living Building Institute.

The \$10.7 million park officially opened in early March, and already SARF has 150 days of programming on the books, organized by nearly 20 different schools and nonprofit groups. "It's been one of the most rewarding efforts of my life," says Amerman, "to see how our community has embraced the park. ■"



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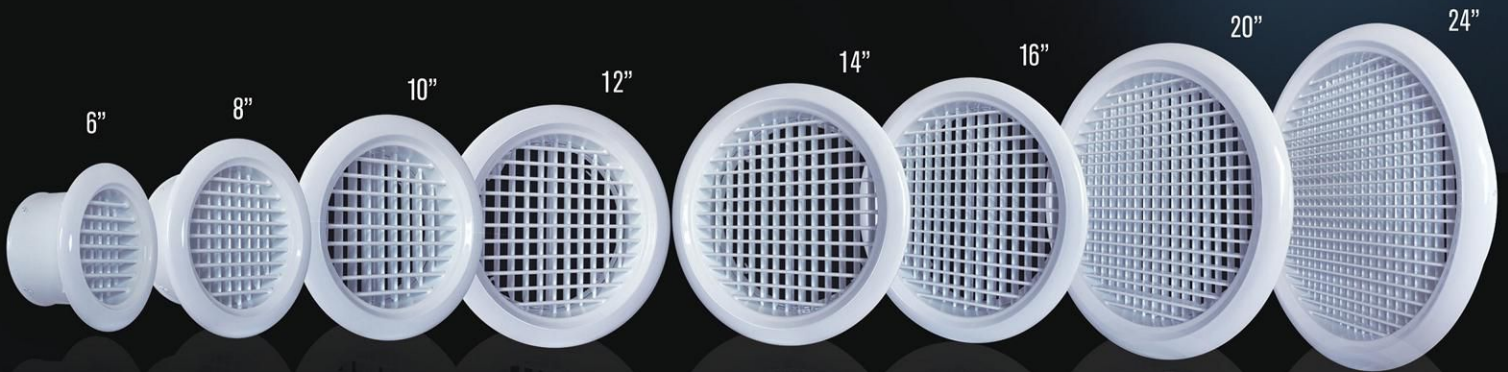
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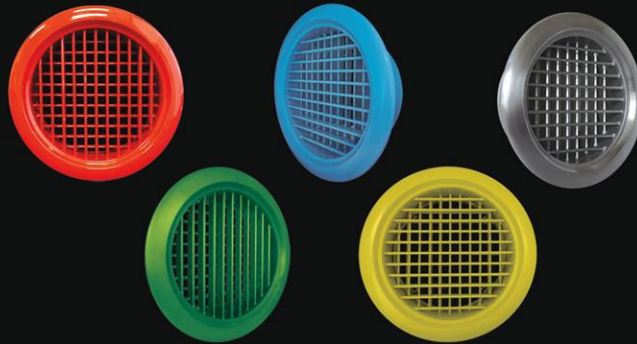
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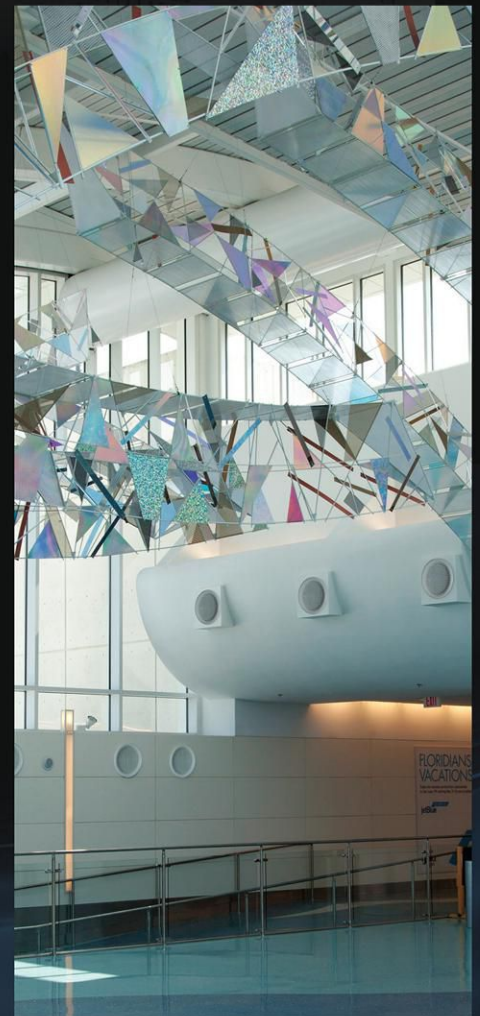
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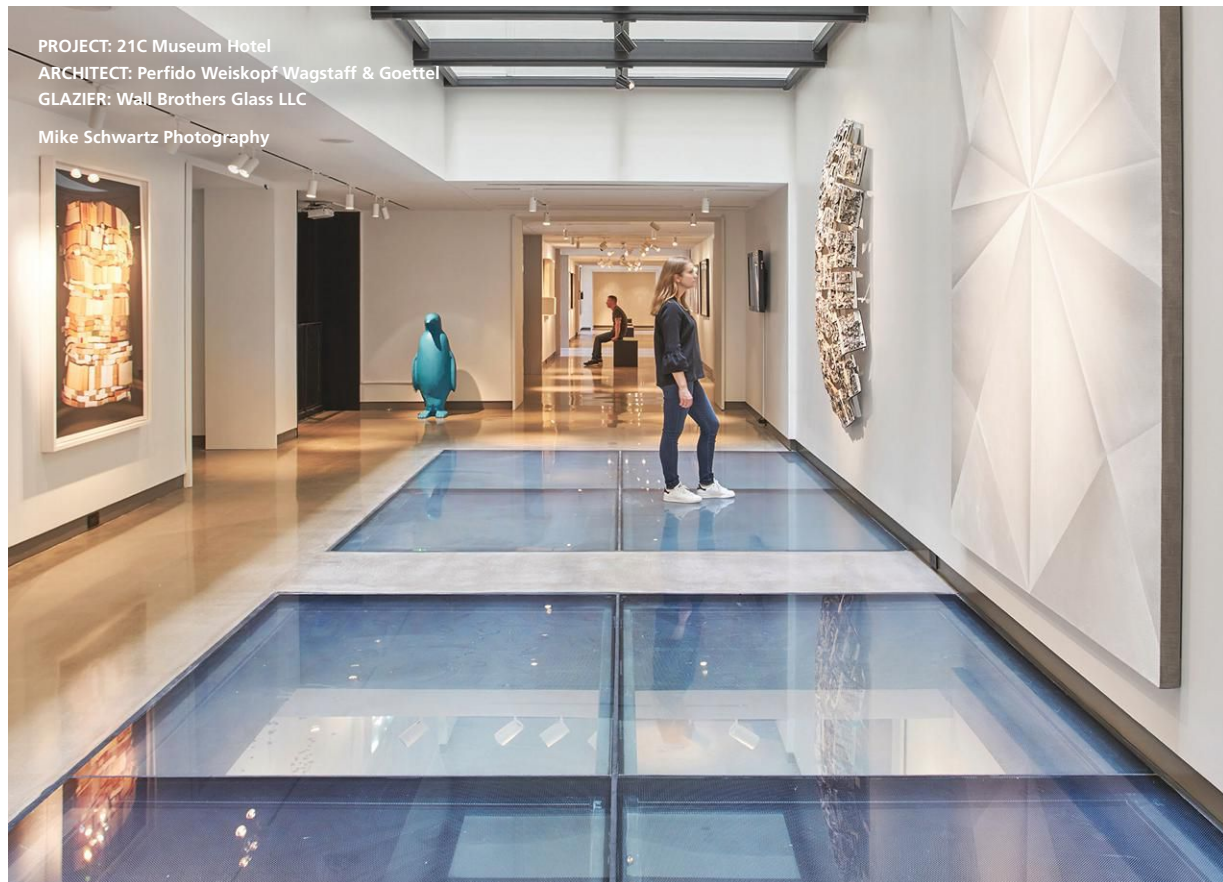
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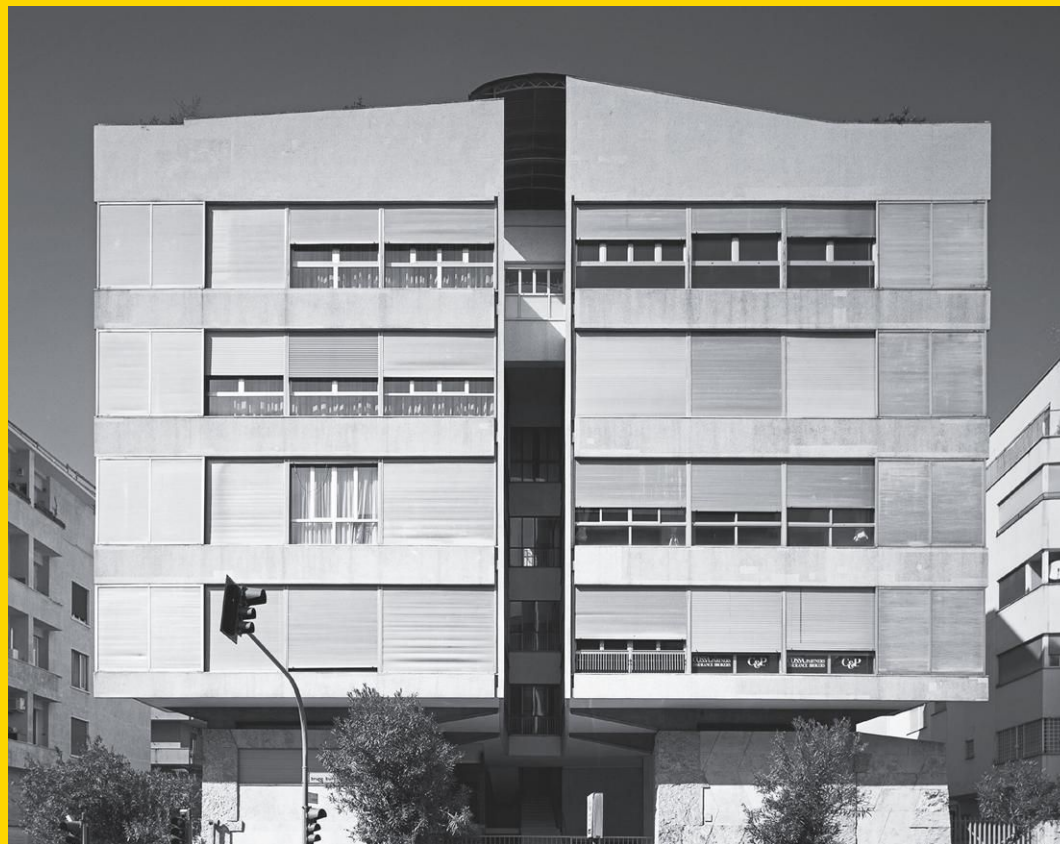


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The architect for the May issue's contest is **Charles Eames** in partnership with designer **Ray Eames**. Their own house (left), or Case Study House #8 (1945–49), examines how technology and prefabricated materials developed in wartime could influence residential design and construction.

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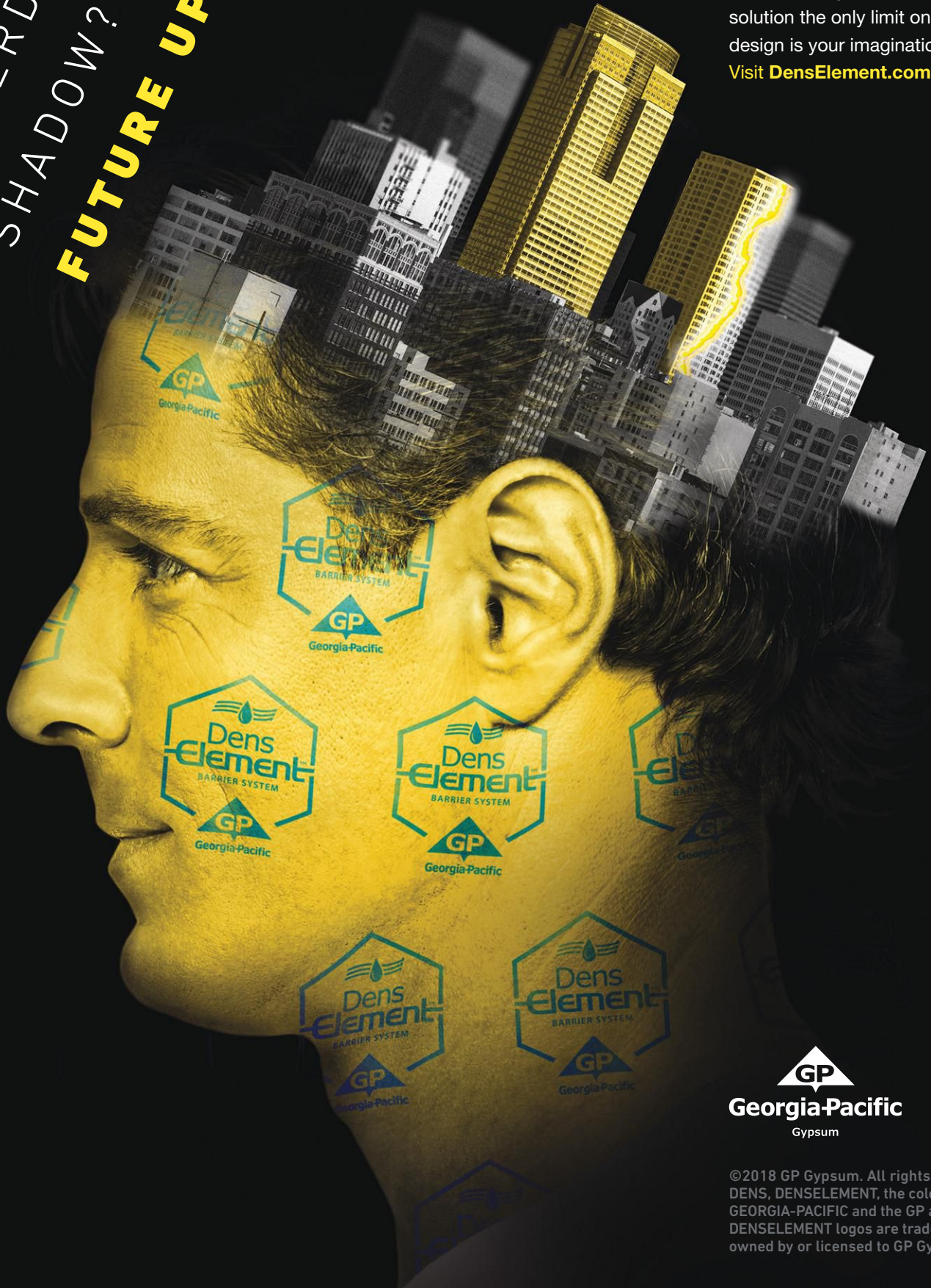
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# Shattered

**Implosion: A Memoir of an Architect's Daughter**, by Elizabeth W. Garber. She Writes Press, 342 pages, \$16.95.

By Anna Shapiro

**WOODIE GARBER** was a Cincinnati architect, like his father and grandfather before him, but they got to design significant public buildings around the city. In 1945, then only 32, Garber did win a design competition for a glassy local high-rise, only to have it nixed by an anti-modern senator. He successfully designed, however, the Modernist but low-rise Cincinnati Public Library of 1955, which was much admired and is still in use. Mostly, he was commissioned for private residences. This memoir by his daughter is about the life she, her brothers, and mother led in the structure intended as their dream house, on which they collaborated beginning in 1966—a years-long effort that, while physically taxing, proved absolutely grueling emotionally.

Elizabeth, the eldest of three, is 13 when they move in, and happily takes on the sanding and gluing of veneers for the extensive plywood built-ins. But as the chores go on, extending to the heavy work of landscaping, she and her brothers want to see friends on weekends. This is not allowed. Their story is like a romance novel in reverse, a dystopian version in which the hero grows gruffer and wilder instead of tame and tender, and the alluring mansion becomes the place the heroine needs to flee. It's a relationship built on architecture but destroyed by the presumptions of the architect.

Woodie monitors everything, as if the open plan of the house were a model for the life inside. He doesn't allow his family to close bathroom doors, requires that they pose for annual nude Polaroids so he can "record their development," and, starting when Elizabeth is 14, mandates she submit to "back rubs," front and back, as his good-nights in her room—avoiding the hottest spots but causing her speechless anguish, a silence that lasts well

into adulthood. As she says, they were trained to obey.

Elizabeth's first disillusionment with her adored father may come when she realizes that their house, which she thought made them special, exactly resembles a famous one they pored over together: "I was shocked. My father had copied Corbu." (Some readers may be reminded more of residences by Mies.)

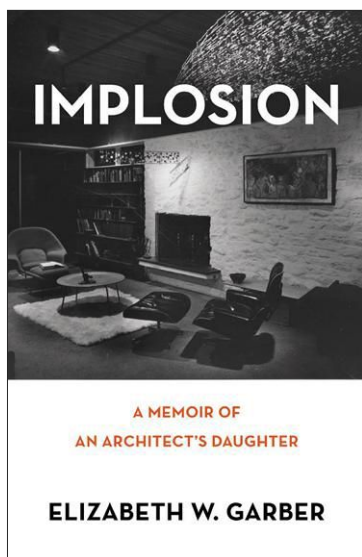
As time passes, Woodie comes to rant at his frozen, terrified family and is callous about even life-threatening physical injuries the children suffer. Covertly rebelling, his

18-years-younger wife starts letting the kids watch TV during his late nights at the office. But when Elizabeth at 16 falls in love with her perfect male counterpart, who is black, Woodie blows a gasket. Color may be a pretext for the unmentionable wish to keep his daughter to himself rather than the true cause, but his craziness destroys the family's remaining loyalty to what has essentially become a cult.

The father's dissolution—diagnosed at some point as bipolar disorder, among other disturbances—parallels the development of his big-

gest commission and first realized high-rise, a 27-story dormitory called Sander Hall (1967–71), with energy-conserving mirror-glass walls unlike anything in the area. Built high by Cincinnati University to avoid encroaching horizontally on the surrounding community, Garber's plans included features, like ample mingling areas, that would be lauded today. The edifice, however, was widely hated by local residents and the school trustees, and subject to frequent acts of arson. The book's title refers to Sander Hall's deconstruction, in 1991, after prolonged administrative neglect.

More primarily, it refers to the implosion of Woodie Garber. He died in 1994, with all but Elizabeth refusing contact with him. In this un-put-downable book, Elizabeth, a poet, acupuncturist, and mother, has, like an architect—ecologically using salvage materials—taken the shock and trauma of the family's disintegration and built from them a powerful narrative you are reluctant to leave. ■



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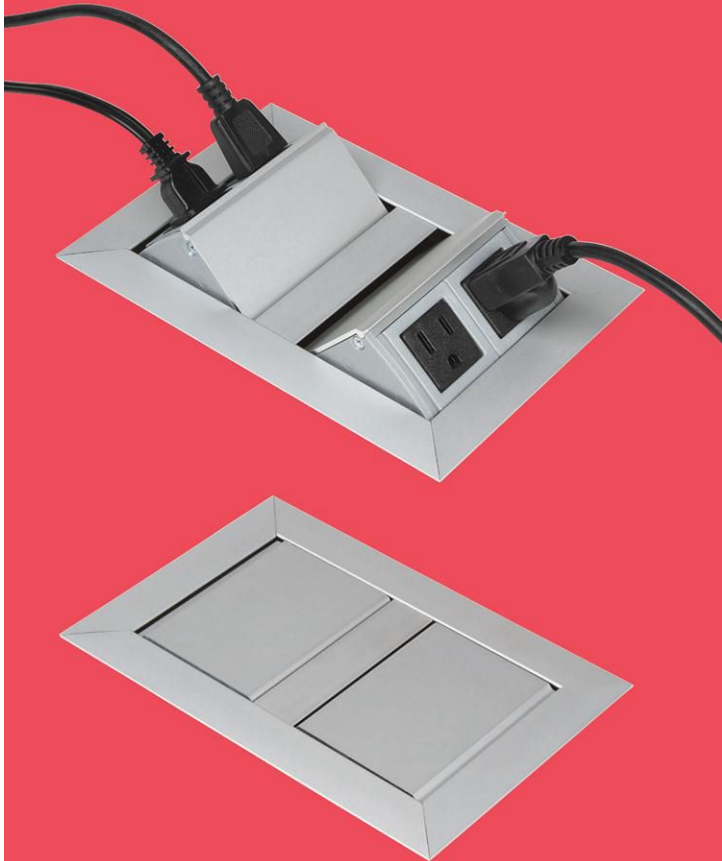


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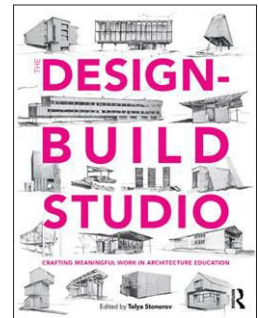
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## Do-It-Yourself that Helps Others

**The Design-Build Studio: Crafting Meaningful Work in Architectural Education**, edited by Tolya Stonorov. Rutledge, 270 pages, \$59.95.

Reviewed by Michael Cockram



**THE REPUTATION** of the Auburn University Rural Studio founded by the late Sam Mockbee stands as a benchmark for innovative and exuberant design with a deep social conscience. In this manifesto for the design-build curriculum in architectural education, Tolya Stonorov reinforces the legacy of pioneers like Mockbee by examining 16 hands-on programs, all of which bridge architecture to the construction process and

have a strong sense of community engagement. In so doing, she adeptly demonstrates the value of extricating architecture students from the confines of the studio and immersing them in the act of making.

The Island Design Assembly—led by Jonathan Marvel (Marvel Architects, New York), Stephen Krendell, and John H. McLeod (McLeod Krendell Architects, Middlebury, Vermont)—whisks students (via kayaks) to an island in Maine for an intensive program that partners with rural schools to create small-scale agriculturally oriented projects. If it sounds like fun and games, the account reads more like an episode of *Survivor*, with windstorms, foraging for seafood, and an all-night design session that ends with ordering materials in the wee hours of the morning for delivery by boat in the afternoon. The delightful results show that “architects can elevate ordinary things like a farm stand or a chicken house or a compost bin into something extraordinary,” says Stonorov.

In her own 804 Lab at Norwich University in Northfield, Vermont, she demonstrated digital technology’s contribution to the design-build process. Her project involved making a portable gallery in a gutted Airstream trailer, the “Archistream,” to take art and architectural exhibitions to rural communities around the state. The design incorporates layers of plywood fins cut with a CNC router to form an intricate undulating interior. In one instance, the students wrestled with digital glitches and finally resorted to a handsaw—a lesson in problem-solving that would be difficult to replicate in a traditional studio.

The German University of Cairo produced playgrounds for Syrian refugee children in Egypt and revealed thoughtful methods of getting children and other stakeholders involved in the design process. At the University of Washington in Seattle, design-build pioneer Steve Badanes (of Jersey Devil fame) had his studio craft an urban-farm “supershed” that houses garden-based educational and support facilities for a nonprofit group working with underserved youth. Badanes has refined an approach to consensus design that encourages students to discard the mindset of an individual designer and work as a team toward a single product.

In presenting these case studies from the U.S. and five programs overseas, Stonorov lets each instructor give a firsthand account of a recent project. The instructors’ intimate connection to the projects, students, and design-build process gives their experiences vividness (and several are stellar storytellers), although the narratives are at times jarringly different in approach and style. The book is an excellent reference for educators interested in design-build, or for anyone looking for a resource that highlights the value of engaging students outside the classroom, in hands-on service to the larger community. ■

*Michael Cockram has taught design-build studios at the University of Oregon and is the principal at Bowerbird Design in Fayetteville, Arkansas.*

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## The Sacred and the Profane

Diller Scofidio + Renfro return to the Met to design another blockbuster fashion exhibition.

**YOU MIGHT SAY** it took a small miracle to pull off this exhibition. *Heavenly Bodies: Fashion and the Catholic Imagination*, on display until October 8, spans 27 galleries and two locations—New York’s Metropolitan Museum of Art’s main building on Fifth Avenue and its annex, the Cloisters, in upper Manhattan—and includes 40 masterworks of papal regalia from the Sistine Chapel sacristy (the first Vatican loan to the Met in 35 years). Then there’s the fashion—contemporary pieces inspired by Catholic themes and imagery, by the



Items from the Catholic-themed show are set within existing exhibitions, and span a variety of spaces in the Cloisters (above) and upper- (top, right, and previous page) and lower-level (bottom, right) galleries within the Met's Fifth Avenue building.

houses of Thierry Mugler, Jean Paul Gaultier, Yves Saint Laurent, Dolce & Gabbana, Chanel, Rodarte, and Versace, among others.

The result is a mix of elaborate confections and pious ensembles interspersed with religious art and artifacts from the Met's collection, in an array of spaces ranging from long, brightly lit galleries to low crypts. Unifying the display, from the pageantry on Fifth Avenue to the austerity and sanctity farther uptown, is the discreet exhibition design by Diller Scofidio + Renfro (DS+R).

The Met's Costume Institute had previously tapped the interdisciplinary firm for an exhibition of couturier Charles James's work in 2014. While that design utilized a variety of digital media, the design for *Heavenly Bodies* is as minimal as could be. "This was a different calling," jokes DS+R partner Elizabeth Diller.



DS+R's role this time around was that of mediator, explains Diller, playing off the axiality and symmetry of the spaces, but also reflecting diverse attitudes, whether ironic, critical, or reverent. Legibility of the installed costumes and baubles as new—especially within the context of already highly curated galleries, featuring *objets d'art* that often could not be moved—was paramount. To effect a consistent language throughout the sprawling show, DS+R limited the display hardware. While pedestals range in size, proportion, and height—some dramatically propping up a succession of mannequins overhead—each is composed of cruciform-shaped blackened steel atop a concrete base, injecting a soupçon of Carlo Scarpa's intervention in the Castelvecchio in Verona. Some, like those displaying the jeweled tiaras and intricately embroidered cassocks belonging to former popes, are encased in glass or acrylic.

According to the exhibition's curator, Andrew Bolton, the works on display "embody the storytelling tradition of the Catholic church." The enchanted world they create is worthy of the pilgrimage. *Josephine Minutillo*



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## Modernism's Deep Roots in Japan

An exhibition highlights traditional architecture's critical role.

BY PAULA DEITZ

**JAPAN IN ARCHITECTURE:** *Genealogies of Its Transformation*, an exhibition at the Mori Art Museum in Tokyo, is like taking the entire country and its architectural history and putting it in a nutshell—well, not exactly a nutshell, since it comprises 100 separate displays, from a 3rd-century terra-cotta model found in a burial site to the present, with an emphasis on the last 150 years since the Meiji Restoration. Much has been made over time about how Japanese architects responded to Western Modernist styles, but here the curators show how the essence of Japan's traditional, even classical, architecture, along with vernacular forms and natural settings, maintains a presence in the most contemporary of forms, which in turn have been exported elsewhere. With an abundance of stunning models, vivid photography, informative videos, and old and new sketchbooks, this composite view is as enjoyable as it is informative—a kind of travel or, better yet, an after-having-traveled experience.

Divided into nine sections, the exhibition, which runs through September 17, appropriately begins with “Possibilities of Wood,” since the concept of *kigumi*, the craft of interlocking joints, is endemic to Japanese architecture. (Other sections include “Transcendent Aesthetics,” “Roofs of Tranquility,” and “Crafts as Architecture.”) Carpentry books on view with diagrams of wooden shrine roof motifs imported from China and Korea were harbored in secret until they leaked out. In the exhibition the double roof of the Great Southern Gate of Tōdai-ji in Nara (1199), with bracket arms, penetrating tie beams, and fan rafters, is juxtaposed with the long span of stacked and cantilevered wooden parts of Kengo Kuma's 2010 Yusuhara Wooden Bridge Museum, similar in appearance.

Rooftops, curved or sharply slanted, are a distinctive feature of the Japanese landscape, whether a low roof with eaves, as seen on a full-scale replica of the 16th-century Tai-an Tea House, attributed to the tea master Sen no Rikyū, or the soaring roof with ridge poles of Kenzo Tange's National Gymnasium for the 1964 Olympics. Captivating among these exhib-



Kengo Kuma's Yusuhara Wooden Bridge Museum (above), which opened in 2010 in Kochi, and the 16th-century Tai-an Tea House (right), seen here in a replica made for the exhibition, both share a tradition of wood craftsmanship and joinery.

its is Kazuyo Sejima's Nishinoyama House in Kyoto, a grid of 10 sleek, small-scale, single-story rental apartments, separated by pathways and courtyard gardens, all under one roof divided into 21 pitched planes shared between the glass-walled structures.

Beyond the fixed categories, there are those iconic symbols integral to Japanese culture that have proved influential. As a high school student, Shigeru Ban saw an unforgettable inverse image of Mount Fuji reflected in nearby Lake Yamanaka. Decades later, he won the competition for the Mount Fuji World Heritage Centre with a gigantic inverted cone in latticed timber (RECORD, March 2018), offering views of the mountain itself.

And then there is the 1615 Katsura Imperial Villa in Kyoto, whose image is woven throughout the show, first on its own, and then in the four separate volumes of photographs by Yasuhiro Ishimoto, which capture its stark modernism. Bruno Taut, the German architect who lived in Japan in the 1930s, drew long horizontal sketches of the villa with a pink ribbon of color along the garden paths between teahouses, indicating the mountains of clipped pink azaleas in bloom on his visit, as they were just now on mine.

In a section called “Living with Nature,” the design of the Nago City Government Office in Okinawa (1981) shows special attention to the



landscape by Team Zoo's Atelier ZO (Elephant) + Atelier Mobile (Running Bird). Designed like a stack of locally inspired pergola terraces, helping to increase ventilation from sea breezes, the building is constructed of two-toned pink-and-gray cinder block, a material developed for postwar construction under the occupation.

And, finally, Hiroshi Sugimoto's retreat, Enoura Observatory, overlooking Sagami Bay, is ostensibly a strolling garden with an indoor gallery, open-air stages, a teahouse, and a Cor-Ten steel tunnel aligned with the winter solstice sunrise (RECORD, February 2018). By lovingly selecting rocks and gates from sacred places and combining them over a 20-year period with structures of contemporary materials, Sugimoto encapsulates the entire history of Japanese architecture and garden art. His creative process is emblematic of this entire exhibition. ■

Paula Deitz is editor of *The Hudson Review*. Her book *Of Gardens: Selected Essays* was published by the University of Pennsylvania Press.



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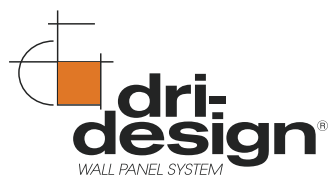
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## Global Culture and Civic Competition

Buildings for the arts in the 21st century reflect openness and flexibility.

BY VICTORIA NEWHOUSE

**THE RADICAL CHANGES** in today's cultural institutions inevitably affect the architecture of these institutions. Libraries are no longer about books, art museums are not primarily about art, and Joshua Dachs, a prominent theater planning-and-design consultant, has recently questioned the need to ever build more theaters.

Many dramatic buildings have contributed to the success of the institutions they house, an outstanding example being, of course, the Guggenheim Bilbao by Gehry Partners (RECORD, October 1997), visited by over a million people a year since it opened two decades ago. But now a beautiful building is no longer enough: innovative programming geared to our evolving societies has become crucial. Financing operations, too, are critical.

Indeed, even the value of costly buildings is far from certain. The cancellations last year of the Metropolitan Museum's new wing for Modern and Contemporary art by David Chipperfield and of the New York Philharmonic's David Geffen Hall renovation, after a competition won by Heatherwick Studio and Diamond Schmitt, raise serious questions.

Consider the new ways in which the public is visiting cultural institutions. The National Endowment for the Arts recently revealed that 73 percent of Americans who visit art museums are doing so first and foremost to meet a friend or family member, and only secondarily to visit the art. According to the research of La Placa Cohen, a strategic-marketing firm, in the 21st century, the very notion of what culture is has been expanded to include street fairs and food and drink experiences.

An example of this new emphasis is the Tate Modern's Switch House wing, completed in 2016 in London (RECORD, July 2016). It is 60 percent bigger than the original building, but 40 percent of the space in the Herzog & de Meuron addition is consigned not to the exhibition of art (in this building, exclusively performance art) but to cafés, theaters, and other areas for social interaction. The Museum of Modern Art's current renovation and expansion by Diller Scofidio + Renfro follows a similar trajectory, adding 25 percent more public space, a new store, and an espresso bar, and only 30 percent more exhibition space.

Performance venues face a similar issue: programming that will attract younger audiences is more critical to long-term success than a striking new building. And, again,



The New World Symphony Concert Hall by Frank Gehry, with special acoustics, in the Miami Beach park designed by West 8, presents free, live outdoor "wallcasts" of musical performances.

financial support for ongoing operations goes hand-in-hand with programming. The League of American Orchestras reports that attendance at performances of classical music, which declined from 2000 to 2014, is now on an upswing in both the U.S. and Europe. Ideas about programming must be reconceived to retain these new audiences, with their changed patterns of behavior; museums and libraries are in fact ahead of performance venues in this regard. The need for adequate funding of programming and maintenance—so often not considered carefully until it is too late—is a prime lesson of my book *Chaos and Culture: RPBW and the Stavros Niarchos Foundation Cultural Center in Athens*, published last May.

The entire \$860 million cost of the new opera house, national library, and park in Athens, designed by Renzo Piano Building Workshop, with the landscape by Deborah Nevins, was assumed by the Niarchos Foundation (RECORD, September 2016). But the debt-strapped Greek government was unable to honor its commitment to pay for running the center. Fortunately, the foundation

stepped in with a \$50 million grant over five years, to prevent a shutdown.

Not every cultural institution is so lucky. A national study asserts that between 1998 and 2004, \$24 billion was spent in the U.S. on the construction of cultural buildings, many of whose futures became uncertain because of crippling operating deficits. Among these were the Kimmel Center for the Performing Arts in Philadelphia, by Rafael Viñoly (from its opening in 2001 until 2011, it incurred an annual debt of \$14.5 million), and the Adrienne Arsht Center in Miami, by Pelli Clark Pelli (where deficits of \$600,000–\$700,000 in 2010 and 2011 indicated a need for ongoing government support). The Winspear Opera House by Foster + Partners in Dallas closed its first season, 2009–10, \$1.5 million in the red, and they are still struggling (RECORD, February 2010).

The Frank Gehry–designed New World Symphony Concert Hall in Miami Beach presents an alternate picture (RECORD, May 2011). Many concerts at the 765-seat venue are briefer than the norm, are scheduled at off hours, and include visual projections. Free "wallcasts"

present live concert screenings on the exterior, with surround-sound acoustics in the specially designed park by West 8, to increase the audience size by an average of 2,000 people. The hall's finances are healthy, with annual subsidies, ticket sales, and a modest dip into the endowment.

Established institutions are making other changes in order to compete with smaller, more intimate venues that offer less costly tickets. One of these is National Sawdust in Brooklyn (RECORD, December 2015), a 150-seat artist-led concert center designed by Bureau V; another is the experimental performing space Soundbox in San Francisco. Large auditoriums are being built in unexpected locations, such as the Paris Philharmonie in the outlying northeast of Paris, by Jean Nouvel; La Seine Musicale, by Shigeru Ban, on an island in the Seine at the opposite end of the city; or the Niarchos cultural center, 2 miles from the center of Athens.

Even in Europe, where, until recently, local and federal governments assumed the cost of building and running cultural institutions, there are surprises. Since its 2008 inauguration, Snøhetta's stunning Oslo Opera House has enjoyed tremendous popular success, both as a performance space and a destination for outdoor strolls on its gently sloping roof overlooking the waterfront (RECORD, August 2008). But higher than anticipated maintenance costs for the building, compounded by the federal government's unexpected imposition of bigger pensions for performers, tore through the company's balance sheet.

In Hamburg, Christoph Lieben-Seutter, director of the Elbphilharmonie, designed by Herzog & de Meuron, is cognizant of such issues. He wonders how this stunning concert hall, sold out for a year after its inauguration in early 2017, will fare three years from now when the novelty has worn off (RECORD, December 2016). Its annual nearly \$7 million operations are currently funded by the local government, donations, and ticketing. The dramatic 26-story glass structure, poised on a

1940s brick former warehouse, includes among its other spaces two concert halls, a hotel, and condominium apartments, all of which enjoy panoramic views of the harbor and the city beyond. Its construction, begun in 2007, cost more than 10 times the original estimate of \$86 million, and was completed seven years late.

The Eli and Edythe Broad Museum in Los



The Tate Modern's Switch House, in London, by Herzog & de Meuron, devotes 40 percent of its space to cafés and other areas for social interaction.

## **A beautiful building is no longer enough: innovative programming geared to our evolving societies has become crucial.**

Angeles by Diller Scofidio + Renfro is one of many small private art museums that have been constructed and maintained by a single patron (RECORD, September 2015). Unlike many private museums—the Nasher Sculpture Center in Dallas, for one, which does not have an endowment from its original benefactor—the Broad has an endowment of \$200 million. And the Glenstone Museum in Maryland is supported by a \$1.25 billion foundation. Scheduled to open in October, the Glenstone's

expansion by Thomas Phifer and Partners places a series of pavilions in a 230-acre park designed by PWP Landscape Architecture. The museum's new incarnation is expected to increase yearly attendance tenfold, to 100,000.

Obviously, it is this kind of success—architecture that supplements the mission and public perception of an institution—that is envisaged by those currently hard at work to raise the \$425 million for the ongoing construction cost of the 200,000-square-foot Shed in Hudson Yards, on the west side of Manhattan, also by Diller Scofidio + Renfro in collaboration with the Rockwell Group. It is based on the concept of flexibility—exemplified in Cedric Price's unbuilt 1964 movable and reconfigurable structure for the Fun Palace—that also influenced the Centre Georges Pompidou by Piano and Richard Rogers in Paris, whose open spaces were unfortunately transformed into staid white cubes by Gae Aulenti less than 10 years after its inauguration. Zankel Hall, a 599-seat venue at Carnegie Hall designed by the Polshek Partnership, has almost never enjoyed the reconfiguration intended for it. Yet advancing

the trend for flexibility is the design by REX for the new 90,000-square-foot Ronald O. Perelman Performing Arts Center now under construction at Ground Zero in Manhattan, which can be transformed from three basic spaces into at least 11 of varying sizes and configurations. Among many atypical uses, the theaters and lobbies will host yoga classes, and monthly tea dances. The grand stair is envisioned as a gathering place akin to the Metropolitan Museum of Art's outdoor stairway.

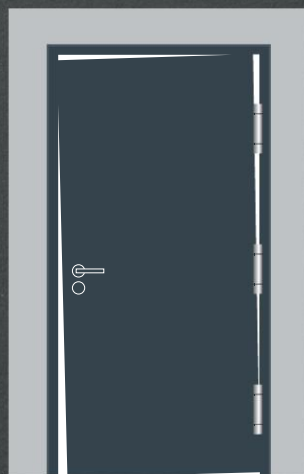
In Hong Kong, the local government's contribution of \$6.4 billion for the construction of performance and cultural spaces in the West Kowloon Cultural District is evidently based on similar optimism about the power of high-profile architecture. Herzog & de Meuron's M+ contemporary art and design museum will be among the first of these venues to open. However, questions persist about the Hong Kong government's willingness to support

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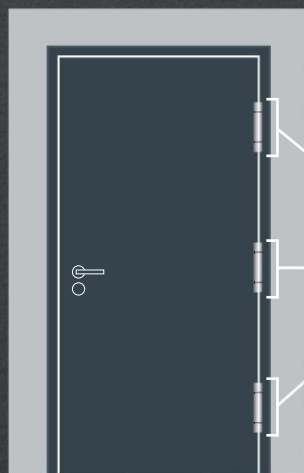
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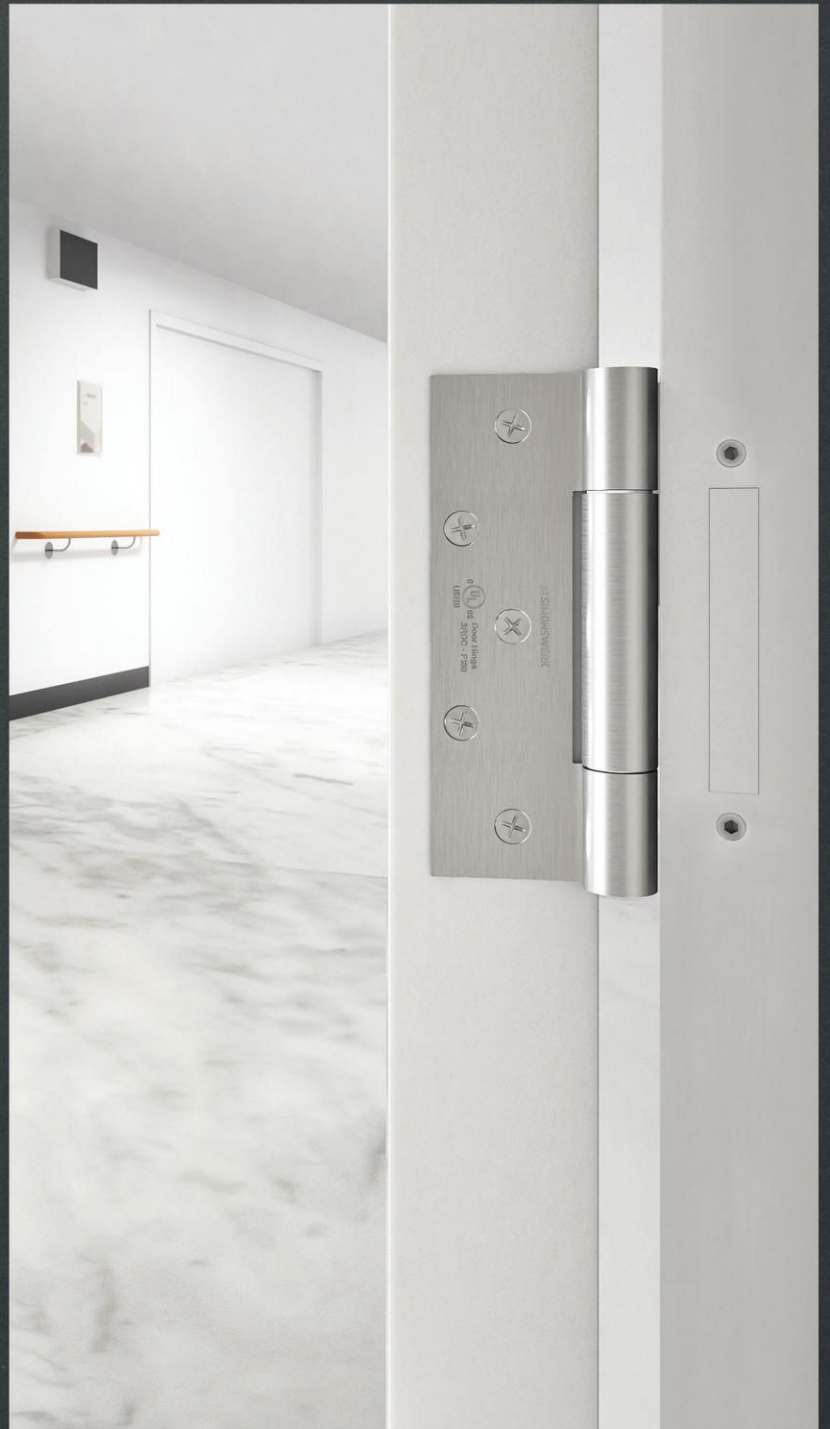
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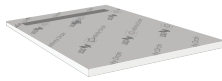


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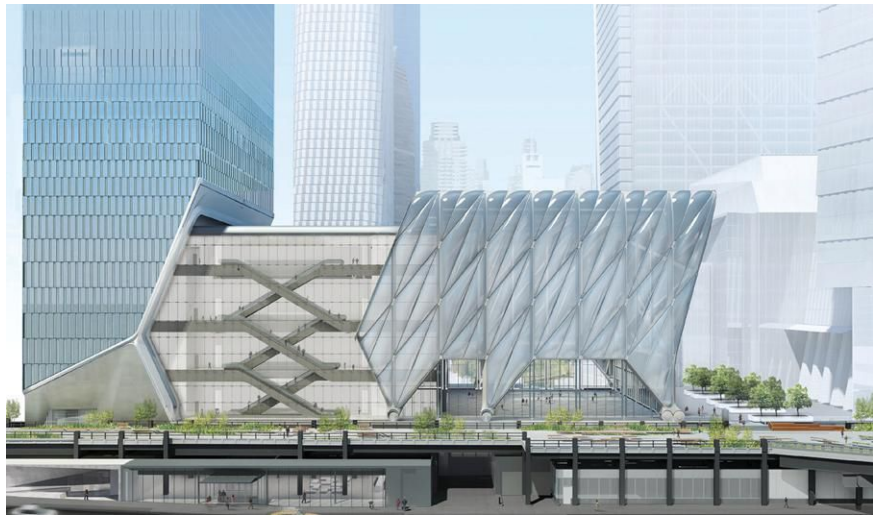


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The Shed, by Diller Scofidio + Renfro in collaboration with Rockwell Group, is designed for flexibility. It opens next year in New York.

**Architecture based on the concept of flexibility – that supplements the mission and public perception of an institution – is one trend.**

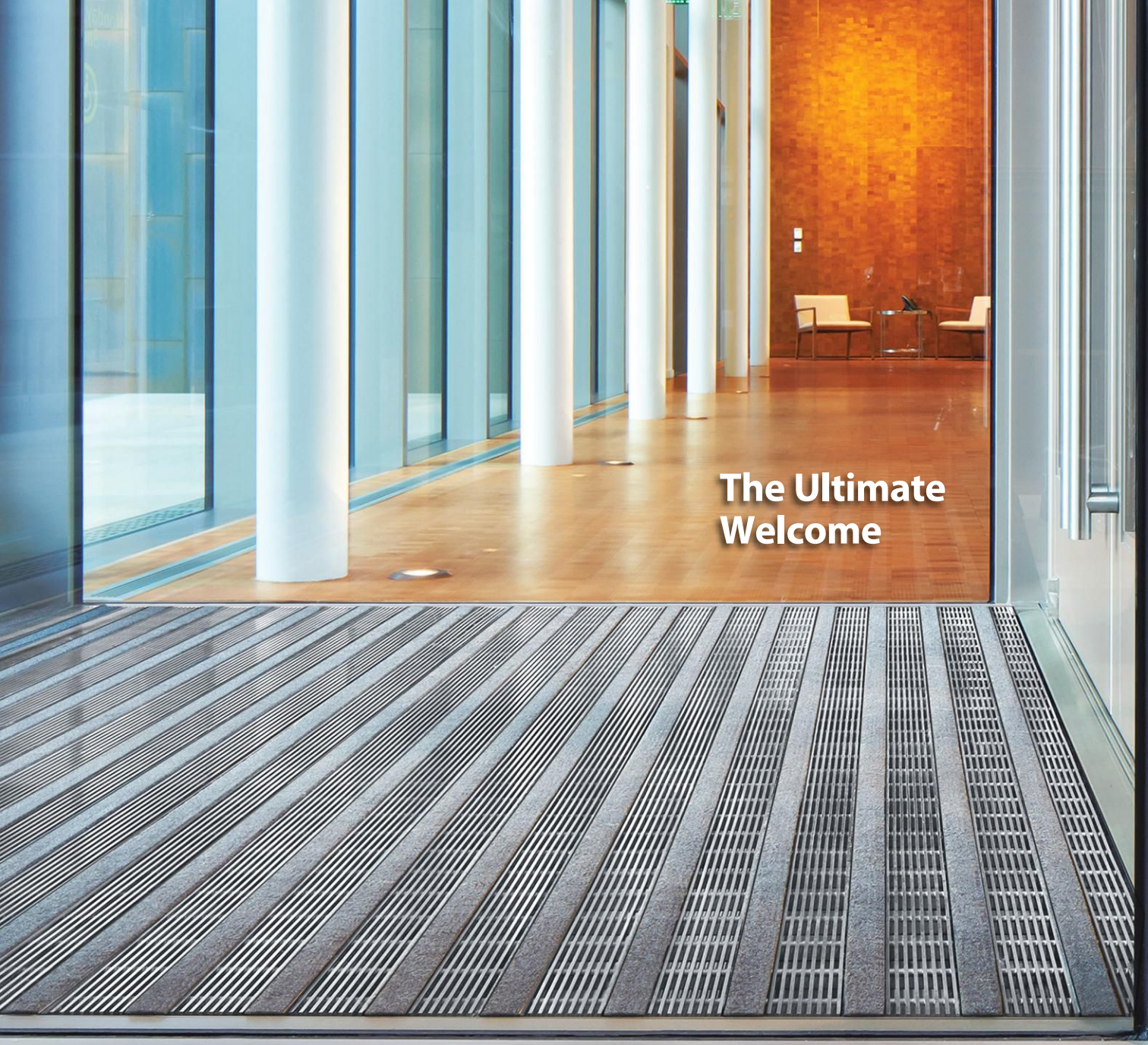
maintenance and programming.

There is no such question about the financing of educational programs in mainland China, where city, regional, and federal governments (with the help of foundations and charities) build and financially support new cultural venues even in secondary cities—for example, DDB International's Xi'an concert hall (2009) and Zaha Hadid's Changsha Meixihu International Culture and Art Center (to open this fall). Both of these cities, as recently as 10 years ago, were without performing-arts facilities. The government also supports activities that will build new audiences throughout the nation.

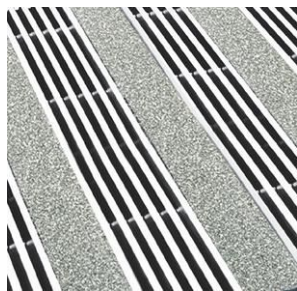
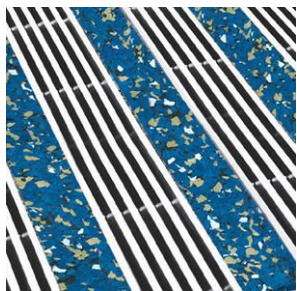
These efforts have paid off handsomely. I have visited many of the elaborate theaters that were constructed throughout China starting in 2010; several were suffering immediately after their openings from poorly conceived, poorly performed programs. In the decade since, however, programs and performances have attained high levels of quality, and Chinese orchestras have developed enormously. Scant audiences have mushroomed, thanks in part to strong marketing and sales techniques, including very affordable tickets (prices as low as \$7.50, although they can go as high as \$375) and the distribution of some free tickets. This remarkable progress provides a telling lesson in what can be achieved with the coordinated help of education and adequate financing.

Clearly, growing audiences for cultural experiences of all sorts do not guarantee the ongoing success of new cultural venues. Inventive architecture, vigorous and creative programming, and money to keep the lights on are all needed to ensure a favorable outcome. Like the teams behind the Shed and the Perelman center, architects who understand the broader audiences, expanded functions, and financial requirements of today's cultural institutions are those who will continue to enjoy design opportunities. ■

Victoria Newhouse has published five books on cultural institutions. She is currently working on one about adaptive reuse for the creation of urban parks.



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## True Blue

A Himalayan textile studio achieves harmony through refined craftsmanship.

BY LAURA RASKIN  
PHOTOGRAPHY BY IWAN BAAN

**WEAVERS' SHUTTLES**, birdcalls, buzzing bees, and the breeze: these are the sounds that architect Bijoy Jain says a visitor can hear in the protected courtyard of the Ganga Maki Textile Studio. Located in a grove of mangoes in the foothills of the Himalayas, in Bhogpur, India, the studio and factory are composed of a series of four L-shaped volumes arranged in a horseshoe pattern around the courtyard—the heart of the project—where a water trough is positioned to reflect a full moon. Adjacent buildings contain dining facilities and residences for staff and guests, a gallery and store, and a cow barn.

The client, Japanese textile designer Chiaki Maki, discovered the work of Jain's 20-year-old firm, Studio Mumbai, at an exhibition in Tokyo. She was intrigued. Her previous factory—about 12 miles away from the current site—was too small for her business, and there was no room to expand. At the new 15,000-square-foot studio, which welcomes visitors, Maki and her





A factory worker hangs indigo-dyed fibers to dry on a bamboo canopy (above). The roof of the gallery and store is fitted with thin slabs of marble, producing a soft, ambient light (opposite, left). A sink appears to grow out of the floor (opposite, right). A kitchen for dye-making and indigo fermentation (left) was designed to control humidity and temperature.



The main factory buildings surround a protected courtyard and are nestled into a remote, hilly region (left). Walls are made of brick and covered in lime (above). Hand-laid stone pathways provide circulation through the stepped site (bottom, left).

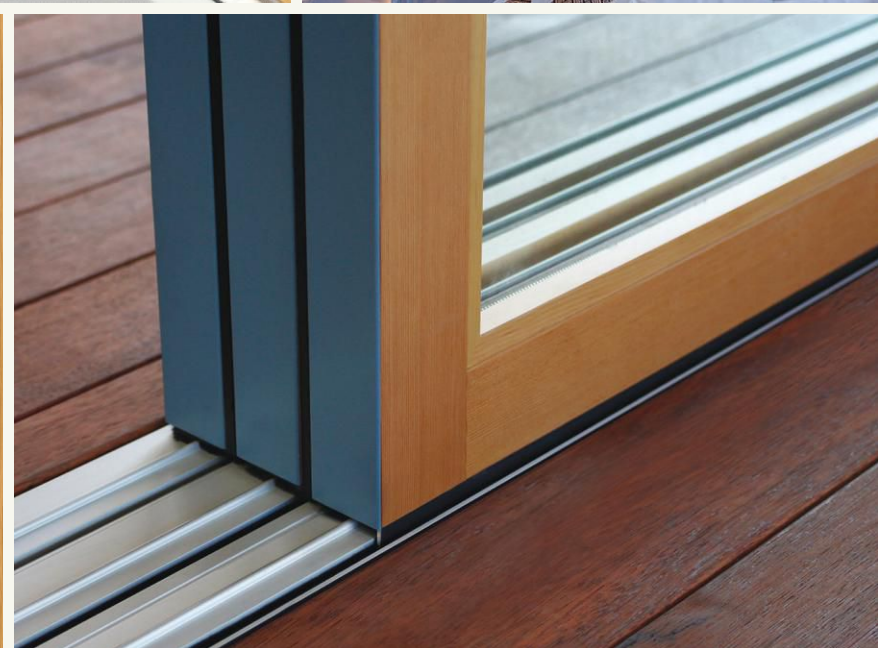


team of craftspeople ferment their own indigo and produce silk, wool, cotton, and linen textiles, all of which are naturally dyed and woven on-site. “The architecture, its materials, the proportion of the spaces, the type and size of openings, the amount of light and ventilation—all of this has been calibrated in accord with each function,” says Jain.

The buildings are constructed with brick and locally harvested lime, as well as stone, marble, and bamboo. RECORD contributing photographer Iwan Baan, who spent a number of days on-site shooting the complex, says, “Bijoy is always amazing at finding craftsmen who have been doing a specific thing for many years. Every column is a single piece of stone. There’s never a veneer with these buildings—all its components are visible.” While most of the roofs are made of cement sheet or stone, Gallery Ganga Maki has a sawtooth roof fitted with thin, translucent panes of marble, protecting the showroom from harsh sunlight and heat and creating a soft, immersive glow. Jain notes that, in fact, the stone is a more economical solution than traditional glazing in this part of India.

As Baan explains, many of the craftspeople employed by the factory come from generations of skilled textile workers—a teenager he met during his visit is following in his father’s footsteps. “The endeavor,” says Jain, “was to embody and cultivate the cyclical relationship between work and life, and the sun and the moon, bringing together past, present, and future.” ■

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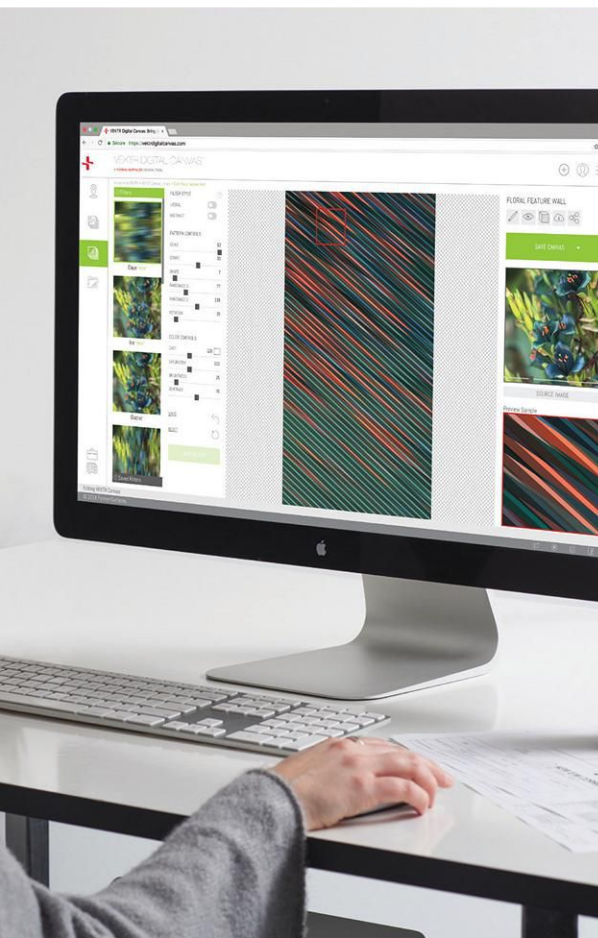


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# Building Blox

A modern structure finally emerges on a complex waterfront site in Copenhagen.

BY JOSEPHINE MINUTILLO



"There have been something like 67 attempts to build on this site since 1965," says Ellen van Loon, the OMA partner who led the design of BLOX, a 290,000-square-foot, extremely mixed-use, thoroughly modern glass building that opened last month on the harbor in Copenhagen's historic center.

The difficulty lay in the heavily trafficked ring road that cuts through the site. OMA's scheme goes under and over the expressway, with five stories aboveground and five stories below, including four levels of fully automated parking. "Not every developer is willing to pay the extra money it takes to do that, but this client wants to invest in the public realm," says van Loon.

The client, Realdania, is a Danish philanthropic group that supports projects in the built environment. Two of the main tenants at BLOX—the Danish Architecture Centre and BLOXHUB, an innovative office for sustainable development—do the same.

Besides exhibition spaces and offices for those tenants, the building also contains co-working spaces, a multilevel restaurant, a café, bookstore, fitness center, and 22 rental apartments, not to mention a playground. Its setbacks integrate large terraces for taking in waterfront views; its facade combines white fritted glass and a green glass that matches the deep green of the water, as well as panels of woven metal.

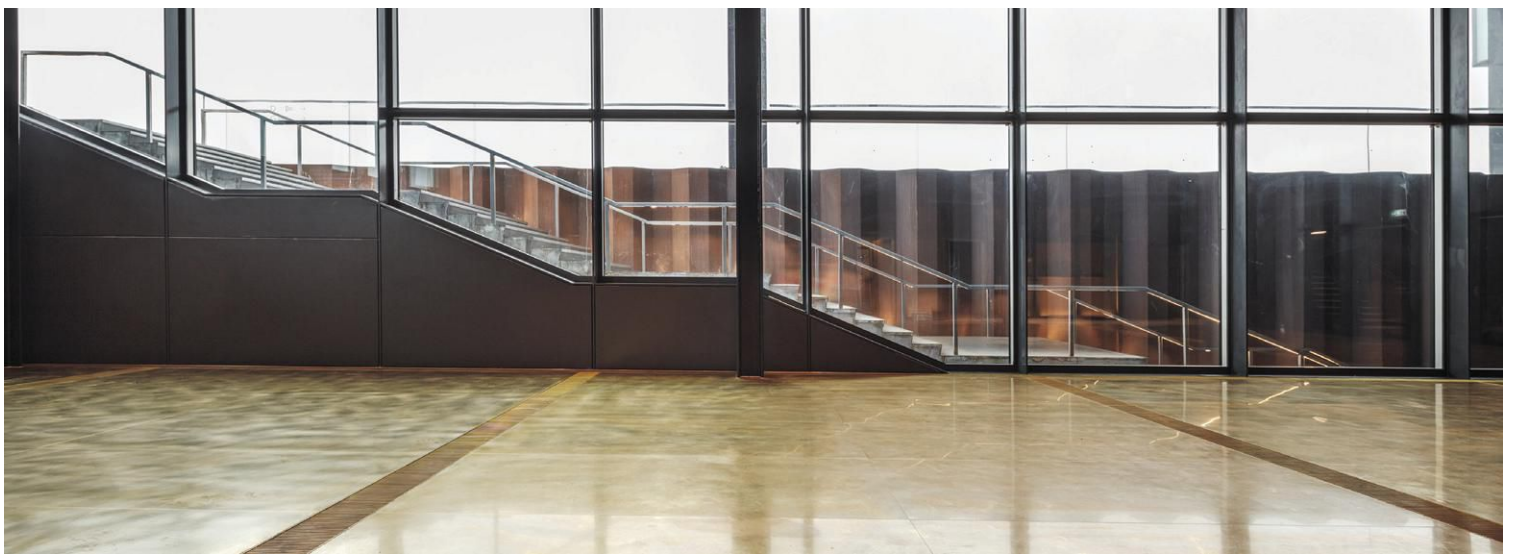
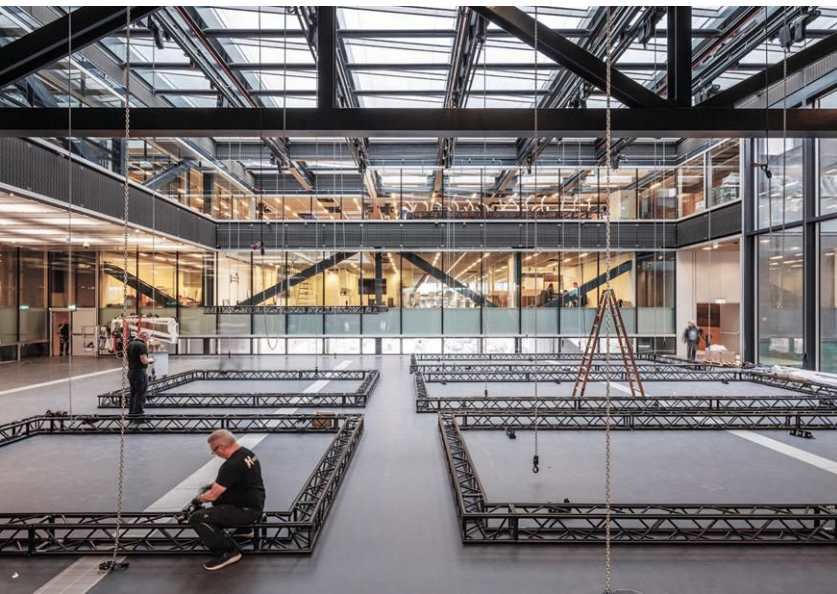
Inside is an arresting mix of dark concrete, black cork, warm wood, cool metal grating, smooth aluminum, and polished brass floors and walls (in what OMA calls the "golden room"). The interiors are arranged somewhat like a panopticon, where the central gallery offers glimpses into the rooms that surround it and vice versa. Similar views across stairwells and atria and through offices connect most spaces. "There's a lot of creative talent in this building," says van Loon. "Seeing each other leads to collaborating."







A playground animates the building at ground level (left). A large skylit gallery occupies the center of the building (middle, left). Interior and exterior spaces feature a medley of materials and textures (below). The "golden room" features a brass floor (bottom).



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# Spirited Finale

The last piece in the Prada arts complex in Milan opens.

BY SUZANNE STEPHENS

A **WHITE, LUMINOUS**, poured-in-place concrete structure looms boldly over the arts complex that the Prada Foundation created in 2015 in a former Milan distillery. The Tower, as this new nine-story exhibition venue is known, adds more edginess to the once-forlorn industrial complex that now includes a gold-leaf covered old building previously used for offices (RECORD, July 2015), a mirror-polished stainless-steel auditorium, and various low-rise, rehabbed warehouses used for temporary shows. Designed by the Rotterdam office of OMA and its head, Rem Koolhaas, with partner Christopher van Duijn, the Tower is the last part of the firm's undertaking for the foundation: the renovation of seven buildings dating back to 1910 and the construction of three new ones. In the few years since the ensemble was opened by the fashion house's designer, Miuccia Prada, and her husband and business partner Patrizio Bertelli, this agglomeration on the southern edge of the city has become a significant cultural attraction.

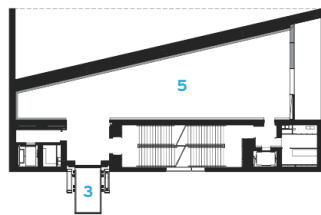
At 21,600 square feet, the tower is small, with one gallery per floor on six of the levels, interspersed with three levels that accommodate a café, cloakrooms, and ancillary services. Still, its 200-foot height makes it imposing, as does its location on the northwest corner of the complex, where it faces abandoned railroad tracks and the city beyond. The program responds to a desire by the foundation and its artistic director, Germano Celant, to have one exhibition space where art is displayed in a minimally detailed "white cube" setting. While recognizing that this quiet backdrop is often favored by curators, OMA wanted something more than bland boxy galleries stacked on top of each other in a generic steel-frame structure.

OMA oriented the Prada Tower's galleries away from the rest of the complex (left), toward abandoned railroad tracks and the center of Milan in the distance. The east and north facades (top) express the floors that cantilever from the poured-in-place concrete structure.

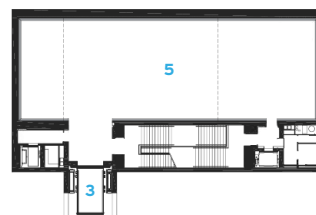




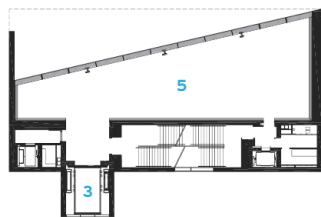
As visitors walk toward the northwest corner of the Prada Foundation complex, they encounter the east facade of the Tower (above). Also visible is the "tube," the structural element on the south side, which encloses cables that help anchor the cantilevers on the north facade (image, below).



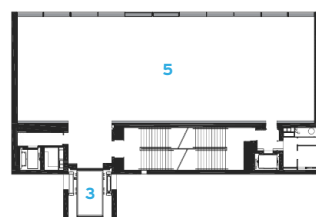
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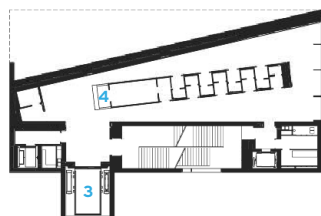
LEVEL-NINE PLAN 0 15 FT. 5 M.



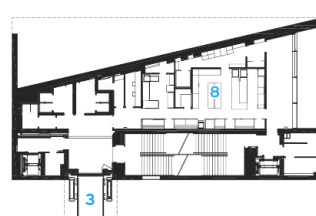
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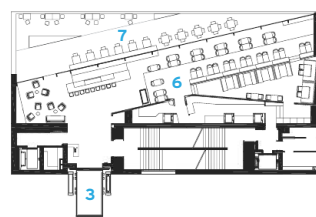
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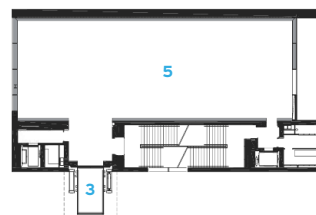
LEVEL-ONE PLAN 0 15 FT. 5 M.



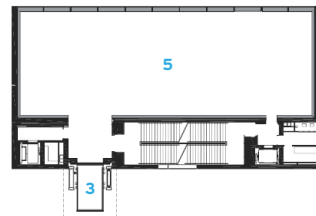
LEVEL-SEVEN PLAN 0 15 FT. 5 M.



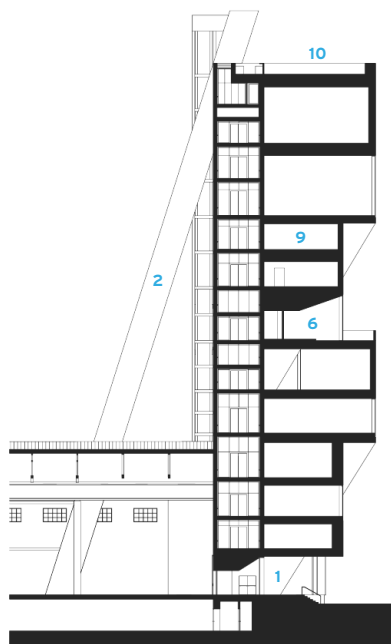
LEVEL-SIX PLAN 0 15 FT. 5 M.



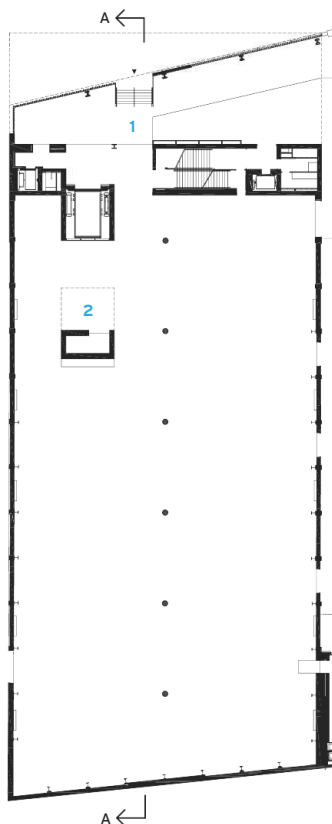
LEVEL-FIVE PLAN 0 15 FT. 5 M.



LEVEL-FOUR PLAN 0 15 FT. 5 M.



SECTION A - A 0 15 FT. 5 M.



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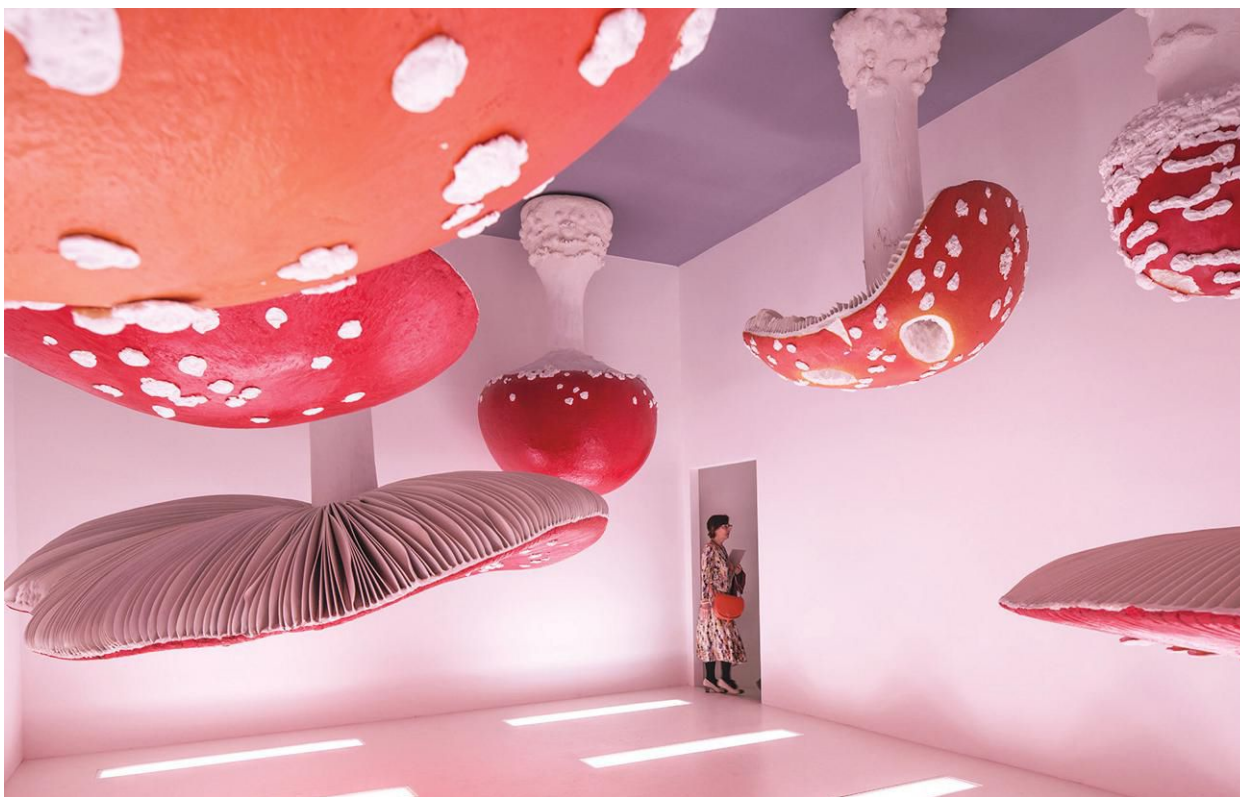


So the architects changed up the spaces by designing both rectangular and wedge-shaped floors, and by raising the galleries' heights from about 9 feet on the first exhibition level to 26 feet on the uppermost one. As Koolhaas has put it, "These variations produce a radical diversity within a simple volume." The project leader, Federico Pompignoli, adds that this structure supplements the complex, which "is like an art fair; there is a repertory of gallery types."

As part of the Tower's structural solution, post-tensioned concrete decks are cantilevered from the stair/elevator core on the south side of the building; rectangular blocks project over wedge-shaped ones on the north. Since the concrete walls are more than 1½-feet thick, both long and short solid walls act as beams to help carry the weight.

Another structural feature is the concrete "tube" that appears to prop up the south wall. While it resembles a flying buttress, it encloses cables that help pull back the thrust of the cantilevered volumes. The base of the tube is contained within a long, low warehouse structure abutting the tower. While there is a connection to the tower from this older building, the main entrance is on the tower's north side. Here, off the street, a small, mirrored lobby is dominated by a large three-dimensional aperture in the ceiling that is discombobulating in the way it reveals stairs going to the first level. You feel as if you might be vacuumed up by it on your way to the galleries.

Circulation swallows up a large part of the space on each floor, so the architects made sure the experience was not boring: stairways bring together a mix of glass, aluminum, and particleboard with a casual elegance and attention to detail. The elevator cab is lined in a rose-colored onyx, intensified by being steeped in pink paint for two months, then mounted on glass panels and backlit—definitely not boring. The café, too, is sui generis: designed by OMA and Prada, it contains furniture



The small foyer, with mirrored walls (top), is dominated by a large distorted *occhio* (eye) in the ceiling. This sculptural protrusion gives a glimpse of an upper stair that angles off the main one. The surreal effect is emphasized by the LED projection on the ceiling, from the installation (left) of Carsten Höller's *The Upside Down Mushroom Room*.

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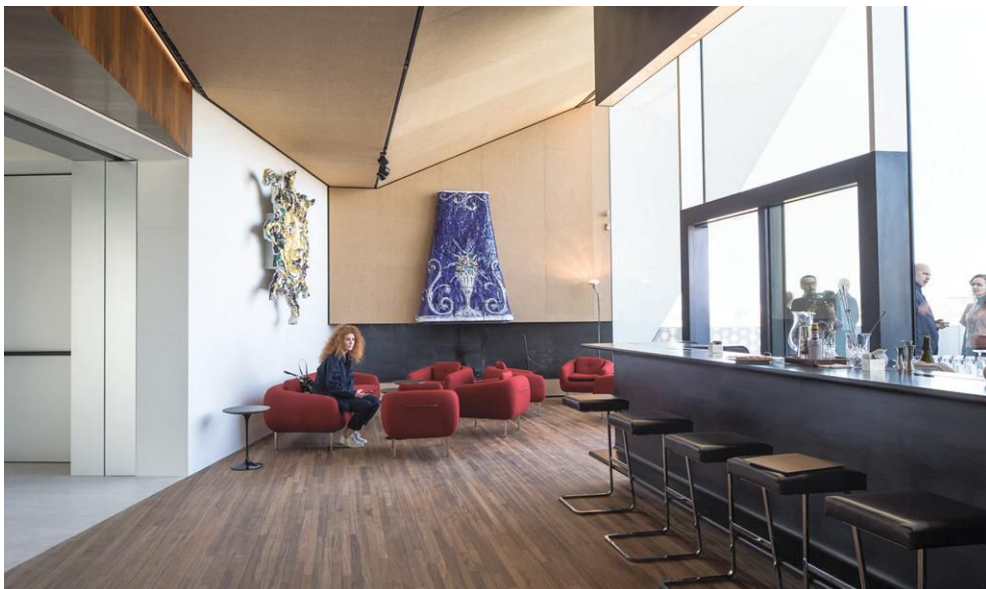
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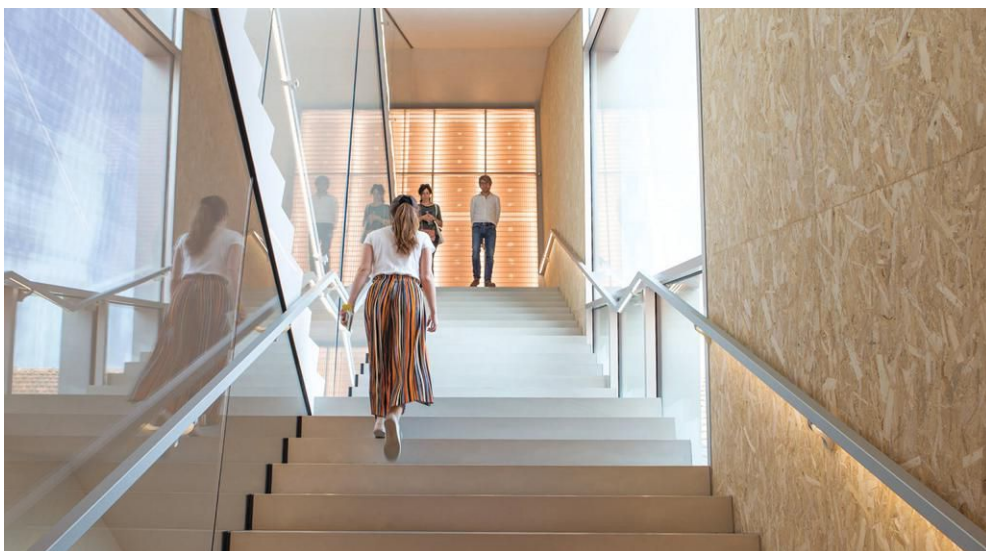
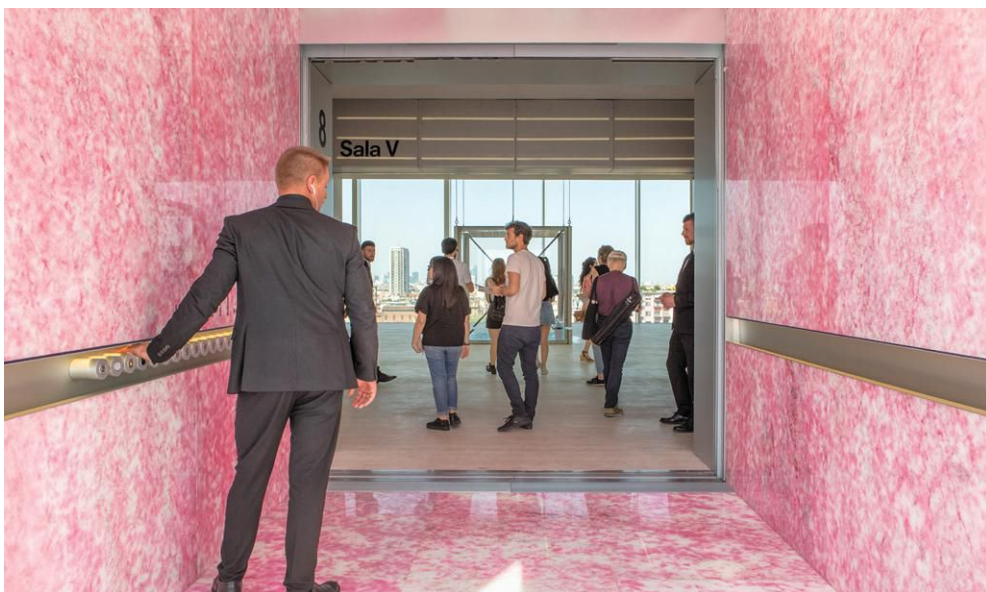


The café and terrace on the sixth floor (left) includes furniture purchased from the old Four Seasons restaurant in New York's Seagram Building, as well as the pieces from artist Carsten Höller's pop-up nightclub for Prada at the 2017 Art Basel in Miami. An elevator (middle) is lined with rose-tinged onyx panels, which had been doused in pink paint for two months (true!), and mounted on glass and backlit. The stairway shows a mix of elegantly detailed aluminum and glass along with common particleboard and exposed plasterboard.

bought from the former Four Seasons restaurant in New York's Seagram Building, along with artworks by Lucio Fontana and others.

The permanent exhibition, *Atlas*, curated by Prada and Celant, focuses appropriately on fashionable art created between 1960 and 2016. Several galleries burst with color, most vividly Jeff Koons's *Tulips*, on the second floor, and Carsten Höller's *Upside Down Mushroom Room* on the ninth level. All the installations, including those by Damien Hirst and Walter de Maria, underscore the dramatic advantage of column-free spaces.

The Tower offers an intriguing twist on the typology of the white cube by means of its structural high-wire act. Yet, given the unique site and program, it doesn't seem likely to become a typology that could be used again. It is an imaginative one-off proposition, just right for this situation. It helps to have a client willing to sign on to the cost of the complex construction process. It also is good to have faithful cognoscenti who don't mind spending almost as much time moving up and down the stairs and elevators as they do actually looking at the art. ■



#### credits

**ARCHITECT:** OMA – Rem Koolhaas, Chris van Duijn, partners in charge; Federico Pompignoli, project leader

**ASSOCIATE ARCHITECT:** Atelier Verticale

**ENGINEERS:** Favero & Milan (structural, m/e/p); Prisma Engineering (m/e/p); GAE Engineering (fire)

**CLIENT:** Prada Foundation

**SIZE:** 21,600 square feet

**COST:** withheld

**COMPLETION DATE:** April 2018

#### SOURCES

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**GLASS SHEETS:** Interpane Glas Industrie

**BUILDING ENVELOPE:** AZA Aghito Zambonini

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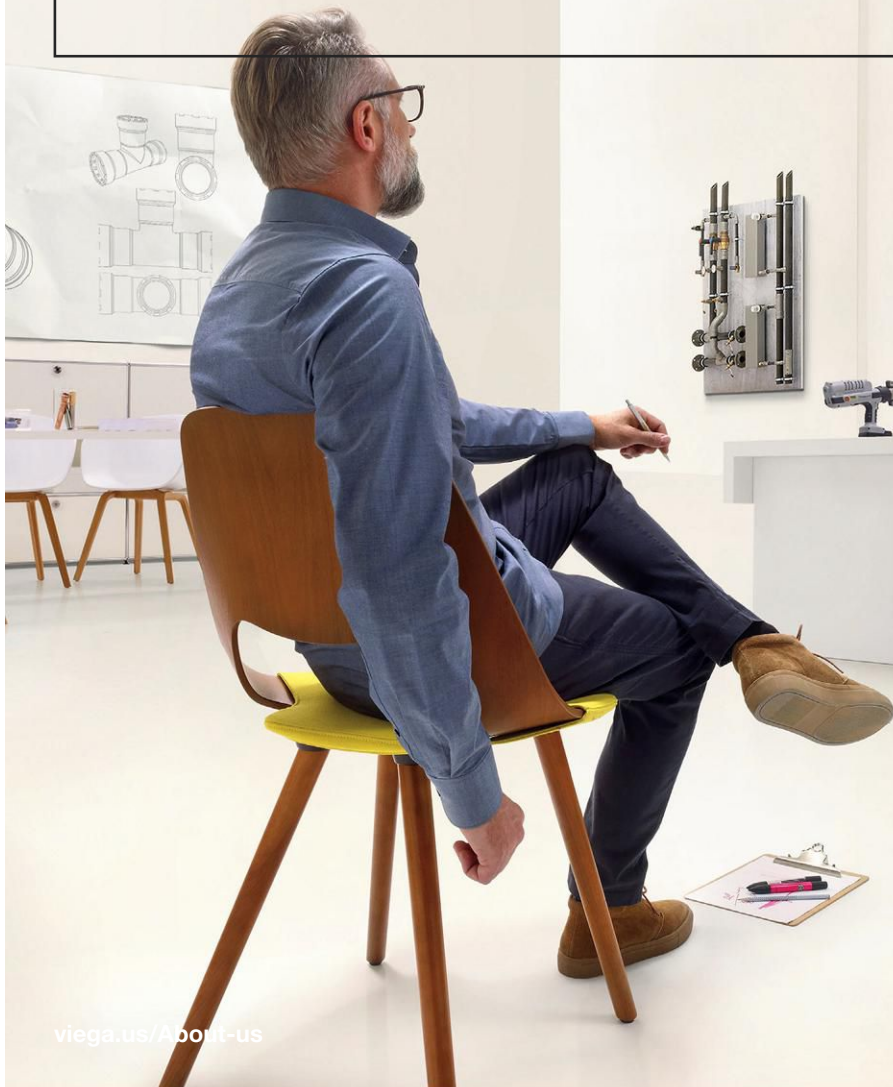
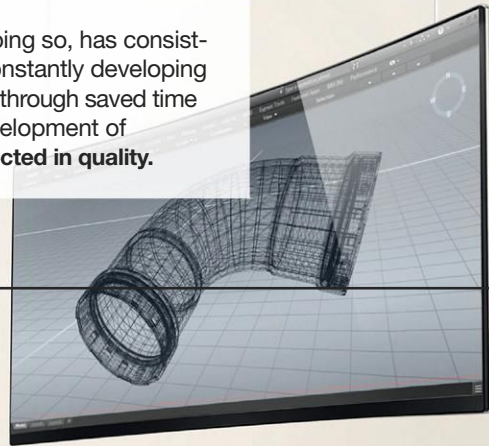
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## Salone del Mobile

At the famous fair in Milan, architects deliver engaging moments.

BY PILAR VILADAS

MILAN'S ANNUAL design fair attracted more than 434,500 attendees from 188 countries—a 26 percent increase compared with last year's crowd of 343,602—and proof, according to Claudio Luti, president of the fair and of furniture giant Kartell, “that the Salone del Mobile is a global benchmark” for design. Buzz surrounding key architectural moments seemed to support that pronouncement.

Although in-town installations, away from the main fairground, are routine, an official written manifesto the Salone issued ahead of this year's opening lent fresh purpose to citywide participation during Milan Design Week. In one instance, Massimiliano Locatelli and his firm CLS Architetti collaborated with Italcementi Heidelberg Cement Group, Arup, and CyBe Construction on *3D Housing 05*, a 1,076-square-foot 3-D-printed concrete house in Piazza Cesare Beccaria. That demonstration featured the



Architect Carlo Ratti addressed a crowd at his *Living Nature* pavilion (top) at Piazza Duomo during the Salone del Mobile in Milan. Massimiliano Locatelli|CLS Architetti built *3D Housing 05* (above), an installation in Piazza Cesare Beccaria.



At Nilufar Depot, the exhibit *Lina Bo Bardi Giancarlo Palanti* (left) showcased the largest-ever massing of furniture by Bo Bardi, the late Italian-Brazilian architect. Snarkitecture's installation *Altered States* (below) reimagined the kitchen island as a kind of center stage.

machine's building the ruggedly elegant volume on-site in a week, which placed the project several steps ahead of many previous efforts in the category. Locatelli completed it with brass door and window casings, a brass kitchen, and furniture such as his aluminum dining chairs, finished in 24-carat gold.

A crumbling former police station, Palazzo dell'Ufficio Elettorale di Porta Romana, was the site for *Altered States*, a collaboration between New York firm Snarkitecture and quartz-surfaces manufacturer Caesarstone. It showcased a dramatic conceptual kitchen island/fountain ringed by amphitheater seating, casting the kitchen island as a star of performances and social interactions.

At Assab One, a nonprofit art space in a former printing plant, the Milan- and San Francisco-based architect Johanna Grawunder's exhibition *Alone Together* featured two colorful light installations, including *Mandala*, which, when seen at a distance, is meant to celebrate the empti-

ness of its once-industrial location.

Design gallery Nilufar Depot presented *Lina Bo Bardi Giancarlo Palanti: Studio d'Arte Palma 1948-1951*, an exhibition (through December 29) of furniture by the late Italian Modernist architect known for her work in Brazil from the 1950s to the 1980s, and by her collaborator and fellow transplant Palanti.

Architect Steven Holl was the subject of *One Two Five*, a small but striking show of his drawings, watercolors, limited-edition furniture, and sculpture, curated by Marco Sammichele, at Galleria Jannone.

Meanwhile, David Rockwell designed the most popular attraction: *The Diner*, a pop-up restaurant that earned the Milan Design Award for Best Engagement. It was his collaboration with graphic design firm 2x4 and *Surface* magazine. It featured a hybrid of regional American diner motifs, using products by a host of manufacturers including Design Within Reach, Shaw Contract Carpets, Cosentino, Maharam, and Kohler, among others.

All of the installations served as reminders of the Salone's manifesto both to "underscore its connection to the city" and to support experiences that unify a global professional community, for the ultimate design week. ■







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### Harbor Sofa

A two-seater is the latest extension of the Naoto Fukasawa–designed Harbor collection for B&B Italia. It features a zipper in back for easy slipcover removal, which also serves as a striking detail.

[bebitalia.com](http://bebitalia.com)

### Helios

Rising Nigerian-American designer Ini Archibong created this family of marble-topped tables with glazed ceramic bases for London furniture manufacturer Sé. Available in 8", 13", and 20" heights, they're part of the Below the Heavens collection, which also includes seating and lighting.

[se-collection.com](http://se-collection.com)



### 1 Inch Reclaimed

This year, Jasper Morrison extended Emeco's classic stackable family of chairs to a version that is 15% waste wood fiber and 75% post-consumer polypropylene.

[emeco.net](http://emeco.net)



### Diarama Mix

Ceramic tile maker Mutina collaborated with acclaimed industrial designer Hella Jongerius on Diarama Mix, which offers a random combination of colored glazes on a single porcelain clay body.

[mutina.it](http://mutina.it)

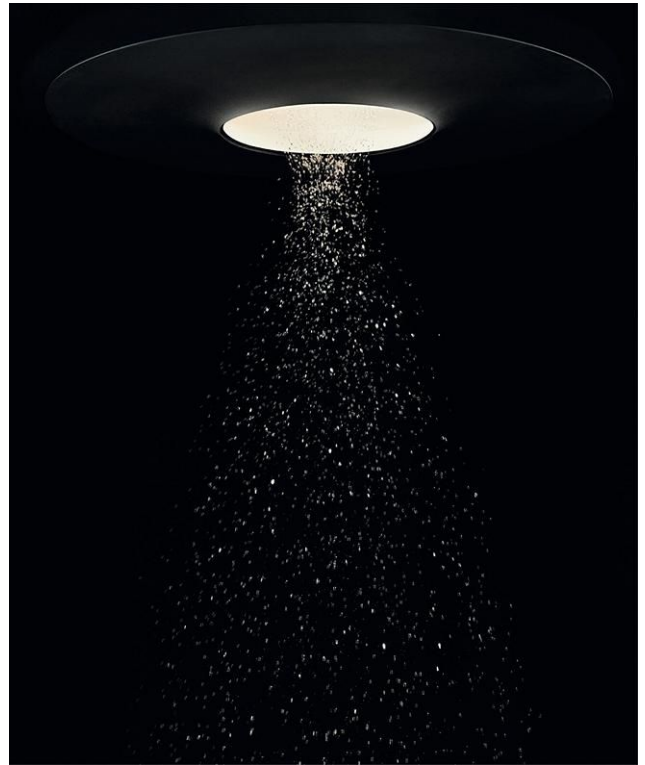




### I-table

A work/dining table that incorporates an induction cooking element under its glass top stands out among Kartell's latest offerings. Designed by Piero Lissoni, the I-table comes in black or white.

[kartell.com](http://kartell.com)



### Rainmoon

Dornbracht's Rainmoon showerhead combines minimalist design, atmospheric lighting, and variable spray settings to evoke the experience of a soothing moonlit shower.

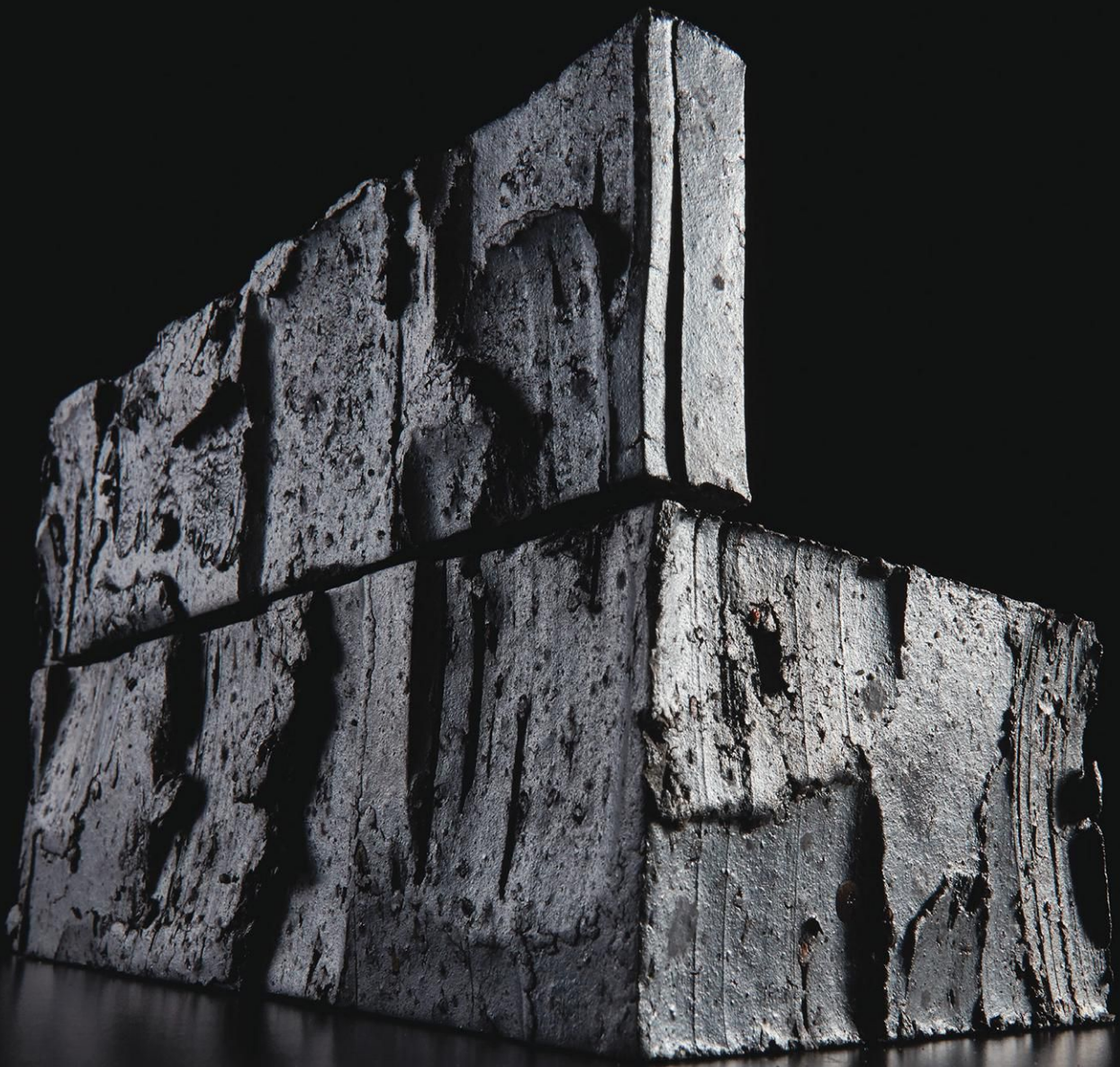
[lifespa.dornbracht.com](http://lifespa.dornbracht.com)

### Combine

Boffi's Combine by Piero Lissoni offers reconfigurable modules that can be linear, angular, or zigzag in layout. Provided in a wide variety of sizes, separate blocks containing cooking, washing, and food-preparation stations can be specified alongside tables on casters for compact and extension dining setups.

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# The Future of Practice

In cities across the country, a profusion of construction cranes points to a bustling building climate, which should make architects happy. Not so fast. Despite a sound economy, architecture is facing a reckoning. This special section examines firms of varying sizes and the challenges—and opportunities—they face today, with greater competition and client expectations, as well as an outmoded business model and the urgent need to evolve along with technology.

## Continuing Education



To earn one AIA learning unit (LU), read "The Future of Practice" (pages 118-140) special section and complete the quiz at [continuingeducation.bnpmmedia.com](http://continuingeducation.bnpmmedia.com)

or by using the Architectural Record CE Center app available in the iTunes Store. Upon passing the test, you will receive a certificate of completion, and your credit will be automatically reported to the AIA. Additional information regarding credit-reporting and continuing-education requirements can be found at [continuingeducation.bnpmmedia.com](http://continuingeducation.bnpmmedia.com).

## Learning Objectives

- 1 Explain the promise and limitations of machine learning as they relate to design and architecture.
- 2 Discuss how architecture firms of various sizes are adapting to and staying ahead of rapid technological change.
- 3 Describe new services and areas of practice that firms are expanding into, beyond the traditional boundaries of architecture.
- 4 Explain how an outcome-based delivery method could improve architectural compensation.

AIA/CES Course #K1806A

# S Small Firms

Practitioners in six studios talk about being hands-on, resourceful, and nimble in order to stay competitive in a fast-evolving field.

BY DEBORAH SNOONIAN GLENN

## DIGSAU

PHILADELPHIA  
FOUNDED IN 2007  
17 EMPLOYEES

## DUST

TUCSON, ARIZONA  
FOUNDED IN 2007  
2 EMPLOYEES

## JENSEN ARCHITECTS

SAN FRANCISCO  
FOUNDED IN 1994  
24 EMPLOYEES

## JGMA

CHICAGO AND MEDELLÍN,  
COLOMBIA  
FOUNDED IN 2010  
22 EMPLOYEES

## MERGE ARCHITECTS

BOSTON  
FOUNDED IN 2003  
16 EMPLOYEES

## nARCHITECTS

NEW YORK CITY  
FOUNDED IN 1999  
10 EMPLOYEES

**CLOSE RELATIONSHIPS** with clients, value-added service, an emphasis on design quality, a collegial work atmosphere—the appeals of small firms have lured many architects into opening up shop. But once you’ve been in business for a while, what does it really feel like? When asked about how the Philadelphia firm **Digsau** establishes fees for clients, a tongue-in-cheek response from one of its four cofounders, Jeff Goldstein, captures the flavor of having a small architecture firm today. “We do our best, based on what we’ve learned from past projects,” he says. “Sometimes we get it right, and we’re glad when that happens. But if any of the other firms you’re talking to have cracked the code on this, let me know.”

Conversations with principals from six firms

across the country, ranging in size from two to just over 20 employees, revealed uncertainties about how to juggle projects and finances while striving to bring in new, meaningful work. But the unease is tempered by satisfaction with their projects, and a deep commitment to good design and its power to transform lives.

Small architectural firms have always dominated the profession. According to the AIA’s 2016 Firm Survey Report, 77.3 percent of firms have nine or fewer employees, representing roughly one-fifth of all architects and bringing in 15.4 percent of all architectural billings. For firms of 10 to 49 people (17.6 percent of all practices), the figures are 32.3 percent and 33.3 percent respectively. Though the stats on small businesses of all types are sobering—



Elizabeth Whittaker of Merge Architects in Boston



Cade Manning Hayes of DUST, in Tucson, Arizona

half of them fail after five years, and 70 percent are kaput by year 10—all six of the firms who spoke to RECORD have stuck it out for eight years or longer, and five weathered the Great Recession. So what helped these firms stay in business? And will the circumstances that boosted them in the past continue to do so in the future?

For Digsau and others, engaging in diverse project types kept them afloat during lean times (they launched in pre-recession 2007). “We always wanted to be working in different building sectors,” says Goldstein, “so we weren’t overly vulnerable in any one area when the recession hit, and we’d hope the same would be true in future downturns.”

So what is it that prompts these designers to take a chance and hang out their shingle in the first place? Personal connections are often one factor. Family and friends of employees gave Elizabeth Whittaker’s Boston practice **Merge Architects** its first townhouse renovations and small retail spaces and cafés when Whittaker opened its doors in 2003. “Through word of mouth, we earned a reputation for delivering high design quality on ridiculously tight budgets, and for using materials in a resourceful, creative way,” she says. Her project mix now includes multifamily housing, large corporate interiors, and university buildings.

Some firms picked up momentum after winning awards or securing a high-profile project. Merge was named a RECORD Design Vanguard in 2014, and then Whittaker herself

won a 2015 Emerging Voices award from the Architectural League of New York; she says “things definitely ticked up” afterward. The New York firm **nARCHITECTS**, also a Design Vanguard—in 2004—had a surge after winning the prestigious Young Architects Program competition the same year to design a seasonal installation at MOMA/PS1, an arts space in Queens. Their project, a bamboo canopy, “be-

came a gateway to many things we’re doing now, like Pierscape, our renovation of the old Navy Pier in Chicago with James Corner Field Operations,” says Eric Bunge, firm principal and cofounder with wife and partner Mimi Hoang.

Engaging with community organizations has helped **Jensen Architects** in San Francisco land such high-profile clients as SFMOMA, for



Jensen Architects on-site in San Francisco



nArchitects in New York (top), Digsau in Philadelphia (above)

whom they designed a rooftop sculpture garden, and IDEO, which tapped the firm to overhaul its San Francisco offices. Founder Mark Jensen has served on many arts boards and commissions in the Bay Area, as have several of his colleagues. “Our interests as architects led us to participate in these efforts, which enabled us to meet wonderful clients who value design as much as we do,” he says.

He and others in the firm also teach at California College of the Arts (CCA), a common way that small-firm practitioners supplement their incomes while expanding their horizons.

For the Chicago firm **JGMA** (Juan Gabriel Moreno Architects), focusing on a particular client base—underserved communities—led to opportunities outside that realm. “There is

such a thirst for high-quality architecture in low-income neighborhoods, and it can lift them up,” says its founder, Juan Gabriel Moreno. After building a new athletic field for Uno Soccer Academy, a high school in a largely Latin neighborhood in southwest Chicago, he got a call from local developer John Buck, who’d been following the project. “Have you ever done a high-rise before?” Buck asked. Moreno told him no. “Good,” Buck said. “I’m going to give you your first one.” Moreno ended up working on schematic design and interiors for Buck’s residential building at 311 Illinois in the River North neighborhood, near the Magnificent Mile.

At the extreme end of small, the two-person firm **DUST** in Tuscon enjoys the freedom to run a practice driven by the master-builder concept. Started by former Texas Tech architecture classmates Cade Manning Hayes and Jesús Edmundo Robles, Jr., the firm has built everything they’ve designed, working closely with local artisans, designers, and craftspeople. The firm’s website showcases just three finished projects—two passive houses and an

**“We can’t always compete on a fee basis with larger firms, but we feel we can deliver a higher level of design and hands-on service,” says Digsau’s Jeff Goldstein.**

outdoor pavilion, all in Arizona—along with smaller-scale work such as furniture and public art. “We see ourselves as an arts-driven practice, and we really don’t think about ‘putting business first,’ so to speak,” says Robles. “If we grow at all, we’d want to do it organically, according to where the work takes us.”

All the firms expressed a similar idea of what they hoped would sustain them: projects that are ambitious in scope and program, and make a positive impact on their occupants and community, with clients who value what the architects bring to the table. “We can’t always compete on a fee basis with larger firms,” says Goldstein, “but we feel we can deliver a higher level of design and hands-on service.” He points to the firm’s new residential hall for Swarthmore College—a cluster of three slate-clad volumes—as a sort of platonic ideal: done for a repeat client who emphasizes sustainability, the project approaches net zero energy use and

successfully mediates an important junction near the campus baseball field and a group of historical buildings. “These are the sorts of projects—and clients—you dream about,” he says.

That said, he and his cohorts know that clients typically tap larger firms for larger projects. Yet small firms are hesitant about the trade-offs of growing bigger and ceding control. “Most of our work is local, and we prefer it that way,” says Jensen. “Our leadership is deeply involved in every project. We’re a very hands-on practice; for a long time, we had just nine or 10 employees. Now we’re at 24 people because of our workload, and I feel as if that’s our fighting weight.” Goldstein believes there’s potential in teaming up with a firm of a similar size and complementary skill sets to pursue projects that larger firms typically win. “Convincing clients it’s cost-effective might be a tough sell, but I’d like to try it out,” he says.

There’s no question that today’s business climate for small firms is far more complex and challenging than in years past. “I’m bracing myself for the next recession,” Whittaker admits. “Housing will take a hit first, and that represents a big chunk of what we’re doing. Even though we’re busy, it all feels extremely fragile.” Jensen says technological innovations have caused a major shift in client expectations. “Tools for drawing, modeling, and communication have proliferated and improved, so clients expect the same level of service from firms of any size,” he says. “That means we have to invest in technology on a regular basis just to remain competitive.”

And money remains a big problem. “Collecting fees has gotten tougher and tougher,” says Moreno. “It’s hard, especially as a young firm, to get enough revolving credit to keep bills paid. Architects have somehow become the bankers for projects. We do all the work in advance, incur expenses of our own, and then need to chase down checks once it’s over. It’s not how I want to be spending my time.” These firms also do too much work for too little money. “Conceptual designs were not a separate deliverable when we started our firm,” says Bunge. “Now we do them for every project and fees don’t accurately reflect the extra work.” Whittaker is pushing back more often on scope creep with clients. “Early on, I lost my shirt on some projects,” she admits. “I can’t do that anymore.” Her fees typically range from 5.5 to 11 percent depending on the program and project type; they can go as high as 15 to 18 percent for smaller projects and residential work. Like people at many firms, she’s moved away from hourly billing toward a fixed-price-plus-expenses model. “With hourly billing, I found that clients would nickel-and-dime every invoice, because they’d question



JGMA (Juan Gabriel Moreno Architects) in Chicago

how long certain tasks should take,” she says. “It was exhausting.”

Though they know they can’t control the economy or where their next clients might come from, these designers also know architectural practice must continue to evolve to remain viable. Getting involved in projects at the earliest planning stages is a critical step. “It used to be that landscape architects got hired last on a project, and now they’re often hired first, because we’re paying more attention to how buildings and land use must work together,” says Jensen. “But if we’re brought on at the end and told ‘put your building here,’ that limits our effectiveness at coming up with creative ways to meet broader program goals.”

Maintaining racial and gender diversity on their staffs is also very much on their minds. “We should reflect the society we live in,” says Bunge. “We have to understand why these inequalities exist in our profession at large, and how they can be rectified.” He also believes engagement in progressive politics is an underappreciated opportunity for small firms, which often work locally and can be more agile than large ones. “The conversations around memorials and historical attractions are shifting to include people whose voices were once

left out,” he says. The state of New York recently tapped nARCHITECTS to design the Equal Rights Heritage Center in Auburn, New York, where Harriet Tubman lived for the last 15 years of her life. Originally envisioned as a simple welcome center, the program has grown to encompass exhibitions about the Underground Railroad, abolition, women’s suffrage, and LGBTQ rights, touting the state’s and Auburn’s roles as leaders in the social-justice movement.

Perhaps the most important survival skill these small-firm leaders have to carry them into the future is a steadfast devotion to their calling, despite its many obstacles and unknowns. “Running a small firm has always been tough, and it’s true that today it’s tougher than ever and harder to know what’s around the corner,” says Jensen. “But we have a lot of great work with great clients who appreciate what we bring to them. And I’m still happy to come to work every day. As long as that’s true, I’ll keep on doing this.” ■

*A former senior editor for both ARCHITECTURAL RECORD and This Old House, Deborah Snoonian Glenn lives in Los Angeles and writes about design and other topics.*

# M Medium Firms

Midsize, design-oriented firms straddle a fine line between smaller, scrappier studios and large corporate offices, often competing against both.

BY JOSEPHINE MINUTILLO

## DILLER SCOFIDIO + RENFRO

NEW YORK  
FOUNDED IN 1981  
100 EMPLOYEES

## MICHAEL MALTZAN ARCHITECTURE

LOS ANGELES  
FOUNDED IN 1995  
30 EMPLOYEES

## NADAAA

BOSTON  
FOUNDED IN 2011  
25 EMPLOYEES

## SELLDORF ARCHITECTS

NEW YORK  
FOUNDED IN 1988  
70 EMPLOYEES

## VALERIO DEWALT TRAIN

CHICAGO + OTHER LOCATIONS  
FOUNDED IN 1994  
82 EMPLOYEES

IT'S NOT ALWAYS clear when to make a leap. "The hardest period for us was when the office had 25 people," says Sara Lopergolo, a partner in the now 70-person New York-based firm **Selldorf Architects**, whose early work on art galleries and residences has led to larger museum projects and apartment towers. "That was the moment we realized we needed to put systems in place to grow, recognizing that we needed to hire for specific roles, upgrade technology, and reorganize the office structure to allow expansion." Transitioning from a small studio to a midsize firm often entails an exponential increase in overhead—in some cases supporting multiple locations. But it also brings more opportunities, including projects that are larger and more complex, even global.

A midsize firm is like the middle child, competing both with large corporate firms and the wealth of assets available to them, and small offices that can be nimble and may produce the same amount

of work on a shoestring budget. In fact, midsize firms are hard to sustain: in recent years, more and more of them have been swallowed up by behemoths like Perkins + Will (which snapped up Texas-based interiors firm lauckgroup and the much larger Danish firm Schmidt Hammer Lassen just



Diller Scofidio + Renfro's New York office (above) and its partners (from left to right), Elizabeth Diller, Charles Renfro, Benjamin Gilmer, and Ricardo Scofidio (top)

since the start of 2018). But despite the challenges, many principals will tell you that their “magic number” falls somewhere in that middle ground between 20 and 100 people, even though less than 10 percent of all American firms are that size. “Seventy feels like a good number for us,” says Annabelle Selldorf, founder of her eponymous firm. “The studio-like environment makes it possible for me to still be involved in all the projects with the four partners. And we can get the whole office together in the conference room. That might seem minor, but it is important in having a good spirit in the office, where people can really get to know one another.”

At 30 people, Los Angeles-based **Michael Maltzan Architecture** is working on residen-

tial, commercial, cultural, and institutional projects at various scales across the globe, but the founding principal feels that midsize crunch. “We compete against a very wide range of firms,” says Maltzan, noting that he’s been on short lists and walk-throughs with large corporate firms. “It’s surprising, because they come with a whole different culture and depth of resources,” he says, “and you’ll also see very small, emerging firms, at times.” That didn’t used to be the case, according to Maltzan, but it shifted significantly during the Great Recession. “You can’t put too bright a line under how much the recession—in sometimes very dramatic and sometimes subtle ways—changed the structure of the profession.”

The AIA’s 2016 Firm Survey Report says that,



**NADAAA team members (left) and founder Nader Tehrani in the Boston office (above)**

in terms of revenue, U.S. architecture firms made a nearly full recovery from the recession. But many architects say that fees have not rebounded to their pre-2008 levels and that clients increasingly expect more—and aren’t always willing to pay for it. “We never included designs for RFQs,” says Lopergolo, “but now many of them require it.” Joe Valerio of the 82-person Chicago-based firm **Valerio Dewalt Train**, which works frequently with the tech industry, points to other changes in the RFQ and interview process. “They not only want to know who on your staff will be working on a project and how many hours they will be spending on it, they want to see those people’s résumés.”

Competitions, on the other hand, have almost always been a losing financial proposition for firms, which can spend as much as 10 times what they receive as a fee (if there is one) for a short-listed competition, with only a small chance of winning. But when it works out, it can make all the difference. To weather the recession, Nader Tehrani took a gamble, entering his firm, then Office dA, in 14 competitions and RFQs in 2008, coming away with three wins—the Melbourne School of Design, the Hinman Building at Georgia Tech, and the Daniels Faculty at the University of Toronto—a trio of architecture schools his 25-person Boston-based firm **NADAAA** has recently completed.

Similarly, back in late 2009 and early 2010, when most studios were struggling to survive, New York-based **Diller Scofidio + Renfro** (DS+R)—an interdisciplinary practice that



had only completed one major building, the Institute of Contemporary Art in Boston—won six competitions in a row, including the Broad Museum in Los Angeles, the Museum of Image and Sound in Rio de Janeiro, and the Vagelos Center at Columbia University in New York. In one year, the office grew from 40 to 80 people—it is now at about 100 and continues to enter many competitions. “Maybe we were just lucky, but I think there’s a double reason,” says DS+R partner Ben Gilmartin. “We’re a highly specialized practice. Our business model isn’t based on cranking out the same thing over and over again. It’s a model that is very hard to sustain today because so many things can be automated. Contractors can take over a lot of that work without even needing architects to participate. But in many other ways, there’s a shrinking of our market. Being in a space where you have the privilege to do pretty distinct, one-off projects that are highly creative, we’ve been able to increase our agency.” And their visibility.

Underscoring the value architects bring to a project has become ever more important, given tightening purse strings and evolving technologies. “I think the recession made everybody sit up and say, ‘What do we need to do to increase the value that we provide?’” says Valerio. “An architect always believes that, whatever the question is, design is the answer. But do we really understand the question?”

To succeed and thrive, architects are expanding their services, responding to the needs of clients to help solve complex problems. “We’re seeing large-scale developers turning toward architecture to help them work through the development business model,” says Maltzan, who from early in his career

took up a community-liaison/developer role for many of the low-cost housing projects he’s completed. “Lately we’ve been asked to help developers plan the programming and start to strategize an approach to getting land entitlements. Architects are working more in the space of urban planning and urban design. There’s less of a distinction between architecture and landscape and planning than there might have been years ago.”

When it comes to complicated projects, architects are often the glue. “My biggest power is when I go into a meeting filled with consultants, engineers, planners, this and that, and everybody brings expertise to the table, none of whom can paint a picture that’s larger than the sum of what they know,” says Tehrani, who juggles his practice with his role as dean at the Cooper Union School of Architecture in New York. “As architects, we conceptualize something that is a bridge between them.”

Finding senior architects with that kind of expertise, however, is a common struggle for midsize firms: some left the profession after the recession; others are less willing today to risk a stable position at a large firm for a new, less certain one. “During the height of the last building boom, when people were doing really big projects, firms couldn’t hire fast enough,” explains Katherine Faulkner, a founding principal of NADAAA with Tehrani, who admits to turning down work rather than hiring too quickly. “That became a real problem, because there were very good people that you would bring in, but you just can’t expect them to know all your standards and how you work. Even a very senior person would need time to join in.” Though Faulkner has taken a slow

approach to growth, she would eventually like to see the office reach 50.

For a variety of reasons, it can make sense for a small to midsize firm to partner with a larger one on a big project. “If you’re doing a performing-arts center, and there’s a firm that has done many of those, you stand to benefit so much from their intelligence,” says Tehrani. “We’re working with DLR right now. That collaboration is something that catapults you into the stratosphere.”

Though Maltzan’s firm will often be the design architect and architect of record, it too collaborates with bigger firms. “If we were doing full service on all the projects that we were doing, the office would probably be twice the size,” he admits. For instance, the firm just finished the Brickyard, a two-building office complex in Los Angeles for Tishman Speyer, and the executive architect was Gensler. “They have a long relationship with Tishman Speyer on commercial buildings, so that made a certain amount of sense.”

With the challenges for midsize firms come advantages, besides the obvious one of maintaining an intimate, or at least informal, office culture. “The office needs to be at this scale to legitimately take on larger, more public institutional projects,” says Maltzan, whose staff size rebounded to its pre-recession level in recent years. Those types of projects tend to be more profitable. Private residential work—the bread and butter of many smaller practices—can sometimes be a drain on resources. “If you’re designing a house, and you’re charging 20 percent, it’s probably not enough, because the clients will ask you for endless handholding, revisions, and oversight that will cost you 30 percent to do,” explains Tehrani. “If you’re doing a tower with repetitive units and relatively little variation, you stand to get a lot of profits just from the bulk, even if the stakes are bigger.”

When asked where they see architecture heading, these architects are both hopeful and cynical at the same time. “I think the future of the profession and the way that we practice is an enormous question mark,” says Maltzan. “But I don’t think the discipline of architecture has ever been more valuable than it is today. What architecture, in its broadest definition, can bring—the type of intelligence, of historical knowledge, of creative ability, and of critical thinking that the discipline has at its core—I think is more powerful than ever.” Despite economic and technological pressures, midsize, design-oriented firms like these believe they are uniquely positioned to translate this expanding influence of architecture into practice. ■



Joe Valerio of Valerio Dewalt Train in his Chicago office



# L Large Firms

As technology streamlines the design and drawing-production process, large practices grapple with antiquated business models and fee structures.

BY MARTIN C. PEDERSEN

## ENNEAD (FORMERLY POLSHEK PARTNERSHIP)

NEW YORK  
FOUNDED IN 1963  
190 EMPLOYEES

## GOULD EVANS

KANSAS CITY, MISSOURI +  
OTHER LOCATIONS  
FOUNDED IN 1974  
153 EMPLOYEES

## KPF

NEW YORK + OTHER LOCATIONS  
FOUNDED IN 1976  
558 EMPLOYEES

## MARMOL RADZINER

LOS ANGELES  
FOUNDED IN 1989  
220 EMPLOYEES

## MITHUN

SEATTLE AND SAN FRANCISCO  
FOUNDED IN 1949  
159 EMPLOYEES

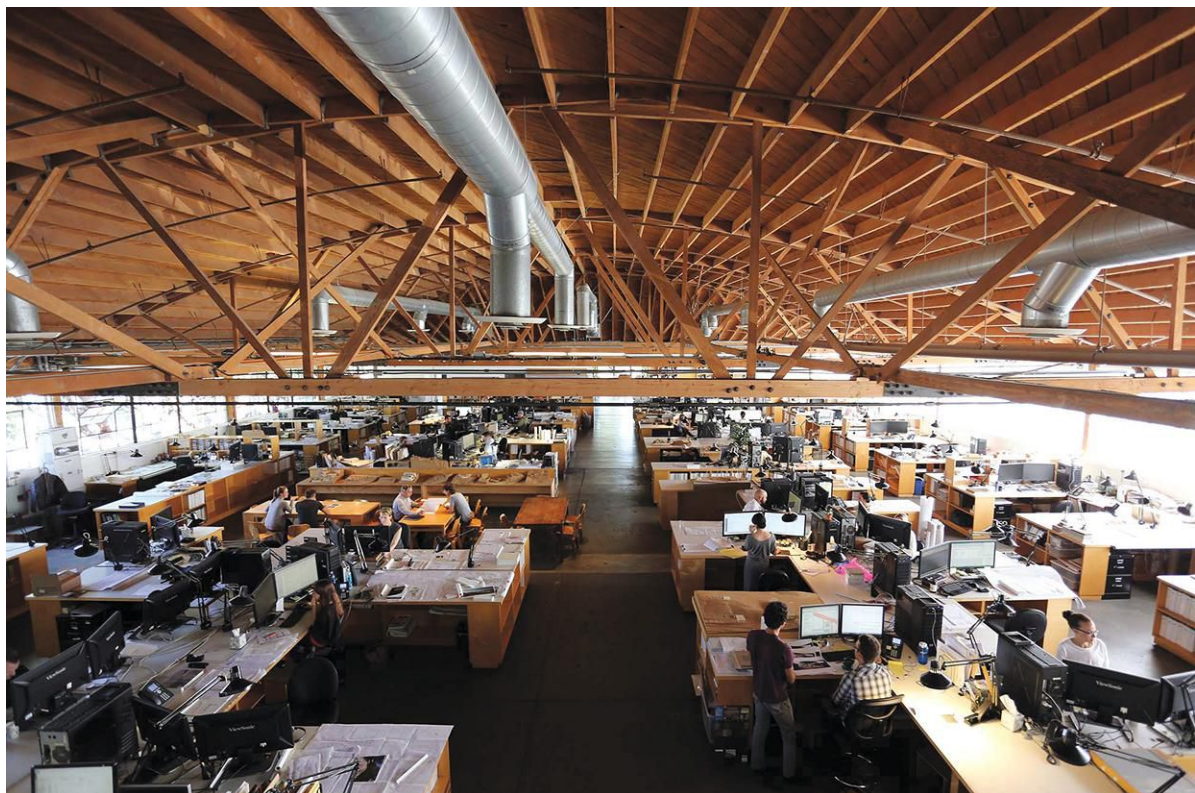
## PAGE

WASHINGTON, D.C. +  
OTHER LOCATIONS  
FOUNDED IN 1898  
479 EMPLOYEES

IN HIS 2005 BOOK on globalization, Thomas Friedman famously declared the world flat. For many large firms, the author's theory was already fact then, and it may be even more relevant now. Clients today have access to virtually any firm in the world; with the proper resources, any firm can work anywhere. As a result, the world feels undeniably small. "We all find that everybody is everywhere nowadays," says Richard Olcott, a partner at **Ennead**, a 190-person firm with offices in New York and Shanghai. "You can be in Kansas somewhere, turn around, and Norman Foster is standing right behind you. Everywhere we go, we see a lot of the same faces."

For large firms (those with 100 to 600 employees), it's a world of promise, opportunity, and

uncertainty. A strong global economy and the ability to access it have been countered by fierce competition, low fees, and shifting business models, as the evolution of digital technology reshapes the entire profession. Firms with high head counts and deep pools of talent are ripe for creative reinvention, but vulnerable as well. "I'd put the 100-to-200-person firm in the high-risk category right now," says Frank Stasiowski, president of PSMJ Resources, a management-consulting firm serving the architecture and engineering (A&E) industry. "We're busier than ever with mergers and acquisitions in that range," he says. "The big, publicly traded firms such as Stantec, AECOM, and Jacobs need access to design resources and markets, so they're buying them, and they tell us they don't



Marmol Radziner's office in a former movie-production studio in West Los Angeles

want to talk to anybody less than 100 people.”

And digital technology, of course, keeps advancing. BIM has been revolutionary, but its current capabilities will look quaint in no time. The Virtual Reality goggles increasingly employed to dazzle clients may, before long, look like the clunky portable phones of the pre-Steve Jobs era (surely something seamless, immersive, and goggle-free awaits us in the not-so-distant future). “In terms of technology, we’re probably in the first inning of a 10-inning game,” as Stasiowski puts it.

Still, BIM and rapidly improving simulation and visualization tools allow more design work to happen at the front end of projects, with multiple iterations and explorations the new norm. “We’re working on what will be the tallest office building in Austin [Texas] right now,” says Laurence Speck, a senior principal at **Page**, a 479-person A&E firm with six offices in the U.S. and one in Dubai, “and the clients—because we can show them—want to see every single corner of their building rendered.” These enhanced views, however, come with some risk. “Expectations get higher and higher,” Olcott says. “But you have to be really careful to make sure you get paid for that stuff.”

Getting fairly paid has never been easy. But two events in the recent past—one specific, the other ongoing—have placed even more financial pressure on firms of all sizes. The first was



The KPF team on-site at the firm’s 10 Hudson Yards tower in New York

the Great Recession, which saw business crater, firms close, and fees drop precipitously. Sadly, the aftereffects of that upheaval are still being felt. “Fees really haven’t rebounded since the recession,” Speck says. “They’re still incredibly low and competitive, especially in market sectors like higher education.”

At the same time, the tech revolution’s efficiencies can be a double-edged sword: they miraculously streamline the process but have begun eroding one of the once-lucrative tasks of the architecture office: construction drawings (CDs). “The traditional models for how fees are generated don’t really correspond to the current processes,” says Brendan Connolly, a partner at **Mithun**, a 159-person firm with offices in Seattle and San Francisco. “With these BIM tools, there’s a much heavier front-end concentration of design time and thinking, so we’re often in a pressured situation, early on, to get a lot done with less fee that we need to, quote unquote, ‘make up at the end.’”

Indeed, despite changes in the delivery process, many firms have not significantly altered their fee structures. “This industry hasn’t yet had its Uber moment,” says Tony Rohr, national managing partner of **Gould Evans**, a 153-person firm headquartered in Kansas City, Missouri, with offices in San Francisco, Phoenix, New Orleans, and Lawrence, Kansas. Today, 200 options for the design of a 75,000-square-foot science lab can be explored overnight by setting up an algorithm. And more automation—especially with the emergence of AI—is on the horizon. “Does anybody think we’re done?” asks Rohr. “I don’t want to be the firm that boasts, ‘We do the best CDs in the world.’ That’s a road to nowhere, man.”

The loss of billable hours dedicated to the creation of CDs—which is somewhat analogous to the newspaper industry’s losing classified ads—appears inevitable, and will require a



KPF’s New York office, with a model of a tower in Seoul in the foreground



Mithun's rowing team on Seattle's Lake Union

major rethinking of the traditional business model (see page 133). **Marmol Radziner**, the Los Angeles-based design-build firm, offers one alternative. Founded in 1989, with 220 employees today, it has practiced nontraditionally for nearly its entire existence. Because the firm initially lacked access to high-quality contractors, it began building its projects.

Over time, that activity has morphed into a multitude of services and revenue streams: architecture (mostly residential); construction (other projects as well as their own); landscape; interiors (including workplace and hospitality); fabrication (the firm employs 45 people in a 17,000-square-foot shop); furniture; jewelry; and, most recently, real-estate development. From both an economic and aesthetic perspective, design-build is the ultimate win-win. Firms get paid as contractors to control the process—and the quality—of the work. “However, I wouldn’t say every architect should do it,” says firm cofounder Leo Marmol. “Many architects don’t want to suffer the drudgery, stress, and pain of being a builder. But we feel we’re better architects because we build.”

While it has no plans to abandon the core business of architecture, Gould Evans is more than willing to expand the definition of what

constitutes the firm’s services. A decade ago, the office launched Canary, a now-profitable graphic design and branding consultancy. It has begun soliciting and funding start-up ideas pitched by employees, including web-based tools for property management and continuing education. “We looked at ourselves and said, ‘OK—if, down the road, we’re not doing construction drawings, then what is the value of what we do?’” says Trudi Hummel, principal and board chair of Gould Evans. “It’s in the front end—the design thinking, the engagement with clients, the identification, and then the solving of, business issues and problems upstream in the process.” Other entrepreneurial initiatives and new fees based on construction efficiencies and building performance will be needed, since the squeeze on traditional billing is likely to continue.

Large firms do possess a number of advantages inherent in size: the capacity to conduct original (and potentially lucrative) research into the development of building products and digital tools; wide expertise; vast portfolios of previous work; healthy marketing budgets; global contacts; and pockets deep enough to accept lower fees in hopes of entering new markets. But, inside the design studio, the

world is flatter. “Almost any size firm can be an international firm,” says James von Klemperer, president and design principal of **KPF**, a 558-person firm with offices in New York, London, Shanghai, Hong Kong, Seoul, and Abu Dhabi.

The reverse is also true. Big firms—which are essentially dozens of small and constantly morphing teams operating under a single umbrella—can be every bit as nimble as small ones. To that end, KPF has a “war room” in its New York office, papered from floor to ceiling with spreadsheets, dedicated solely to pairing available and appropriate talent to projects worldwide. It’s part art, part science. “If you want to design an airport with a \$20 billion budget, you can’t do it by being an atelier of bohemian architects,” von Klemperer says. “You have to cross that, hybridize it, with people who believe in marching orders and charts. It’s both sides of the brain. But without the bohemian side, you just can’t do the most interesting work.”

One of the greatest challenges vexing big firms is diversity. Large practices can no longer hide behind a curtain of mystery about how they hire and promote: the issue is central to a new generation of architects, is vital to recruiting—and is becoming an important touchstone for many clients. “We now get questions in project interviews, ‘What’s your firm policy on diversity?’” says Anne Torney, a partner at Mithun. “What does your leadership look like?” Among the six firms explored in this article, Mithun stands out on approaching gender equity: 44 percent of their partners and principals are women. KPF recently doubled the number of women directors (now six, out of 30 total), but all seven senior partners at Page are men. Like any good-sized company, each of these firms have formal sexual-harassment policies in place, though many women who work in those offices would probably agree that deeply embedded sexism is harder to address without changes in the culture and greater equity in leadership.

Even more difficult to address, however, is racial diversity and the alarming absence of African Americans in the profession. (The Directory of African American Architects currently lists just 2,200 licensed architects in its database.) “You can say you want diversity all you want,” Speck says, “but I chaired a search committee at the University of Texas School of Architecture for a technology position. We did an extensive search, including some minority organizations: we got zero African American architects, out of 80 applicants.”

Without more aggressive efforts to remedy the inequalities in the profession, large firms



Ennead's Richard Olcott (right) and colleagues discussing the design of a concert hall

will increasingly seem out of step. But all of these challenges—a reliance on construction documents for profits, hourly or lump-sum payments, diversity, even firm size as a determining factor for jobs—are all holdovers from the last century. Stasiowski, who is currently working on a book about the state of the profession in the year 2030, predicts that the large-firm business model “will be subject to all kinds of gyrations in the next 10 to 15 years,” but that new ways forward will be forged. “The younger professionals—who grew up in the digital age and are now burdened by this antique, time-card mentality—are going to be the ones who break out of the larger firms and create new ways to do business.” ■

*Martin C. Pedersen runs the architecture and design website Common Edge ([commonedge.org](http://commonedge.org)). He lives in New Orleans.*



Marmol Radziner's fabrication shop in El Segundo, California

# XL Extra-Large Firms

Three mega-offices, with their distinct histories, reveal strategies for addressing problems looming for the profession.

BY LAURA RASKIN

## GENSLER

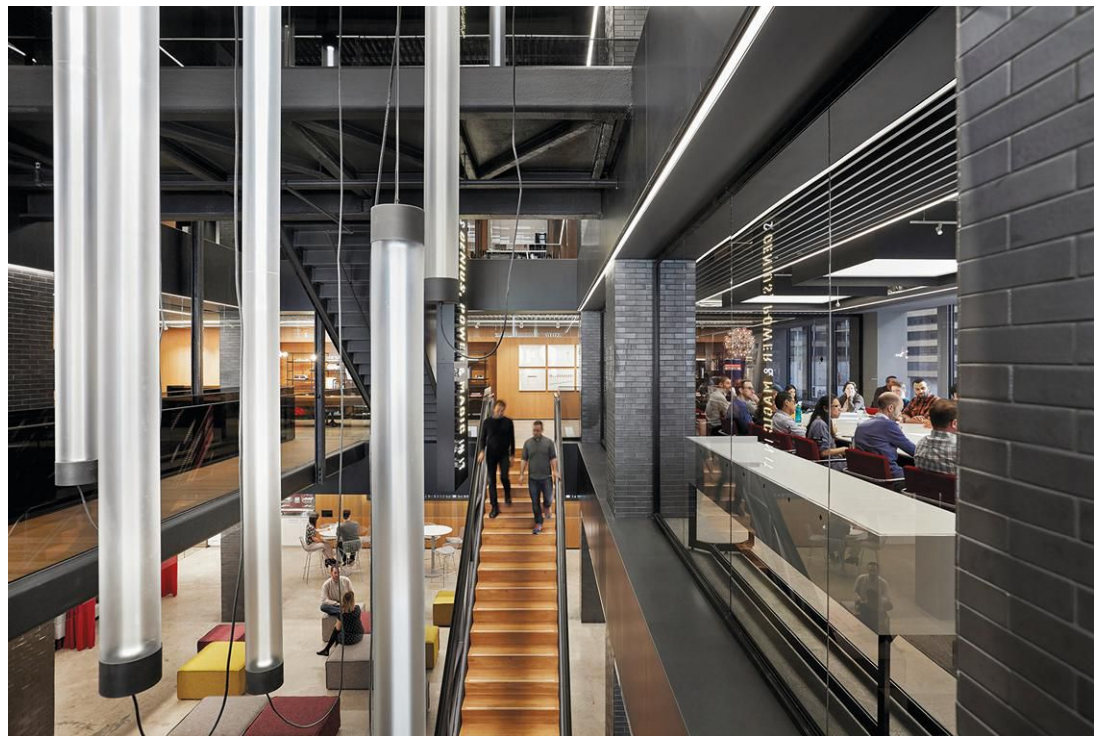
SAN FRANCISCO +  
OTHER LOCATIONS  
FOUNDED IN 1965  
5,500+ EMPLOYEES

## HDR

OMAHA, NEBRASKA +  
OTHER LOCATIONS  
FOUNDED IN 1917  
9,600+ EMPLOYEES

## PERKINS + WILL

CHICAGO + OTHER LOCATIONS  
FOUNDED IN 1935  
2,200 EMPLOYEES



Gensler's New York offices, with internal stairs for multiple levels

**THINK OF THE CONDITIONS** in the world today: aging infrastructure and an urgent need for housing across the globe; a warming planet and exponential natural disasters that leave communities to pick up the pieces; a construction industry that, according to a 2017 McKinsey Global Institute report, has evolved at a glacial pace, despite being one of the largest economic sectors. Rapidly changing technology. Terrorism. And, overall, a globalizing economy. Because of their size and reach, extra-large architecture firms—for the sake of this investigation, let's say those with 1,000 employees or more—are perhaps best equipped to tackle these daunting challenges. As Lance K. Josal, CEO of CallisonRTKL, wrote for a Design Intelligence blog post in 2017, "Who better to deal with these topics than a professional trained in life-safety, resiliency, and design on a global scale?"

These themes were repeated in recent interviews with CEOs at three of the largest U.S. firms: **Perkins + Will** (P+W) continues to acquire other firms (three in the last 12 months) to provide a one-stop design shop, and the company runs its own rigorous research arm; **Gensler**, founded in 1965 and credited with advancing the practice of architecturally oriented interior design, is building bigger and bigger, having completed the Shanghai Tower in 2017, China's tallest building; and 100-year-old employee-owned **HDR** continues to saturate such seemingly disparate markets as workplace and health care, while getting design recognition along the way.

To continue to be successful, practitioners at these firms say they must embrace diversity in their workforce as well as their work product; act locally, regionally, and globally; and offer "full service," from graphic design to urban planning. There is



Perkins + Will's Minneapolis office in the IDS Center

pressure to complete projects in a range of scales and markets with speed and agility, and at a low cost—while simultaneously producing quality design that can compete with a boutique firm's specialized aesthetic.

### Growth and Globalization

"Size is never something we think about," says Phil Harrison, CEO of P+W. "It's a result, not a strategic goal." Instead, a desire to work for "best-in-class clients" in a globally integrated marketplace will continue to motivate the firm's expansion plans. The firm's test for adding an office or acquiring another firm is: Can they serve their clients better by being more geographically diversified or offering more services? If they are expanding, is there a good pool of talent in that area? Typically, the firm wants its offices in metropolitan areas with more than 5 million people.

In January, P+W acquired the 170-person Copenhagen-based firm Schmidt Hammer Lassen Architects—a move inspired by a post-Brexit world and the need to have mainland European offices in addition to its London one, as well as the desire to tap into Scandinavia's design talent. But, driven by a different strategy, P+W merged last October with Denver's Sink Combs Dethlefs in order to expand its wellness, sports, and recreation practice—a now "booming" market, according to a 2017 report, as the wellness industry is "reaching beyond its (narrowing) association with wealthy elites."

HDR CEO Doug Wignall has seen his firm's

growth skyrocket abroad in the last decade. About six years ago, HDR decided to diversify outside the U.S., using a similar formula to P+W's: a new office should be located in a country with robust GDP growth, a strong banking system, and a history of ethical means of doing business. "The world then becomes very small," says Wignall. About 60 percent of HDR's growth has been achieved through acquisition. The firm has eight offices in Germany alone, six of them acquired by buying TMK Architekten in 2013. HDR has also established outposts in Australia and Canada. Six years ago, 3 percent of HDR staff and 5 percent of the work was overseas; now that ratio is 35 percent and 40 percent.

But when is *big* big enough—or too big? "There is a point where you move into as many markets as deeply as you can. We're not there yet," says Wignall. "We are starting to compete in building types that aren't institutionally based, including retail, corporate, hospitality, aviation, etcetera. But to do that, we'll have to acquire that expertise."

Gensler, the global architecture and planning firm with 45 offices in 14 countries, was founded by M. Arthur Gensler, Jr. "by happenstance . . . with no grand plan," he says, recalling the time Alcoa asked him, then 28 years old, to do its interiors while he was at Wurster Bernardi Emmons. (At 83, he still goes into the San Francisco office every day.) Gensler has held the title of largest U.S. architecture firm for six years, with more than \$1.19 billion in revenue in 2017. The practice

works in roughly 30 sectors, from aviation to brand design. It will not venture into design-build or acquisitions, however, says Gensler. "We're a private company, and we don't buy firms." Firm co-CEO Diane Hoskins echoes P+W's Harrison when she says, "We've never had a goal of being a certain size." As the world continues to urbanize, "clients and communities want us to help them think about their future." Gensler has started an innovation-and-research consultancy, and its statisticians, data analysts, and other non-architect scholars are leading its focus, says Hoskins, on everything from the future of education to how fuel cells can be deployed in buildings as a sustainability measure. The self-funded program is not paid for by clients, except in certain instances.

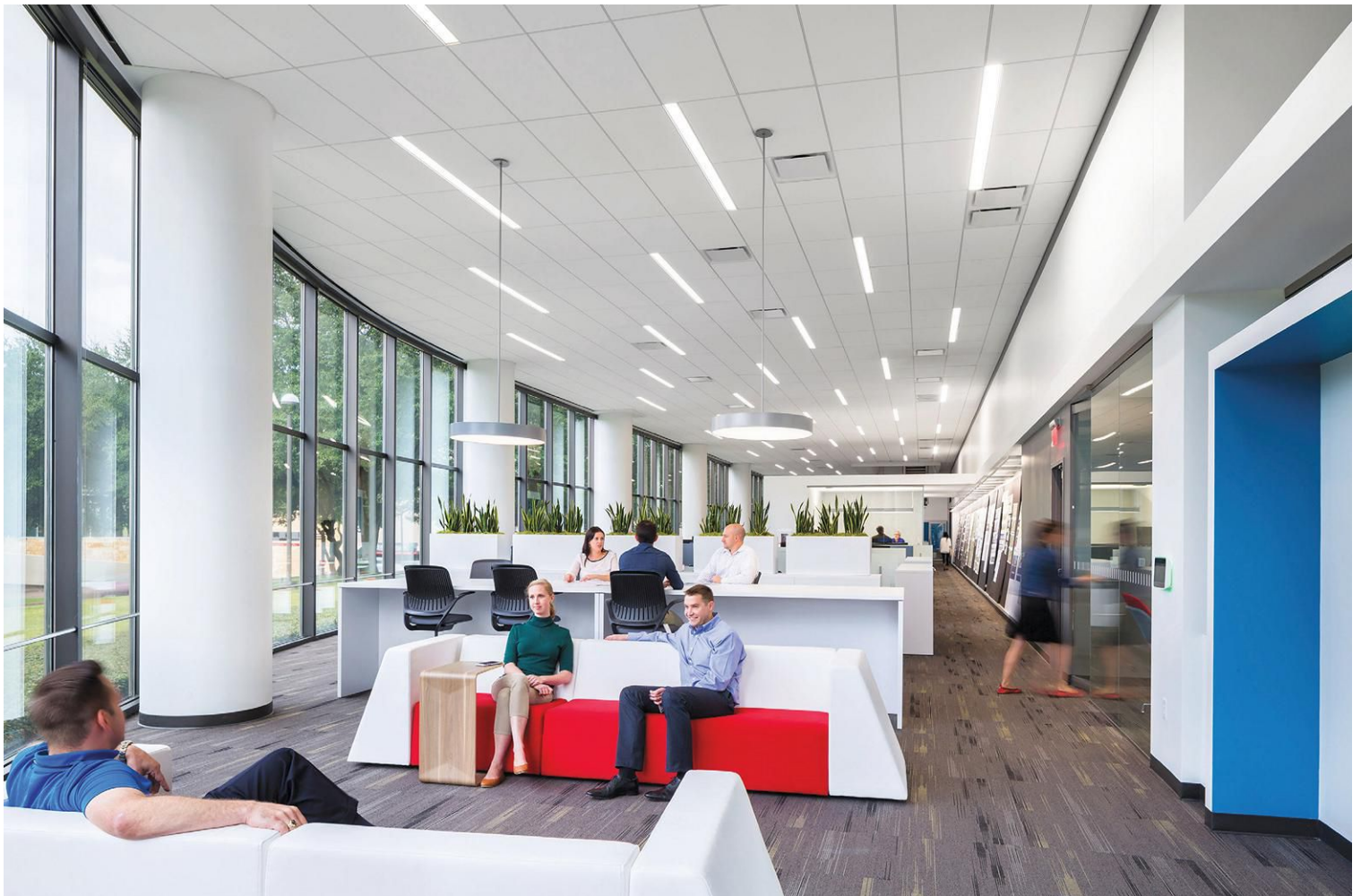
### Agility Matters

All three CEOs say that, aside from wanting to penetrate new markets, the growth of their firms is a result of a desire to be local and embedded in the communities and cultures where their clients are. Says P+W's Harrison, "We are striving to be the largest small firm possible. We want to have a culture, a decision-making structure, and a leadership distribution that feels like a small firm, so you don't have to go up a big, bureaucratic chain of command and can take action right away." As he puts it, if you go to a meeting with 200 people, it's not a meeting. Technological tools and social networks within the firm provide the research on certain subjects, such as

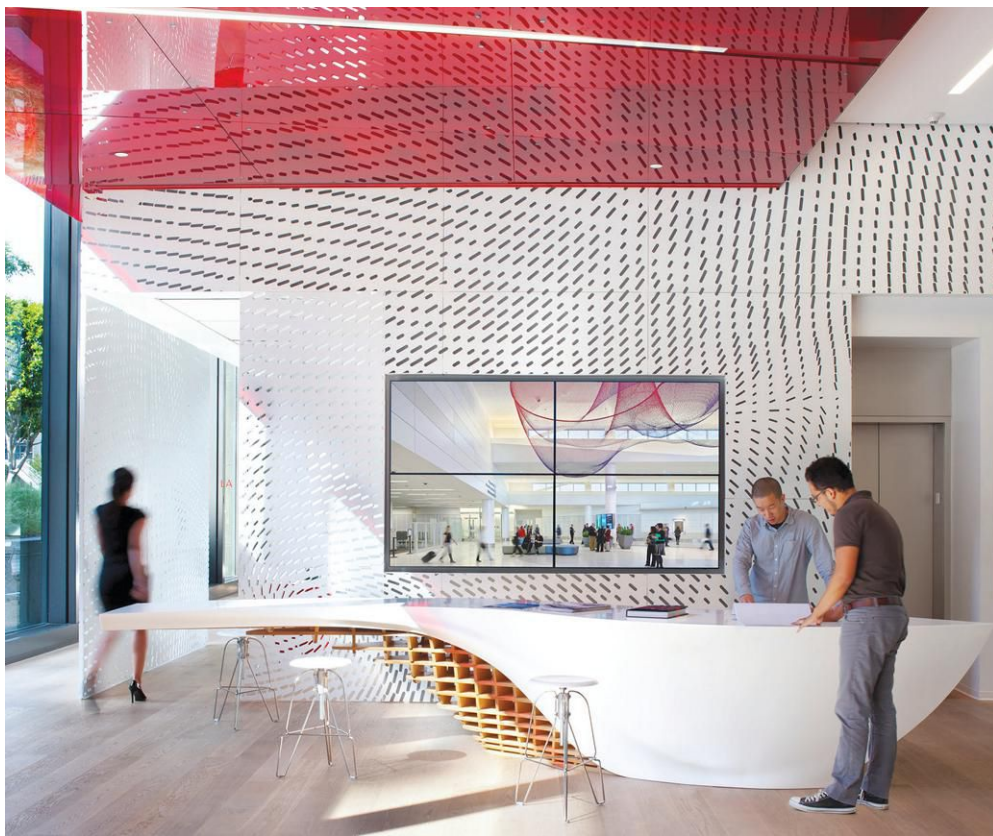
health care or resiliency, which is dispersed to new projects that come up. For each design endeavor, a custom team is gathered.

### Collecting Data

Like Gensler, HDR is investing heavily in predictive analysis. “We’re finally getting to the point where there’s enough data available that you can organize and manipulate it and make predictions,” says Wignall. “We’re hearing all about that now with Facebook. You can do the same thing with building data.” With the erosion of the classic design and construction-document model, and the commoditization of the “back end” of construction, he believes HDR should focus on what architects do best—design—and then augment that with technology. Through parametric modeling, HDR’s data analysts attempt to predict how a building’s design will affect their client’s outcomes, operationally and financially. “It’s a really compelling story for the owner, and it’s making our design process better and better.” According to Wignall, the resulting design is



HDR'S Princeton office with VR equipment (top) and the firm's Dallas office (above)



Gensler's Los Angeles office

enhanced because architects can spend more time on aesthetics. The fees for this service are included as a “base offering,” he adds, with exceptions for extensive analysis.

### Diversity, Staff Equity, and #MeToo

When P+W turned 75 in 2010, one of its 25-year goals was to achieve global diversity, which the firm defined in terms of gender, race, ethnicity, geography, and skill sets. “We thought, We’re going to move the needle slowly,” says Harrison, “but in the last three years, we’ve realized it’s an immediate, urgent goal.” P+W has also been implementing procedures to ensure salary equity and is planning to publish the results soon.

Wignall reports that employee-owned HDR’s most recent five-year plan is focused on staff development rather than on finance goals. He’s aware that young designers, who have greater technological skills, have less patience for the plateaus of traditional career development and have far less allegiance to any single employer. The business, tech, and hospitality worlds thrive on workers who see themselves as free agents and who can practice their craft from anywhere, including their apartments. To counter this, Wignall says HDR allows staff to do independent research, and underwrites employees’ involvement in vari-

ous professional organizations.

At Gensler, the staff is 54 percent women, and the firm has always had women in leadership roles, says Hoskins. (Given Gensler’s history and practice in interior design—a field with 66 percent women, according to a 2017 study by *Interior Design* magazine—that statistic isn’t so surprising.) Hoskins, who is African American, says that diversity at Gensler is almost a matter of course.

In the male-dominated worlds of architecture and construction, and an atmosphere that has historically glorified late nights in studios and hero-worship of its mostly white, male auteurs, it is not surprising that #MeToo has begun to crack open the issue of sexual harassment in the profession. Manhattan-based employment attorney Mark Ottinger says that two of the strongest ways in which firms can protect staff and send a no-tolerance message is by doing away with confidentiality agreements in harassment settlements and ending arbitration agreements, which many employees often sign when hired without realizing it. These require disputes with the firm to take place behind closed doors. Neither P+W nor HDR make their employees sign either kind of agreement. Gensler’s Hoskins says only, “Every issue, person, and situation is unique, and

everyone deserves to be treated fairly. That’s the bottom-line view—fairness.”

### Costs and Value

Firms are seeing rapid change in almost every aspect of practice—except in fees, according to P+W’s Harrison. “Fees change slowly, and the basic methodologies that we use to come up with fees change slowly,” he says. “A lot is still based on construction cost, square footage, time, and materials of actual effort.”

From Wignall’s perspective, fee structures are changing more quickly. Instead of project fees being based on a percentage of construction costs, he says that the majority of the firm’s work is billed on an alternative delivery model—a term for projects that don’t fall under the traditional design-bid-build rubric, including integrated project delivery (IPD), public-private partnerships (P3), and multiple variations on design-build work.

Gensler’s Hoskins agrees, adding that the firm typically follows a value-based compensation model, where a base fee is charged, and compensation is added as design teams hit certain building-performance targets.

### Architects as Thought Leaders

If architects are going to take the lead in addressing the challenges of our time—and are going to avoid being marginalized by Silicon Valley start-ups that are pushing into the design and construction sector—“we have to get out of the office and see what is happening in our cities,” says Hoskins. She notes that climate change and the fact that buildings contribute such a big percentage of the CO<sub>2</sub> on the planet need to be addressed: “At Gensler, we have a strategy to ensure every project is moving towards a carbon-neutral model.” Architects must also help communities build contextual, smart cities—one reason why Hoskins sees Gensler’s 45 individual offices as so important. In Los Angeles, for example, where homelessness rose 23 percent from 2016 to 2017, the local office designed a prefab permanent supportive-housing prototype that it hopes to help implement.

Harrison says that it’s time for architecture to be aspirational and broaden its mission in an increasingly urbanized world. Designers need to create change—to have an impact on “tertiary” sectors: health, quality of life, education, social equity, mobility. He adds that architects need to assume a much broader role as designers, taking a page from their polymath Renaissance forebears. If these firms continue on the paths they are pursuing now, there is hope for a new golden age. ■

*Laura Raskin, a former editor at RECORD based in Brooklyn, New York, writes about architecture.*



# Show Me the Money

Architects must change the profession’s value proposition and find new ways to do business.

BY PHIL BERNSTEIN

A RECENT headline in Britain’s tabloid *Express* read, “Construction jobs BOOM: Bricklayers and plasterers earn MORE than architects.” It seems that skilled construction workers in the UK are at the front of the pay line, with architects bringing up the rear. Ouch. But architects reading this headline on either side of the Atlantic are hardly surprised.

There’s an oft-repeated trope in our profession that we’re underappreciated, losing ground to specialists, and under the thumb of contractors. Most architects have their own version of these complaints, but, unfortunately, they reflect the reality of the essential value proposition of architecture as a profession. Despite the relative strength of the current economy, architects are still paid far less than comparable professionals of equal education and import, and we create value through outmoded delivery systems where the client’s first—and often most important—priority is getting the lowest fee from the architect. When your price is driving selection, you’re a commodity.

Let’s examine the economic dynamics of this syndrome, and then I would like to challenge the current methods of value creation and propose a new business model for architects.

## Why the Value of Architectural Services Is Depressed

First, some economic basics: according to AIA statistics, American architects are responsible for designing about \$600 billion worth of buildings each year, for which they are paid approximately \$29 billion in fees, or about 4.8 percent of construction value. Those fees are largely paid as a commodity, mostly as lump sums or versions of a fixed fee (like percentage of construction). But real value is rarely reflected when compensation is a commodity, and that is hurting the overall economics of the profession.

Other professions have much better value propositions, and that shows up in their paychecks. There are about 110,000 licensed architects in the U.S. and about 126,000 billable positions in U.S. firms. Compared to the 950,000 practicing physicians and 1.33 million lawyers, we’re a pretty rare resource. Nonetheless, the salaries of architects—as a proxy for how well we convert our value in the marketplace of building—are depressed, and that’s depressing.

At Yale, where I teach, three of the professional schools accredited for licensure (Law, Architecture, and Medicine) make for an interesting



comparison of starting and early-career salaries for graduates, who presumably are in high demand and able to command paychecks at the high end of the spectrum:

PROFESSION	STARTING SALARY	6-10 YEARS OUT
Architecture	53,900-65,000	137,060-157,360
Medicine	53,000-62,000	267,500-489,000
Law	110,000-180,000	271,950-391,300

The architecture profession today is far leaner and meaner than its pre-crisis state in 2009, likely due to new technology. Net revenues of American firms have largely recovered from the dip, having returned to their 2008 peak by 2015. But firm staffing has decreased by 18 percent, from 128,000 billable positions in 2008 to just 126,000 in late 2016, meaning 23,000 fewer in staff are doing roughly the same amount of work. Salaries are showing modest rises but fee percentages probably lag pre-crisis levels, and since employees haven’t seen 18 percent increases in their paychecks, the productivity gain may be even higher. And while there are no well-understood measures of architectural productivity, there is a strong correlation between this productivity jump and adoption of advanced technologies like BIM in our discipline. But efficiency merely drives prices down further in a market where time spent isn’t related to value delivered.

### Are Architects Selling Time or Results?

Commoditized fee structures, salary pressure, and low profit margins are all symptoms of a larger disease: the actual value that architects create is not realized for them financially. Buildings are central to civilization itself, and absolutely necessary not just for survival but progress. As insurance companies remind us relentlessly, designing things is risky business, but the business risk of practice (running out of money) is not correlated to liability risk (getting sued), unlike the way it is in almost every other market where assuming higher risk means a higher reward. The economic models for designing and building—how architects and builders are selected and contracted—are almost exclusively driven by getting the lowest price, irrespective of the desired result. Enormous waste (as much as 35 percent of construction costs), ineffectiveness (where around 30 percent of all projects miss budgets and schedules), and environmentally irresponsible building (resulting in 40 to 50 percent of the carbon contributing to climate change) are the outcomes. Clearly, there is lots of room for improvement. Designing and building remain risky, questionably profitable, unpredictable, and often just not very much fun.

Once upon a time, contracts in our business were gentlemen's agreements (and they were, unfortunately, all gentlemen). But, since then, various experiments in project-delivery models—construction management, design-build, “early contractor involvement,” design assist—have each attempted to make the industry more effective. Whether “bring the contractor on early!” (construction management), or “create one line of responsibility” (design-build), or “let the builders do the working drawings” (design assist), each of these attempted to improve the ends without a careful reexamination of the means. None of these techniques, despite episodic success, has improved the productivity, profit margins, results, or even the pleasure of working in the building industry itself.

But focusing exclusively on productivity and cost/schedule conformance is to miss the real opportunity for change, like measuring the success of surgery not by whether the patient is cured but by how fast the procedure was completed. There is another way: shifting the value propositions of practice from selling time to creating results for clients. Compensation models could be based on delivering outcomes of the building process itself, including the performance of the finished building. This isn't just magical thinking—rapidly evolving technologies that combine the computational power of the cloud, the representational potency of digital models, and the analytic

capabilities of simulation software are already allowing designers to predict aspects of building more accurately—cost estimating with more quantitative precision, energy consumption based on use, even embodied energy and carbon. It is just a matter of time before these technologies expand the predictive reach of the architect into occupant behavior, building life cycle performance, even usage outcomes like employee satisfaction or staffing efficiencies.

### Using Digital Tools to Drive Results and Innovate Practice

The implications of this strategy are far more profound than just new contracts and fee formulas or fancy digital simulation tools. The predictive power of new digital tools can amplify our abilities as designers to solve complex “wicked problems,” as theorist Horst Rittel puts it, and create new, important, and valuable solutions for clients willing to pay for them. But practice models, design methods,

**The economic models for designing and building are almost exclusively driven by getting the lowest price, irrespective of the desired result.**

and our willingness to take responsibility for the results of our work, will need radical reform.

We could start with the immediate challenges of cost and schedule conformity, working in concert with our builder collaborators to assure clients that these basic objectives of design and construction can be accomplished—and we should be rewarded when they are (and punished when they are not). Establishing credibility from there, we could move on to building-performance objectives like energy usage, carbon emissions, even maintenance-cost optimization. Ultimately, an outcome-based delivery system could connect the purpose of a building—offices to boost the effectiveness of workers, schools to teach better, hospitals that promote faster healing—with the architect's ability to realize those goals. These changes in the business model can't be implemented by architects unilaterally, but clients would certainly welcome any strategy

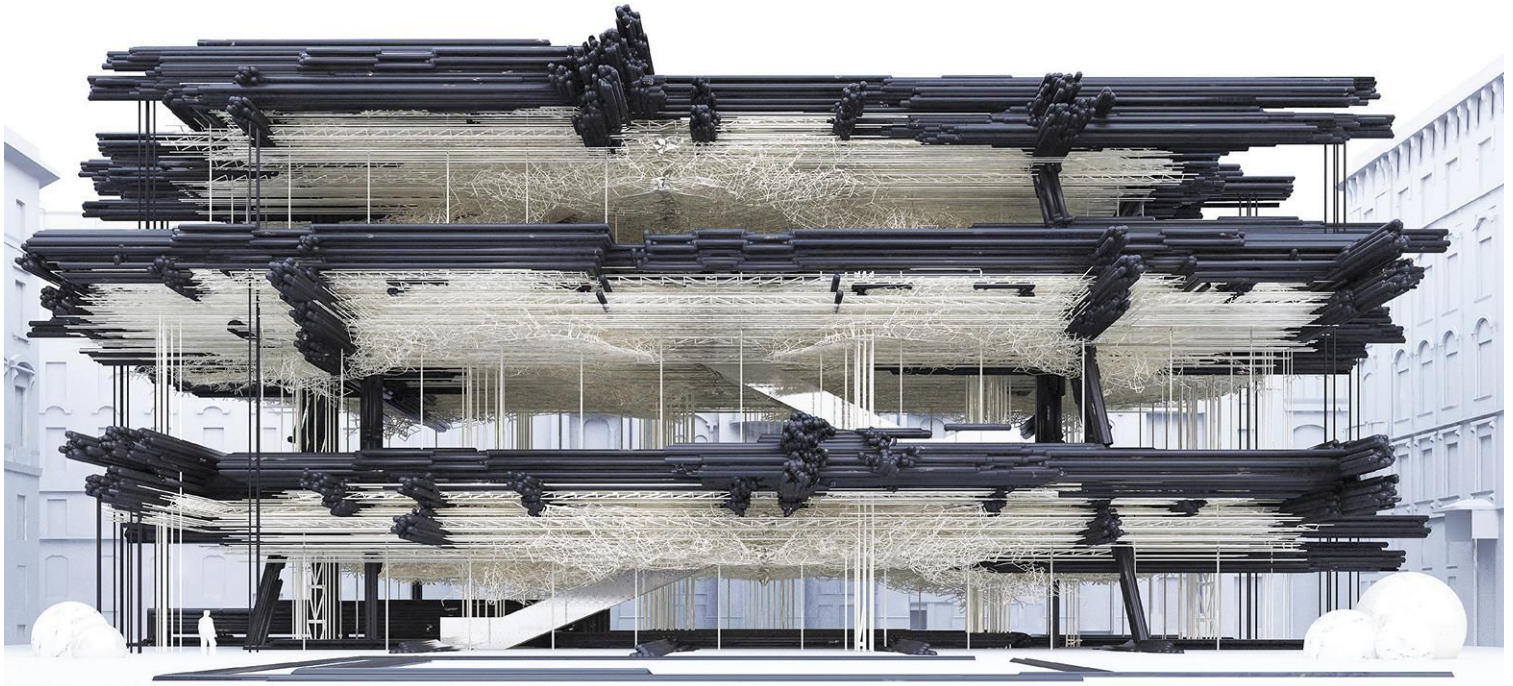
where the architect, with skin in the game, is truly invested in project-based outcomes that are both in the client's and the architect's interest.

Examples of result-based fees have been gaining momentum in construction: architects paid to provide subcontractors with digital data under design-bid-build; shared conditions based on selected outcomes in CM at Risk contracts; integrated teams under design-build; outcome-based profit objective paid under Integrated Project Delivery (IPD). Architects empowered by predictive and simulative tools (and, soon enough, bolstered by machine learning and big data) can operate with more powerful agency to create greater value for clients.

And here's where today's innovation culture can meet the challenges of outcome-based practice; technology might be necessary, but it's not sufficient to create ideas of new value, and technology's potential will go unrealized without equal inventiveness in new business models, practice approaches, and willingness to experiment with definitions of architectural services. In the past several years, I have observed a dramatic shift in the interests of my architecture students, who are increasingly dissatisfied with the standard platforms, obligations, and rewards of traditional practice; they have lost their enthusiasm for establishment firms. They're taking courses outside the architecture school at the business school, some even earning MBAs to go with their M. Arch.'s. They are studying and generating innovative business models, creating start-ups, joining hackathons, and seeking jobs with firms led by architects who are also entrepreneurs, researchers, builders, and developers. This is good news for the profession: a generation of fresh talent demanding new ways of practice, moving ahead with both youthful enthusiasm and a blissful ignorance of our inglorious past.

The architect and mathematician Christopher Alexander once suggested that architectural design was the obligation to create “an intangible form in an indeterminate context.” This can certainly be true of the serious, ineffable qualities of good design. But in our modern age, the practical context is increasingly determinate, and outcome-based design practice—enabled by new attitudes, business models, and technology—will empower us to deliver the real value of both. ■

*Phil Bernstein is Associate Dean and Senior Lecturer at the Yale School of Architecture. This essay is based on his book Architecture Design Data: Practice Competency in the Era of Computation, which will be published by Birkhauser in August.*



Linear hexagonal strands define a series of thick volumetric strata in Hextrata, designed by Gilles Retsin Architecture for a Vienna art museum extension.

# Excessive Resolution

Designers meet the second coming of artificial intelligence.

BY MARIO CARPO

**DESIGNERS HAVE** been using computer-based tools for design and fabrication for almost one generation. In the course of the last 30 years we have learned that computers can help us draw and build new forms of unprecedented complexity, and we have also discovered that, using CAD-CAM technologies, we can mass-produce variations at no extra cost: that is already history—the history of the first digital turn in architecture. Today, however, more and more powerful computational tools can do way more than that. Computers, oddly, seem now capable of solving some design problems on their own—sometimes problems we could not solve in any other way. Twenty years ago we thought computers were machines for making things; today we find out they are even more indispensable as machines for thinking. That's one reason why many, including many design professionals, are now so excited about Artificial Intelligence (AI). The term itself, however, is far from new: it was already popular in the 1950s and '60s, when computer scientists thought that Arti-

ficial Intelligence should imitate the logic of the human mind—that computers should “think” in the same way we do. Today, to the contrary, it is increasingly evident that computers can solve some hitherto impervious categories of problems precisely because they follow their own, quite special, logic: a logic that is different from ours. And already it appears that this new, post-human (or, simply, nonhuman) logic vastly outsmarts ours in many cases.

The main difference between the way we think and the way computers solve problems is that our own brain was never hard-wired for big data. When we have to deal with too many facts and figures, we must inevitably drop some—or compress them into shorter notations we can more easily work with. Most classical science was a means to that end. Geometry and mathematics—calculus in particular—are stupendous data-compression technologies. They allow us to forget too many details we could never remember anyway, so we can focus on the essentials. Sorting is an-

other trick of our trade. As we could never find one name in a random list of 1 million, we invest a lot of work in sorting that list before we use it: if the names are ordered alphabetically, for example, as in a telephone directory, we can aim directly at the name we are looking for without having to read all the names in the list, which would take forever. Yet that's exactly what computers do: since they can scan any huge sequence of letters and numbers in almost no time, they do not need to keep anything sorted in any particular order. Take alphabetic sorting as a metaphor for the way we think in general: we put things in certain places so we know where they are when we need them; we also sort things and ideas to make some sense of the world. But computers need none of that: unlike us, they can search without sorting. Computers are not in the business of investigating the meaning of life either.

Just as we could not easily deal with a random list of a million names when we look for one in particular, we could not easily work



WanderYards, designed by Daniel Koehler and Bartlett UCL students (above) shows how shifts of combinatorial granularity enable diversity through repetition of simple space samples. VoxelChair v1.0 (below), designed by Manuel Jiménez García and Gilles Retsin of Bartlett UCL Design Computation Lab, is a prototype chair using new design software for robotic 3-D printing.

with a random heap of 1 million different bricks when we need them to build a house. In that case too, our natural aversion to big data (or to data too big to manage) drives us to some drastic simplifications. First, we standardize the bricks, so we can assume they are all the same. Then we lay them in regular rows, and we arrange all rows within simple geometric figures—most of the time, rectangles or circles drawn in plans, elevations, and sections. Thus we can forget about the physical shape and material properties of each individual brick, and we can design entire buildings by composing simpler and cleaner outlines of bigger and supposedly uniform surfaces and volumes. An individual craftsman with no blueprint to follow and no accounts to render could deal with each brick (or stone or wooden beam) on the fly and on the whim of the moment, following his talent, intuition, or inspiration—that's the way many premodern structures were built. But no modern engineer or contractor would dream of notating each brick one by one, since that would take forever, and the construction documents would be as big as the *Encyclopaedia Britannica* in print. Yet, once again, this is what computers do. Today, we can notate, calculate, and fabricate each individual brick or block of a building—one by

**Let's leave to machines what we are not good at doing and keep for us what machines cannot do, which is plenty.**

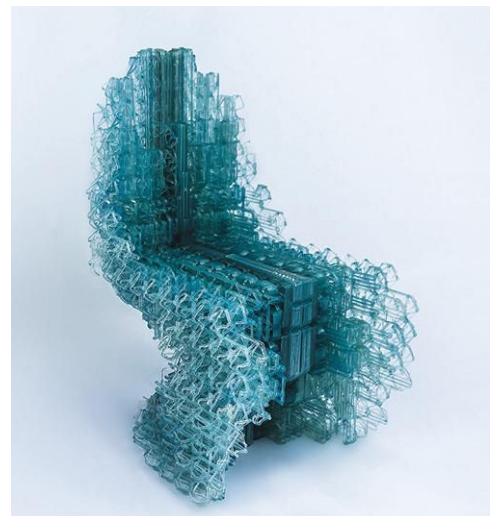
one, to the most minute particle. If the particles are small, they can be 3-D printed on-site. If they are bigger, they can be assembled by robotic arms. That procedure is exactly the same, and takes the same time, regardless of the regularity of the components, their number, size, and layout. Computation at that scale today already costs very little—and it will cost less and less.

The advantages of the process are evident. Micro-designing each minute particle of a building to the smallest scale available can save plenty of building material, energy, labor, and money, and can deliver buildings that are better fit to specs. Not surprisingly, buildings designed and built that way may also look

somewhat unusual. And rightly so, as the astounding degree of resolution they show is the outward and visible form of an inner, invisible logic at play that is no longer the logic of our mind. Perhaps human workers could still work that way—given unlimited time and money. But no human mind could think that way, because no human mind could take in, and take on, that much information. Each to its trade: let's leave to machines what we are not good at doing and keep for us what machines cannot do, which is plenty.

Machines search—big data is for them. We sort: compressing data (losing or disregarding some in the process) is for us. With comparison, selection, formalization, generalization, and abstraction come choice, meaning, value, and ideology, but also argument and dialogue. Regardless of any metaphysical implications, no machine-learning system can optimize all parameters of a design process at the same time; that choice is still the designer's. Fears of the competition coming from Artificial Intelligence today may be as misleading as the fear of the competition coming from industrial mass-production was 100 years ago. But, just as coping with the mechanical way of making was the challenge of industrial design in the 20th century, coping with the computer's way of thinking is going to be the challenge of postindustrial design in the 21st century, because today's thinking machines defy and contradict the organic logic of the human mind, just as the mechanical machines of the industrial revolution defied and contradicted the organic logic of the human body. ■

*Mario Carpo is the author of The Second Digital Turn: Design Beyond Intelligence and other books. He is the Reyner Banham professor of architectural history and theory at the Bartlett, University College London.*



# Thinking in Approximations

A structural engineer offers a perspective.

BY ROBERT SILMAN

**THE USE** of computers in analyzing building structures is undeniably a great step forward in our profession. When I trained as a structural engineer in the 1950s, computers were a brand-new wonder, and there were no packaged programs available. If you wanted to use a computer, you had to write the program yourself.

Our firm, Silman, founded in 1966, was one of the first to write its own structural-analysis and design programs. In 1970, we took our successful composite-steel-beam design program to the New York City Department of Buildings and asked them how we should file calculations. Fortunately, they realized that this was the wave of the future and suggested that we develop prototype calculations by hand in the conventional way and then submit parallel results performed by the computer, illustrating that the solutions were the same. To do so, we rented an IBM 1130 with 8k capacity, which was fed by decks of punch cards grinding away for many minutes on fairly simple problems. This became standard protocol for the Department of Buildings, and the first nine programs filed were from our office.

So I am a great advocate of the use of computers for structural analysis and design, and I always have been. But there are drawbacks. When I was studying structural engineering, I used a slide rule, a wonderful apparatus and now an archaeological artifact. Slide rules help to multiply and divide, provide exponential functions, do logarithms and trigonometry. But the slide rule does not tell you where to place the decimal point. Is the answer 10.00 or 100.00 or 1,000.00?

So most of us, before we even started to fiddle with the slider and the cursor window, estimated the answer in advance. We learned to think in approximations. I can remember designing flat-plate concrete buildings with completely irregular column layouts. We used Hardy Cross's method of moment distribution and generated pages of incredible calculations for different column configurations. The process became repetitive, and we could guess the required reinforcing pretty accurately before putting pen to paper.

This arcane process gave us a "feel" for the

buildings that we were designing. They were not some abstract product of machine technology but were rather tactile creations of our very selves. We had used our intuition, which became sharper with experience. There was no way that a large-scale mistake would find its way into the work—we would notice it as a glaring intruder on our orderly process.

In my present role, I review drawings produced by the engineering staff. When I spot an error, the young engineer inevitably will say, "How did you see that so quickly?" I shrug and reply that it was how I was trained, to think about the approximate answer before figuring out the answers. When skipping that intuitive step, one can be easily seduced by computer results that look so neat and orderly.

I am not a Luddite: Our early design methods had enormous shortcomings. Perhaps two of the most grievous were the inability to model the building in three dimensions, as a whole entity, as well as the difficulty in computing building movements. Even structural-analysis problems of modest indeterminacy were often impossible to solve. Anyone could write the compatibility equations, but as the unknowns grew beyond four or five, finding solutions loomed as a lifetime chore.

So we developed neat techniques called approximate methods. Large mathematical matrices of the compatibility equations could be partitioned and manipulated with all sorts of tricks. Indeed, some very complicated buildings were analyzed using tricks, and they have behaved beautifully over their lifespans, much to the credit of their designers.

For sure, the complicated geometries and configurations of buildings today could never have been analyzed with any degree of confidence using some of these approximate techniques. Computer analysis provides a higher level of mathematical certainty about the behavior of a structure—advantageous in new construction as well as in the renovation of historic buildings. One example is Fallingwater, which we helped renovate in 2002. To



Silman completed the renovations of Frank Lloyd Wright's Fallingwater (1937) in Bear Run, PA, in 2002. The process required the firm to shore up the main-floor cantilever as well as the waterfall's rocky ledge.

fix the sagging cantilevers, we needed to determine the stresses in the main

cantilever girders that support the house. We knew accurately the building geometry and the reinforcing in the girders, as well as the actual deflections that had occurred over the first 60 years. By performing a three-dimensional analysis, and accounting for the participation of the slabs in two-way action by computer, we were able to manipulate various stiffness factors until the calculated deflections of every cantilever matched the actual measured deflections. With this information we could then design the repair, placing the right amount of post-tensioning where needed. Approximate methods would not have provided the precise answer required.

So how do we train ourselves to get the utmost out of computer analysis without losing an intuitive sense of how a building should behave and what its constituent members should look like? And, as our buildings become more complicated, is it really possible to develop that sort of grasp of their structural elements? We should at least start with some training in approximate analysis of simple structures. Like my professor in my first graduate course in indeterminate structures, instructors should demand that, for the first four weeks of the class, students not be allowed to use any mechanical aids—no calculator, no slide rule, and certainly no computer. Professors should encourage them to sketch the shear and moment diagrams and the shape of the deflected structure; they should thus be able to determine the critical points and quantify them within 15 percent accuracy.

It seems to me that we cannot depend wholly on the answers high technology can give us. Rather we must develop a feel for structures by using some of the educational techniques of the past—fostering the ability to see the whole, which technology supports but cannot replace. ■

*Robert Silman, president emeritus of Silman, the structural engineering firm, is on the faculty of the Graduate School of Design at Harvard University.*

# The Disruptors

Technologically savvy firms lead the profession and embrace change.

BY FRED A. BERNSTEIN

AS A PARTNER at Ennead, the Manhattan architecture firm, Tomas Rossant has helped many colleges and universities develop master plans. He generally begins by spending a day observing people moving around campus, but what he finds, he admits, is “situational and subjective; it’s affected by whether it’s raining and whether it’s homecoming weekend, and so on.” So Ennead’s applied-computing department has developed an app to track where students and faculty go and when—potentially a better way to document campus activity. Rossant can’t talk about the details yet, but he has met with venture capitalists about turning the app into a product that could be made available to users other than Ennead and its clients.

“Do we want to give this away, or do we want to make money off it?” Rossant asks, suggesting that Ennead may take an “if-you-can’t-beat-em-join-em” attitude to software development, which could be more lucrative than just practicing architecture. If so, Ennead will probably create a discrete corporation to develop and sell its campus-planning software. In choosing that route, it would be following a trail blazed by Philadelphia-based KieranTimberlake (which offers several apps through its KT Innovations affiliate, owned by the firm’s founding partners) and the Seattle-headquartered NBBJ (which formed a separate company to market a virtual-reality tool)—and, much earlier, by Frank Gehry (whose firm spun off Gehry Technologies with its Digital Project software, in 2002).

Of course, not every architecture firm in the future will spawn a separate software company, but every architecture firm will have to respond to technological changes that are rocking the profession. Over the past two decades, new tools have transformed ateliers into veritable computer labs. But soon the continuing digital revolution may have even more dramatic consequences. “There are hundreds of kinds of technology that will impact the practice of architecture,” says Christian Derix, the director of Superspace, the computational-design group of Woods Bagot, a global firm with nearly 1,000 employees in 14 offices. “Architecture is facing an existential crisis,” agrees his colleague Shane Burger, a principal and director of technical innovation. He believes architecture firms that also do software will eventually turn into software firms that



KieranTimberlake staff using projection mapping

also do architecture. “I don’t see it as a threat to the profession,” says Burger. “I see it as a threat to the business model. It’s just a question of what the identity of the architecture firm will be 10 years from now.”

Other fields, from education to communications, have been radically altered by technology. “Architecture is ripe for disruption,” says Steve McConnell, the managing partner of NBBJ. “Efficiencies aren’t going to just be born out of a traditional architecture practice, but through application of high-tech tools.” Instead of expecting clients to rely solely on our expertise, he says, “now we have the ability to use algorithms to prove the value of our work.”

One technology that could be particularly disruptive to the profession is machine learning. An approach to achieve artificial intelligence, machine learning is a way for computers to discern patterns in vast quantities of data. But several experts say it could also be used to generate designs. According to Kat Park, the firm-wide emerging-technology leader for Skidmore, Owings & Merrill (SOM),

machine learning is different from parametric modeling, in which you “wrote a script to produce a design outcome. That’s the old-school way of using computers.” With machine learning, however, “there is no script. The computer is a black box.”

Is that one way that machines will replace human architects? Derix says that a computer with enough data on existing buildings—say, hospitals—can use algorithms to create configurations for a new one. “That’s where machine learning becomes dangerous to the profession,” he says. “Design will be a kind of data search.” But that prospect also offers promise, says Park. “If we took all of our firm’s past data and fed them into a machine, that would encode the expertise of SOM.”

A self-described optimist, Park says that machine learning may solve problems humans don’t have the brain power to solve—and do so almost instantaneously (see “Excessive Resolution,” page 135). That means that architects can get answers to complex questions early on. “We’ve been talking for so long about making performance analysis available at the concept

stage, when it has the most impact,” she says, “but until now we haven’t had the tools.”

Woods Bagot’s Burger says the future will belong to architects “who are so used to working with these new tools that they become extensions of their minds.” He calls them “augmented” architects. Architects shouldn’t be scared of the new tools—a pencil is a tool, he notes. But, he says, “the firms that are going to survive are the ones that embrace the role of the augmented designer.” SOM’s Park concurs: “If you don’t know how to work with a robot, or work with an intelligent machine, you will probably be out of work.” (No wonder the new machines are sometimes known as “cobots.”)

For the architecture profession, there are other big challenges on the horizon. In recent years, firms like SHoP have pushed for modular construction, investing in technologies that would facilitate factory fabrication, providing greater control over the finished product. But now Silicon Valley tech companies are jumping into the game. Katerra, a startup with nearly \$1 billion in funding from SoftBank, the Japanese conglomerate, is promising to use technology to transform design, the building-product supply chain, and the construction process. Architects have long chided the building industry for old-school ways, “but now it may leapfrog over us,” Rossant predicts. Yet SHoP continues to explore new construction and fabrication methods—most recently through a potential collabo-



Sheila Kennedy (far right) in Peru with High Altitude Urbanism design-team members

ration with a car company, according to partner Chris Sharples, though he declined to provide details.

Another well-financed start-up moving into architects’ territory is WeWork. Best known for providing shared office space to young creatives, the company is now selling design services to its corporate clients and is expand-

ing beyond workplaces. It already employs architects in major cities. Last month, it appointed the Danish wunderkind Bjarke Ingels as its chief architect (see page 36), upping its design game overnight.

So if architecture’s core functions are losing value, what does the profession have to offer? “Critical design thinking is the one thing that can’t be replaced by an algorithm,” says Rossant. “Right now, Ennead is an architecture firm that gives away strategy free. We’re thinking of becoming more of a strategy firm that gives away architecture free.” Though he makes clear that Ennead will always put architecture first, he would like the firm to emulate McKinsey & Company, the consulting group that charges handsomely to give business advice.

Nader Tehrani, dean of the architecture school at Cooper Union and founder of the Boston-based firm NADAAA (see page 122), sees another way for architects to expand their role: “The architectural voice can become instrumental in the many political and cultural conversations that are affecting the world today, among them climate change, health, education, food, and the state of the city as a place to live, to name just a few.” Kennedy Violic Architects, based in Boston, has been bringing “design thinking” to non-architectural problems since its early days. It worked with a startup company that uses big data to reduce solar-energy costs through peer-to-peer energy sharing in Australia. More recently, in the Peruvian Andes, the firm led a workshop that helped devise a system for Wi-Fi connectivity in high-altitude villages. The



Tomas Rossant (center) and Ennead colleagues



SOM's Kat Park (facing, right) sharing insights in a Smartgeometry group

goal, says principal Sheila Kennedy, is to “imagine the future while testing ideas on the ground in the present reality.”

One way for firms to embrace the future is to rely on expertise from other fields. NBBJ offers a fellowship, which for the last four years has been held by a neuroscientist, John Medina, who works with the firm's architects to identify ways buildings can improve health and happiness. Methods include encouraging movement, bringing users into contact with nature, and facilitating serendipitous meetings among colleagues. The office translated Medina's insights into computer simulations, to predict the number of such interactions likely to occur in each iteration of an office tower designed for the Chinese company Tencent, in Shenzhen.

KieranTimberlake, meanwhile, hired architects who also have degrees in fields like sociology, ecology, and computer science. “When I joined the firm in 2008,” says Billie Faircloth, a partner and the company's tech guru, “my charge was to build up a transdisciplinary practice.” While assigned to actual design projects, KieranTimberlake's architect hyphenates also form internal research groups. On a recent Friday, the dozen or so members of a group called Near Future Practices met in a conference room in the firm's Philadelphia office, a former beer-bottling factory, to discuss using machine learning as a way of improving buildings' energy efficiency. “If we had the data on predicted versus actual energy consumption of a large number of buildings, we could begin to rank which factors actually matter in terms of energy use,” she says. But the

amount of data required is, Faircloth cautions, “bigger than any one firm. So we have to ask ourselves, as a profession, do we want to work together to get this data? And,” given privacy concerns, “is it appropriate to do so?” These are the kind of questions that architects' moving rapidly into evolving technologies, and their clients, will have to address.

Meanwhile, NBBJ has taken another route to getting out in front of technological change. Seeing an opportunity not just to improve practice and engage clients but to create another income stream, NBBJ founded the

virtual-reality (VR) firm Visual Vocal, staffed it with non-architects, and funded it with more than \$3.5 million in venture capital. Its product, developed after studying how architects at NBBJ collaborate, is a communications tool that allows project stakeholders to annotate VR presentations verbally. Visual Vocal is selling the product to other firms. But that doesn't trouble McConnell, who is pleased with the cross fertilization. “We're putting a start-up and a mature business together” in the same office, says McConnell. “That's how you avoid becoming calcified.”

KieranTimberlake has also created potentially profit-making products apart from its core architectural practice. On Faircloth's watch, KT Innovations has released Tally (life-cycle assessment software), Pointelist (a low-cost, high-density sensor network), and, most recently, Roast (an occupant-comfort survey app now in beta testing).

In Toronto in May, at the Smartgeometry conference, a biannual gathering of architecture brainiacs, Faircloth and Christopher Connock, KieranTimberlake's director of design computation, shared insights with representatives of other research-oriented firms, including Woods Bagot and SOM. Although many of the participants are competitors, “we are all interested in the positive redefinition of what an architect does,” says Burger. Naturally, he says, “I'm not handing out code for software that we've developed in our practice. But we're all here to help each other. We all think it's beneficial to the world to have a healthy architecture profession.” ■



Christian Derix (second from left) in LA with the Woods Bagot team for data-driven design training





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# DESIGN VANGUARD 2018

As Record examines the future of practice in this issue, we decided to include our annual Design Vanguard winners. These top emerging firms, all established fewer than 10 years ago, are beginning to make their mark on the profession with smart and striking projects in North America, Europe, Asia, Africa, and the Middle East, foreshadowing what's to come.

## FEATURED FIRMS

**DAVIES TOEWS**  
NEW YORK

**CHEREM ARQUITECTOS**  
MEXICO CITY

**OMAR GANDHI**  
HALIFAX, NOVA SCOTIA

**REVER & DRAGE**  
OSLO

**IBDA DESIGN**  
DUBAI

**EDWARD OGOSTA**  
CULVER CITY, CA

**WUTOPIA LAB**  
SHANGHAI

**LOCAL STUDIO**  
JOHANNESBURG

**CIVIC ARCHITECTS**  
AMSTERDAM

**P.R.O.**  
BROOKLYN, NEW YORK

# DAVIES TOEWS

## NEW YORK



### FOUNDED: 2010

**DESIGN STAFF:** 8-10

**PRINCIPALS:** Trattie Davies, Jonathan Toews

**EDUCATION:** *Davies:* Yale School of Architecture, M.Arch., 2004; Yale College, B.A., 1994. *Toews:* Yale School of Architecture, M.Arch. 2003; Yale College, B.A., 1998

**WORK HISTORY:** *Davies:* Gehry Partners, 2005-06; Pierce Allen, 1995-2000; *Toews:* Grimshaw, 2009-10; SHoP, 2006-08; Leroy Street Studio, 2004-05; Turner Brooks, 2001-03

### KEY COMPLETED PROJECTS:

University of Chicago Charter School Woodlawn Campus, Chicago, 2018; Warren Street Townhouse, Brooklyn, NY, 2018; Madison Park, Memphis, 2017; Regional Plan Association Office, NYC, 2017; Azil Residence, NYC, 2017; Cai Guo Qiang Studio and Residence, Chester, NJ, 2016; Hill House, NYC, 2015; Hudson Linear Park, Hudson, NY, 2015; Cupsuptic Lake Campground, Oquossoc, ME, 2014

### KEY CURRENT PROJECTS:

Martha's Vineyard House, Chilmark, MA; Cai Guo Qiang Studio and Archives, Chester, NJ; Bronx Feasibility Study, NYC; East Village Penthouse, NYC; Pisar Residence, NYC

[daviestoews.com](http://daviestoews.com)

**THE NARROW** storefront office of Davies Toews in New York's East Village doesn't try to hide from passersby. Floor-to-ceiling windows expose its interior—with its warm, plywood finish and a central table covered in architectural models shaped like exploded origami—to a busy stretch of 13th Street infamous for dive bars. "People come in here all day long, wondering what we're doing," says Trattie Davies, one of the firm's founding principals. "The other day, two kids walked in and said, 'We wanna watch.'"

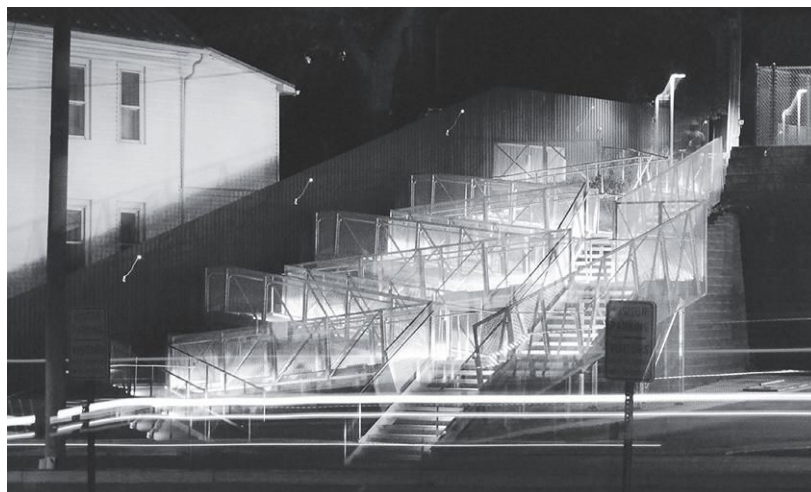
The work, like the office, founded in 2010 by Davies, 45, and her husband, Jonathan Toews, 41, invites a deeper look. For example, the 2015 project Hudson Linear Park unites two parts of Hudson, New York, previously separated by a steep slope. It was designed with PARC Foundation, a nonprofit seeking to enrich communities with public art and architecture projects. Together the designers threaded two narrow lots, bisected by an alley, with a ramp climbing the hill in sharp switchbacks. Its procession is interrupted by a staircase and punctuated by greenery. From the street below, the ramp's zigzagging railings appear jumbled, like a labyrinthine scaffold inviting the kind of interaction you'd expect from a jungle gym.

Davies Toews directly confronts irregularities and constraints to transform potentially awkward moments into meticulously designed spaces and public installations. To address these challenges, the firm creates geometrically complex forms that subtly convey a shift in scales and forge connections between disjointed spaces. "Every problem has to be an opportunity," says Davies of the low budgets and unusual sites they're used to working with. This ethos drove them to experiment with affordable materials like plywood, brick, and Sheetrock. In a townhouse in Brooklyn, the architects sculpted the closed, sinuous balustrade and underside of a staircase with Sheetrock. On one floor, it meets the ceiling in a curvaceous turn and spins out into little eddies that echo into the next room, creating drama with shadow and light.

These discoveries are born from an iterative process that emphasizes model-making. "Walking by a model, if something bothers you, you have to fix it," says Toews. "It's not as if it lives in the computer."

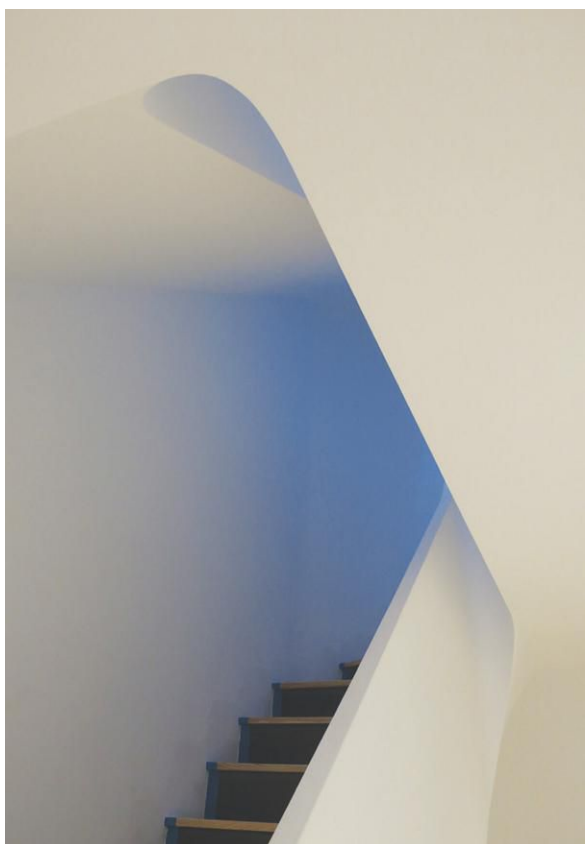
In Chicago, Davies Toews recently designed a 72,000-square-foot charter school. The rectangular building with double-loaded corridors would seem relatively straightforward. But the architects realized the school's dynamic and demanding curriculum required a design that synthesized disparate yet focused activities for students in grades six through 12. The building offers students access to a thesis-preparation room above a double-height foyer, where they can take a break in front of city views or circulate to a green roof, science labs, and research areas. Outwardly, the architects represented this plurality in a unifying facade made from two types of brick, arranged in geometric patterns that shift across the building, which has slight, 12-inch bends. Together, the patterning and parapet-peaked kinks give the dramatic illusion of massing.

A continually shifting perspective in their approach to projects keeps their practice active and engaged. "We're resistant to people branding or defining us," says Toews. "We want to let parts of ourselves and our business be discovered over time, and we try to impart this in our buildings." *Jordan Hruska*



### HUDSON LINEAR PARK

In Hudson, NY, a skinny and steep site was used to create a linear park that connects an old residential neighborhood to the city's main strip.



**UNIVERSITY OF CHICAGO CHARTER SCHOOL** The ground floor, punctuated by multiple points of entry and large-scale windows, invites current and prospective students into a foyer that leads to a cafeteria, gymnasium, dance space, and library serving both school and public programs (top).

**WARREN STREET TOWNHOUSE** A curving stair anchors a townhouse renovation and addition, becoming a canvas for the changing hues of sunlight entering from a skylight above it (left).

**CUPSUPTIC LAKE CAMPGROUND** Working with the PARC Foundation, Davies Toews used vernacular construction materials and methods for a bathhouse and pavilion (above).

# CHEREM ARQUITECTOS

## MEXICO CITY



**FOUNDED:** 2012

**DESIGN STAFF:** 10-12

**PRINCIPALS:** Abraham Cherem, Jose Antonio Aguilar Garcia

**EDUCATION:** Cherem: Universidad Iberoamericana, B.Arch., 2005. Aguilar: Universidad Autonoma Metropolitana, B.Arch., 2001

**WORK HISTORY:** Cherem: ChermSerrano 2003-11. Aguilar: Serrano Arquitectos y Asociados, 2001-10; Taller de Arquitectura Mauricio Rocha, 2010-13

**KEY COMPLETED PROJECTS:** House C, San Miguel de Allende, 2018; Tevila, Mexico City, 2017; Tereo Office Building, Naucalpan, 2017; Synagogue, Huixquilucan, 2016; Guesthouse C, San Miguel de Allende, 2016; El Japonés Oasis Restaurant, Mexico City, 2016; Apartment A, Mexico City, 2015; House P, Huixquilucan, 2013; Apartment S, Mexico City, 2012 (all in Mexico)

**KEY CURRENT PROJECTS:** House D, Mexico City; Gourmet Market, Mexico City; North Bay House, Miami; 1 Hotel Cabo, Cabo San Lucas; Hotel Curio by Hilton, Zacatecas; El Japonés Artz, Mexico City; El Japonés Interlomas, Huixquilucan (all in Mexico, except North Bay House)

[cheremarquitectos.com](http://cheremarquitectos.com)

**ONE OF** the first things that will impress anyone reviewing the work of Cherm Arquitectos is its variety in scale and program. The Mexico City-based firm's portfolio includes single-family residences, hospitality work, places of worship, and office buildings. But a shared goal holds these diverse projects together, explains the 35-year-old founder, Abraham Cherem. He and partner Antonio Aguilar, 38, strive to imbue each new commission with its own magic, he says.

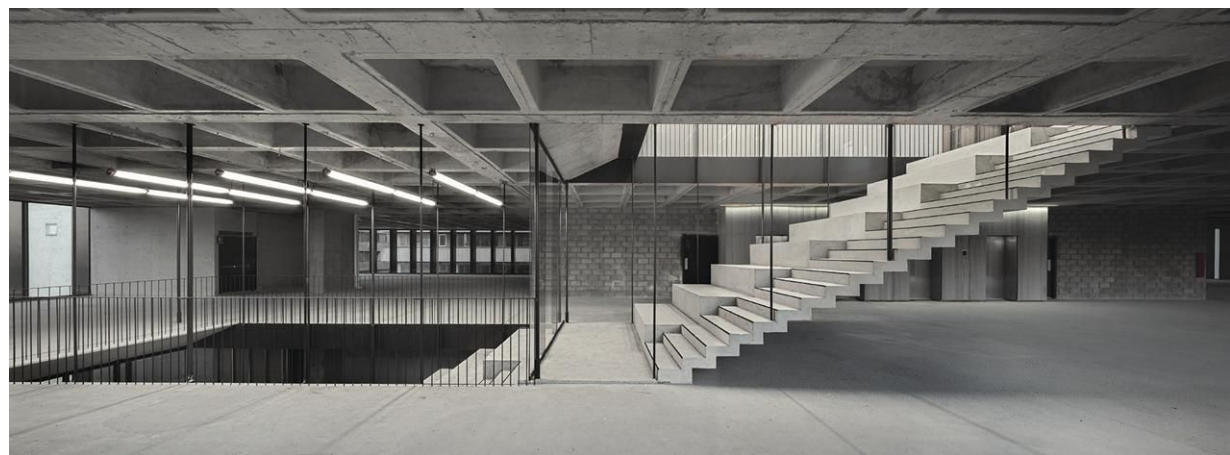
The tools used to create their magic—or what Aguilar calls “music”—are carefully considered materials, well-executed details, and an adept handling of illumination. This combination resulted in the serene atmosphere of a *mikvah* (a bath for Jewish purification rituals) in Mexico City's Polanco neighborhood. Here, individual immersion pools are enclosed within buff-colored concrete walls, their board-formed texture revealed by daylight that enters—almost mysteriously—through a hidden skylight.

The architects have developed their space-making skills through close study of buildings they admire, including the work of Louis Kahn, Carlo Scarpa, Peter Zumthor, and Renzo Piano. And they have honed their craft through experience. Cherm started the firm ChermSerrano with a friend, Javier Serrano, in 2003, even before the pair finished architecture school. They began small, with interior renovations, gradually increasing the size and complexity of their projects. Then, in 2011, Serrano was tragically murdered just as their highest-profile project yet—the conversion of a 17th-century mansion in Mexico City's historic center into a hotel (RECORD, June 2013)—was about to open. “It was a tough time,” says Cherem, “but I decided to continue.” He founded his eponymous firm the next year, with Aguilar joining soon after. Aguilar's past work experience included nearly 10 years at Serrano Arquitectos y Asociados, the well-established Mexico City firm started by Javier's father.

Together, Aguilar and Cherem have built an impressive body of work, one that is characterized by constant investigation. One example is a large residential compound in San Miguel de Allende that includes a main house, guest quarters, and a caretaker's house. They used rammed earth, selecting it, in part, because the resulting layered walls would provide a human scale for the sprawling complex. Similarly, within a 7,000-square-foot Japanese restaurant in Mexico City, they created smaller distinct environments, including a wood-lattice teppanyaki “tunnel.” And for a six-story speculative office building in Naucalpan, they experimented with having a mutually shared space for all tenants, carving out a skylit void and inserting a sculptural, suspended stair that links all the floors.

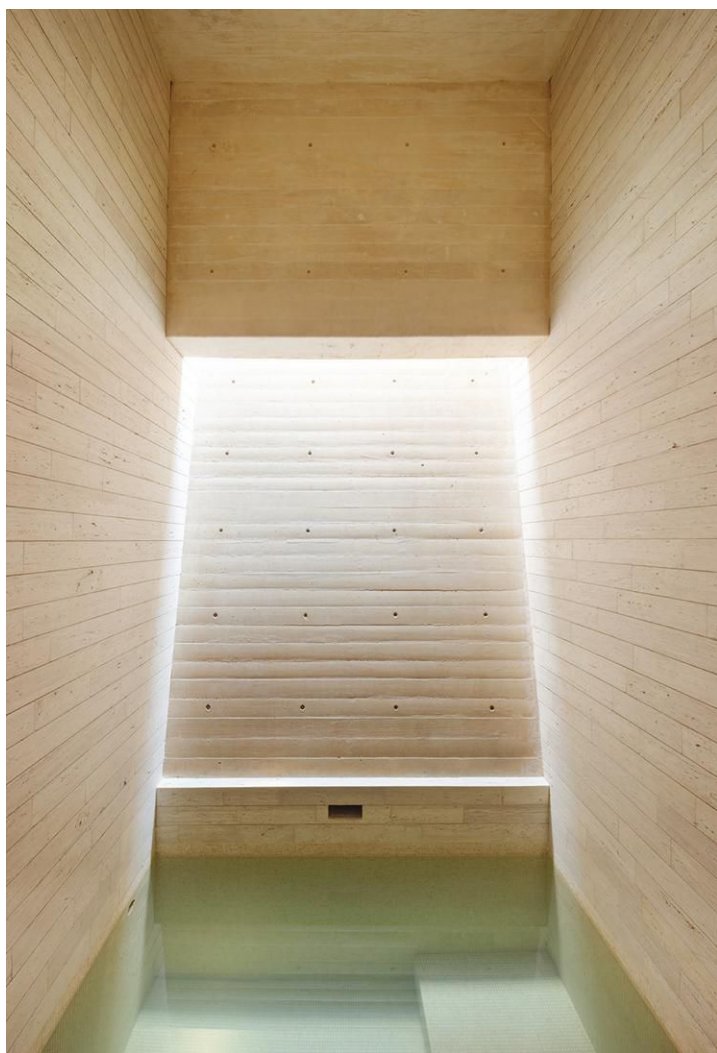
Among Cherm Arquitectos' current projects are several houses, including one in Miami, two restaurants, and a boutique hotel for the subsidiary of an international chain. We can only expect that this inventive firm will continue to use materials, details, and light in surprising and captivating ways.

*Joann Gonchar, FAIA*



**TOREO** The waffle slabs in this office building are suspended from the perimeter steel structure, resulting in mostly uninterrupted open space and highly flexible floors. From the interior, the architects carved out a skylit void, inserting a sculptural stair.





**EL JAPONEZ OASIS** Within a 7,000-square-foot restaurant, the architects have created several smaller distinct environments. One of these is a teppanyaki "tunnel," a pavilion defined by wood lattice (top).

**HOUSE C** A residence in San Miguel de Allende encompasses a number of structures, including a guesthouse (above). The architects chose to make all the buildings of rammed earth, to give the sprawling complex a human scale.

**TEVILA** For a bath used in Jewish purification rituals, Cherem Arquitectos created an otherworldly interior by enclosing the immersion pools within board-formed concrete and admitting daylight through a hidden skylight (left).



# OMAR GANDHI

## HALIFAX, NOVA SCOTIA

**FATE** can be strange.

Toronto-born architect Omar Gandhi can attest to that. Nearly a decade ago, what felt like an unfortunate string of hiccups in Gandhi's career—a layoff and a position that was unexpectedly cut short—became the catalyst for opening his own firm. It isn't overstating it to say Omar Gandhi Architect—which today has offices both in Halifax, Nova Scotia, and in Toronto—was born largely out of desperation.

Gandhi, 38, who now splits his professional and personal life between those two Canadian cities, decided the healthiest thing to do was keep his nose to the grindstone. He took on a few small projects working from a home office. "I just tried to do the most I could with what I had," he says, "and it snowballed from there."

It certainly did: Cedar in Three Textures (2011) saw Gandhi expand upon a century-old single-family residence in Halifax. Shantih (2012), a vacation house that engages the lush landscape in a coastal town about two hours south of Halifax, is a study in "contrasting identities" that's both "eerily mysterious" and "loud and bright." Finally, Moore Studio (2012) is a 1,500-square-foot, two-story home located in a dense forest just outside Halifax. Designed specifically for two "new empty-nesters with dogs," the house was built from the ground up, using off-the-shelf birch plywood and salvaged rusted steel so that "the project is quite homogeneous with the buildings surrounding it."

Gandhi, not unlike Halifax architect Brian MacKay-Lyons, uses vernacular architecture as a starting point, drawing on familiar forms and materials and adapting them "formally, spatially, and programmatically to respond to simple things like daylight, the wind, and precipitation." Beyond erratic weather patterns, Nova Scotia comes with its own set of challenges: budgets aren't huge, and there aren't that many people in the region with an interest in contemporary architecture. Gandhi doesn't think of these as deterrents. "The best work comes from constraints," he says. "They force you to tell a much richer story about places and people."

That genuine interest in places and people goes a long way in explaining Gandhi's versatile body of work. Currently, the Halifax office is concentrating on residential buildings (with one retail store thrown into the mix), while the Toronto studio is focused on two mixed-use mid-rise projects, a couple of restaurants, and various single-family residences in urban and rural environments.

"Ultimately, our process is about investigating and coming to understand each particular site," he says, "and really getting to know the clients on a much deeper level." *Derek De Koff*

**SLUICE POINT** This structure (opposite, top), located on the southern tip of Nova Scotia, in a region that became known as an international shipbuilding center, features an economical shed roof inspired by local fishing sheds and shanties.

**RABBIT SNARE GORGE** For this summer getaway in Cape Breton, NS (opposite, bottom left), Gandhi takes a familiar cabin form and stretches it into a tower. The building recently won a Governor-General's Medal in Architecture, which recognizes Canada's best projects.

**FLOAT** This residence (opposite, bottom right) is inspired by the jagged field of strewn outcrop, subcrop, and bedrock float on which it sits. The exterior is clad in gray washed wood, with slight variations in pattern resembling bedrock strata.



**FOUNDED:** 2010

**DESIGN STAFF:** 5-8

**PRINCIPAL:** Omar Gandhi

**EDUCATION:** Dalhousie University, M.Arch., 2005; Dalhousie University, Bachelor of Environmental Design Studies, 2003; University of Toronto, B.A., 1998-2006

**WORK HISTORY:** MacKay-Lyons Sweetapple Architects, 2008-10; Kuwabara Payne McKenna Blumberg Architects, 2007-08; Young + Wright Architects, 2005-07

**KEY COMPLETED PROJECTS:**

The Lookout and Broad Cove Marsh, 2016; Cabot Links Villas, 2015 (both in Inverness, Nova Scotia)

**KEY CURRENT PROJECTS:**

Jib House, Chester, Nova Scotia; Shaw Mann Residence, Shaw Island, Nova Scotia; Lady Marmalade Restaurant, Toronto; Lafayette Cottage, Carling Township, Ontario; 23 Buckingham, Toronto

[omargandhi.com](http://omargandhi.com)

PHOTOGRAPHY: © EMA PETER (OPPOSITE, TOP); DOUBLESPEACE (OPPOSITE, BOTTOM LEFT); OMAR GANDHI (OPPOSITE, BOTTOM RIGHT)



# REVER & DRAGE

## OSLO



**FOUNDED:** 2008

**DESIGN STAFF:** 3

**PRINCIPALS:** Tom Auger, Martin Beverfjord, Eirik Lilledrange

**EDUCATION:** Auger/Beverfjord/Lilledrange: NTNU, Master in Architecture, 2008

**WORK HISTORY:** Auger: Reiulf Ramstad Arkitekter, 2007. Beverfjord: Niels Torp Arkitekter, HUS Arkitekter, 2006

**KEY COMPLETED PROJECTS:** Kvåsfossen Visitor Center, Kvås, 2017; Cabin at Troll's Peak, Sunndal, 2017; Cabin Straumsnes, Møre & Romsdal, 2016; Hustadvika Tools, Fræna, 2014; Feinsteineveien, Stavanger, 2013 (all in Norway)

**KEY CURRENT PROJECTS:** National Tourist Routes, Farstadsanden, Fræna; House Horse Hill, Flekkefjord; Cabin Kritt, Ulvik; Housing Ringvegen, Sunndal (all in Norway)

[reverdrage.no](http://reverdrage.no)

**FOXES & DRAGON**, the Norwegian firm's name in English, seems fitting for the three-person outfit. "We wanted something that was a bit silly and a bit adventurous," says Tom Auger, 38, who founded the firm with former classmates Martin Beverfjord, 37, and Eirik Lilledrange, 39, following their graduation from the Norwegian University of Science and Technology's architecture program in 2008.

But *pragmatic* is also how Auger describes their work and personalities, despite the fantastical ideas behind some of their projects. For instance, in a commission for a toolshed, the architects successfully proposed expanding the program to include a retractable glass roof so "you can lie down and watch the stars at night."

Creating structures in harmony with Norway's rugged and beautiful countryside—be it a cliff's edge or a nearby mountain—the firm puts its own twist on the vernacular with unexpected elements. In the recently completed Troll's Peak cabin, part of the gabled structure is encased in glass, exposing its wood frame, while another part is covered in grass.

"We try to test out new things on every project," says Auger, explaining that clients in rural areas, who have commissioned the bulk of their portfolio to date, seem more open to this approach. It may help that all three of them come from different parts of the country, and Lilledrange, who "runs the office," according to Auger, is based in the town of Flekkefjord, about six hours outside of Oslo, where Auger and Beverfjord work.

One unusual project is an underwater restaurant they collaborated on with Snøhetta. According to Auger, Rever & Drage participated in selecting the site and made early design contributions with respect to the

building's roof and plow-like position; however, they left the project after about a year due to their limited experience with complex projects. Though many firms might have reacted by hiring more staff, for Rever & Drage, expansion isn't a priority—"maybe in the next 10 years" they'll hire someone, Auger says.

Upcoming projects include a roadside structure commissioned as part of Norway's scenic National Tourist Routes, a prestigious series of architectural interventions—Peter Zumthor has designed two—embedded within landscapes of high, barren mountains, lush hillsides, and deep fjords. Since founding the firm, the threesome has often helped construct their buildings alongside local carpenters—some of whom are frequent collaborators and make introductions to new clients. "It's very satisfying running your own office and building things yourself," Auger says. "That's the main reason we do this." *Erin Hudson*

**KVÅSFOSSEN VISITOR CENTER** Nestled on a cliff's edge, the building—the firm's largest to date—mirrors the precipice's jagged form while obscuring the adjacent roadway from the wooded landscape. Overlooking a waterfall, large windows frame views of salmon jumping upstream.





**CABIN AT TROLL'S PEAK** In Sunndal, Norway, the firm oriented this striking house, with its assorted building envelopes, so that prevailing winds and other elements would batter one side, while doors and windows are grouped on the opposite one (above).

**PEDERVEGEN HOUSE** Two curious curved peaks top a small house addition in Molde, Norway. Glazing on the flat edges facing east and west brings ambient morning and afternoon light into the bedroom and bathroom respectively (left).

**AL WARQA'A MOSQUE** Three entryways instead of one lead to a courtyard, through which the indoor prayer hall is accessible behind a glass wall. The result, when the mosque's wooden doors are left open, is multiple sight lines from outside the building into the sacred space (right).

**BEIRUT MUSEUM OF ART** This conceptual design uses a double-skinned ETFE facade to filter light into a museum containing indoor gardens; the scheme was driven by the Japanese word *komorebi*, which is the dappled effect of the sun shining through the leaves of a tree (below).

**HAI D3** For a mixed-use office complex, the architects offer a contemporary spin on traditional elements. Here, they fashioned hollow vertical structures out of shipping containers to funnel strong desert winds downward into landscaped meeting areas and walkways, like the wind towers that once dominated Dubai's skyline (bottom).



PHOTOGRAPHY: © SADAO HOTTA (TOP, RIGHT); IBDA DESIGN (TOP, LEFT)

# IBDA DESIGN

## DUBAI

**ARCHITECTS WAEL AL AWAR** and Kenichi Teramoto, principals of Dubai-based ibda design, have an unusual way of communicating. Their ability to express themselves in English, their mutual language, sometimes fails them, so they resort to sketches and diagrams. Says Al Awar, “Through the drawings, the ideas become self-explanatory.”

Al Awar, 40, who is Lebanese, and Teramoto, 43, who is Japanese, met in Tokyo in 2004, when both were working for C+A, a small firm known for residential and educational projects. They landed there after Al Awar had worked in Barcelona and Teramoto in the Netherlands. Over the next seven years, as they jointly managed C+A’s projects throughout Asia and the Middle East, “our design philosophy grew closer and closer together,” Al Awar explains. So it felt natural when, after Al Awar decided to found ibda (Arabic for “start”), he asked Teramoto to join him. Teramoto didn’t hesitate: “I didn’t have any doubts,” he says.

After considering Beirut and Tokyo, Al Awar set up shop in Dubai in 2009 for a confluence of reasons—he knew several clients from previous projects; there was a flurry of development activity, but few boutique firms; and travel to Asia and other Middle Eastern countries, where they hope to expand, was easy. Teramoto moved there in 2012.

The improbability of their collaboration, and eventual location, is what makes ibda’s work unique. “There’s a heightened sensitivity in our designs to different cultures and contexts,” says Al Awar. Their approach is reflected in their process, which begins with a careful consideration of natural phenomena like daylight, the skilled labor and materials available, and historical building typologies.

In practice, this is evident in the architects’ reinterpretation of traditional elements. In a Dubai mosque, for instance, a marble and stone courtyard, which would traditionally be a private enclave, serves as a permeable transition between the street and the prayer hall, where the architects imagined kids could play soccer while adults gather. Inside the hall, the architects designed a series of skylights that allow the movement of the sun over the course of the day to alter the experience of the space. “We wanted it to have a sense of the passage of time,” says Teramoto.

Similarly, in a 145,300-square-foot mixed-use office complex, also in Dubai, the architects studied the layout of traditional Arab cities, which are characterized by buildings positioned close together to create shaded alleyways. The outcome is a series of interconnected two-story structures made of shipping containers (a nod to Dubai’s longtime status as a port city in the Persian Gulf), with public courtyards woven throughout. And for a forthcoming arts center in Jeddah, Saudi Arabia, ibda created stepped terraces and open circulation that links multiple levels through a central courtyard, effectively extending and activating the space vertically.

With each project the firm takes on, the architects blend contemporary and historical elements to create fresh designs. The results are buildings both subtly innovative yet comfortably familiar. *Erin Hudson*



**FOUNDED:** 2009

**DESIGN STAFF:** 12

**PRINCIPALS:** Wael Al Awar, Kenichi Teramoto

**EDUCATION:** Al Awar: American University of Beirut, B.Arch., 2004

Teramoto: Tokyo University of Science, B.Arch., 1999; MS.Arch., 2001

**WORK HISTORY:** Al Awar: Archikubik, 2003; C+A (formerly Coelacanth and Associates), 2004-09

Teramoto: Neutelings Riedijk Architects, 2000-03; C+A, 2003-12

**KEY COMPLETED PROJECTS:** Yamanote Atelier, Dubai, 2016; Al Warqa’a Mosque, Dubai, 2015; Hai d3, Dubai, 2015; Omote Sando H, Tokyo, 2012

**KEY CURRENT PROJECTS:** Hayy: Creative Hub, Jeddah, Saudi Arabia; Beach Villa Jumeirah, Dubai; Mosque of Reflection, Dubai

[ibdadesign.com](http://ibdadesign.com)



# EDWARD OGOSTA

## CULVER CITY, CALIFORNIA



**FOUNDED:** 2011

**DESIGN STAFF:** 2-3

**PRINCIPAL:** Edward Ogosta

**EDUCATION:** Harvard Graduate School of Design, M.Arch., 2001; University of California, Berkeley, B.A. Arch., 1997

**WORK HISTORY:** Clive Wilkinson Architects, 2006-11; Michael Maltzan Architecture, 2004-06; SPF:architects, 2002-04

**KEY COMPLETED PROJECTS:**

Corner Pocket House, Manhattan Beach, 2017; Rear Window House, Culver City, 2016; Hangar Office, Culver City, 2014; Nanobrewery, Berkeley, 2013 (all in California)

**KEY CURRENT PROJECTS:**

Fraternal Twins House, Culver City; Vitrocsa Container (mobile exhibition); Swell House, Manhattan Beach (all in California, except as noted)

[edwardogosta.com](http://edwardogosta.com)

**TO HEAR** Edward Ogosta tell it, once a strong concept is in place, a project practically designs itself. “It’s simple,” he says, about the innovative Southern California residences and workplaces he has built since founding Edward Ogosta Architecture in 2011. “We try to do the most with the least number of moves. That leads to clear and elegant solutions.”

But simple is not easy. At 43, Ogosta has paid his dues, working for more than a decade in construction management on large-scale international projects after receiving his M.Arch. degree from Harvard, in 2001. When he finally went out on his own, he says, “I turned the creative side of my brain back on and pursued my own ideas, with the confidence to get things built.”

Ogosta’s buildings are not inert structures; they are experiences. “I’m interested in views, moments, atmosphere, how humans interact with buildings,” he says. The unbuilt Four Eyes House comprises four towers oriented in different directions, toward the sunrise, mountains, sky, and the city of Palm Springs. Each is a 10-by-12-foot bedroom containing a bed and nothing more, to be interchanged among family members depending on the experience each wants.

Ogosta also likes to draw people through his buildings. In Rear Window House, an expansion of a Culver City bungalow for his own family, a large opening at the end of a series of rooms frames a view of backyard greenery. “There are destination points in a building, where your attention is awakened to your surroundings—a view or quality of light or material that grounds you in the moment and makes you feel a relationship to the architecture,” he says. His home’s serene minimalism is “the polar opposite of the house I grew up in” in Palos Verdes, California, says Ogosta: his parents bought a predecorated model ranch in the 1970s, complete with shag carpet and floral wallpaper, and never changed a thing.

When Ogosta applies his signature tenets to projects like the Hangar Office, the adaptive reuse of a warehouse as headquarters and training center, the idea is still “to create moments, but for a group.” A skylit void became an exhibition and event space with “a sense of quiet ambient light,” says Ogosta, who says he often feels more affinity with contemporary light and space artists like James Turrell and Robert Irwin than with the “computationally driven” architecture in vogue right now in L.A.

For Ogosta, architecture is about all the senses. He tells his students at Woodbury University’s School of Architecture, where he is an adjunct professor, to “imagine the entire building in your head before you draw a thing—the way gravel crunches, light falls, surfaces feel.” By not rushing to “random graphic design moves,” this nonconforming architect believes, “you get at the fundamental experience a person would have in that space.” *Cara Greenberg*

**HANGAR OFFICE** This 3,400-square-foot LEED Platinum warehouse conversion provides a new training center for Servicon Systems, a provider of sustainable maintenance services for Southern California’s aerospace industry.







**REAR WINDOW HOUSE** Through careful sequencing of new spaces and strategically located apertures, this addition to a 70-year-old bungalow for the architect's own home opens itself up to become deeply integrated with the rear garden (top).

**CORNER POCKET HOUSE** Located on a noisy intersection in Manhattan Beach, California, this transformation of a cramped 1950s bungalow "actually designed itself," according to Ogosta. The need to buffer the house from traffic meant few windows on the street elevation; a depression in the terrain dictated retaining walls (above). The plan is a straight shot from the front patio to a giant tree in the backyard, the rooms "all lined up to clearly create a connection from inside to out" (right).



# WUTOPIA LAB

## SHANGHAI



**FOUNDED:** 2013

**DESIGN STAFF:** 10-15

**PRINCIPALS:** Yu Ting, Min Erni

**EDUCATION:** Yu: Tongji University, Ph.D., 2011; Tsinghua University, B.Arch., 1995.

Min: Shanghai University, Bachelor of Interior Design, 2005

**WORK HISTORY:** Yu: Shanghai Xian Dai Architectural Design Group, 1995-2013. Min: Shanghai Xian Dai Architectural Design Group, 2003-07

**KEY COMPLETED PROJECTS:**

His House and Her House, Shenzhen, China, 2018; Plain House, 2017; Metal Rainbow, Suzhou, China, 2017; Underground Forest, 2017; 123+ Growth Center, 2016; One Person's Gallery, 2016; Eight Tenths Garden, 2016; House on the House, 2015 (all in Shanghai, except as noted)

**KEY CURRENT PROJECTS:**

Children's Restaurant of Aranya Beidaihe, China; Riddle BnB; Z House; Chinese Model Museum; Sinan Mansion Bookstore; Bookstore in Eastern Orthodox Church; Children's Bookstore; 24-hour Bookstore, Rizhao, Shandong Province, China (all in Shanghai, except as noted)

**YU TING**, one of the two founders of the Shanghai-based firm Wutopia Lab, describes himself as an “architect, gourmet, and columnist” and stays busy in each of those pursuits. In addition to running his architectural practice with cofounder Min Erni, 37, he writes articles on food for the *Xinmin Evening News* and on culture and his home city for various publications. Along with Dai Chun, an editor at *Time + Architecture* magazine, published by Tongji University in Shanghai, he runs Let's Talk, a forum that has hosted more than 100 discussions with architects, designers, and thinkers during the past three years, and Urban Micro Space Revival Plan, an effort to research and activate small “lost” spaces scattered throughout Shanghai.

Yu, 46, revels in the diversity found in the city and approaches architecture as a “study of complex systems.” Instead of emphasizing simplicity in a messy world, he tries to bring different—even opposing—concepts together. This process of “antithesis” design resembles the way the Chinese language places different ideograms together, creating poetic juxtapositions that are often hard to translate. “Antithesis is all about relationships,” explains Yu.

You can see this strategy at work in many of Wutopia Lab's projects. At Eight Tenths Garden, for example, Yu places a four-story circular building within a set of two-story bar structures wrapping the outer edges of the triangular site. Perforated white metal panels create a veil around the circular volume and contrast with the more opaque gray exteriors of the lower buildings on the perimeter. Gardens tucked between the circle and the bars, and within the central building itself, add to a sense of layered but balanced complexity. Form, color, and materiality help modulate the relationship among all the elements.

At Plain House, a residence for the artist Li Bin, Wutopia Lab took a more extreme approach to color, painting the living room a vibrant red and a tall central space an aqueous blue. Skylights animate both these spaces with changing light as the sun moves from east to west. The result is a project more layered and complex than its name would imply.

Shanghai's rich culture—from the diverse ingredients in its food to the striking contrasts between old and new—drives everything he does, says Yu. Even the firm's name derives from its home base, since the character *wu* connotes the areas and the people in Jiangsu and Zhejiang provinces encompassing Shanghai. By coupling this Chinese character with a Greek suffix, Yu is practicing the sort of antithesis thinking that he preaches, and which points his firm in the seemingly opposing directions of idealism and the practicalities of place. *Clifford A. Pearson*



**EIGHT TENTHS GARDEN** Pleated shutters enclose a cylindrical enamelware museum and cultural center (left and opposite) that offers a multipurpose art space, a library, study rooms, chess rooms, and a café and restaurant to the public. The garden covers 9/10 of the site area.





**PLAIN HOUSE** Wutopia Lab designed a second studio for artist Li Bin that includes living spaces and emphasizes the duality between those two functions (left).

**123+ GROWTH CENTER** Led by Min Erni, this daycare was designed with the scale of a child in mind, and made flexible enough to allow each kid's imagination to determine the space's function (below).

**METAL RAINBOW** Housed within a bookstore in Suzhou, China, a series of colorful arching metal screens soars over the reading area. By varying their curves, an architecturally abstracted landscape of cliffs, valleys, and islands is created (opposite).





PHOTOGRAPHY: © SHAO FENG (OPPOSITE, BOTTOM)

# LOCAL STUDIO

## JOHANNESBURG



**FOUNDED:** 2012

**DESIGN STAFF:** 10

**PRINCIPAL:** Thomas Chapman

**EDUCATION:** University of the Witwatersrand, M.Urban Design, 2013; University of the Witwatersrand, M.Arch., 2009

**WORK HISTORY:** Silvio Rech and Lesley Carstens Architects, 2006-12; C.UR B, 2007-11; Dirk Bahmann Architects, 2004-05

**KEY COMPLETED PROJECTS:**

Refugee and Migrant Support Centre, Johannesburg, 2017; Trevor Huddleston Memorial Building, Sophiatown, 2016; African School for Excellence, Tsakane, 2015; Outreach Foundation Community Centre, Johannesburg, 2014 (all in South Africa)

**KEY CURRENT PROJECTS:**

Hope for the Blind Ophthalmology Centre, Modimolle; African School for Excellence, Port Elizabeth (both in South Africa)

[localstudio.co.za](http://localstudio.co.za)

### WESTBURY PEDESTRIAN BRIDGE

A publicly funded pedestrian bridge connects two areas divided by a dangerous roadway, a product of Apartheid-era planning. The structure, designed to be humble in appearance, incorporates an adjacent park and amphitheater, and provides a connection to a nearby public transit station.

**JOHANNESBURG NATIVE** Thomas Chapman was 10 years old in 1994 when apartheid was officially dismantled. As a white male raised by progressive parents, he grew up aware of his privilege; interest in both political activism and the built environment led to separate master's degrees in architecture and in urban design from the University of the Witwatersrand, where he addressed the spatial injustices of apartheid-era city planning in his thesis projects.

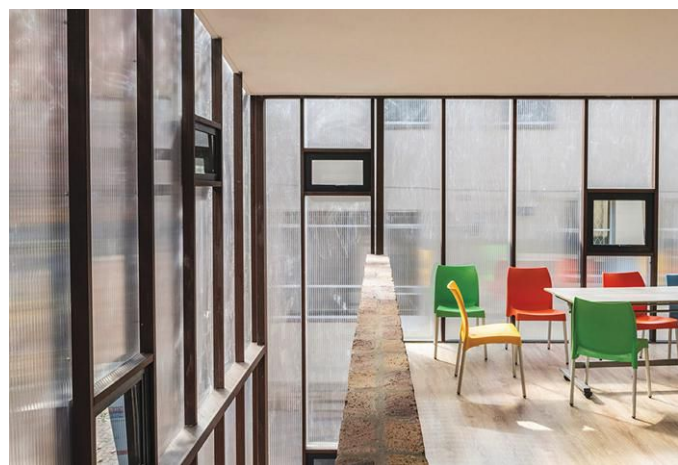
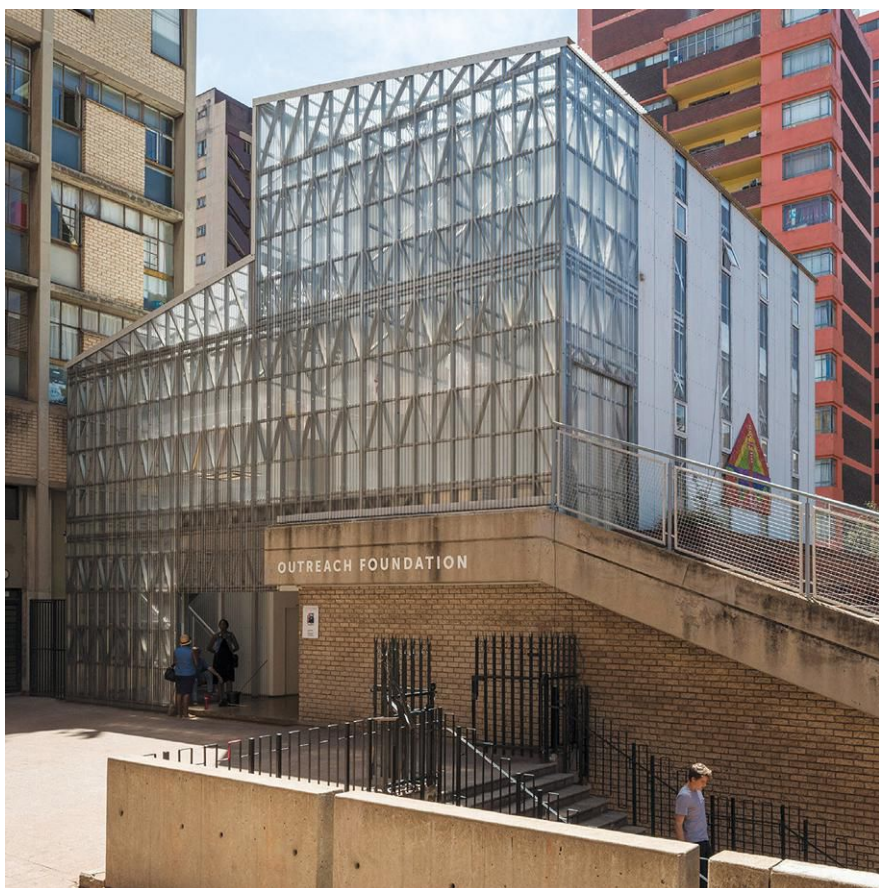
Yet despite his advocacy for public space, Chapman, now 33, found himself working for a firm specializing in tropical island getaways and safari lodges after graduating; one of his projects included the transformation of an island into private villages (Prince William and Kate Middleton honeymooned on one). To satisfy a desire for humanitarian work, he took on small public art installations in Johannesburg on the side. "I reached the point where it was completely schizophrenic," says Chapman. In 2012, he made the jump and founded his own practice, Local Studio.

Local Studio has built on Chapman's academic work. The now 15-person firm quickly established a name for itself with its scrappy approach to low-budget yet handsome structures, including schools, housing, and clinics, that serve the city's most impoverished communities. The goal, according to Chapman, is to use architecture to overcome the city's physical barriers. "Infrastructure was planned to separate racial groups," he explains. "The injustice manifests in the lack of social spaces in areas that have emerged as poor, black neighborhoods."

The Outreach Foundation Community Centre, which offers performing-arts education in a crime-ridden area in downtown Johannesburg, nicely exemplifies Local Studio's ethos. The first new civic space built in the neighborhood since the 1970s, the light steel-frame structure is clad in polycarbonate and galvanized steel sheeting. An innovative use of low-cost industrial materials is a hallmark of the studio's approach, and plastic is a frequent go-to for wall systems. "We came to the idea that we can adapt the industrial typologies seen on the outskirts of Johannesburg to get more out of tight budgets," Chapman says.

A steady stream of developer, government, and NGO clients has the firm juggling commissions, including several affordable-housing projects. And Chapman wants to reach beyond what's local. "It's only a matter of time until we go farther north," he says. "The whole continent of Africa is in our sight line." *Alex Klimoski*





#### AFRICAN SCHOOL FOR EXCELLENCE, TSAKANE CAMPUS

Working with a nonprofit organization offering secondary schooling in a poverty-stricken township east of Johannesburg, the design team took inspiration from the local industrial vernacular for the lightweight structural steel building, which comprises 24 classrooms, a multipurpose hall, and a reception area (top).

#### OUTREACH FOUNDATION COMMUNITY AND COUNSELING CENTERS

Featuring a lightweight steel structure and polycarbonate cladding, the community center (left) provides much-needed social infrastructure to the crime-ridden neighborhood of Hillbrow, Johannesburg. Its program includes a computer center, dance studio, conference room, and offices. For the same client, a religious nonprofit, the firm designed a small trauma-counseling center using the same plastic wall system (above).

# CIVIC ARCHITECTS

## AMSTERDAM



**FOUNDED:** 2015

**DESIGN STAFF:** 10

**PRINCIPALS:** Jan Lebbink, Rick ten Doeschate, Ingrid van der Heijden, Gert Kwekkeboom

**EDUCATION:** *Lebbink/ten Doeschate/Kwekkeboom:* Technical University of Eindhoven, M.Arch., 2009. *Van der Heijden:* Technical University of Eindhoven, M.Arch., 2010

**WORK HISTORY:** *Lebbink:* VenhoevenCS architecture+urbanism, 2009-12, Paul de Ruiter Architects, 2012-15. *Kwekkeboom:* Fabrications 2009-10, Venhoeven CS architecture+urbanism, 2010-12. *Ten Doeschate:* VenhoevenCS architecture+urbanism, 2009-12; Atelier for Chief Government Architect of the Netherlands, 2009-17. *Van der Heijden:* AWG Architecten, 2010-11

**KEY COMPLETED PROJECTS:** Willem II Passage, Tilburg, NL, 2016; Piushaven Harbour Pavilion, Tilburg, NL, 2017; Flemish-Dutch pavilion, Frankfurter Buchmesse, Frankfurt, 2017

**KEY CURRENT PROJECTS:** Public Library & City Forum, Tilburg, NL

[civicarchitects.eu](http://civicarchitects.eu)

**CIVIC ARCHITECTS** started its work on a cyclist and pedestrian underpass with a bit of a white lie. The Amsterdam-based firm promised its client, the city of Tilburg, Netherlands, it could design a high-tech facade of transparent brick that would allow light into a passageway connecting the historic downtown with a new development on the other side of the railroad tracks. “Of course, that brick didn’t exist,” says Jan Lebbink, 36, one of four partners—including Rick ten Doeschate, 34; Ingrid van der Heijden, 49; and Gert Kwekkeboom, 33—who founded Civic in 2015. They went through unsuccessful tests with ceramic and porcelain brick before finding Van Tetterode glass studio, known for working with artists to create custom glasswork. “Would it be three or four bricks?” asked the studio. No, the architects would need 30,000. Once that hurdle was overcome, Civic collaborated with interactive-design firm Lust and Philips Lighting to integrate an algorithm that reacts to passersby and to shifts in the environment like a passing train or changing weather. The resulting tunnel makes good on the architects’ promise, creating a passageway that feels more like an open-air street; residents even rent it out for parties now.

The project embodies a philosophy underpinning much of Civic’s work, which is that the role of technology is not to lead but to support the advancement of materials or experiences. In this way, the firm aims to weave together architecture with public value and cultural heritage with the logistics of urban life.

Civic brings community-mindedness to its operation as a practice too. As architecture-school graduates at the height of the country’s recession, its principals found themselves part of a network of peers who were just trying to get by. “We were in crisis, and not everyone had the most interesting work,” says Lebbink. So they started collaborating on temporary exhibitions and small projects, and eventually formed Cloud Collective, which today consists of three firms, Civic, Bright, and Matters, a trifecta that can tackle public projects from all angles: public architecture, scenography and culture, and strategic urban planning, respectively. “For architects, working with other people is sometimes hard to do,” says Lebbink, “but for us it’s part of our DNA. Everyone has an ego and voice, and we are able to manage that.”

Though Amsterdam faces a housing crisis—and many local architects have entered the residential design sector to meet a demand estimated at 60,000 units—Civic has sought broader subjects. Its work for the International Architecture Biennale Rotterdam, which launched this month, is a catalogue about creating buildings that breathe. It will be a resource for young architects who want to design facades that relate to their environments and provide better interior air quality—something that Lebbink says has been lost in Dutch housing in the fervor to create airtight, energy-efficient structures.

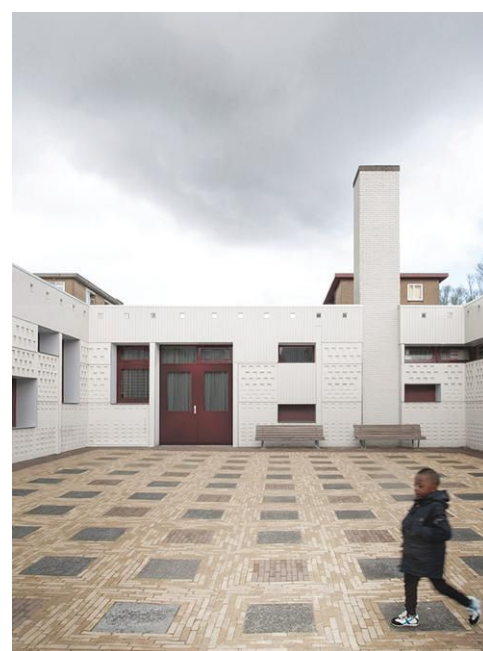
As for what’s next, Civic prefers to seek out project types it hasn’t tackled before. “We play public-buildings bingo,” jokes Lebbink. In this way, the firm may never find its comfort zone, but it can always find a new frontier. *Jennifer Krichels*

**URBAN ALGAE FARM**

For a garden festival in Geneva in 2014, Civic created a closed system of transparent tubes along a viaduct for growing algae, which only need sunlight and carbon dioxide. The project illustrates potential future practices, including food production in urban environments, conservation of green space, and the reinterpretation of existing infrastructure.







**PIUSHAVEN HARBOR PAVILION** Collaborating with Bright, a fellow member of the Cloud Collective, Civic designed this Miesian pavilion on the central pier in Tilburg's old harbor to serve as a public viewing platform, gathering place for recreational boaters, and restaurant (top).

**WILLEM II PASSAGE** Luminous glass brick lines this public passage, which links the historic city center of Tilburg with the redevelopment area along the railway. Thousands of embedded LEDs generate dynamic light effects that respond to movement, weather, and time of day (above).

**MOSQUE** Civic transformed a nondescript H-shaped postwar school building in Amsterdam into a highly detailed mosque, with changing brick textures along the facades, and courtyards that are securely enclosed on one side by high stone entrances and loosely enclosed on the other by low hedges (above).

# P.R.O.

## BROOKLYN, NEW YORK



**FOUNDED:** 2013

**DESIGN STAFF:** 4-7

**PRINCIPALS:** Miriam Peterson,  
Nathan Rich

**EDUCATION:** *Peterson:* Yale School of Architecture, M.Arch., 2009; Cornell University, Economics B.A., 2004. *Rich:* Yale School of Architecture, M.Arch., 2008; Wesleyan University, B.A., 2002

**WORK HISTORY:** *Peterson:* Tod Williams Billie Tsien Architects, 2009-12 and 2004-06. *Rich:* Steven Holl Architects, 2010-14; ShoP Architects, 2009

**KEY COMPLETED PROJECTS:** Galerie Perrotin, 2017; Mental Health by Design, Bronx, 2017; Prismatic Bay Townhouse, 2016; Build it Back, Brooklyn, 2016 (all in New York)

**KEY CURRENT PROJECTS:** New Tenement; 624 Metropolitan, Brooklyn; Sonoma House, Santa Rosa, CA (all in New York, except as noted)

[pro-arch.com](http://pro-arch.com)

ON A RECENT Saturday afternoon brimming with spring fever, a line of people, young and old, snaked down Manhattan's Orchard Street and into Galerie Perrotin—a new contemporary-art space housed within a late 19th-century industrial building. The occasion was the opening of Japanese pop artist Takashi Murakami's latest show—Perrotin's most extensive since its inception in April 2017. The fan-frenzied event, which filled out the expertly lit space's three levels, was a christening of sorts, and the architects of the gallery, Miriam Peterson and Nathan Rich, were the proud parents. "We've done cool projects before," said Rich, "but nothing that 500 people have walked through in a day."

It's an exciting moment for the husband-and-wife team, who founded their Brooklyn-based firm, P.R.O., in 2013, when one of Rich's former painting professors commissioned him to build an art studio in rural Connecticut. The project—a modest, shedlike volume—planted the seed for Rich, 38, and Peterson, 35, to break from their roles at the offices of Steven Holl and of Tod Williams and Billie Tsien, respectively, to start something new. For the couple, who met as graduate students at the Yale School of Architecture, establishing their own studio had always seemed the natural course. "I think we actually talked about it on our first date," jokes Peterson.

It makes sense that Perrotin, with outposts in Paris, Hong Kong, Seoul, Tokyo, and Shanghai, approached the two designers, both of whom had worked at firms known for high-profile cultural projects. Perhaps less predictable is the couple's focus on affordable housing. In 2014, with fellowship funding from the Institute for Public Architecture, they developed a housing concept rooted in the reclamation of underutilized parking lots. Although not implemented, that sealed a relationship with the New York City Housing Authority (NYCHA), for whom they have developed a series of follow-up proposals. In addition to their commissioned work—including residential interiors and wellness spaces for two public high schools in the Bronx—the couple is developing a research component of their practice, focusing on the public realm, which they see as a more productive alternative to entering architectural competitions. Across budgets and scales, the young firm looks for opportunities to broaden their engagement with the city, where Peterson, the daughter of two architects, was born and raised.

The couple's own neighborhood of Gowanus, the industrial wasteland turned artist enclave in South Brooklyn where they live and have their office, is vital fodder for their process; the two have developed creative ties with many local tradespeople, including metalworkers whose shop provided the blackened steel for Perrotin's facade. A similar spirit also snagged them a recent commission, now in design development, for a 20-unit rental building and art gallery, also on the Lower East Side: when they saw an artwork they wanted but couldn't afford, they proposed bartering their services to the owner in exchange for it. "We hustle a lot," says Rich.

The duo hope to grow their four-person design team, but they are adamant about staying directly involved in projects—together. "She's more pragmatic, and I'm more conceptual," says Rich, who trained as a painter, while Peterson's undergraduate degree is in economics. This friction is an essential part of their design approach, and balances the entrepreneurial and creative aspects necessary to sustain the practice. "We're actively trying to be good architects and good businesspeople," says Peterson. With nine projects in the pipeline, including two ground-up mixed-use housing units, the effort seems to be working. *Alex Klimoski*



**GALERIE PERROTIN**

Adapted from a former fabric store, the new gallery is the largest on the Lower East Side. The architects maintained the original hand-painted facade, altering only the storefront exterior, which is clad in blackened steel (right). Inside, a vaulted ceiling with recessed lighting references the building's original terra-cotta flat-arch ceiling, while organizing the space with bays of light (opposite).





**TELFAIR STUDIO** The one-room painting studio has a steeply pitched standing seam roof with deep eaves and blackened-cedar cladding (above). Carefully placed vertical apertures, as well as two large banks of skylights, admit daylight and connect the interior to the surrounding rural landscape (far left).

**5X5** The firm's entry for 5x5, an exhibit of provocative architectural models, each responding to issues related to the public realm, addresses the topics of zoning and air rights with a new building typology called the site-less tower (left).



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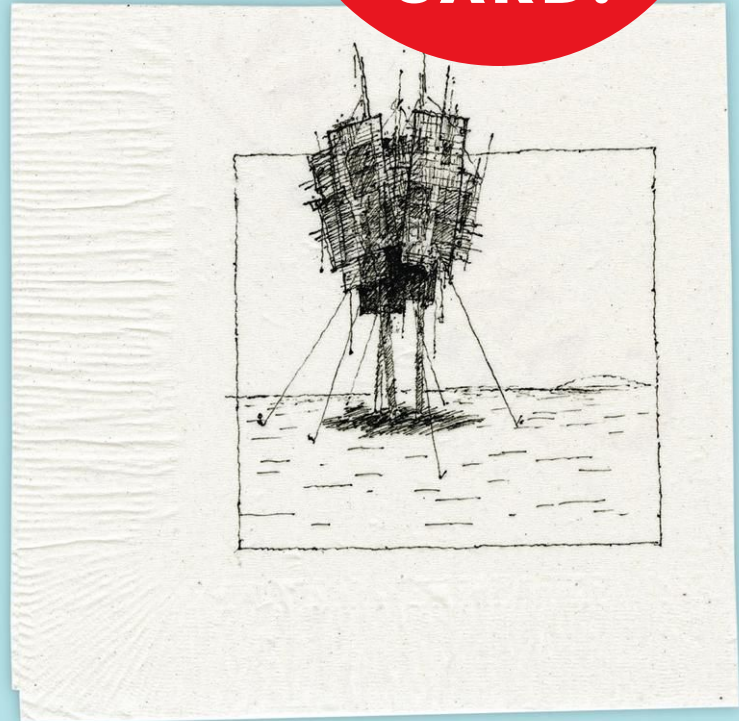
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- ▶ You may submit up to 6 cocktail napkin sketches, but each one should be numbered on the back and include your name.
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198 Kvadrat Flagship Showroom  
202 Google at 1212 Bordeaux

PHOTOGRAPHY: © NICK MERRICK

BNIM OFFICE AT CROWN CENTER  
KANSAS CITY, MISSOURI



BNIM Offices at Crown Center | Kansas City, Missouri | BNIM

# A Modernist Reconstruction

A firm's transformation of its own new space in an Edward Larrabee Barnes building leads to a more productive studio.

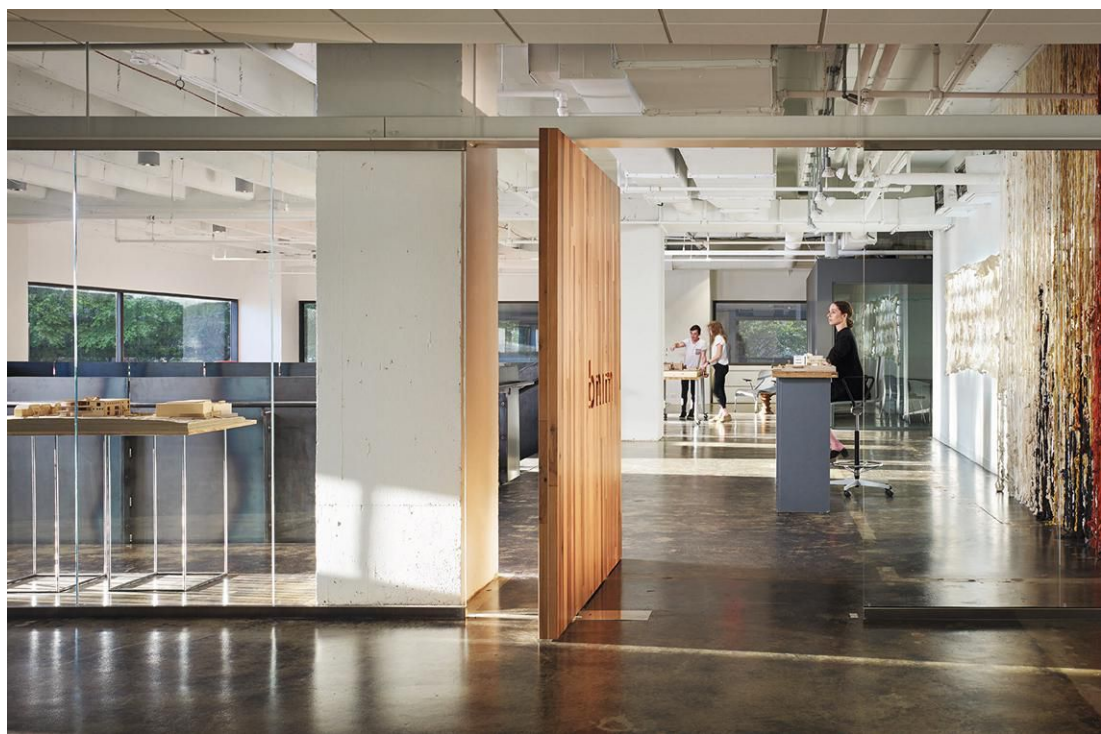
BY CHARLES LINN, FAIA

Ever since BNIM's predecessor firm, PBNA, was founded in 1970, its principals have committed themselves to helping revive Kansas City's deteriorating downtown by keeping their offices there. For years they were the only tenant in the Kansas City Power and Light building, a once-glorious 1931 Art Deco office tower. "There was nothing there but feral cats, pigeons, and us," says BNIM principal Steve McDowell.

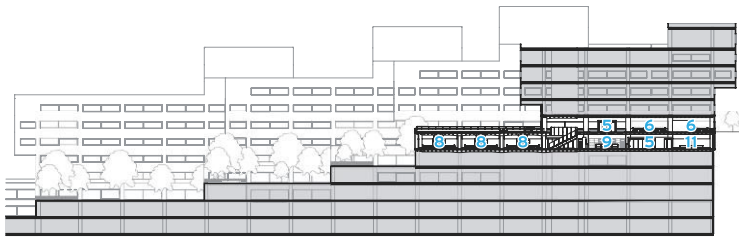
But while being in an old building was cool, it didn't allow the flexibility and ease of communication that a modern architectural practice demands. At the Power and Light building, the principals were grouped on a mezzanine that was separated from the studios, which were stacked on floors above and below them. Communication was poor. Reconfiguring the office layout would be painful. And while BNIM was known for designing connections to nature for its clients' buildings,



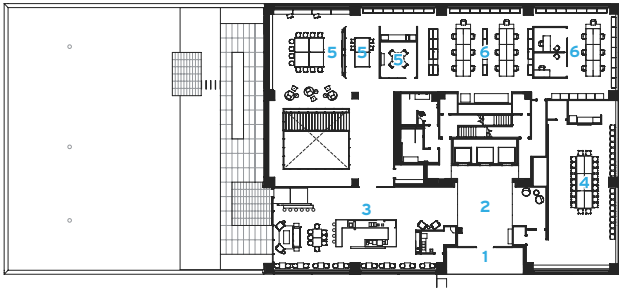
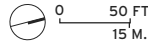
PHOTOGRAPHY: © MICHAEL ROBINSON (OPPOSITE); NICK MERRICK



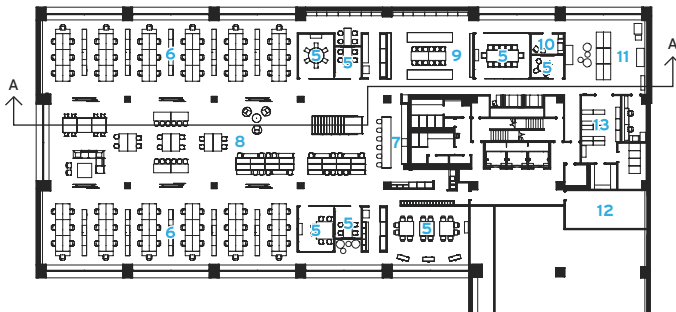
**SPARE SPACE** The architects made the most of the minimal tenant-improvement allowance by keeping the interior raw. The only big move was the removal of a 24-foot-square section of the concrete slab to join the floors (left). The balustrades are sheet steel discolored by laser cutting. The office entrance (above) is on the upper floor, where a small reception area and coffee shop welcome visitors and employees.



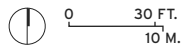
SECTION A - A



LEVEL-FIVE PLAN



LEVEL-FOUR PLAN



- |                   |                     |                  |
|-------------------|---------------------|------------------|
| 1 ENTRANCE        | 6 STUDIOS           | 10 WELLNESS ROOM |
| 2 LOBBY           | 7 KITCHEN           | 11 MAKER SPACE   |
| 3 COFFEE SHOP     | 8 THE BOULEVARD     | 12 WORKSHOP      |
| 4 CONFERENCE ROOM | 9 MATERIALS LIBRARY | 13 STORAGE       |
| 5 MEETING SPACE   |                     |                  |

its own office was surrounded by streets and grim parking lots.

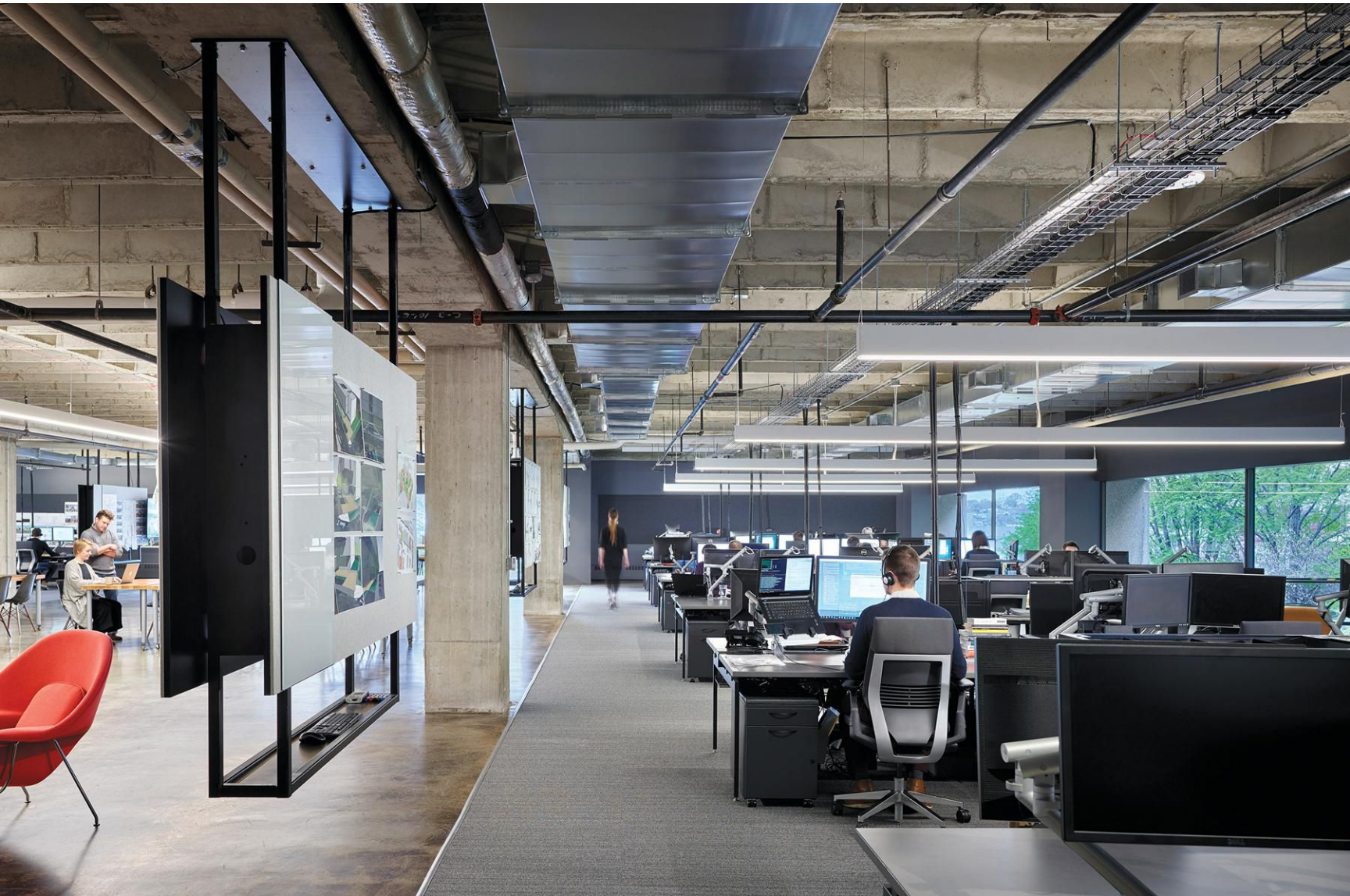
When the building's owner decided to turn it into condominiums, the firm moved to another downtown building. And after the potential renovation of that space fell through in June of 2016, the architects decided to look for one beyond the downtown for the first time. With a lease expiring and seven months to find a new location, design, build, and move into it, they settled on two floors in a 1971 five-building concrete office complex designed by Edward Larrabee Barnes that is part of Crown Center.

Barnes's buildings were the first constructed at this highly success-



ful mixed-use development built by the Hall family next to their Hallmark Cards headquarters. The concrete structures are clad in tan precast panels that frame enormous panes of tinted glass. After more than 45 years, their facades remain unsullied by corporate-tenant signage or other alterations.

A 1970s concrete building might seem like the last place an architecture firm whose principals helped found the U.S. Green Building Council would move. But, inside, Barnes's panoramic 26-foot-wide windows, which fit within the structure's generous 30-foot column spacing, offer spectacular views to the mature trees and gardens out-



**BEFORE AND AFTER** BNIM's offices are indicated by the ochre-tinted section of the photo of the 1970s late modern complex (opposite, top). The space was originally filled with workstations that blocked views to the grounds outside (opposite, bottom). Now "the Boulevard" bisects the ground floor, where everybody can see out (above).

side, and of Crown Center's 10-acre public plaza and fountains.

"Having a strong eye-level connection to nature made the difference in this tenant space," says design team member Rohn Grotenhuis. "We preserved and enhanced this condition with the openness of our layout, dark color tones, and lower lighting levels. It's a little like a secret garden. A visitor doesn't expect that indoor-outdoor connection in this Brutalist building."

The construction budget set by the owner's tenant-improvement allowance was minimal, as was the compressed schedule, so the architects went minimalist too, polishing the concrete floors and exposing the concrete pan-joint structure, ducts, electrical, and cable trays. The sole big move was cutting a 24-foot-square hole through the slab separating the two floors and connecting them with a stair. A long, open space called "the Boulevard" extends from the bottom of this stairway toward one of the sweeping views of the trees and plaza. Here employees meet at custom-made farmhouse tables to eat, work, and gather for informal conversations.

There are no private offices. Conference rooms large and small afford privacy if needed. Desk assignments in the open studio areas are flexible, so that a principal might be sitting at a workstation alongside a young employee, an arrangement that minimizes overt hierarchical office structure and facilitates the sharing of knowledge. Wi-Fi and monitors that anyone can use to stream content mean pop-up studios are created on the fly just by people with their laptops getting together. Business phone numbers are ported to each employee's cell phone, so desktop landlines have been eliminated.

The new environment has yielded almost immediate gains in productivity and revenue for BNIM, which they attribute to better communication and a healthier, more pleasing environment. According to the firm, net revenue per employee increased by 7 percent the first year after their move in January 2017. Net revenue per technical staff member improved by 9 percent. The efficiency of BNIM's work hours improved too, as reflected in a 14 percent increase in net revenue per direct labor hour. Applications from new architecture graduates more than doubled, from 51 in 2016 to 105 in 2017.

The Hall family, which still owns Crown Center and Hallmark Cards, whose headquarters have not moved, built its business based on good design. In addition to Barnes, they hired Victor Gruen, Harry Weese,



**SERENE SURROUNDINGS**  
 Contemporary furnishings create comfortable meeting areas on the upper (above) and lower levels. 26-foot-wide by 6-foot-8-inch-high windows on the lower floor have the visual effect of bringing trees and the garden into the interior (left and opposite). "The Boulevard" features long farmhouse tables (opposite) made from solid-wood-core doors BNIM salvaged from the demolition phase of a project.



Warren Platner, and The Architects Collaborative to do the master plan, as well as hospitality, housing, and retail design for the original mixed-use development. And, 45 years later, people still flock to the complex.

Crown Center Redevelopment Corporation still honors the tradition. Having BNIM as a tenant is good for marketing, and they love showing off what the firm did with its space. So BNIM negotiated a special deal with them: for every new tenant it helps bring in, they get a rebate on their own rent. Now the firm regularly hosts “broker parties,” where leasing agents show potential renters what’s possible once the old lay-in ceilings, workstations, and dirty carpet are stripped away. So far, the firm has helped sign one tenant, who took 30,000 square feet, and they believe that more are in the works. ■

*Charles Linn is a Kansas City-based writer and architect and a former deputy editor of ARCHITECTURAL RECORD.*

#### credits

**ARCHITECT:** BNIM – Steve McDowell, James Pfeiffer, Rohn Grotenhuis, Anastasia Huggins, Gretchen Holy, Ashley Perrin, design team

**ENGINEERS:** Henderson (m/p); Antella (electrical, lighting); Structural Engineering Associates (structural)

**GENERAL CONTRACTOR:** Lytle Construction

**CLIENT:** BNIM

**OWNER:** Crown Center Redevelopment

**SIZE:** 22,000 square feet

**COST:** withheld

**COMPLETION DATE:** January 2017

#### SOURCES

**HARDWARE:** Assa Abloy

**CEILING:** Armstrong World Industries; Sound Away

**PARTITIONS:** Maars Living Walls

**WALL FINISHES:** Sherwin-Williams; Unika Vaev

**SURFACES:** Wilsonart; Recycled Surfaces

**CARPET:** Interface

**FURNISHINGS:** Knoll; Herman Miller; Steelcase; Bernhardt; Square One; Watson; Andreu World; Maharam

**LIGHTING:** Ketra; Finelite; Konzept





The Shop at the CAC | New Orleans | Eskew+Dumez+Ripple

# A Sharing Economy

Smart design and real-estate savvy result in an equitable collaboration for a start-up and an established arts institution.

BY MARTIN C. PEDERSEN

PHOTOGRAPHY BY NEIL ALEXANDER

Sometimes the most creative aspect of a project is the elegance of the deal that made it possible. That is the case for the Shop at the Contemporary Arts Center (CAC) in New Orleans, a new co-working space, designed by Eskew+Dumez+Ripple (EDR), located inside a museum—a first in the U.S. Occupying the top two floors of the building, the Shop has a decidedly tech-office vibe, with a variety of workspaces including private offices, a communal lobby that feels (and acts) like one in a boutique hotel, and a young, creative demographic. For the CAC, it's a deal that was many years in the making.

The artist-founded CAC has scrappy roots. When the organization moved into its historic 1905 building in 1977, the surrounding Warehouse District was in freefall. Many of its would-be neighbors were pulling up stakes and leaving. Most of the historic buildings nearby were empty; others had been demolished, tragically, to make way for parking lots. The museum took up residence on the bottom two floors of the building, leaving the third and fourth levels for storage and temporary rentals. A renovation in 1990, designed by Concordia, created a dramatic building-height atrium that helped put the museum on the cultural map and sparked the neighborhood's eventual rebirth. But the top two floors remained woefully underutilized for decades.

It wasn't for a lack of trying. In 1999, the museum's landlord, local philanthropist Sydney Besthoff, donated the building to the CAC. "We've been trying to maximize those floors to generate income for the nonprofit since the building was given to us almost two decades ago," says Neil Barclay, CAC director and CEO. Over the years, the museum vetted innumerable proposals: public and arts high schools, a branch of the University of New Orleans, condos, rental units, the World War II Museum (which eventually got built blocks away), a Barnes & Noble superstore, an advertising agency, *The Times-Picayune*, even a radio

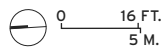
**ROOMS WITH VIEWS** The Shop at the Contemporary Arts Center occupies the third and fourth floors of a 113-year-old building in the New Orleans Warehouse District. The new co-working space overlooks the atrium of the building.



**LANDMARK DECISION**  
 Before becoming home to the Contemporary Arts Center in 1977, the historic building had a variety of uses: law offices, light manufacturing, printing, even a ground-floor Sears & Roebuck. When CAC moved in, its strong cultural presence helped plant the seeds for the area's revival, which began prior to Katrina and has exploded in recent years.



THIRD-FLOOR PLAN

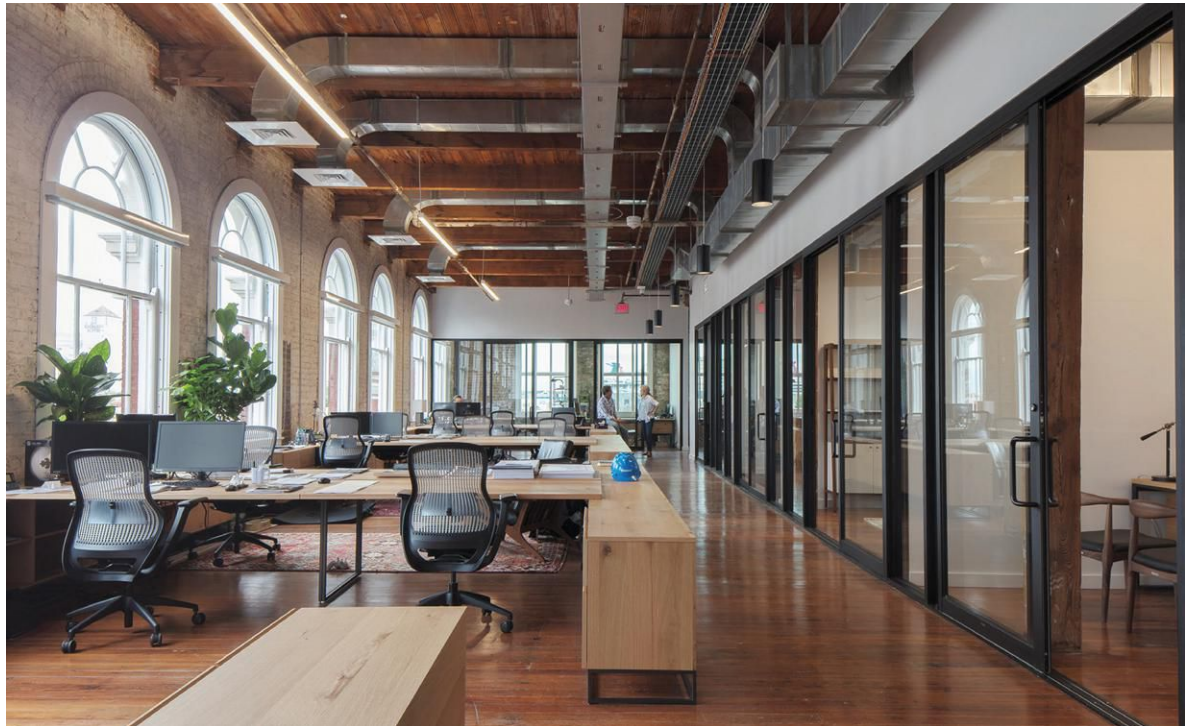


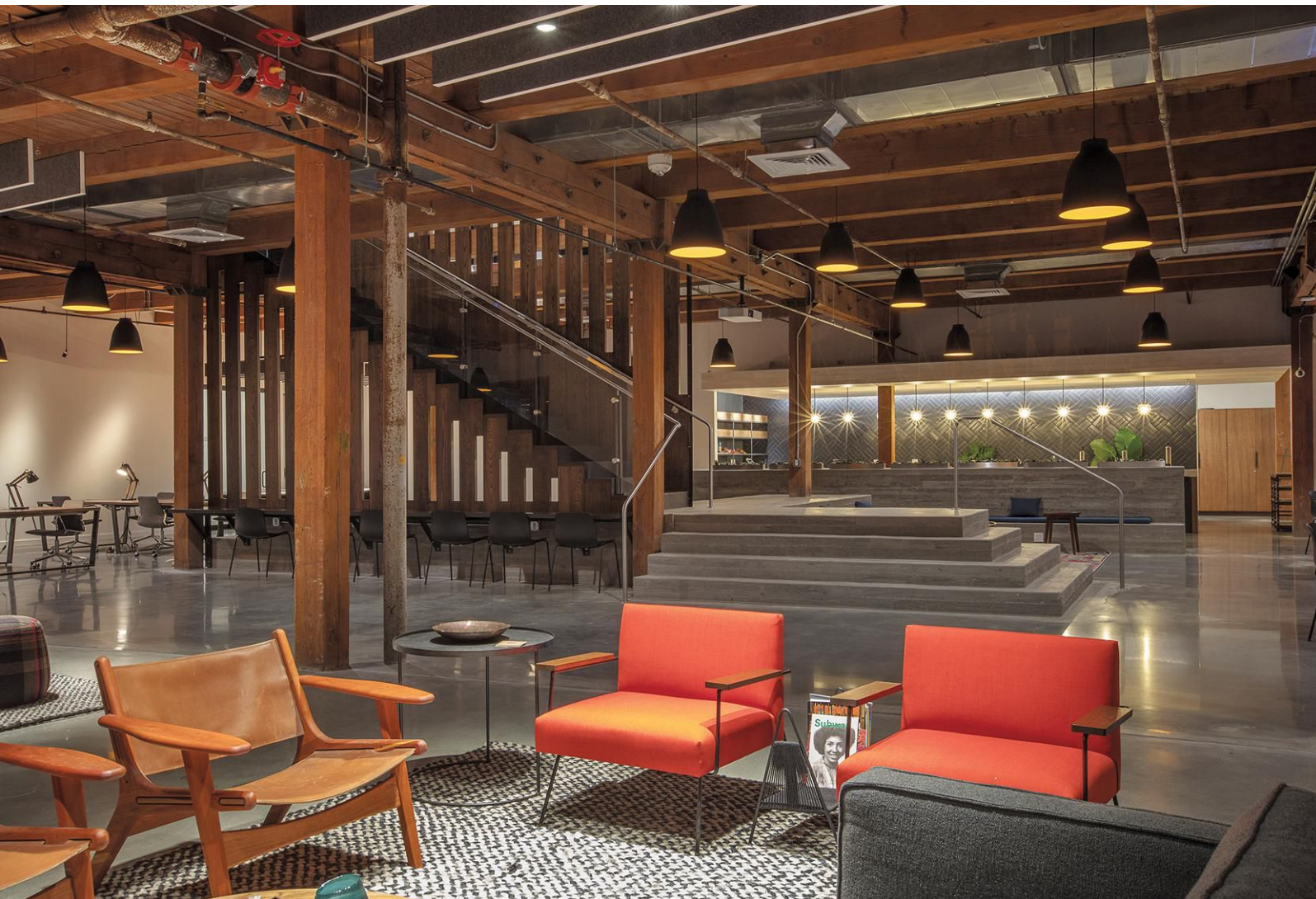
- |                |                      |
|----------------|----------------------|
| 1 ENTRANCE     | 7 SMALL OFFICE SPACE |
| 2 RECEPTION    | 8 LARGE OFFICE SPACE |
| 3 ELEVATOR     | 9 CONFERENCE ROOM    |
| 4 ATRIUM       | 10 IDEA VILLAGE      |
| 5 COMMON SPACE | 11 MAILROOM          |
| 6 BREAK AREA   | 12 MECHANICALS       |



#### SPACE TIME

A meeting room located on a fourth-floor balcony has a view of the dramatic atrium (above). This office suite houses the Domain Companies, the project's developer (right). The Shop offers a variety of rental options, everything from 10-day and monthly passes (which give members access to common areas) to individual offices ranging in size from one- to 10-person.





**RAW POTENTIAL** A dramatic central stair (above) was built on a concrete plinth that serves as a place for events, informal work, and impromptu gatherings, adjacent to a communal kitchen. EDR enlarged the opening around the stair to visually connect the two floors (opposite) and created a wall of private work booths near its base.

station. None led to a workable partnership.

In October 2014, the CAC conducted a building evaluation and determined that the 109-year old structure needed more than \$4 million in building upgrades. The list was long and typical for a building its age, but the money to do the work was largely nonexistent. So, about a year later, the organization renewed its exploration of real-estate options for the upper floors. The most promising offer, a boutique hotel, posed logistical problems connected to art and security. “So, as we were vetting that deal—and it was a good deal—we got this second offer from Domain Companies,” Barclay says.

Domain Companies, in the persons of Matt Schwartz and Chris Papamichael—a pair of former Tulane University fraternity brothers, who returned to New Orleans post-Katrina and have developed a handful of projects in the Warehouse District—had been considering a co-working project, but hadn’t found the right venue. They learned, through EDR principal and former CAC board member Steve Dumez, among others, about the museum’s difficulties. Schwartz and Papamichael sensed an opportunity and presented a plan to the board. “We told them, ‘We have a great idea that will be a perfect match for what you’re doing,’” Papamichael says.

The CAC came back a week later with a counterproposal, and in less than a month a deal was struck. Using state and federal historic-tax credits, Domain was able to fold the building-improvement funds into its \$12 million budget. A 49-year lease was signed that includes \$200,000 in annual rent, with increases for inflation every five years. EDR, which had done several previous projects in the area with Domain, was hired as architect of the building renovation and Domain’s co-working venture, called the Shop.

The first order of business was to install a new roof (with a deck for seating), replacement windows, and a new HVAC system. The design team then created a first-floor visual-arts gallery and made enhancements to the museum’s two adjoining warehouses, which are critical to its mission and finances. (They host CAC-sponsored performances and produce significant revenue from special-event rentals, such as Serena Williams’s wedding last November.)

EDR’s design solution for the Shop was an elegant and spatial one. Taking full advantage of the light-filled atrium, they replaced decades-old Sheetrock with glass, carved out common areas on both floors, and then connected them with a dramatic central staircase. “We designed the stair so that it would occupy a large area of the third floor, which

is the main level,” Dumez says. The concrete plinth emerges out of the floor to become both stairs and seating, and spreads out to serve as informal working and conversation zones. The common areas throughout the Shop provide a variety of work-style options and are beautifully curated, with both site-specific and local art.

Individual offices and workspaces for independent freelancers and small businesses—which include a high percentage of architects and designers as well as Domain—ring the common areas. For a co-working facility, all of it feels remarkably cohesive. In less than a year, Domain says, they’ve almost reached full capacity.

The CAC’s Barclay describes the Shop’s arrival, in September, as “transformational.” But the transformations aren’t just architectural. One of the quieter aspects of the deal was a smart and synergistic arrangement whereby members of the Shop automatically become members of the museum. As it turns out, the 300 or so new members have been fairly active ones. “We noticed their participation during our annual fundraiser,” Barclay says. The bustle and activity above the CAC also sends the right signal to the funding world. “Although we’re not entirely dependent on foundations,” he adds, “they’re a big part of our income, and they like to see that we’re making money the old-fashioned way: earning it with the assets we have.” ■

### credits

**ARCHITECT:** Eskew+Dumez+Ripple – Steve Dumez, design director; Jose Alvarez, principal in charge; Hussein Alayayan, project manager; Jill Traylor-Mayo, interior designer; Emily Heausler, Andy Redmon, project team

**ENGINEERS:** YKM (m/e/p); Pace Group (structural)

**CONSULTANT:** Studio Interior Design (art)

**GENERAL CONTRACTOR:** Palmisano

**CLIENT:** Domain Companies

**SIZE:** 58,100 square feet

**CONSTRUCTION COST:** \$9 million

**COMPLETION DATE:** August 2017

### SOURCES

**GLAZING:** Viracon; Birdview Skylights

**DOORS:** Oldcastle BuildingEnvelope; Assa Abloy; Kawneer; Won-Door; Modernfold; PC Henderson

**INTERIOR SURFACES:** Benjamin Moore; Maharam; Trove; NLXL; Eykon; Lamin-Art; Caesarstone; Cosentino; Offecct; FilzFelt; Itirs Ceramica; Daltile; Crossville; Tandus Centiva; Masland

**FURNITURE:** Knoll; Darran; Bernhardt; Blu Dot; Hay

**LIGHTING:** Eaton; Liteforms; Prima; Flos; Prudential

**CONTROLS:** Legrand



Squarespace | New York | Architecture Plus Information (A+I)

# Hip to Be Square

A fast-growing tech company's new headquarters embraces hospitality and savoir-faire.

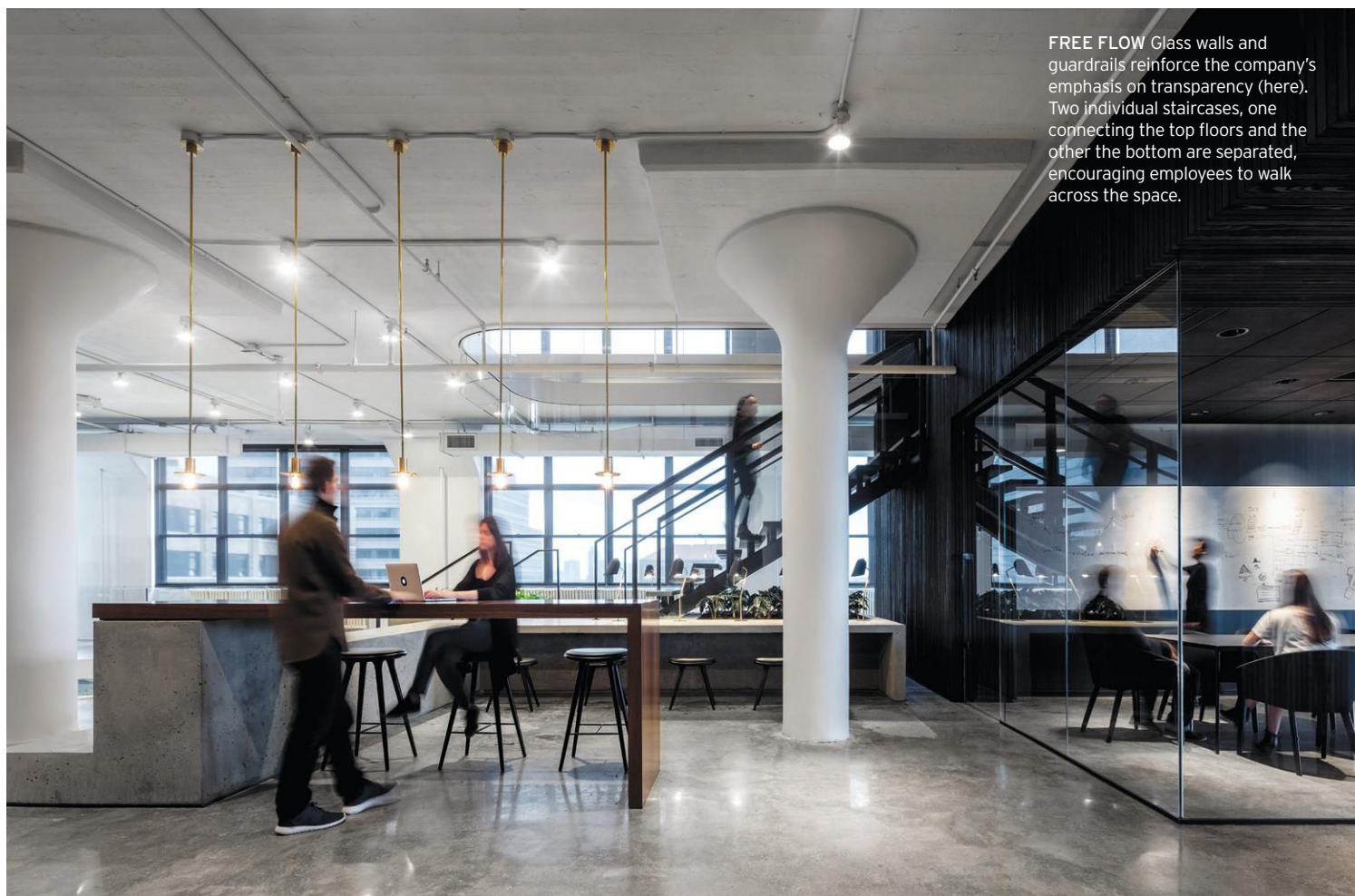
BY ALEX KLIMOSKI

PHOTOGRAPHY BY MAGDA BIERNAT

Squarespace is in the business of developing brands. So it's no surprise that the company—a website-building platform geared to the independent workforce—has a strong identity of its own. With spokesmen such as Keanu Reeves, John Malkovich, and Jeff Bridges (stars of some of the Millennial generation's cult films) Squarespace, which began as a start-up in 2004 and now has nearly 800 employees in New York; Portland, Oregon; and Dublin, has relied heavily on the “cool” factor to attract a customer base and staff of young cre-

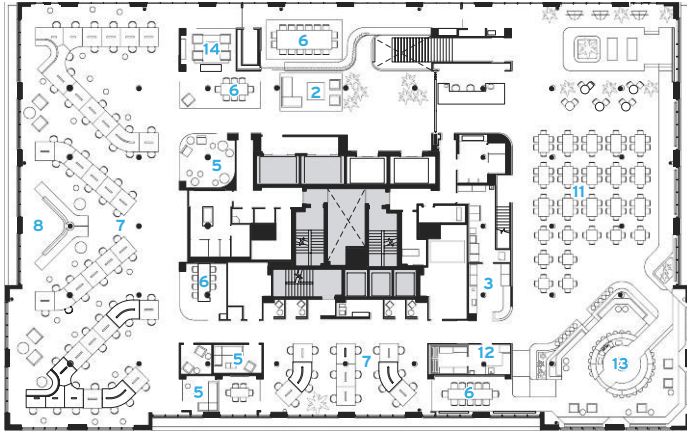
atives. Likewise, the company's new headquarters, in the 12-story 1927 Maltz Building, a former printing-district factory in New York's West Village, exhibits a laid-back panache.

At the building's base, a storefront lobby features exterior details of blackened steel and wire-brushed larch wood, which contrast with the original brick exterior in a way that is dramatic yet subtle. Peering into the loungelike space from the sidewalk, passersby might take it for a hotel. The misperception would be understandable. According to project architect Eliane Maillot of New York-based Architecture + Informa-

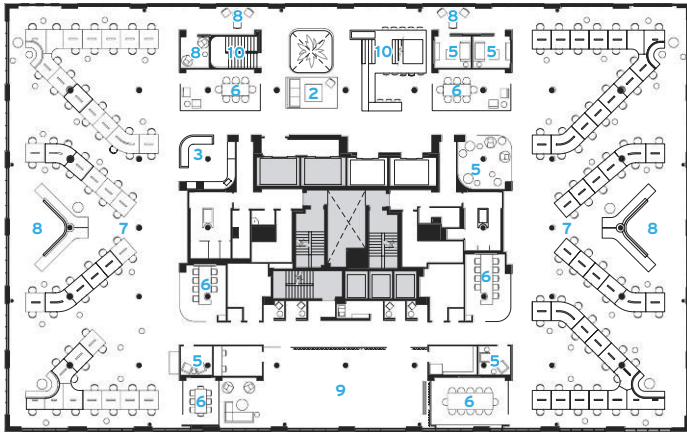


**FREE FLOW** Glass walls and guardrails reinforce the company's emphasis on transparency (here). Two individual staircases, one connecting the top floors and the other the bottom are separated, encouraging employees to walk across the space.





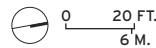
12TH-FLOOR PLAN



11TH-FLOOR PLAN



GROUND-FLOOR PLAN



- |                  |                   |                |
|------------------|-------------------|----------------|
| 1 RECEPTION      | 6 CONFERENCE ROOM | 11 DINING AREA |
| 2 LOUNGE         | 7 WORKSTATIONS    | 12 FOOD PREP   |
| 3 PANTRY         | 8 BREAK-OUT AREA  | 13 BAR         |
| 4 ELEVATOR LOBBY | 9 STUDIO          | 14 LIBRARY     |
| 5 MEETING ROOM   | 10 STAIR          |                |



tion (A+I), the design team took inspiration from the Roman and Williams–designed lobby of Manhattan’s Ace Hotel, which functions as both a study area and parlor. The intent for the reception space here, says Maillot, was to create a work-away-from-work zone, a calming environment furnished with couches and coffee tables in lieu of desks and chairs. Adapted from a loading dock, the 5,300-square-foot space is the company’s exclusive entrance (all other tenants access the building around the corner). Elevators transport employees directly to the main office spaces, which occupy the top three levels.

The lobby sets the tone for the larger Squarespace experience. Its minimal palette of off-white paint and ebonized wood paneling for the walls and ceilings, as well as concrete floors and furnishings, extends throughout the multilevel interior. “The brand identity is very black-and-white,” says founder and CEO Anthony Casalena, “but you’ll never see a hard black or a hard white—we varied the materials to get lots of texture.” The 36-year-old tech entrepreneur wielded a heavy hand in instituting the office’s aesthetic. “I’ve come to understand the power of design,” he says. “When it comes to brand identity, if it looks clean and smooth, it has a lot more credibility.”

Casalena wanted the new offices to be polished yet anti-corporate, with a relaxed, free-flowing, and democratic feel. Previously, the headquarters were spread out across four locations in SoHo, where employees would occasionally rely on WeWork spaces for lack of sufficient meeting areas. It was essential that the company’s new home be well-connected and cohesive, as well as have a range of flexible environments suitable for all teams, including marketing, engineering, and design.

The Maltz Building’s vast open floor plates and wraparound windows provided an ideal template for translating the Squarespace brand into a workplace for its now 530 New York employees. Around the building’s vertical circulation core, A+I clustered back-of-house functions and meeting spaces, creating a primary path of movement around each floor’s perimeter, through the different work settings; the main desk areas anchor the building’s east and west ends. “For workstations, there’s usually a set logic of straight rows,” says Maillot, “but we didn’t think it would give the ambience that Anthony wanted.” Instead, banks of custom-made precast-concrete desks are arranged diagonally, creating a more dynamic feel while optimizing space by incorporating the building’s flared mushroom columns





#### RELAXED RECEPTION

Squarespace's blackened-steel and larch-wood entrance stands out on a block lined with brick buildings (opposite). The lobby (above) welcomes visitors and provides an informal work area. Plantings add a pop of color to a neutral palette. An intimate wood-paneled pantry (right) connects the reception area to the elevator lobby.



rather than working around them. Anticipating growth, the desks were designed to be modular and easily added to.

In addition to these designated work zones, where Casalena sits among his employees, there are a number of informal nooks catering to off-the-cuff collaboration: alcoves with whiteboards are carved out of the main desk regions; intimate breakout spaces are tucked away at the edge of the floor; lounge chairs are placed along the circulation route. "If you're working through some ideas and need to get away from your desk," says Maillot, "you have quick access to a variety of places, from semiprivate to more public." To activate the space, the designers separated two stairways, placing one at the eastern end, the other to the west, encouraging people to walk across the floor to travel to the two connected levels. A large, rounded aperture cut through the slab opens the lowest of the three floors visually to both the others.

On a recent spring afternoon, the office buzzed, with employees in T-shirts and hoodies lying on couches with their laptops, coworkers stopping to chat over quick coffees, and even dogs following their owners around. Keeping the young staff happy has been key to

**WORK YOUR WAY** A fully glazed conference room allows visual access to the primary desk areas, which flank the building's east and west ends (opposite, top). A cafeteria (below) and bar (opposite, bottom) serve as flexible environments for collaboration or individual work, as well as accommodate office-wide social gatherings.

Squarespace's success, notes Casalena. A favorite perk is the daily catered lunch, which is served hot in an airy and daylight-infused cafeteria and bar at the top level. "Happy hour was definitely a big consideration," says Maillot. Another bonus: the views. Either inside, or out on the roof deck, which provides an additional gathering area, occupants can relax, eat, drink, and work surrounded by a sweeping vista of the Manhattan skyline.

Casalena says the office has proven to be the right environment for productivity and creativity to thrive—so much so that A+I is currently renovating two more levels in the building, gearing up to accommodate the fast-growing staff (the New York team has nearly doubled in size since moving in 2016). Now in its 15th year, the company has come a long way from its beginnings in Casalena's dorm room at the University of Maryland. "We've gotten a lot of positive feedback on the new space," he says, "even though we're running out of it." ■





### credits

**ARCHITECT:** Architecture Plus Information (A+I) – Brad Zizmor, Dag Folger, Eliane Maillot, Laura Sinn, Cheryl Baxter, Brita Everett, Peter Knutson, Tim Aarsen, Alan Calixto, Megan Kalinowski, Ryan Erb, Katina Kremelberg

**ENGINEERS:** Severud (structural); AMA (m/e/p)

**CONSULTANTS:** New York Green Roofs (landscape); Lighting Workshop (lighting); Cerami (acoustics); Presentation Products (AV)

**GENERAL CONTRACTOR:** JRM

**CLIENT:** Squarespace

**SIZE:** 98,000 square feet

**COST:** withheld

**COMPLETION DATE:** March 2016

### SOURCES

**CURTAIN WALL:** Kawneer

**METAL PANELS/GLASS:** Empire Metal and Glass

**WOOD:** Patella

**CUSTOM WOODWORK:** Bauerschmidt & Sons

**WALLCOVERINGS:** Maharam

**FLOOR AND WALL TILE:** Nemo

**DOWNLIGHTS:** Ketra





Fast Retailing Headquarters | Tokyo  
Allied Works Architecture

# Street of Dreams

Uniqlo's year-old home base borrows from the organizational logic of an urban plan.

BY ERIKA SAWAGUCHI

In 2014, Fast Retailing, one of the world's leading apparel companies, decided to move its headquarters and flagship creative studio to the top floor of an existing warehouse in a growing waterfront area of Tokyo. Best known for its fast-fashion brand Uniqlo, the company has competed with international apparel companies such as Zara from Spain and H&M from Sweden. In today's world, where consumers can easily access products online, however, the walls between industries have disappeared, and Fast Retailing realized that its competition has extended not only to sports apparel and e-commerce companies but to enterprises that provide everything else that consumers might want.

Before moving to their new headquarters in the Ariake District on Tokyo Bay, various departments at Fast Retailing operated separately—both physically and psychologically—in typical compartmentalized office environments with low ceilings and a few glazed meeting rooms. To survive in the new era, the company set a goal to completely transform its work culture to one in which information can seamlessly flow from planning to distribution to sales, inspiring the employees' creativity and increasing the efficiency of operation. The company's global creative director, John C. Jay, formerly a partner at Wieden+Kennedy, approached Brad Cloepfil of Allied Works Architecture—whose design of W+K's headquarters in Portland, Oregon, initiated a creative breakthrough for the advertising agency—to discuss the design of the new headquarters and creative studio.

The resulting single-floor office, spanning four acres, accommodates more than 1,000 employees from around the globe who are in charge of R&D, design, marketing, merchandising, and management, and work collaboratively to deliver new products and services. The 242-by-830-foot floor plan, resembling a city block of Manhattan, draws from the organizational logic of an urban center. For

**PEDESTRIAN PASSAGE** Employees walking along the office's main "street" can look into the company reading room, where they can find books and magazines collected from around the world for inspiration. Behind it is a café.



example, a “street” runs through the middle of the floor, connecting the entire office from north to south. To impart a human scale to the gigantic proportions of the warehouse, the meandering street is punctuated by social “nodes,” such as a digital-information center called Answer Lab, a reading room, a dining room, and a Great Hall for company-wide gatherings. Employees are free to work in any of these nodes or other, smaller areas with chairs and couches. In fact, the entire floor, including the street, is their workplace.

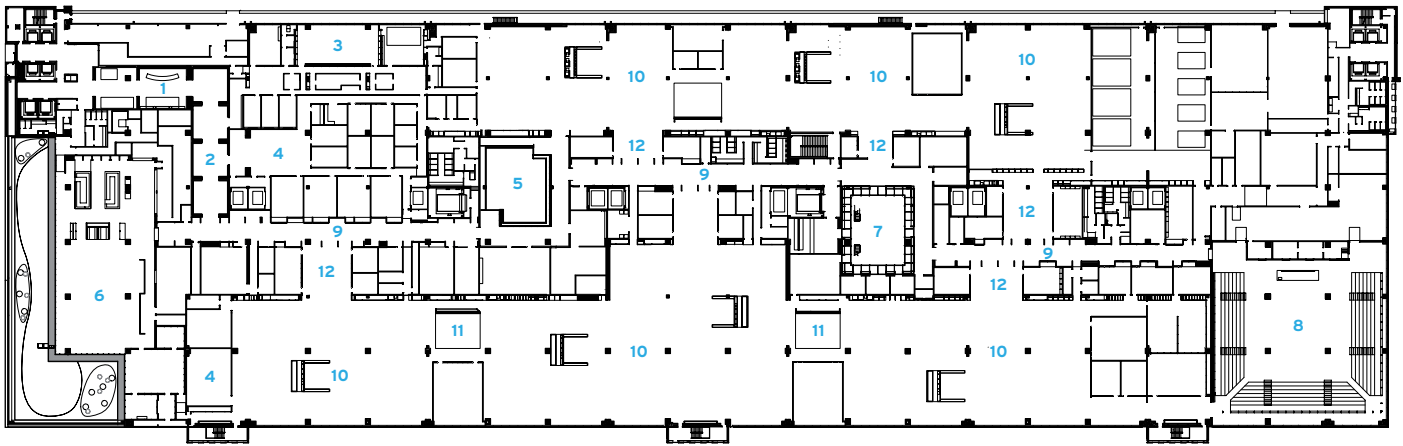
The street has a ceiling height of almost 16 feet, with skylights—specially developed with the building’s designer, Daiwa House Industry, to be used in an industrial structure—that give people the sense of walking along a busy avenue. Facing the street, “porches” with couches and tables for informal meetings, along with larger gathering spaces at the nodes, stimulate people to move around, be seen by others, and exchange information regardless of departments or job titles.

Employees enter the light-filled work lofts—open office or studio

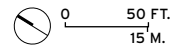
areas—through these porches. Taking advantage of the expansive floor plate, the lofts are partitioned by lounges, ateliers, and columns placed on a 30-by-36-foot grid, so employees can see the activities of their colleagues. This arrangement also provides flexibility, so spaces can be reconfigured to respond to changing needs that can crop up during product development.

Larger spaces—a dining room at the northwest corner and the Great Hall at the opposite corner—act as town squares, encouraging employees to move the entire length of the floor. The Great Hall allows the company for the first time in its history to gather all of its employees together for presentations and product reviews. It also can hold various types of events like fashion shows and ceremonies for new employees. On a daily basis, the space can be divided for smaller work sessions.

Uniqlo aims to provide its customers around the world with casual wear that can enrich their everyday lives at affordable prices. To do this in a fast-paced, digital era, the company needed to develop a new



LEVEL-SIX PLAN



- |                   |                         |                |              |
|-------------------|-------------------------|----------------|--------------|
| 1 RECEPTION       | 4 VISITOR & VENDOR AREA | 7 READING ROOM | 10 WORK LOFT |
| 2 HALL OF HISTORY | 5 ANSWER LAB            | 8 GREAT HALL   | 11 LOUNGE    |
| 3 EXECUTIVE SUITE | 6 CAFETERIA             | 9 "STREET"     | 12 PORCH     |



PHOTOGRAPHY: © KENJI TAKAHASHI (RIGHT AND OPPOSITE)

**WELCOME SPOTS**  
 The two-level reading room (opposite) is a cloistered space but provides views to other parts of the workplace. The reception area (left) has a more corporate feeling and leads to the Hall of History, where photographs introduce visitors and employees to the company's story before they reach the work areas.



**FLEX TIME** Each work loft (above) has a glass-enclosed atelier and an open lounge that serves as a buffer zone between departments. The Answer Lab (left) is a digital-information hub. The street (opposite, top) encourages spontaneous discussions. The Great Hall (opposite, bottom) can hold company-wide events or divide for smaller meetings.

work style where all employees can communicate easily or freely, work in small teams, and instantly respond to customers' needs.

Fast Retailing's CEO Tadashi Yanai asked Cloepfil and his team at Allied Works to transform not only the work environment for his employees but also challenge the more restricted work culture in Japan. The idea of working in a place where employees are free to claim various spots as their workplace embodies a possibility that could be applied beyond a single office project to others in the city as a whole. As the architect states, his collaboration with Fast Retailing "has resulted in the creation of a new design paradigm for what a workspace can be." ■

*Erika Sawaguchi, based in Tokyo, is an architectural journalist and translator.*





## credits

**ARCHITECT:** Allied Works Architecture – Brad Cloepfil, principal; Kyle Lommen, Thea von Geldern, Yuri Suzuki, Rashmi Vasavada, Brent Linden, Rebecca Wood, Rachel Schopmeyer, Bjorn Nelson, Emily Kappes, Daniel Martinez, Alexis Kurland, Minh LeDao, design team

**ENGINEERS:** Arup (structural); Daiwa House (civil); Nomura (m/e/p)

**CONSULTANTS:** Endo Shomei (lighting); Workplace Solutions (furniture)

**CLIENT:** Fast Retailing Co.

**SIZE:** 200,000 square feet

**COST:** withheld

**COMPLETION DATE:** May 2017

## SOURCES

**CEILING:** Asahi Fiber Glass Company

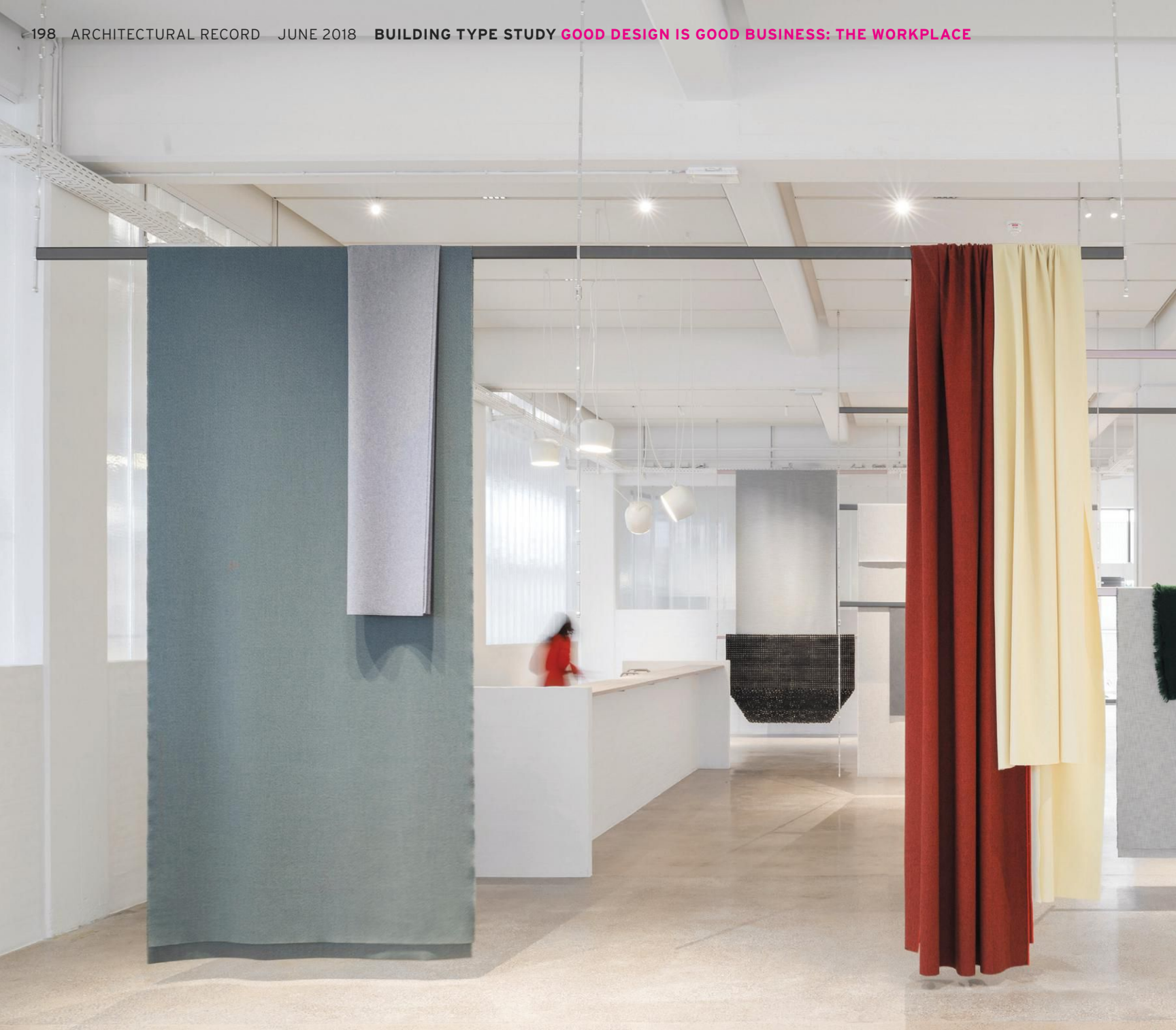
**DEMOUNTABLE PARTITIONS:** Komatsu Wall Industry

**FLOORING:** Interface (carpeting); Kasthall (rugs)

**FURNISHINGS:** Okamura; Ritzwell; Maruni; Bo Concept

**LIGHTING:** Endo Lighting Corporation





Kvadrat Flagship Showroom | Copenhagen | Ronan and Erwan Bouroullec

# Open Storage

A design team and client develop a materials-rich office and display.

BY MAIRI BEAUTYMAN

PHOTOGRAPHY BY MICHEL GIESBRECHT



Eight years after the French brothers Ronan and Erwan Bouroullec designed interiors for Kvadrat's flagship showroom in Copenhagen, the high-end textile manufacturer's 4,300-square-foot space in a 1950s redbrick warehouse was bursting at the seams. Founded in Denmark in 1968, Kvadrat has earned a global reputation as an industry leader in the upscale textile market, with Hella Jongerius, Frank Gehry, and Renzo Piano among its high-profile designer and architect collaborators. In recent years, innovation and international expansion has garnered the company huge growth, with annual sales leaping from \$22.7 million in 1992 to \$188.9 million in 2017. However, in Kvadrat's prime harbor-front location in the Nordhavn district, a busy shipping port undergoing transformation into a modern residential and business quarter, this success translated into a serious shortage of space, and

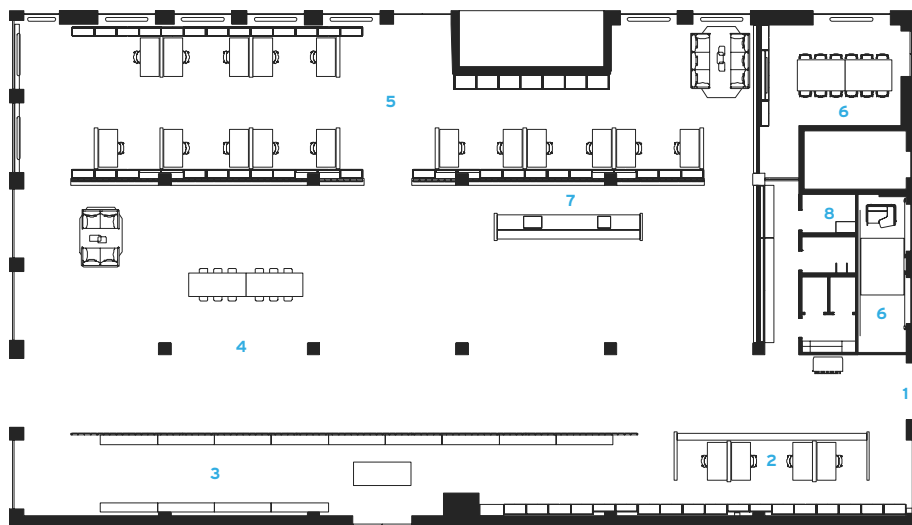
**MATERIALS SHOWCASE** The anodized-aluminum display surrounds a white-painted brick kitchen (opposite), which seats 10 at the oak counter. The Bouroullecs designed the presentation table (above) and semitransparent fabric hanging across the aisle.

divided work teams. "Having sales downstairs and marketing upstairs was just not great for the atmosphere," says Njusja de Gier, Kvadrat's vice president of branding and communication. So the executives were quick to broker a deal when they learned of an available ground-floor property, double the size of what they had, in the building.

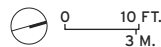
The 8,600-square-foot space benefits from an abundance of daylight, with expansive 13-foot-high by 7-foot-wide windows on three sides, one of those directly on the water. To carve out a new home, the Paris-based Bouroullec design studio was enlisted once more—leading to a unique situation. "Since we've been working with Kvadrat for a very long time,



**CLEAR VISION** A translucent glass wall divides the space without blocking light, offering a peek at the product library (above). In the office area (opposite, top), which seats 16, high fronts on custom desks made of Solid Textile board provide privacy. The product library (opposite, bottom) has a harbor-view, which can be enjoyed from a Hay Palissade chair designed by Ronan and Erwan Bouroullec.



FLOOR PLAN



- |                   |                |
|-------------------|----------------|
| 1 ENTRANCE        | 5 OFFICE AREA  |
| 2 RECEPTION       | 6 MEETING ROOM |
| 3 PRODUCT LIBRARY | 7 KITCHEN      |
| 4 GALLERY SPACE   | 8 I.T. ROOM    |

we know nearly all the people there,” says Erwan, who, along with his brother, has designed textiles and related interior products for the company.

The brothers devised a scheme with a highly flexible anodized-aluminum display system that allows virtually limitless options for elegantly and efficiently presenting fabrics and rugs throughout the showroom. Consisting of an 11-by-19-foot ceiling-mounted grid and chainlike rods dropping down to hold horizontal rails—think trapeze swing—the system spans the entire footprint of the space and allows large swaths of the textiles to be slung from varying heights and positions. “We can create different exhibitions as we please, and always make the system suitable for our needs,” says de Gier. “The aim is to change it twice a year, coinciding with new-product launches.”

On average, 15 different locations across the showroom are used to present products, in layered groups or alone. “We really wanted to make a tool, something useful,” Erwan notes. Rails, 9 to 16 feet in length, are intended to withstand up to 220 pounds. “Some of the carpets—say one that’s made of thick wool—can be very heavy,” he explains.

Decisions for the rest of the space were driven by a strong materiality to create a dialogue with the raw extremes of the industrial harbor. “It’s not Miami Beach—it’s Copenhagen! So, most of the time, it is windy and rainy, the kind of weather we used to have during our childhood in Brittany,” Ronan explains. Once an unloading area for containers carrying everything from bananas to steel, the raw space had concrete floors, which the designers retained. “If anyone had asked me to change it, I would have said no,” Erwan says. “It’s as important as the sea around it, with marvelous traces, polished by life.”

Relying on the textiles for color, the design team created a pristine white interior as a backdrop. Then they installed translucent ribbed-glass partitions to maintain the feel of an open floor plan and carve out semi-private zones for the showroom’s meeting and office areas, reception desk, I.T. room, kitchen, product library, and presentation tables. “There is a much better split between working space and showroom,” de Gier comments. The glass walls—one full-height, revealing the product library, the other partial, above a low, white-brick wall adjacent to the office area—create a central corridor and impart an ethereal

luminescence due to the diaphanous material's ability to capture sunlight. "Though the glass is not handmade, it is beautiful in its irregularity, sometimes with little bubbles inside," Erwan notes. Oak flooring beneath the workstations is soft underfoot and dampens sound, while milk-white glass desk lamps provide a gentle glow.

The brothers incorporated their furnishings throughout the showroom: plastic Belleville chairs are paired with a large custom table in one meeting area, and Alcove high-backed sofas provide sheltered nooks in two others, handy for the staff's frequent phone meetings, de Gier notes. They also used Kvadrat products. Ceiling, cabinets, reception desk, and office desks are all made of an upcycled rigid textile board, a blend of thermoplastic and the company's cotton and wool scraps. The panels reveal a dedication to sustainability and demonstrate the innovative use of manufacturing castoffs.

Moving to the airy, open office from a traditional one, with the typical free-standing display shelves and racks confined to a separate area, was a revelation for the company's 19 Copenhagen-based employees, who are now surrounded by the company's materials. "So many of them told me that they had never seen the textiles at such a large scale," says Erwan. The sheer luxury of so much fabric hanging for both sales and décor has proven to be a valuable asset for the new showroom, appealing to staff and clients alike. ■

*Mairi Beautyman is a design and travel journalist based in Berlin.*

#### credits

**DESIGNERS:** Ronan and Erwan Bouroullec

**GENERAL CONTRACTOR:** Syncro Aps

**CLIENT:** Kvadrat

**SIZE:** 8,600 square feet

**COST:** withheld

**COMPLETION DATE:** November 2017

#### SOURCES

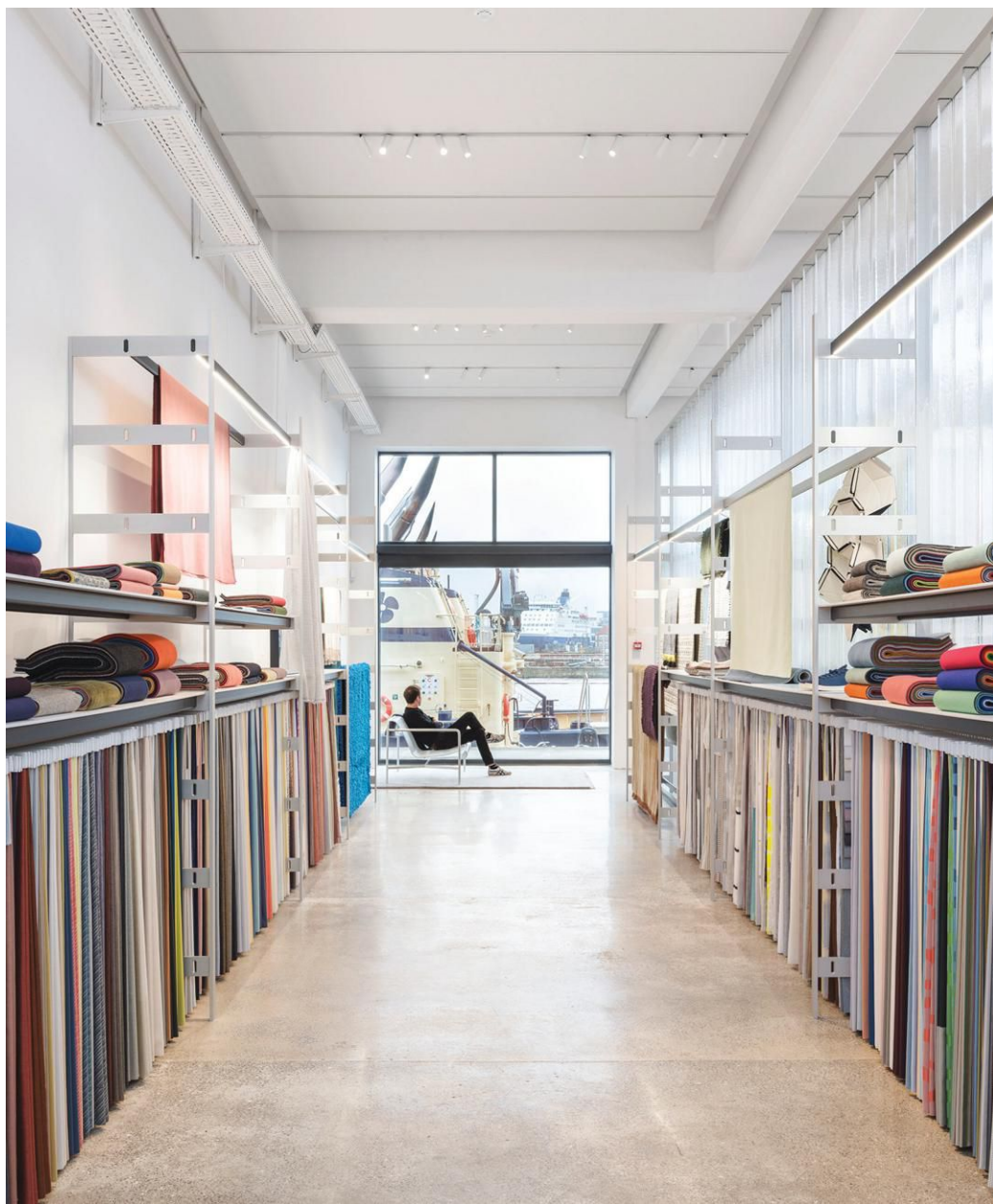
**GLASS:** Lamberts (walls)

**DOORS:** Zederkop (glass)

**INTERIOR FINISHES:** Kvadrat (acoustical ceiling); Really (Solid Textile board); Dinesen (oak floors)

**FURNISHINGS:** Vitra; Kvadrat; Hay; Magis

**LIGHTING:** Flos (downlights, task, controls)



Google at 1212 Bordeaux | Sunnyvale, California | Parabola

# Full Scale Mock-up

A small office is a testing ground for a giant client's future campuses.

BY LYDIA LEE

PHOTOGRAPHY BY PRAKASH PATEL





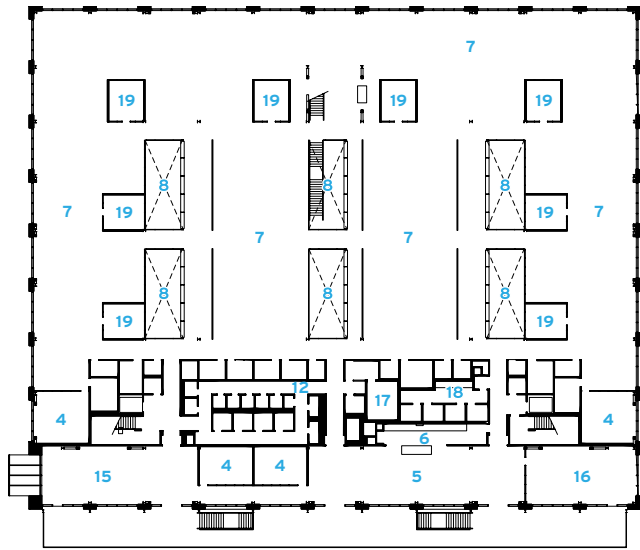
A few years ago, as Google started preparing to build two enormous, over-the-top campuses in Silicon Valley—totaling 1.6 million square feet and costing an unspecified sum—the corporation decided to dip its toes in the water with a much smaller, restrained project nearby. The first ground-up building for the search engine company, Google at 1212 Bordeaux in Sunnyvale, California, is not a prototype for either of the forthcoming complexes—a tentlike extravaganza by the Bjarke Ingels Group (BIG) and Heatherwick Studio, and a terraced facility BIG is designing independently. Instead, the 100,000-square-foot office by Charlottesville, Virginia-based Parabola Architecture is testing various strategies for optimizing fundamentals like daylighting, air quality, and acoustics to help employees focus and be productive in an open-plan space. For the most part, the moves are familiar and time-tested options rather than innovative technologies; it is the overall commitment to improving occupant comfort that sets the building apart. “This is essentially a giant mockup that people can interact with, allowing us to collect data on what is and isn’t working,” says Josh Portner, district development executive at Google.

The 200,000-square-foot lot had been occupied by a 1960s-era satellite-manufacturing plant. Because the existing concrete tilt-up structure would have been difficult to adapt, new construction seemed the obvious choice. Google paired the three-person firm of Parabola Architecture (whose principals had previously worked on Google’s master plan and design guidelines) with local Devcon Construction to create a design-build team, for a more efficient and cost-effective process.

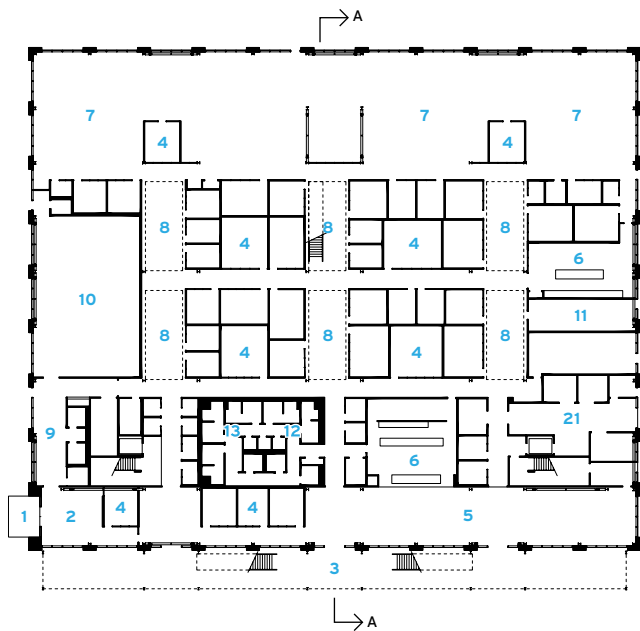
Familiar with Google’s leanings, the architects started out with the idea of an exposed unfinished-steel structure and developed the design from there. “We embraced the idea of simplicity and tried to have a building that was responsive and tunable to light, air, and noise,” says



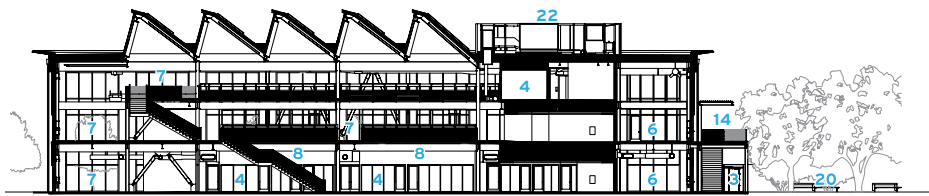
**PLAIN AND SIMPLE** Google’s new building relies on materials that don’t require finishes, including steel and board-formed concrete (left and above). Olive trees and exterior shades shield the western facade, while the southern exposure benefits from terrace overhangs.



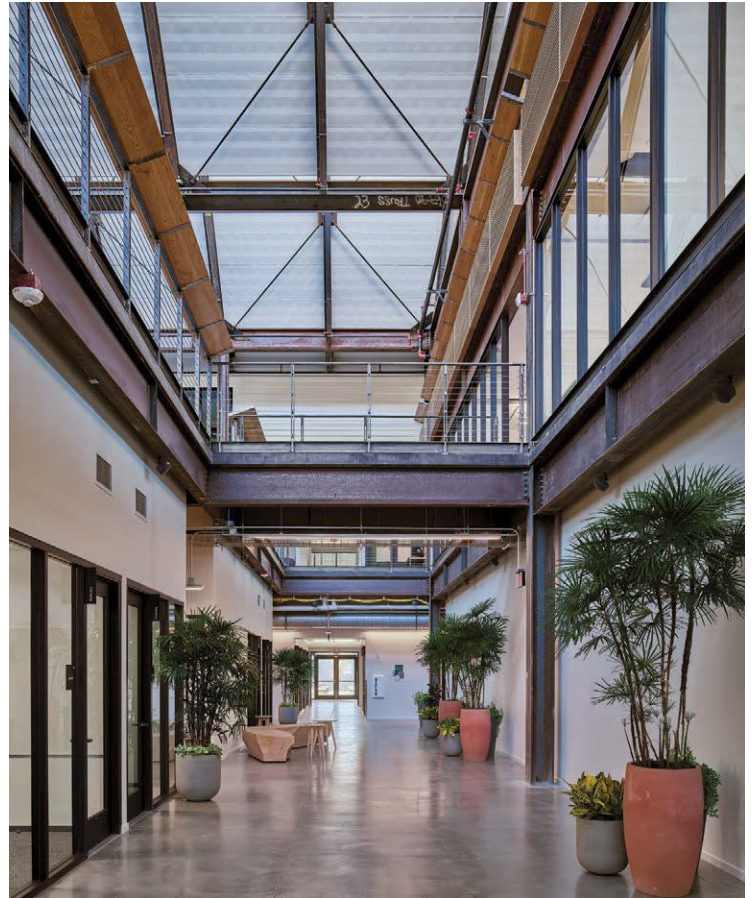
LEVEL-TWO PLAN



LEVEL-ONE PLAN



SECTION A - A



Kevin Burke, a Parabola principal. Adds Carrie Meinberg Burke, another principal, “We’re technically driven in our practice. We want to learn more and more about the immutable factors that impact the experience of buildings, so we put our attention toward performance and user comfort.”

From outside, the rectilinear three-story building, with its curtain wall and precast-concrete panels and cornice, blends in easily with its office park neighbors, belying the drama of the space inside. Past a modest lobby, the building opens into a narrow, triple-height space, one of three ground-floor corridors that rise to a luminous sawtooth roof, supported by exposed steel trusses. The building’s lower level is devoted to a café, a bank of meeting rooms organized compactly between the corridors, and desk space to the north. The main open work area occu-

- |                            |                          |
|----------------------------|--------------------------|
| 1 MAIN ENTRY               | 13 GENDER-NEUTRAL SHOWER |
| 2 LOBBY                    | 14 TERRACE               |
| 3 COLONNADE                | 15 LOUNGE                |
| 4 MEETING                  | 16 GAME ROOM             |
| 5 DINING/COLLABORATION     | 17 MASSAGE THERAPY       |
| 6 CAFÉ                     | 18 MOTHERS’ ROOM         |
| 7 FLEXIBLE WORKSPACE       | 19 ENCLOSED WORKSPACE    |
| 8 LIGHT WELL               | 20 GARDEN                |
| 9 PRE-FUNCTION             | 21 STORAGE               |
| 10 PRESENTATION            | 22 MECHANICAL            |
| 11 BIKE ROOM               |                          |
| 12 GENDER-NEUTRAL BATHROOM |                          |





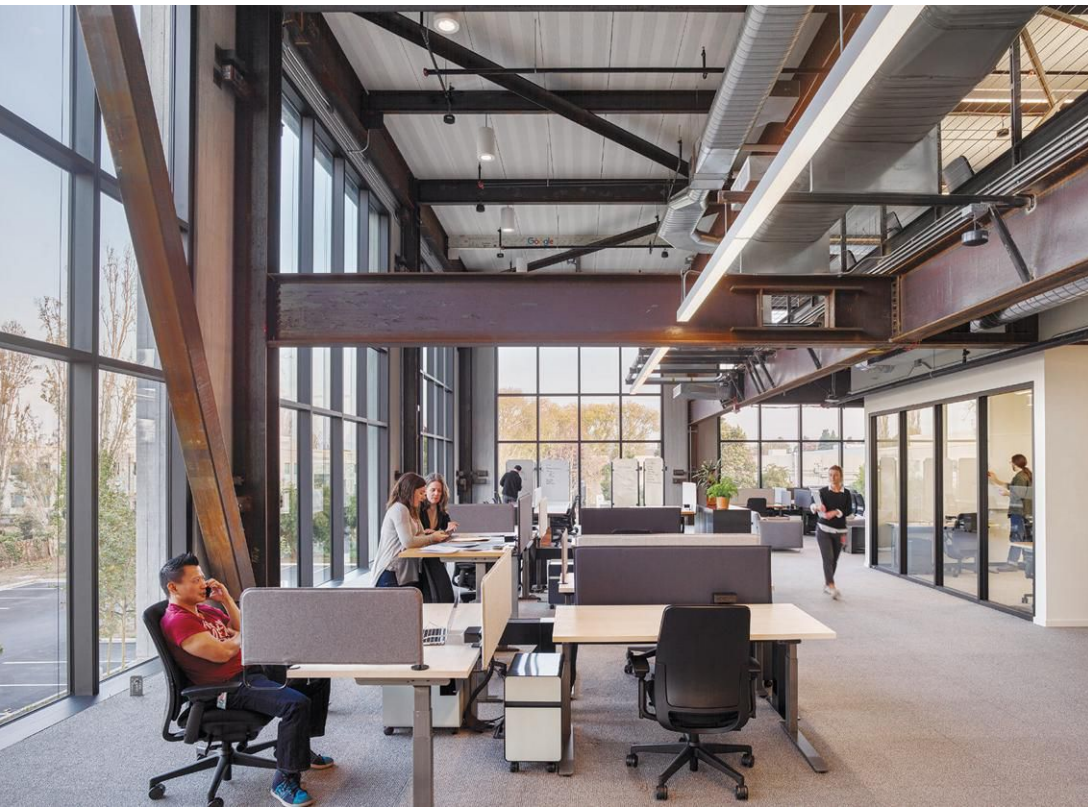
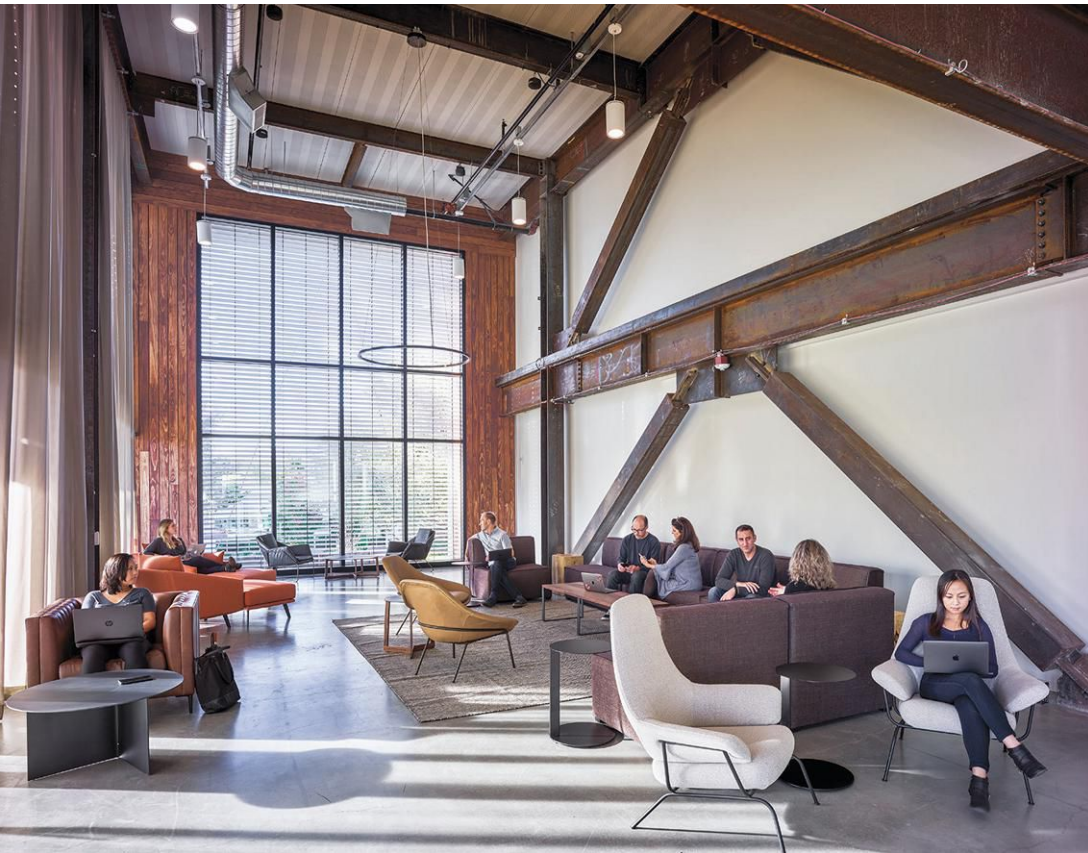
pies the second floor: a double-height, largely column-free piano nobile that is ringed above by a mezzanine level with additional desks. Glass-walled meeting rooms line the floor's perimeter, allowing daylight to penetrate its center. While providing an optimal work environment, this soaring space was also a response to zoning requirements: the floor-area ratio restricted the total square footage of the building, but permitted greater height.

Pushing the service core to the building's south end (rather than locating it in the center) also helped the team create the second floor's large, continuous expanse, which enables flexibility for subsequent uses. Given the rapidly evolving nature of office work, Google wanted to avoid building too many enclosed spaces and is considering the use of "pop-up" conference rooms. While the building currently holds approximately 500 people, the company plans to increase the density of

**SEEING THE LIGHT** Five rows of north-facing clerestory windows (above) on the sawtooth roof provide abundant illumination; openings cut into the main floor create light wells and allow the corridors (opposite) to look up into the volume above.

desks to test out the ideal ratio of workstations to collaborative areas; staff can choose to work at their own assigned desks or in various common areas. Addressing the elevated noise levels that often come with the open plan, the team used the service core as an acoustic buffer between the noisy café areas and desk spaces. Noise is further mitigated by metal acoustical decking throughout, screens and railings of white oak slats that do double duty as acoustic panels, and a sound-masking system that is specifically tuned to voices to prevent conversations from traveling.

While flooding the building with light, the sawtooth roof's glazing offers glimpses of the sky, another attribute valued by Google. "We



**STRUCTURED ENVIRONMENT** The second-floor lounge (top) is visually and acoustically separated from the main workspace by the service core. Ductwork for the building is integrated into the mezzanine (above) so that it blocks sight lines to the work area below.

believe that giving people access to nature in some way—to be able to see out and understand what time of day it is and what season it is—is really important,” says Mary Davidge, director of campus design at Google. “Every person in this space can do that, which is difficult with a 40,000-square-foot floor plate.” To reduce glare, the design team oriented the roof’s glazing to the north and included terraces whose metal overhangs shade the southern exposure. The building also has automated exterior blinds on all sides. Addressing another quality-of-life issue—air flow—the team employed a system used in laboratories: a centralized sensor continually monitors the interior environment and adjusts ventilation accordingly.

Since Google staff only moved in this past January, it is a bit early for the company to say that the trial run has been a definitive success. It is collecting quantitative data using a series of sensors that allow it to compare reality to computer models, as well as gathering employee feedback through online surveys. But, based on initial responses, it’s very likely that most of the building’s design elements will be implemented in the bigger projects. “Unlike some of our other buildings, where we’ve gotten hundreds of complaints right away,” says Portner, “for this one, people have submitted positive feedback, which is highly unusual.” ■

*Lydia Lee writes about architecture and urban planning from the San Francisco Bay Area.*

#### credits

**ARCHITECT:** Parabola – Carrie Meinberg Burke, Kevin Burke, Ryan Carbone

**ARCHITECT OF RECORD:** Devcon Construction

**INTERIOR DESIGN:** Parabola, Rapt Studio

**CONSULTANTS:** Nishkian Menninger (structural); OWSW (landscape); Point Energy Innovations (m/e/p); Integral Group (daylighting)

**DESIGN-BUILD CONTRACTOR:** Devcon Construction

**SIZE:** 100,000 square feet

**COST:** withheld

**COMPLETION DATE:** November 2018

#### SOURCES

**CLADDING:** Walters & Wolf (curtain wall); Willis (precast concrete); Draper (exterior blinds)

**GLAZING:** Viracon

**ACOUSTIC METAL DECK:** ASC

**INTERIOR FINISHES:** Armstrong (acoustical ceilings); Fireclay Tile (floor); Bentley Mills (carpet); Romabio (paint); Haworth (raised flooring)

**ELEVATORS:** KONE

**PLUMBING:** Elkay, Kohler, TOTO, Bricor



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# NeoCon: As You Like It

BY KELLY BEAMON

At the 50th annual Chicago tradeshow, which defines contract design, the most innovative products are those that reflect the various new ways people are engaging with their work environments. Among the trends we're seeing are designs that . . .



offer flexible privacy . . .



feel like home . . .



and are sized to fit.

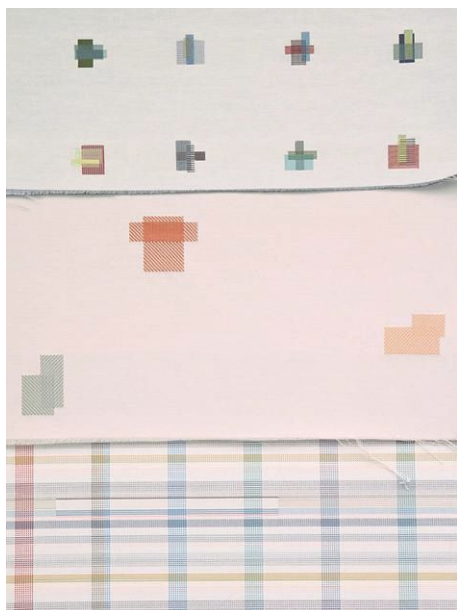
LYSS WOOD LOUNGE FROM ALLSEATING (TOP); NAPQ BY FRAMERY (MIDDLE); AND BESPOKE WORKSTATIONS BY INNOVANT (ABOVE)



### Cosm

Berlin-based Studio 7.5 (left)—a Herman Miller design partner for 20 years, with products such as its popular Mirra chair—engineered Cosm, the manufacturer's most intuitive task chair to date. Likening its development to "designing a flying carpet," the designers built a line of seating that never needs manual adjusting, instead using proprietary technology in its Auto-Harmonic Tilt: the chair responds automatically to a user's weight and posture. Cosm is offered in a choice of three back heights or as a stool, and in split or monochrome finishes.

[hermanmiller.com](http://hermanmiller.com)



### Darning Sampler

The simplicity and geometry of 18th- and 19th-century Dutch darning samplers inspired this new collection of upholstery fabrics by Maharam. Despite their homespun appearances, Darning Sampler, Darning Sampler Large, and Darning Sampler Plaid are designed for commercial applications—in a blend of polyester, cotton, and nylon that is abrasion-tested for up to 100,000 double rubs, and ideal for covering seating.

[maharam.com](http://maharam.com)



### Outline Sofa Chaise Longue

This sofa is among the Scandinavian-style furnishings Knoll now offers as the new parent company of Danish manufacturer Muuto. The chaise longue profile is new to the company's Outline collection by Norwegian designers Torbjørn Anderssen and Espen Voll. The upholstered foam seat and powder-coated aluminum legs are available with the chaise on the right and left and in a selection of fresh neutrals, including the pinkish Fiord 551 by Kvadrat (see page 198) shown here.

[muuto.com](http://muuto.com)

### Gateway Collection

Part of a family of new flexible workstations by Nienkämper, these sit/stand desks offer a layer of individual control for users, which may contribute to workplace wellness, or at least comfort. The Gateway tabletops are available in wood veneer or laminate with optional privacy panels.

[nienkamper.com](http://nienkamper.com)



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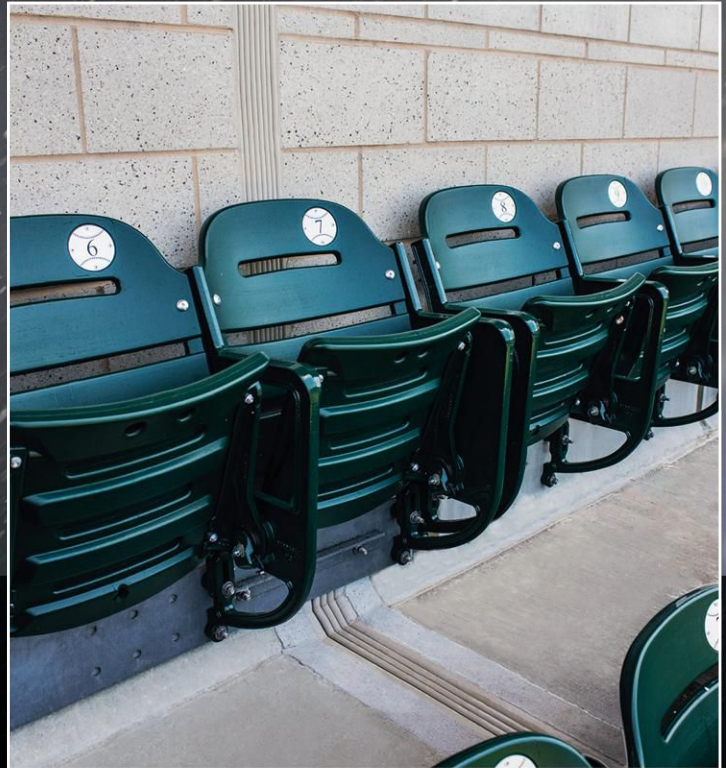
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**HK29**

To satisfy the needs of offices with shared workstations, hardware manufacturer Mockett is expanding its organizational offerings with a polished stainless-steel hook that can hold up to 20 pounds—though it's perfect for stashing headphones and other personal gear under a desk or shelf.

[mockett.com](http://mockett.com)



**LJ3**

The felt seat of the LJ3 stool by Dutch manufacturer De Vorm is both recyclable and recycled (from plastic bottles). The PET cushion provides comfortable support, sound-dampening properties, and comes in 10 color blends. The 34"-high powder-coated steel frame is available in more than 200 RAL colors.

[devorm.nl](http://devorm.nl)

**KIIK**

Japanese industrial designer Ichiro Iwasaki (right) collaborated with Arper on this flexible furniture system. KIIK's colorful modular seating, tables, consoles, and ottomans can be arranged in multiple configurations suitable for reception, informal meeting, and lounge areas. Laminate table-tops, contract-grade upholstery, and aluminum legs make this collection ideal for shared spaces.

[arper.com](http://arper.com)





### Farel

This cupola-inspired pendant extends Luceplan's growing collection of acoustic lighting fixtures. Farel features a 2700K LED with a high color-rendering index (of 90) and a shade made from the company's proprietary molded material that absorbs sound.

[luceplan.com](http://luceplan.com)

### SILQ

First, designer James Ludwig (right), Steelcase vice president of global design, created SILQ, the company's groundbreaking ultralightweight carbon fiber task chair. Then, with a team of engineers, he developed a totally new material composition that mimics some properties of carbon fiber. Steelcase sells both versions, the \$3,000 carbon fiber model and the new polymer (shown). It sells for \$970 and comes in the same selection of unexpected fabrics, including digital prints.

[steelcase.com](http://steelcase.com)



### Moiré Collection

Artist Gabriel Dawe (above), known for his rainbowlike textile installations woven from miles of thread, collaborated with Mannington Commercial on the Moiré carpet collection after two company executives saw his work, which has been exhibited in major museums such as the Denver Art Museum. (Dawe is shown creating a site-specific piece in the Merchandise Mart for NeoCon.) Moiré's modular and broadloom patterns recall the artist's large, intricate displays.

[mannington.com](http://mannington.com)



### Wall2Wall

This colorful glass wall from Clarus is also magnetic and writable, to provide a functional work surface for any collaborative space. The floor-to-ceiling panels are ¼" thick nonstaining tempered glass in magnetic and nonmagnetic finishes.

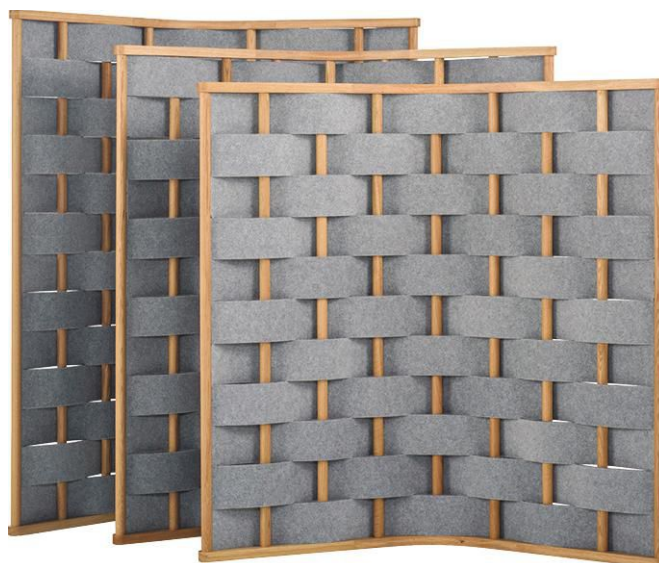
[clarus.com](http://clarus.com)



### Atelier Collection

These residential-style fabrics from Pallas are made from post-consumer recycled polyester that is woven with nylon, rayon, cotton, and wool. All are designed for contract applications, with resilient patterns tested to withstand from 51,000 to 102,000 double rubs.

[pallastextiles.com](http://pallastextiles.com)



### Bower Screens

The handcrafted look of these woven freestanding privacy screens adds warmth in workplace settings. Like other pieces in the Bower Collection of furnishings with acoustic properties, the partitions feature sound-absorbing strips of felt. The 2"-thick ash, oak, walnut, or metal frames are available in a 57", 62", 67", or 72" height.

[icfsource.com](http://icfsource.com)



### BuzziSpark

When industrial designer Alain Gilles (left) came up with this sofa for BuzziSpace, the acoustic-furnishings company, he had workplace nomads in mind. BuzziSpark's high backs, upholstered in the company's sound-absorbing fabric and foam, provide both visual and acoustic privacy, turning the sofa into a virtual conversation pit. One-, two-, and three-seater versions will soon be available.

[buzzi.space](http://buzzi.space)

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reasons why people attend trade shows. These events provide a great opportunity to get up close with new offerings and to learn how to implement them for the next great project. That's why BNP Media, in conjunction with more than 20 of its AEC and mechanical systems brands, is proud to introduce the AEC BuildTech Conference & Expo.

This new annual interactive event, taking place April 30 to May 2, 2019, at the Donald E. Stephens Convention Center in Rosemont, Ill.,

is where architects, engineers and contractors will learn about tomorrow's building processes and construction technologies and how to leverage them.

Of course, collaboration is a key topic in the AEC industry. That's why within the past year you've seen an article that had some form of "Our industry needs to be included at the outset to ensure the best outcome." It's a theme you can find in any number of AEC-related professions, from architecture and engineering to plumbing and HVAC. Every discipline wants to be included because every discipline needs to be included for a project to be truly successful. That's why AEC BuildTech was created and what makes it unique.

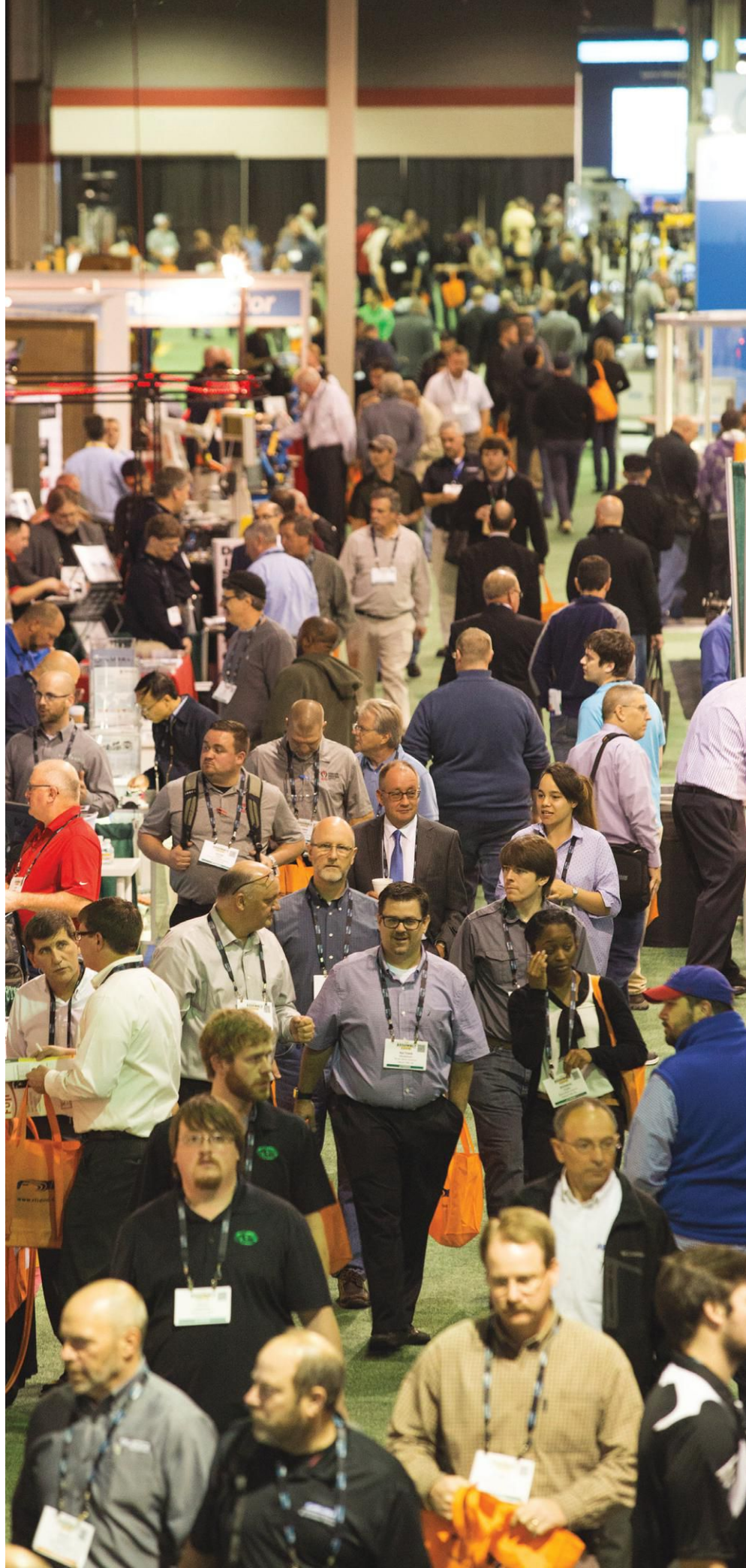
This is a show where architects, engineers, general contractors and tradespeople from the roofing, HVAC, flooring and plumbing industries can interact. Our editors and publishers across



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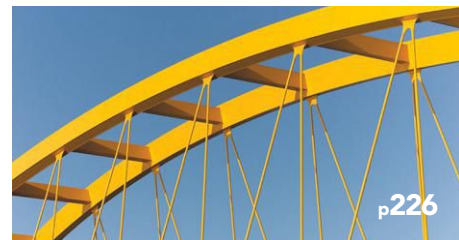
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**BE** BUILDING ENVELOPE DESIGN  
**IN** INTERIORS

**PM** PRODUCTS AND MATERIALS  
**PMD** PRACTICE, MANAGEMENT, DIGITAL TECHNOLOGY

**RE** RESIDENTIAL  
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# Acoustic Privacy

Incorporating sound control into the built environment

Sponsored by LogiSon Acoustic Network | *By Niklas Moeller*

**T**yping the word ‘privacy’ into any search engine yields a virtually endless stream of entries describing the ways in which this basic human right can be violated. There are reports of hackers acquiring credit card information, law enforcement agencies mining social networking sites, and members of the public using drones to take aerial photographs. More recent headlines indicate that voice-activated electronics can eavesdrop on their owners.

Our preoccupation with the vulnerabilities exposed by the internet and electronic products is understandable given their relatively rapid spread into almost every aspect of our lives. However, we should not lose sight of the fact that privacy can still be violated in ‘traditional’ ways. In fact, it can even be lost to those who do not intend to infringe upon it. People are often exposed to sensitive information simply by being within audible range of a conversation.

Current privacy legislation tends to focus on securing access to information stored on computers or within filing cabinets, but attention also needs to be paid to our built environment. When examined in this context, privacy has both an acoustic and a visual component. This course primarily focuses on the former, except insofar as it is affected by the latter.

## WHAT IS ACOUSTIC PRIVACY?

Many immediately equate acoustic privacy with speech privacy, but there is more to this concept than the ability to clearly hear what another person is saying.

For example, even if the conversation taking place in the room next to you is unintelligible, you may still be able to identify the speaker’s tone and ascertain whether they are happy, sad, or angry. This type of information can be

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1 AIA LU/HSW



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### Learning Objectives

After reading this article, you should be able to:

1. Define acoustic privacy and why it is important.
2. Explain how speech intelligibility is measured within the built environment.
3. Identify how to achieve acoustic privacy using various interior elements.
4. Describe the impact of background sound levels within both open and closed spaces.

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considered private under certain circumstances, such as when issuing from behind the closed door of a human resources manager's office. The same can be said for nonverbal noises like those overheard from an adjacent hotel room.

How much we understand of a conversation also depends on whether or not we can see the speaker. This effect—known as visual cues—has been quantified by various studies. Generally speaking, if you can only understand 20 percent of someone's conversation when you are not looking at them, the ability to see their lips increases that amount to nearly 55 percent. If you start at 50 percent, visual cues increase it to almost 90. In other words, there is also a visual component to acoustic privacy, which is important to bear in mind when designing a space.

Furthermore, acoustic privacy should not only be considered from the perspective of the person speaking but also that of the listener(s). The reasons will become clear when we explore the various impacts of a lack of privacy.

#### WHERE IS IT NEEDED?

A lack of acoustic privacy carries real risk, particularly in facilities where there is a perceived need for it or an expectation on the part of its users. Examples that readily spring to mind include hospitals, bank branches, law offices, government, and military facilities. However, other types of spaces—such as commercial offices, call centers, and hotels, to name but a few—have privacy needs as well. The degree required typically depends on the type of activities the space hosts.

#### WHY IS IT NEEDED?

It is easy to understand the need for acoustic privacy—or even acoustic security—from a speaker's perspective, particularly in environments where they are discussing medical information, financial planning, personal relationships, trade secrets, matters of national security, and similarly confidential topics. However, a lack of acoustic privacy can have impacts beyond divulging sensitive information to unintended parties. This fact becomes clear when we shift our perspective from the person talking to that of the involuntary listener.

When a noise or voice enters 'our space,' some degree of annoyance is typical, but it can also make us feel as though our privacy is being invaded or our sense of physical separation from others violated. Perhaps the most relatable examples of this sensation are when the guest in a neighboring hotel room turns up the television volume or the patient at the other end of a waiting area starts speaking loudly into a cell phone.

If we can inadvertently hear a conversation, we can also become self-conscious about our own level of privacy. In some contexts, it can create a sense of unease, which in turn impacts our ability to freely communicate. For instance, if we visit a medical clinic and hear what is happening in the adjacent examination room, we might be less inclined to disclose information to the nurse or doctor, knowing that we too can be overheard.

The degree of acoustic privacy afforded by the built environment can even impact an organization's brand image. We want to be in control of our personal information when meeting with a financial or legal advisor, for example, and a positive acoustic experience can reinforce our confidence in the firm. This level of protection is also indispensable for staff to effectively negotiate the terms of various agreements.

In some countries, protecting verbal communication within particular types of facilities is actually mandated by law. The Health Insurance Portability and Accountability Act (HIPAA) introduced by the U.S. Department of Health and Human Services in 1996 is a good example. It requires health-care entities to take "reasonable safeguards" to ensure speech privacy during both in-person and telephone conversations with patients and between employees.

Acoustic privacy is also vital to employees' overall satisfaction with their workplace. A decade-long survey of 65,000 people run by the Center for the Built Environment (CBE), University of California, Berkeley, found that lack of speech privacy is the number-one complaint in offices. Participants expressed irritation at being able to overhear in-person and telephone communications, as well as concern for their own level of privacy.

#### WHAT ABOUT THE OPEN PLAN?

The topic of workplace satisfaction also emphasizes the need to consider those occupying spaces other than closed rooms. Though some may dismiss the importance of acoustic privacy when designing an open plan, studies show that it has a significant impact on productivity.

For instance, research conducted by Finland's Institute of Occupational Health shows that unwilling listeners demonstrate a 5 to 10 percent decline in performance when undertaking tasks such as reading, writing, and other forms of creative work. Simply hearing that someone is speaking can disturb concentration, but this problem is greatly magnified when you can clearly understand what they are saying because, if you can follow a conversation, it is much harder to ignore it.



**If we visit a medical clinic and hear what is happening in the adjacent examination room, we might be less inclined to disclose information to the nurse or doctor, knowing that we too can be overheard.**

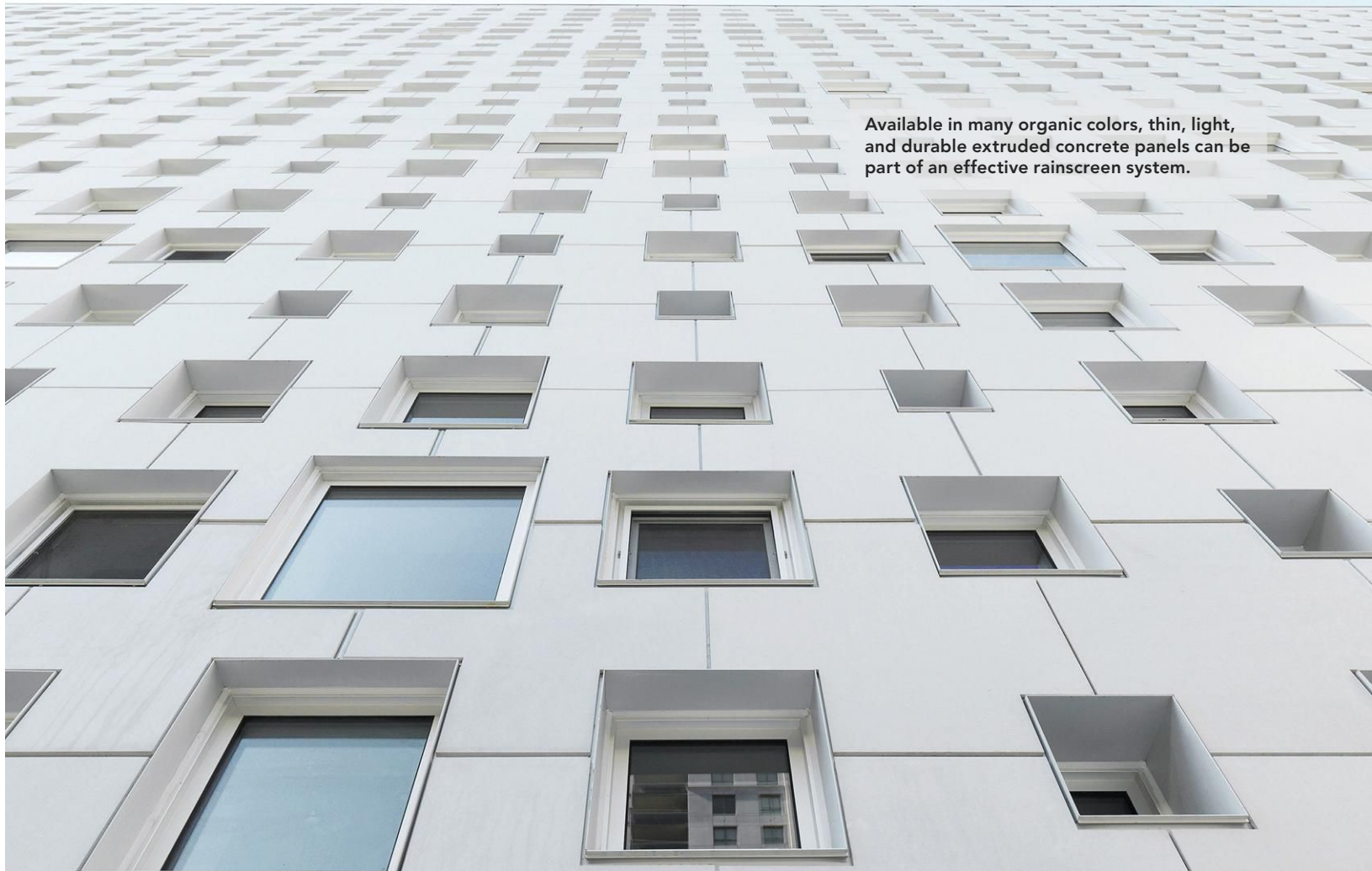
Though an organization might not consider privacy a goal within an open plan, it is impossible to justify increasing disruptions. Taking the steps required to lower speech intelligibility within this type of space increases occupants' output and reduces error rates.

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Available in many organic colors, thin, light, and durable extruded concrete panels can be part of an effective rainscreen system.

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# The Use of Extruded Concrete in Rainscreen Applications

Extruded concrete is a versatile material that can be used in rainscreen systems and to create dynamic and durable facades

Sponsored by Rieder North America | By *Andrew A. Hunt*

**R**ainscreen systems can help protect a building from wind, rain, and all forms of extreme weather. Until recently, the materials available for rainscreens were aluminum panels, phenolic panels, or fiber cement panels. The availability of extruded concrete is changing the game. Appropriate for both rainscreen applications and other exterior facade features, extruded concrete is thin, light, strong, and noncombustible. It is available in many colors and even can be incorporated in panelized or unitized applications. This course will compare extruded concrete to other rainscreen material options and describe the many benefits of using extruded concrete in your next rainscreen application.

## WHAT IS A RAINSCREEN?

A rainscreen is an exterior wall detail in which the exterior cladding or siding is installed with a small air gap between the cladding and the rest of the wall assembly. This space helps to create a capillary break and provides a path for moisture to exit the building envelope. This strategy not only enhances the durability and longevity of the building, but it also contributes to the health and well-being of occupants.

While some refer to the air gap and others to the cladding material when discussing rainscreens, in actuality, a rainscreen is a system that includes three essential components: the exterior cladding (the “screen”), a sealed air gap, and a water-resistive barrier, or WRB.

## CONTINUING EDUCATION



1 AIA LU/HSW

### Learning Objectives

After reading this article, you should be able to:

1. List the water-management, fire-resistance, strength, and durability benefits of including rainscreens in commercial buildings.
2. Identify the common materials used to manufacture rainscreens.
3. Compare and contrast the performance characteristics of common rainscreen materials.
4. Explain the processes of creating and installing prefabricated panelized systems.
5. Describe the benefits of extruded concrete and how the material contributes to a building's longevity, energy efficiency, and aesthetics.

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The rainscreen assembly also must include openings or vents that connect the air gap to the outside. Some rainscreen systems only include vents (or “weep holes”) at the bottom of the assembly, while others include vents at both the top and bottom of the wall. These components work together to protect the structure by controlling external moisture so that it does not reach the building’s substructure.

### HOW RAINSCREENS WORK

A rainscreen assembly helps keep water out of the building interior by providing a barrier against the water outside and controlling any water that makes it past the cladding. The internal air gap and WRB ensure that any water that makes its way in either evaporates or is drained through the gap and back outside. Some systems work to force air through the wall cavity/air gap to moderate the pressure differential between the exterior and interior wall, thus reducing the amount of moisture that is drawn into the building.

The air gap creates a path for liquid water to drain out of the envelope; it also creates a capillary break between the cladding and the WRB. An assembly that includes ventilation at both the top and bottom of a wall can dry out more quickly. This is because air rises as it is heated, a phenomenon known as the stack effect. A gap as small as 1/16 inch will provide a capillary break; however, most rainscreen assemblies include an air gap that is at least 1/4 inch and up to 3/4 inch wide.

There are several ways to create the air gap. Many builders use vertical wood furring strips that are made on-site and attach directly to the studs. Other options include plastic mesh and textured or “bumpy” housewraps. Some of these materials allow for horizontal air movement as well as vertical venting.

Moisture management is a rainscreen’s *raison d’être*. The main benefit of a rainscreen is that it facilitates the drying of the sheathing should moisture accumulate there. It also helps cladding that has become wet from precipitation dry out. The long-term benefits of moisture management include a healthier, more durable building. To understand these benefits, let’s take a look at the ways moisture can intrude upon the building envelope.

### THE RISKS OF WATER INFILTRATION

When it comes to understanding the behavior of moisture in buildings, it’s important to remember that water follows the path of least resistance. Buildings receive moisture in the form of “bulk moisture.” This liquid moisture can contact buildings in the form of precipitation (rain and

snow) or as flowing groundwater (flooding). Moisture in the air will condense on surfaces when the surface temperature falls below the dew point. Water also can enter a building at the time of construction if building materials aren’t adequately dry.

Roofing and exterior walls receive the impact of bulk water when it rains or snows; however, while roofing systems are designed to shed water downward to the eaves, exterior walls are more exposed to variations in water flow.

The exterior material impacts how water behaves. For example, because masonry is porous, a masonry wall will absorb water unless it has been protected with a water-resistant seal. Water that permeates through an unsealed masonry wall will eventually dry unless it encounters a weak spot in the joints.

When water encounters a nonporous material—for example, metal or glass—it follows the path of least resistance and trickles downward. However, wind can push it in any direction, even up under a roof. Wind can also push water through weak points in the exterior cladding.

Moisture damage is every builder’s nightmare. Moisture damage can compromise a building’s structural integrity, and groundwater entry from flooding can cause lasting damage to the building’s foundation. Trapped moisture can create conditions that lead to rot, mold growth, and/or insect infestation.

Increasingly, building professionals are recognizing the link between moisture and the health and well-being of building occupants. Many moisture-compromised materials release volatile organic compounds (VOCs) as they degrade, which can negatively impact health with long-term exposure. Moisture inside buildings can lead to mold and mildew growth, and it also creates ideal conditions for certain bacteria and dust mites. The presence of these, in turn, can aggravate allergies and respiratory conditions such as asthma. Often occupants suffer symptoms for months without realizing their homes or workspaces are making them sick.

### A COMPREHENSIVE STRATEGY

Most building codes do not require rainscreens, although Oregon requires them in new residential construction, and British Columbia requires them in coastal areas. Though rainscreens require additional labor and materials, the benefits usually far outweigh the cost, and rainscreens have become standard practice in areas such as the Pacific Northwest.

Because moisture in buildings is such a serious problem, building professionals should plan

a comprehensive water mitigation strategy early on in the design process. In environments that experience high humidity and frequent rainfall—for example, coastal zones—a rainscreen system can play a key role in a comprehensive strategy for keeping water out of the building.

### COMMON RAINSCREEN MATERIALS

As part of a water mitigation system, rainscreens first and foremost need to repel water. However, they also need to be durable enough to withstand other environmental forces such as wind, UV radiation, and extreme heat and cold.

Many types of siding or cladding materials can be part of an effective rainscreen system. Designers must weigh a number of factors when specifying this material, including the desired aesthetics, fire resistance, sustainability, installation requirements, lifetime maintenance, and project budget.

Architects and designers have a wide range of options for materials that can serve as part of a rainscreen assembly while also contributing to an aesthetically beautiful building envelope. Some of the materials commonly used for rainscreens include wood, aluminum composite (ACM), stone, cement board and fiber cement, high-pressure laminate (HPL), reconstituted stone, terra cotta, ceramic tile, glass reinforced plastic (GRP), and fibrous concrete. More recently, extruded concrete has emerged as an effective and desirable option. In this course, we will focus on wood-plastic composite, cement board and fiber cement, cast-in-place concrete, and extruded concrete.

### Wood-Plastic Composite

As the name implies, wood-plastic composite (WPC) is a composite material comprised of plastic and wood fibers that are bonded together. Available as panels or planks, the material is often designed to mimic conventional wood cladding and encapsulated in a durable polymer shell. As with wood, it can be painted and is a cost-effective alternative for some applications. WPC is often touted as a material that boasts the aesthetic benefits of wood but without the maintenance.

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# An Introduction to High-Performance Coating Systems

Specifying the correct coating can help ensure durability, longevity, and reduced maintenance costs over the life of the project.

High-performance coatings add to the structural integrity, soundness, and health impacts of buildings, building sites, and structures

Sponsored by Benjamin Moore | *By Andrew A. Hunt*

**W**hile architects, interior designers, and building professionals are accustomed to using traditional, acrylic architectural paints, most are less familiar with high-performance coatings. Yet, in certain situations, these coatings are exactly what is needed for a project. The catch is that the world of high-performance coatings requires specific knowledge; professionals in this field go through extensive training to learn how to specify these products. Not surprisingly, professionals not in this particular field often find themselves unsure where to start when considering these products. This course is an entry point to the world of high-performance coatings by introducing these coatings and exploring why, when, and where they are used. Once building professionals have the foundation they need to work confidently with coating

specialists, they can begin to take advantage of products that outperform architectural paints in just about every way.

The chances are good that through the course of a day, most people come into contact with several high-performance coating systems without thinking about what the material is or why it is important. Anyone who has walked over painted metal grates on the street, crossed a bridge, taken their kids to a playground, boarded a subway car or bus, entered a school or health-care facility, had a meal at a restaurant, passed a shipping container or dumpster, or attended a sporting event at an arena has likely encountered some type of high-performance coating.

While larger industrial structures such as power plants, oil rigs and pipelines, and other facilities may come to mind when discussing high-performance coatings, they are by no

## CONTINUING EDUCATION



1 AIA LU/HSW



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### Learning Objectives

After reading this article, you should be able to:

1. Explain the purpose and common applications of high-performance coatings.
2. State why, where, and how high-performance coatings are used and how they help improve the durability, longevity, and other aspects of structures and surfaces.
3. List and define the most commonly used types of high-performance coatings.
4. Describe the environmental and operational conditions that impact coating performance and service life.
5. Identify the factors that influence coating system selection.

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means the only places these coatings are used. As the general list above suggests, these coatings are used on many common structures and surfaces, and they are so ubiquitous that most people do not even notice them, let alone think about what they are or how they are used.

### HIGH-PERFORMANCE COATINGS: THE BIG PICTURE

Let's start with the big picture of where high-performance coatings are used and what they are designed to do. In the most basic sense, these coatings are designed for protection, performance, and aesthetics. That is, they protect capital investments by maintaining the integrity of the surface and structure for safety purposes. High-performance coatings are used to extend the surface life of the structure and increase the time until the structure needs to be recoated. For example, a steel bridge in a major urban center that has nonstop daily traffic needs to be as safe as possible for as long as possible, and a high-performance coating system can help by resisting corrosion and adding durability. The coating also addresses an aesthetic need, whether that is to make a bold statement with color or to provide a muted color that blends in with the surroundings. Either way, the coating adds color and durability to the structure, depending on the project.

High-performance coatings are typically used in environments where structures and surfaces require enhanced abrasion and chemical resistance and require added durability. They are



High-performance coatings can be part of an overall strategy to ensure caustic or dangerous chemicals remain secured.



**Concrete, cement, and brick masonry are vulnerable to chipping and cracking. However, when they are properly primed and coated, they become better protected from a potentially damaging environment.**

designed to meet the requirements of their primary function, which is to protect the surface that they are coating. In some cases, the coatings may protect surfaces from excessive use and abuse—for example, flooring in an automotive shop garage or on the steps, railings, and in hallways of a large sports arena. In other cases, they may protect surfaces from corrosion caused by simple exposure to the elements or aggressive environments that may include corrosive chemicals. Regardless of the case, high-performance coatings enhance the overall durability of whatever they coat. This added protection is provided to ensure the safety of not only the people who come into contact with the structures but also the immediate physical environment surrounding the structures.

As a paint product, high-performance coatings also have a secondary function, which is to enhance the aesthetics of a structure or space. Coatings may be used in many different ways: to downplay a space (e.g., a neutral tan or grey), to highlight a key feature (e.g., a bright red or yellow fire hydrant or holding tanks colored to indicate different contents), or to beautify or brand a space (e.g., high school lockers, or a transit system bus or subway car). Whatever the case, high-performance coatings are everywhere—all it takes is learning to see them and understand why they are there.

### WHY, WHERE, AND HOW HIGH-PERFORMANCE COATINGS ARE USED

In the previous section, we established the basics about high-performance coatings, but let's dig deeper into why, where, and how these coatings are used.

#### Why are High-Performance Coatings Used?

High-performance coatings serve three primary purposes: protection, performance, and aesthetics. Protection, for example, can refer to the coating's ability to protect the substrate from the elements, such as moisture, dirt and dust, and sun exposure. It also can refer to protecting the substrate against chemical exposure and abrasion. That protection, in turn, ensures that the substrate underneath remains as durable and safe as possible, whether that material is metal, masonry, concrete, or drywall.

Construction materials are used to meet specific needs, and each has different limitations. Steel, for example, is one of the most commonly used materials in construction projects, and it is critical that it resists corrosion. High-performance coatings protect steel and other metals by creating a highly durable barrier between the metal and its service environment. Architectural paints cannot provide that level of protection or performance. Concrete, cement, and brick masonry are also vulnerable to chipping and cracking. However, when they are properly primed and coated, they become better protected from a potentially damaging environment. Drywall, which is commonly used in many architectural projects, is limited in that it easily can be damaged by impact if painted with a standard architectural coating. A high-performance coating, on the other hand, can add a level of durability from light scuffing that is quick and easy to clean while simultaneously adding a pop of color to the surface.

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# Introducing the Steel-Plate Composite Core

Eliminating the need for formwork and reinforcing bars, a new coupled steel-plate composite wall system, appropriate for wind and seismic zones, is expected to shave months off of mid-rise and high-rise projects

Sponsored by Steel Institute of New York

**W**hile structural engineers, contractors, and structural steel manufacturers are consistently coming up with better, more efficient ways of designing and building nonresidential structural systems, a new approach to hybrid core construction seems to be garnering even more attention and promise than usual.

In fact, in his 30-some years in the industry, expert Michel Bruneau, Ph.D., P.Eng.,

professor, Department of Civil, Structural and Environmental Engineering, University of Buffalo, New York, states, “I have never seen the industry so excited about a new type of structural system.”

In place of a traditional concrete core, Ron Klemencic, P.E., S.E., Hon. AIA, chairman and CEO, Magnusson Klemencic Associates, Seattle, has adapted the steel plate composite system currently utilized by the nuclear

power industry. In Klemencic’s version, a high-strength concrete shear wall is sandwiched by two structural steel plates, which serve as both the formwork and reinforcing bars. In addition to lending a high level of seismic support, the coupled steel-plate composite wall system is much faster to erect. As opposed to a concrete core, which takes three to five days per floor to construct, the steel can be erected at the rate of one floor per day.

Consequently, the higher the structure, the more construction efficiencies to be gained, which is why the high-rise market is looking very carefully at the first coupled steel-plate composite wall system currently under construction at the MKA structurally designed Rainier Square Tower in Seattle. It is anticipated that this coupled steel plate shear wall system will actually shave several months off the construction schedule and 2 percent off the construction costs to build the 58-story high-rise.



Image courtesy of MKA

As compared to conventional concrete core construction, which takes three to five days to erect a floor, a new high-rise core innovation, the coupled steel-plate composite wall system, can be erected at the rate of one floor per day.

## CONTINUING EDUCATION



1 AIA LU/HSW

### Learning Objectives

After reading this article, you should be able to:

1. Evaluate different types of steel and concrete composite core systems used to support elevator shafts, exit stairs, restrooms, and mechanical/electrical services.
2. Describe the concrete-filled composite plate shear wall (CF-CPSW) system and its main durability, constructability, and performance benefits
3. Explore CF-CPSW's first application for Seattle's Rainier Square, including performance requirements in a high-seismic, high-wind environment.
4. Assess how and why experts anticipate that CF-CPSW will become a serious consideration for high-rise building designs.

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## BEGINNINGS

To appreciate the evolution of this newer composite system, a little history is in order.

Prior to 9/11, much high-rise steel construction, particularly in New York City, used a braced steel core. However, the World Trade Center collapse—where the steel core yielded to the impact of the terrorist-flown aircraft, cutting off exit routes—led the mid-rise and high-rise building market to exclusively start using reinforced concrete construction.

While the impact would have pulverized concrete cores as well, this addressed what was envisioned as public concern. Consequently, for the past two and half decades, with some notable exceptions such as Renzo Piano's New York Times Building, most tower construction has consisted of reinforced concrete core walls surrounded by structural steel composite floor framing.

The construction of these cores was accomplished using formwork and an internal densely packed reinforcing bar cage. But while reinforced concrete provides the required strength and stiffness, there is a long cycle time involved in setting the formwork, installing the reinforcing steel, placing the embedded plates, installing the sleeves and block-outs, and placing the cured concrete before the next level of the core can be constructed.

Another drawback to the concrete core systems are that they require extensive internal reinforcing. If any penetrations through the wall are required for items such as piping, they may interfere with this reinforcing, and the location of the reinforcing may interfere with the placement of the embedded steel plates required for the attachment of steel floor framing beams.

As a result, the need to reduce construction time and resolve interferences have been major incentives to develop alternative structural core solutions.

## HYBRID CORE ALTERNATIVES

Generally speaking, hybrid core alternatives use the same concrete shear walls but with different types of coupling beams. Coupling beams are structural components designed to connect individual shear walls where openings are required in the shear wall. By connecting the shear walls, the coupling beams stiffen the building and may serve as a fuse to dissipate seismic movement. This could be concrete walls and steel coupling beams, concrete walls and coupling beams made from engineered cementitious composites, or concrete walls and precast post-tensioned coupling beams,

explains Amit H. Varma, professor, Lyles School of Civil Engineering, and director, Bowen Laboratory of Large-Scale CE Research at Purdue University, West Lafayette, Indiana.

"In general, all these systems attempt to improve the seismic performance of the core wall system by improving the performance of the coupling beams," explains Varma. "The hybrid cores replace these conventional beams with other alternatives to alleviate rebar congestion and constructability issues while providing good energy dissipation capacity."

While these alternate systems are being used in practice, their use is not widespread. Varma conjectures that because their economic advantages are limited to the coupling beams, the cost benefits are therefore not very significant.

Another composite innovation is called Bi-Steel. The lightweight tied-plate steel panels are assembled on-site, erected, and then filled with concrete. This system can be constructed six times faster than conventional concrete, is highly flexible, and offers efficiencies with build sequences and reduced site congestion. In addition, no formwork is required, and the system offers better accuracy in interfacing with the adjoining steelwork.

The original Bi-Steel system included a patented welding procedure to affix interconnecting tie rods between two steel plates. While it has been used for a few apartment buildings in London, the system does have some fabrication limitations, and is not designed for seismic locations so its application has been limited.

Another alternative, called the modular core, is a prefabricated precast concrete modular unit. The columns, beams, and walls are precast concrete; prestressed hollow core flooring and steel units provide the structural hybrid frame solution; and in-situ concrete is used to facilitate structural connections. The system has been used in the United Kingdom.

In yet another configuration, steel plate shear walls, a thin steel web plate is welded or attached to horizontal and vertical boundary elements. As a thinner component, the walls can be thinner as well, thereby offering more usable square footage. Similarly, the building weight and required structural support, particularly when compared to concrete walls, is significantly less.

The relatively thin steel plate also offers excellent post-buckling capacity, is faster to construct, and is designed to handle wind and seismic loads. Most notably, the structural system was designed for the U.S. Federal

Courthouse in Seattle, the Hyatt Regency Hotel at Reunion in Dallas, the Century in San Francisco, and a few projects in Japan.

Demonstrating the cost savings offered by the steel plate shear wall (SPSW) system, a study performed for The Century project recorded an average wall thickness, with furring, of 18 inches, as compared to an average concrete shear wall thickness of 28 inches, resulting in a savings of 2 percent in gross square footage.

The Century project study also found that the building weighed approximately 18 percent less than a building designed using a concrete shear wall core system. This led to a reduction of foundation loads due to gravity and overall building seismic loads. In terms of the project schedule, a one-month reduction in time was attributed to the SPSW system.

Because SPSW systems are usually more flexible than concrete shear walls, primarily due to their flexural properties, when designed for tall buildings, additional flexural stiffness must be provided. For example, for The Century and U.S. Federal Courthouse projects, large composite concrete infill steel pipe columns were used at all corners of the core wall to improve both the system's flexural stiffness and overturning capacity.

There is also the consideration that excessive initial compressive force in the steel plate panel may delay the development of the tension-field action, so it's important that the construction sequence be designed to avoid excessive compression in the panel. For the Courthouse, this was addressed by delaying the welding of the plate splice connections until most of the dead load deformation occurred in order to relieve the precompression within the SPSW panel.

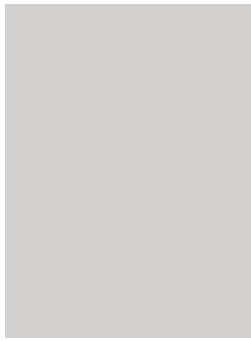
## CONCRETE-FILLED, COMPOSITE PLATE SHEAR WALL SYSTEM

While these systems do offer advantages, it's the above-mentioned newer application of the coupled-filled steel, composite plate shear wall (CF-CPSW) system for high-rise structures that is really turning heads.

Similar to how a reinforced concrete shear wall system functions, with a similar wall arrangement and thicknesses, with this newer system, the reinforcement is provided by the steel plates on the outside of the wall.

"The steel plate composite wall system is a natural evolution of the reinforced concrete wall system," explains Varma.

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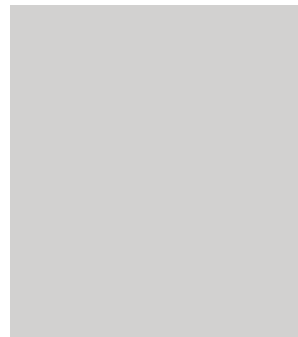
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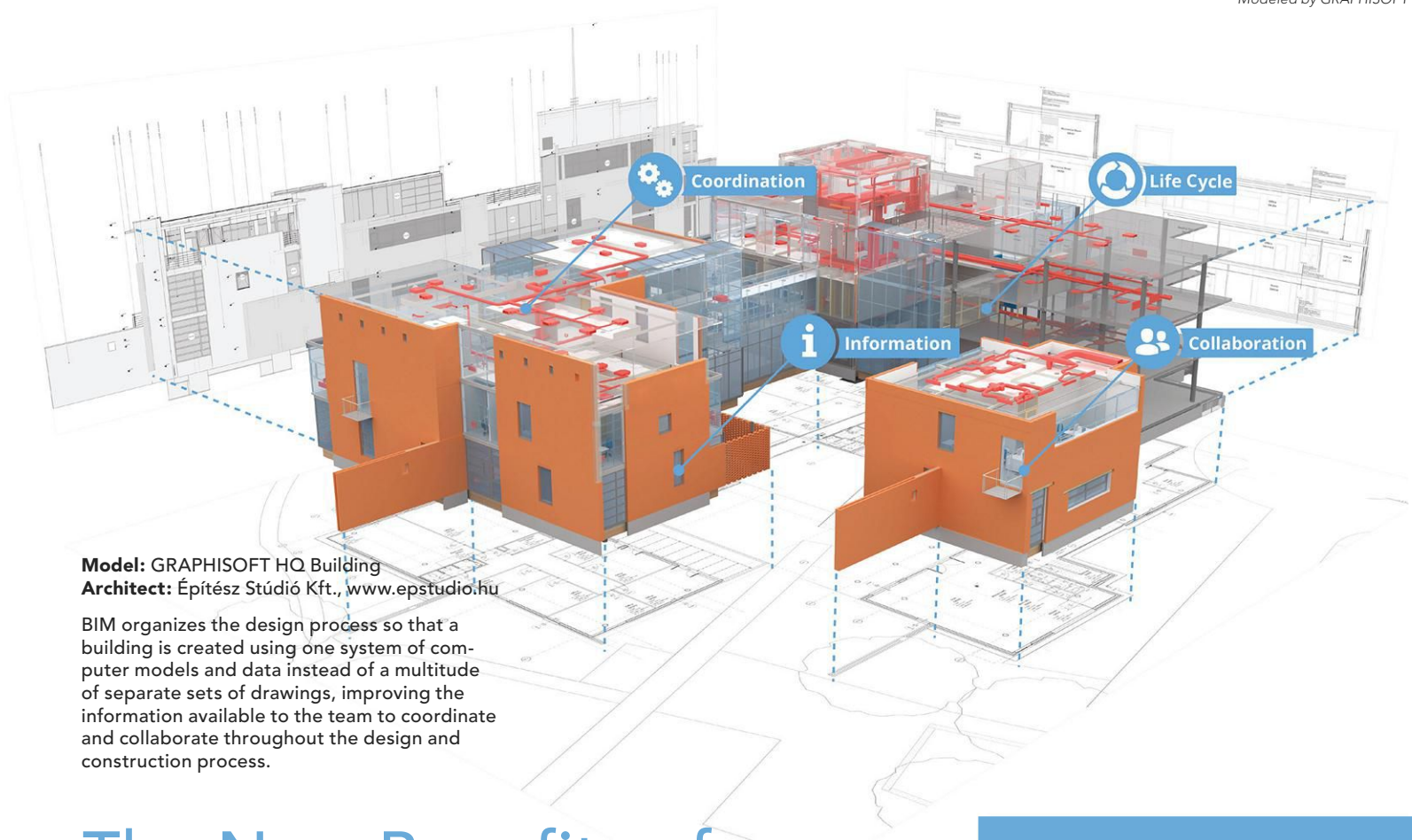
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BIM organizes the design process so that a building is created using one system of computer models and data instead of a multitude of separate sets of drawings, improving the information available to the team to coordinate and collaborate throughout the design and construction process.

## The New Benefits of Designing with BIM

Improve productivity, safety, creativity, and collaboration with the new tools and enhanced functionality now available

Sponsored by GRAPHISOFT® | By Jeanette Fitzgerald Pitts

**B**uilding information modeling (BIM) is an intelligent, digital, model-based process of design, where a building is created using one system of computer models instead of separate sets of drawings. Although BIM is not a new concept or technology, its adoption has skyrocketed over the past decade, and continuous advancements have dramatically improved the productivity, safety, creativity, and collaboration that can be fostered and supported by the BIM-enabled process.

According to the report titled *The Business Value of BIM in North America: Multi-Year Trend Analysis and User Ratings (2007–2012)* by McGraw-Hill Construction, industry-wide adoption of BIM throughout the architectural, engineering, and construction community

in the United States surged from 28 percent in 2007 to 71 percent in 2012. In the past few years, worldwide use of this technology has continued to grow at an impressive rate. The United Kingdom is currently considered the most enthusiastic BIM adopter, with adoption rates estimated at nearly 80 percent. Many countries are requiring the use of BIM for government-funded projects. In South Korea, the Public Procurement Service requires BIM for all public sector projects of a certain size.

One explanation for this incredible increase in BIM adoption points toward the undeniable benefits that BIM now offers. Before BIM, the design process was rigid, sequential, and fragmented, allowing many opportunities for miscommunications, misinformation, and errors to occur.

### CONTINUING EDUCATION



1 AIA LU/HSW



1 IDCEC CEU/HSW

#### Learning Objectives

After reading this article, you should be able to:

1. Describe how the new stair tool helps to design stair solutions that are safe and easy to navigate and meet all applicable national and local codes.
2. Explain how the integrated collision detection feature can reveal potential flaws and weaknesses in the design before construction begins.
3. Explore how BIM automates documentation updates and eliminates potential errors or miscommunications that can occur when the documentation is not kept current.
4. Provide three examples of how BIM improves the collaboration between architects and the rest of the consulting and engineering team.
5. Use new presentation tools in BIM software to engage clients.

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Architects were required to define the project in 2-D and communicate design intent across many separate drawings instead of consolidating the entire project into a single file driven from a 3-D model. Beyond the improved coordination of a project, it is often touted that BIM dramatically streamlines workflow and makes it easier to engage clients in the design process with improved project visualization capabilities, both in 3-D and virtual reality (VR) technologies.

Anthony Laney, Laney LA, describes the moment he knew his firm would make the investment in a BIM solution. “I was sitting at a conference, and a presenter brought out a giant roll of drawings and said, ‘This is option A.’ Then he held up an iPad and said, ‘This is option B,’ and he started spinning the 3-D model and flipping through plans, and I knew right then that this was where we needed to invest.”

### USING 3-D ARCHITECTURAL BIM SOFTWARE TO DESIGN

The ability to design in 3-D space is one of the most defining features of working in BIM. The software creates a comprehensive 3-D digital model that contains virtual equivalents for the spatial, structural, and mechanical systems included in the project. Designers define the materials, detailing, and spatial characteristics, among other items, in the program, creating layers and layers of metadata that the software uses to generate the 3-D visual representation. As designers interact with the representation, the supporting data is continually updated. This ensures that the incredible amount of information necessary to convey the design intent of a project remains accurate throughout the iterative design process.

Before BIM, architects either drafted buildings manually or with computer-aided design technology, referred to as CAD. Both approaches required architects to design in 2-D, which relied on typing commands into a form to describe the structural and mechanical elements, flesh out the floor plans and elevations, and populate the schedules and sections that comprise the complete drawing set. Once 3-D technology became available, it was only used to create 3-D views and renderings of projects that were designed in 2-D. The 3-D models that could be generated were static, not interactive.

Now, with BIM, architects can design in 2-D or 3-D and modify the design by interacting with the 3-D model of the building.

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“BIM enables the team to engage with the design in a more visually rich way.”  
—Anthony Laney, Laney LA, @LaneyLAinc



With BIM, architects can design in 2-D or 3-D and modify the design by interacting with the 3-D model of the building.

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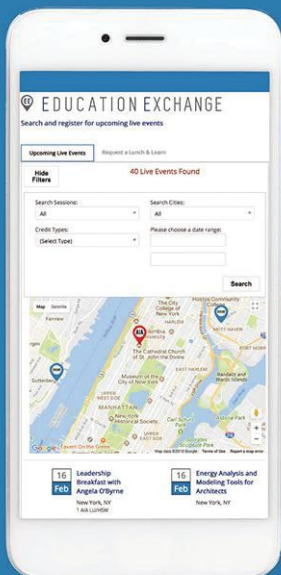


# EDUCATION EXCHANGE



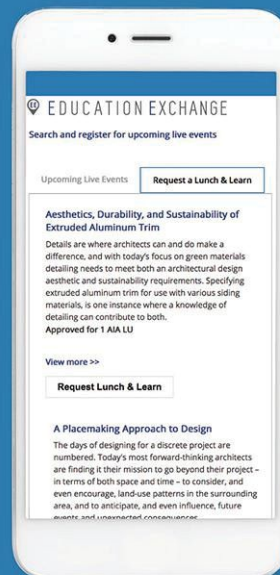
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Architects looking to achieve the look of clay tile, wood shake, or slate shingle roofing but want the durability and lighter weight of metal roofing can now design and specify metal roofing to meet these needs.

All images provided by CertainTeed

# Metal Roofing with the Appearance of Traditional Materials

More variety and more sustainability is now available for new and renovated residential and light commercial projects

Sponsored by CertainTeed | *Peter J. Arsenault, FAIA, NCARB, LEED AP*

**M**etal roofing has been around a long time. That can be said in general terms as well as on specific buildings, which explains its well-earned reputation for long-term durability and enduring appearance. These longevity characteristics bode well in light of current demands for greater sustainability and better material choices in buildings. Metal roofing also supports a strong return on investment over the longer term since, in many cases, it can contribute to lower cost of ownership in terms of reduced maintenance, potential energy savings, and insurance premium savings. Given these popular advantages, it is easy to see why metal roofing has become a huge segment of the U.S. roofing industry at more than \$4 billion annually. It is also the fastest-growing segment in the roofing industry with a forecast to be more than \$7 billion by 2024, according to the industry market research firm The Freedonia Group.

When thinking of metal roofing, however, many architects, owners, and others envision standing-seam or corrugated profiles as their only choices. In fact, those who look a little closer are also discovering that it is available in more looks, colors, and types than they may have thought. In particular, it is available in patterns that very effectively mimic other traditional residential roofing materials, such as clay tile, slate shingles, or wood shakes. This course will look at some of the current choices, options, characteristics, and green building properties of metal roofing available, particularly those with traditional appearances.

## BUILDING DESIGNS WITH METAL ROOFING

Standard metal roofing products come in some common types and styles that do include standing-seam profiles and corrugated profiles along with stone-coated metal panels. All of these are fairly versatile products and

### CONTINUING EDUCATION



1 AIA LU/HSW



1 GBCI CE HOUR

#### Learning Objectives

After reading this article, you should be able to:

1. Identify and recognize the high-performance characteristics of metal roofing (wind and weather resistance, fire classification, and durability) as determined by national standards.
2. Investigate the design potential and innovative opportunities to use metal roofing in a variety of profiles and colors to create sustainable buildings.
3. Assess the functional contributions of metal roofing as part of the green and sustainable design of a building.
4. Specify metal roofing in a variety of green and conventional buildings by selecting from many choices and options.

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**Metal tile roofing provides the look of clay tile with less weight and more impact resistance.**

bring all of the desirable properties of metal roofing to a building, while also providing a strong, visible aesthetic for a variety of architectural styles. However, they also have some limitations that need to be taken into account when it comes to their use on traditional-style residential and light commercial projects.

Standing-seam metal roofing provides a defined pattern of clean lines with all fasteners and connectors concealed from view when the installation is complete. It can provide the roofing for a complete building or be judiciously selected for an accent section in contrast to other roofing materials on a building. Either way, the final appearance is limited to a selection of standard solid colors as available from manufacturers—patterns or textures are not readily obtainable. In some cases, the sleek appearance can clash with a traditional or historical design, particularly for a residential building since the standing seams can be seen as more of a commercial or institutional look. From a construction viewpoint, standing-seam metal roofing can be more challenging to install than other roofing materials. The individual panels are intentionally long and can be cumbersome to handle, all requiring specialty trades and tools for a successful installation. Of course, those needs contribute to higher installation costs compared to some other metal roofing options.

Corrugated steel roofing refers to any type of corrugation whether a low-profile and asymmetrical pattern or a full-depth, continuous corrugation across a roofing panel (i.e., with a similar look of cardboard corrugations.) The corrugations add strength to the metal panels and help facilitate the overlapping of adjacent pieces to maintain weathertightness. They are

typically less expensive to install, which means they have been associated with agricultural and industrial buildings more than with residential and light commercial ones. The available colors are limited to the solid color choices provided by manufacturers, including “bare metal” galvanized choices. The final appearance usually includes exposed fasteners, which may or may not detract from the overall design but can certainly increase the potential for water leaks.

Stone-coated metal is available for installations where different colors or textures are sought compared to solid colored metal. However, the stone coating works best on smaller-sized panels, ultimately meaning more labor is needed to install more individual panels using more fasteners than painted metal panel options. In some cases, a batten system may be selected as part of the design, which increases the cost notably. The stone coating also inhibits the ability of the metal to be resistant to algae growth due to the metallurgical reaction between the coating and the base metal, thus requiring some ongoing maintenance.

While these three metal roofing options (i.e., standing seam, corrugated, and stone coated) provide solutions for many building designs, manufacturers have responded to requests for durable metal roofing products that can provide the appearance of more traditional materials to be more compatible with traditional and even historic designs. Currently, it is possible to select from at least three alternative metal roofing products that can enhance a residential or commercial building by blending traditional aesthetics with the modern performance of metal. Each are available in workable-sized panels that make them easy to install and integrate into a variety of design schemes. These alternative choices include the following:

- **Clay tile roofing in metal:** With its classic elegance and long history, the look of Mediterranean-style clay tile remains the most popular choice in many parts of the United States. Metal-tile roofing panels provide a new, improved way to create this desired style. These carefully designed metal panels provide the appearance of clay tiles but without the weight and breakage concerns of clay. The panels include edge reveals that provide a fully three-dimensional product with concealed fasteners for an authentic look. They are available in a range of colors, including browns, reds (terra cotta), grays, and greens in a finishing process that mimics the look of natural clay.
- **Slate shingles in metal:** Slate roofing is a regional favorite steeped in tradition in many locations around the country. New technology allows metal panels to be pressed to create depth and patterns that match the look of slate roofing shingles. In order to achieve the desired traditional look, edge reveals and three-dimensional detailing are combined with concealed fasteners to replicate the authentic look of a slate shingled roof. To further enhance the design, a full range of colors is available that reflects the natural and varied colors of slate in different regions.

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**Peter J. Arsenault, FAIA, NCARB, LEED AP**, is a nationally known architect, consultant, continuing education presenter, and prolific author advancing building performance through better design. [www.pjaarch.com](http://www.pjaarch.com)  
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Photo courtesy of 3A Composites USA/Jamey Price Photography



In order to sustainably retain the strong architectural massing of Uniondale, New York's Nassau Veteran's Memorial Coliseum, while giving its facade an entirely new look, an intricate metal design system wraps the 416,000-square-foot coliseum with approximately 4,700 unique aluminum "fins" created with recyclable aluminum composite material.

## The ABCs of LCAs and EPDs

Recognizing the importance of comprehensive life-cycle analysis studies for roofing and cladding systems, the metal industry has invested substantial resources and effort to provide building teams with key product information to help design and build truly sustainable buildings

Sponsored by Metal Construction Association

**S**ustainable building design is arguably one of the biggest trends in the building and construction industry and is an important consideration in just about any building project going on today.

In fact, Market Research Future predicts the green building market will continue growing at a rate of 17 percent annually through the year 2022, and within the next four years, the market's collective value will surpass a valuation of \$245 billion, up from \$158 billion in 2015.

To really appreciate this rate of growth, a look at U.S. Green Building Council statistics reveals a dramatic increase from 296 LEED project certifications back in 2006 to 92,000

registered and certified commercial projects totaling more than 1.8 billion square meters (19.4 billion square feet) in 2017.

Now that green building is fully established, the industry is experiencing an important shift toward incorporating health and well-being into today's sustainable criteria.

In line with this market demand for building product transparency, building product manufacturers have been busy analyzing the full life-cycle assessment (LCA) of their products, from raw material extraction to recycling/landfill to help building teams make more informed decisions when seeking green products.

### CONTINUING EDUCATION



1 AIA LU/HSW

#### Learning Objectives

After reading this article, you should be able to:

1. Explore the sustainability and durability benefits of metal roofing and wall systems.
2. List the information provided in product category rules (PCRs), life-cycle assessments (LCAs), and environmental product declarations (EPDs), and describe how the sustainable building market is driving the need to continue developing them.
3. Review extensive metal roof and cladding industry efforts to perform these LCA studies and make this information freely available to the industry.
4. Discuss how metal roofing and cladding systems compare to other systems in terms of LCA.
5. Identify shortcomings with current LCAs and subsequent EPDs and how they are being addressed.

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Photo courtesy of 3A Composites USA, Inc.



Meeting International Future Living Institute Living Building Challenge standards, the net-zero VanDusen Botanical Gardens Visitor Centre in Vancouver, British Columbia, features a living roof blending striking aluminum composite panels with traditional wood.

Photo courtesy of Metal Sales/Lara Swimmer



When designing the Medicine Crow Middle School in Billings, Montana, the community was interested in a resilient space that could provide a minimum lifespan of at least 50 years. Sustainable metal wall panels were designed as a durable and aesthetically interesting solution while meeting sustainability and energy goals for the exterior envelope.

### METAL WALLS AND ROOFING

Under LCA criteria, the characteristics of metal wall and roofing systems fare quite well with high recycled content, recyclability, durability, and longevity characteristics.

“From a product perspective, metal buildings are good for the environment because they are made from recycled steel, are 100 percent recyclable, and produce a low carbon footprint,” states John Cross, P.E., vice president, American Institute of Steel Construction (AISC), Chicago. “From a performance perspective, metal building panels promote energy efficiency because they are designed to incorporate fiberglass or rigid insulation of varying thicknesses, thus enhancing insulation values. From a construction perspec-

tive, offsite fabrication reduces excess material required and construction equipment emissions, and faster cleanup is achieved because metal buildings generate over 50 percent less job site waste than other construction materials.”

Take metal roofs, for example. Their average service life can reach 60 years, which is considerably more than roofing alternatives. In fact, BOMA International reports that the expected life-cycle cost of metal roofs is 30 cents per square foot per year, as compared to 37 cents per square foot for asphalt and 57 cents per square foot for single-ply roofing per year.

Significantly factoring into this are maintenance costs, with owners spending 3.5 percent of total installed costs on maintenance versus 28.5 percent for asphalt roofs and 19 percent for single-ply, according to BOMA.

Furthermore, metal roofs and panels are light weight for easier installation and reduce the structural load on the building, resulting in a lower environmental footprint and building costs.

In an *Environmental Building News* article, “Cladding: More than Just a Pretty Facade,” Brent Ehrlich, LEED AP BD+C, product and materials specialist, BuildingGreen, points out that metal panels can be anodized to improve corrosion resistance and coated, which enhances durability and resistance to dirt accumulation. “Because metal claddings are lightweight, rainscreen systems that employ them can use smaller clips, resulting in less thermal bridging and better overall thermal performance for the building,” he writes.

As a highly recyclable material, end-of-life metal roofs rarely go to the landfill, as compared to an Environmental Production Agency estimation of 11 million tons of asphalt shingles ending up in landfills every year.

Incidentally, steel can be “multi-cycled” with no loss of material attributes, which makes steel the first and only true cradle-to-cradle building cladding, roofing, and framing material. Furthermore, steel enjoys superior water resource management with a 95 percent water recycling rate—with no external discharges—producing a net consumption of 70 gallons per ton.

Another important point is that metal roof and wall cladding systems are custom-engineered and produced for each building project to exact specifications, which means that the metal and other building details are fully optimized (i.e., not wasted) during fabrication and construction.

Furthermore, metal building providers typically have multiple production facilities around the country, making regionally sourced materials frequently available.

### LCAS AND EPDS

As building teams work to navigate the challenging process of assessing the true sustainable attributes of building products and systems, LCAs and environmental product declarations (EPDs) are becoming indispensable tools.

Unlike a simplified, one-attribute approach to sustainability, LCAs are designed to take a much broader look at the environmental impacts produced by a product’s full life cycle. This includes the utilization of a recognized global methodology with a transparent, holistic, and balanced approach to product evaluation; an inventory of all energy/material inputs and environmental releases; the potential impacts associated with all these inputs and releases; and an interpretation of these results.

Included in this LCA is information on sourcing of raw materials, transporting the raw materials to the manufacturing plant, the manufacturing process, shipping and transportation, construction and installation, the product’s use and maintenance, and recycling, disposal, or product repurposing.

Manufacturers are then taking these comprehensive, third-party-verified LCAs and turning them into EPD labels for their products.

“The EPD provides a summary of the environmental impacts and attributes of a product that the consumer can use to gain a better understanding of a product and/or system,” explains Gary Jakubcin, president/general manager, B&G Jakubcin & Associates LLC, Pickerington, Ohio.

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The Metal Construction Association brings together a diverse industry for the purpose of expanding the use of metal in construction through marketing, research, technology, and education. MCA member companies gain tremendous benefit from association activities that focus on research, codes and standards, market development, and technical programs.  
[www.metalconstruction.org](http://www.metalconstruction.org)

From design through construction and use, standard and high-performance gypsum boards and panels are estimated to be used in 97 percent of residential construction for a high-quality, sustainable, interior finish solution.

# Innovations in Residential Construction Using Advanced Gypsum Products

No longer a commodity, high-performance gypsum products provide solutions for safer, healthier, greener, and more sustainable buildings

Sponsored by CertainTeed Gypsum | By Peter J. Arsenault, FAIA, NCARB, LEED AP

**R**esidential construction widely relies on a variety of gypsum products such as gypsum boards, panels, finish compounds, and accessories. According to the Gypsum Association, the North American industry trade association of gypsum manufacturers, an average home in the United States uses about 200 sheets of 4-by-12-foot board (approximately 8,500–9,000 square feet) for walls and ceilings. While this usage and its fairly long history in North American construction may lead some to think that gypsum board is just another commodity product, the reality is that gypsum board and panels have evolved and progressed in the past few decades. Changes in building codes, the rise of green building programs such as LEED, and evolving construction practices have generated a need for a suite of specialized solutions. Gypsum product manufacturers have responded with an array of standard and high-performance products that many architects and builders can benefit from by being more knowl-

edgeable about them. High-performance gypsum board in particular has truly taken this former commodity to the status of an innovative product, allowing wall and ceiling surfaces to help solve a variety of current concerns and design issues. For example, the most recent advancements can help address indoor air quality, enhanced sound control between spaces, better durability, and overall sustainability. This course will review some of the history and manufacturing of gypsum products, distinguish between standard and high-performance products and finishing levels, and focus on the ways these advanced products can be used for environmental and human health considerations.

## WHY GYPSUM? A SHORT HISTORY

Naturally occurring gypsum is a mineral made from calcium sulfate with chemically combined water ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ). As such, it is quite workable when mixed with extra water and will harden back to a rock-like state as the excess water not

## CONTINUING EDUCATION



1 AIA LU/HSW



1 GBCI CE HOUR

### Learning Objectives

After reading this article, you should be able to:

1. Review the history of gypsum as a natural material and how it has become so widely used in residential construction.
2. Identify the manufacturing process of both natural and synthetic gypsum products and the sustainability and green attributes of manufacturing each.
3. Investigate the full range of high-performing, innovative gypsum products and the different finish levels that can all help contribute to green building design.
4. Assess the functional performance of gypsum products as they contribute to green and sustainable design in any residential building or project.

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needed for chemical bonding is removed. Gypsum has been used in a variety of solid forms and mixed into plasters of different consistencies for thousands of years.

The earliest known use of gypsum in building construction appears to have occurred in 3700 B.C. It has been discovered that the Egyptian pyramid of Cheops used gypsum blocks and plaster applied over woven straw lath as part of the construction. It is notable that much of this construction is still intact some 5,700 years later, testifying to the strength and durability of gypsum. Other places in the Mediterranean are known to have used gypsum for buildings and palaces through the centuries. In the Middle Ages, it was used to make alabaster (a form of gypsum) that was used by sculptors.

During the late 1700s, the noted French chemist Antoine Laurent Lavoisier analyzed the chemical makeup of gypsum. His work and subsequent research by a group of his contemporary chemists helped with a better understanding of its properties. Meanwhile, the discovery and mining of huge reserves of gypsum found near Paris led to the widespread use of “plaster of Paris” as a building material, primarily for plastering wall and ceiling surfaces. During a trip to France around this time, Benjamin Franklin observed farmers using gypsum as a soil additive. He was so impressed

by the idea that he began to enthusiastically promote it upon his return to America.

Throughout the 1800s, many gypsum deposits were also discovered in the United States. Following the lead of the French, its primary usage was agricultural at first. However, in 1888, the so-called “grandfather of the gypsum board manufacturing industry” Augustine Sackett teamed up with Fred Kane and developed Sackett board—plaster of Paris sandwiched between several layers of felt paper. Sackett boards did not necessarily provide a nice wall finish, but they did provide a more convenient and excellent plastering base compared to wood lath for wall and ceiling construction. Sackett patented his manufacturing process and opened several production facilities over the next decade so that by 1901, he was producing nearly 5 million square feet of board annually. In 1916, the original board was finally replaced with a paper-faced product that was ready to finish, and gypsum board, or “drywall” as we recognize it today, was born.

World War I brought new challenges for the country but also new growth in the use of gypsum board. The U.S. Army had an immediate need for temporary housing both in the United States and overseas for an increasing number of troops. But when a tragic barracks fire claimed the lives of several servicemen, gypsum boards quickly became the material of choice for its in-

herent fire resistance. Its increasing use also led to new technological improvements, including air entrainment for lighter-weight and less-brittle boards, along with evolving joint treatment materials and systems. By 1930, there was a growing demand and a high enough number of manufacturers that the Gypsum Association was founded in April of that year. Some of the association’s first tasks were to develop standardized fire-resistance testing for gypsum products.

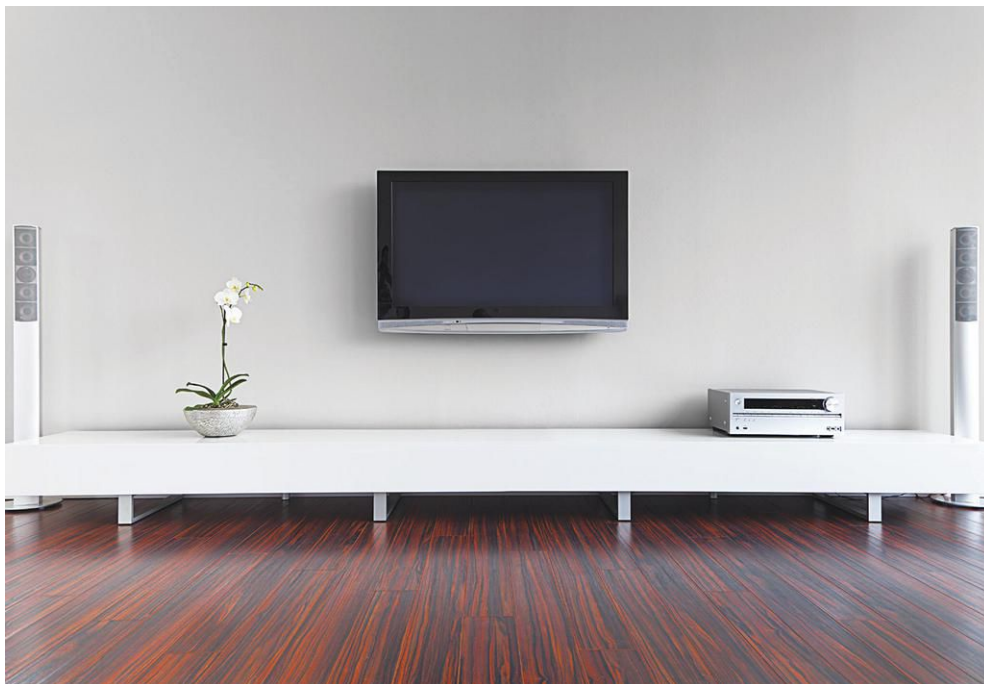
During the 1940s, gypsum boards were being incorporated in both domestic and overseas military construction for its ease of installation and fire-resistive qualities. By 1945, the government had used approximately 2.5 billion square feet of gypsum board in a variety of buildings and locations. The time period immediately following World War II is well known for the housing boom that followed but it also helped fuel a shift away from domestic plaster use and toward gypsum board. At this time, about 50 percent of the new houses being built in America used gypsum wall board, while the other 50 percent were being built with gypsum plaster over lath. This is also the time period when type X gypsum board was introduced with specific fire-resistance ratings available.

The 1960s and 1970s found the industry focusing on expanding the use of gypsum board into commercial construction, concentrating in particular on apartment building and office tower design solutions. This was also the time that improvements developed in the products, particularly for different types of fire-resistance-rated systems. Concurrently, there was a recognition that gypsum could be created synthetically using the same chemical makeup as natural gypsum so that by the 1990s entire manufacturing facilities were devoted to that purpose.

From a rather humble beginning over a century ago, gypsum boards have become the interior finish material of choice, currently covering the interiors of 97 percent of the new homes constructed in the United States and Canada as reported by the Gypsum Association. Building on this tradition and development, the industry is steaming headlong into the 21<sup>st</sup> century with more options and choices for design and construction than previously available.

▶ Continues at [ce.architecturalrecord.com](http://ce.architecturalrecord.com)

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



Gypsum boards have been commonly used in residential construction of all types for decades and have evolved to include high-performance solutions to meet the demands of 21<sup>st</sup> century homes.

# Designing Beyond Borders

Creating symmetry, sustainability, and enhancing indoor-outdoor living with multi-panel folding and sliding door systems

Sponsored by LaCantina Doors | *By Amanda C. Voss, MPP*

**W**hy must we think of home and nature as distinct, or even opposing, spaces? For the health of both home and nature, a marriage between what lies within the edifice and the space outside is critical. Bringing the outside into a structure enhances indoor air

quality (IAQ), ventilation, natural daylighting, and the health of occupants. Taking into consideration the natural surroundings when adding a structure means creating minimal ecosystem disruption and preserving as much of the environmental balance as possible. The best design

does not stand in opposition to nature; instead, it facilitates cooperation and the elimination of perceived boundaries.

By their very design, multi-panel door systems enable an unbroken engagement between interior and outdoor spaces.

▶ Continues at [ce.architecturalrecord.com](http://ce.architecturalrecord.com)

*Amanda Voss, MPP, is an author, editor, and policy analyst. Writing for multiple publications, she also serves as the managing editor for Energy Design Update.*



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## CONTINUING EDUCATION



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### Learning Objectives

After reading this article, you should be able to:

1. Understand the health benefits of integrating better ventilation and outdoor rooms with a building's interior.
2. Identify the aesthetic uses of consistent sightlines and product styling in creating a seamless profile for a perfect match.
3. Discuss multi-panel door system materials and components and their environmental, sustainability, and energy benefits for a project.
4. Realize the importance that proper installation holds for a building's sustainability.
5. Recognize environmental ratings, such as NFRC and LEED, and how multi-panel door systems can help to meet these standards.

To receive AIA credit, you are required to read the entire article and pass the test. Go to [ce.architecturalrecord.com](http://ce.architecturalrecord.com) for complete text and to take the test for free.

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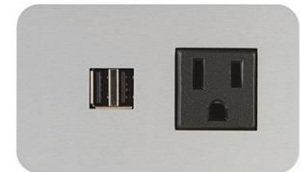
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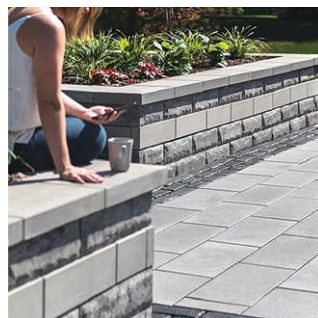
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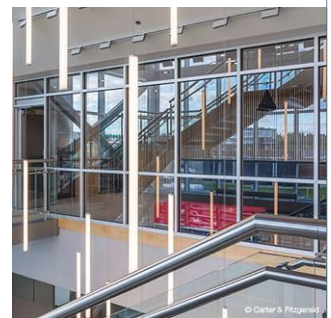
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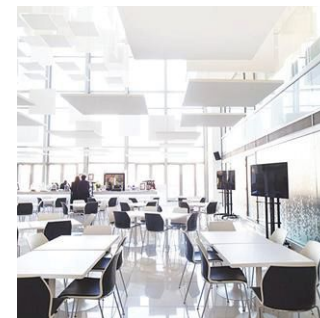
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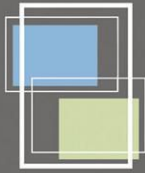
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**New and Upcoming  
Exhibitions**

**Santiago Calatrava: Art and Architecture  
Prague**

*June 7–September 16, 2018*

This exhibit will feature Calatrava’s key projects, including the World Trade Center Transportation Hub and the UAE Pavilion for the Dubai World Expo in 2020, as well as his large-format paintings and kinetic and abstract sculptures. At the Stone Bell House. More information at [en.ghmp.cz](http://en.ghmp.cz).

**Serpentine Pavilion 2018  
London**

*June 15–October 7, 2018*

Designed this year by Mexican architect Frida Escobedo, the annual temporary pavilion serves as a community hub and café during the day, and a venue for learning, debate, and entertainment at night. More at [serpentinegalleries.org](http://serpentinegalleries.org).

**Daniel Buren: Voile/Toile–Toile/Voile  
Minneapolis**

*June 26–October 8, 2018*

Conceptual artist Daniel Buren’s first major public artwork in the U.S., which translates from French to *Sail/Canvas–Canvas/Sail*, will feature a public performance and installation. The show, taking the form of a sailboat regatta, will take place on June 23, following which the boat’s striped sails will be installed in the Minneapolis Sculpture Garden’s Cowles Pavilion. More at [walkerart.org](http://walkerart.org).

**Amsterdam Magical Centre: Art and  
Counterculture 1967–1970  
Amsterdam**

*July 7, 2018–January 6, 2019*

Featuring artwork from the museum’s permanent collection, this exhibition displays conceptual artwork that was installed or shown in Amsterdam from 1967 onward, as well as tracking historical civic actions such as the city’s squatter movement. Participating artists include Robert Morris, Dennis Oppenheim, and Lawrence Weiner. At the Stedelijk Museum Amsterdam. More at [stedelijk.nl/en](http://stedelijk.nl/en).

**Toward a Concrete Utopia: Architecture in  
Yugoslavia, 1948–1980**

New York City

*July 15, 2018–January 13, 2019*



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This exhibition looks at the architecture of the former Yugoslavia through a survey of more than 400 drawings, models, photographs, and films that were sourced from regional archives held by both governmental entities and private collections. The work by architects such as Bogdan Bogdanović, Juraj Neidhardt, Svetlana Kana Radević, Edvard Ravnikar, Vjenceslav Richter, and Milica Šterić will be included in the show, the first of its kind to be staged in the U.S. At the Museum of Modern Art. Visit [moma.org](http://moma.org) for more information.

## Ongoing Exhibitions

### Junya Ishigami: Freeing Architecture

Paris

*Through June 10, 2018*

For the first time, Fondation Cartier pour l'art contemporain is staging a solo architecture show, featuring the work of acclaimed Japanese architect Junya Ishigami. The exhibit highlights 20 of the architect's projects and includes films, drawings, 40 custom-made models, and other relevant documents. See more at [fondationcartier.com](http://fondationcartier.com).

### Arakawa and Madeline Gins: Eternal Gradient

New York City

*Through June 16, 2018*

This exhibition looks at the nearly five-decade collaboration between artist Arakawa and his partner, poet and philosopher Madeline Gins, which culminated in architectural designs realized on four sites across Japan and one in East Hampton, New York. Hand drawings, archival material, manuscripts, slides, and an architectural model are among the objects featured in the display, designed by Norman Kelley. At the Arthur Ross Architecture Gallery. Visit [arch.columbia.edu](http://arch.columbia.edu) for more.

### Image Building: How Photography Transforms Architecture

Water Mill, New York

*Through June 17, 2018*

This exhibit, organized by guest curator Therese Lichtenstein, is a survey of historical and architectural photographers' work from the 1930s to the present, exploring the relationship among architecture, photography, and the viewer. At the Parrish Art Museum. More at [parrishart.org](http://parrishart.org).

### The Bibliothèque nationale de France: Portrait of a Project, 1988–1998

Paris

*Through July 22, 2018*

Commemorating the 20th anniversary of the Bibliothèque nationale de France, this exhibition—curated by its architect, Dominique Perrault—reexamines the project from its design to its furnishings, landscaped gardens, and place in what was a newly created neighborhood. Perrault includes films, sketches, plans, and models from both his own archive and public collections to reevaluate the well-known library. More information at [bnf.fr](http://bnf.fr).

### Public Parks, Private Gardens: Paris to Provence

New York City

*Through July 29, 2018*

This exhibition focuses on the 19th-century boom in landscape design that transformed France's public spaces and personal gardens. The movement is illustrated through paintings, photographs, and various objects by artists, from the Metropolitan Museum of Art's collection. Details at [metmuseum.org](http://metmuseum.org).

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**Tacita Dean: Landscape**  
London*Through August 12, 2018*

Visual artist Tacita Dean will explore landscape through collections of objects found throughout the course of her site visits to various countries, a series of chalk drawings on a sculpted blackboard, and a new experimental film. At the Royal Academy of Arts. More at [royalacademy.org.uk](http://royalacademy.org.uk).

**Now What?! Advocacy, Activism & Alliances in American Architecture Since 1968**

Los Angeles

*Through August 28, 2018*

This exhibit examines how architects and designers participated in and responded to major social and political movements over the past 50 years, including the Civil Rights, women's, and LGBTQ movements, beginning in 1968. At the A+D Museum (though the exhibit will travel to other unconfirmed venues across the country following the Los Angeles exhibition). More at [nowwhat-architexx.org](http://nowwhat-architexx.org).

**David Chipperfield Architects Works 2018**

Vicenza, Italy

*Through September 2, 2018*

The architect's exhibition of 15 projects at the Basilica Palladiana will be the first contemporary architecture show at the venue in 12 years. Chipperfield will show projects from London, Berlin, Milan, and Shanghai. visit [chipperfield.abacoarchitettura.org](http://chipperfield.abacoarchitettura.org).

**We Make Carpets: Crêpe Paper Carpet**  
Houston*Through September 8, 2018*

The Dutch artist collective We Make Carpets is installing a site-specific exhibition of their large fabric works in the Moody Center for the Arts' Central Gallery. The artists will be using vibrantly dyed crepe paper to create the Houston installation. At Rice University. Visit [moody.rice.edu](http://moody.rice.edu).

**Japan in Architecture: Genealogies of Its Transformation**

Tokyo

*Through September 17, 2018*

The exhibition traces the history of traditional Japanese architecture from the Meiji Restoration in 1868 to contemporary times. Featuring 100 projects and over 400 items

that range from architectural materials to models and interactive installations. At the Mori Art Museum. Visit [mori.art.museum](http://mori.art.museum).

**Lectures, Conferences, and Symposia****Birmingham Design Festival**  
Birmingham, U.K.*June 7–10, 2018*

This festival's inauguration includes a series of workshops, talks, exhibitions, demonstrations, and screenings set in various venues across the city. Visit [birminghamdesignfestival.org.uk](http://birminghamdesignfestival.org.uk).

**San Francisco Design Week**

San Francisco

*June 7–15, 2018*

This future-focused program examines the city's connections to tech companies through events about designing for cryptocurrency, augmented reality, and artificial intelligence. The week-long festival features exhibitions, events, and lectures that showcase the intersection of ideas, design, business, and entrepreneurialism in the Bay Area. Visit [sfdesignweek.org](http://sfdesignweek.org).

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**NeoCon**

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One of North America's largest design exhibitions and conferences for commercial interiors, the three-day event is in its 50th edition, featuring exhibition space for products and services, over 100 CEU programs, and keynote presentations, including one by architect Carol Ross Barney, and a conversation between Art Gensler and Cheryl Durst. More at [neocon.com](http://neocon.com).

**Art Basel**

Basel

June 12–17, 2018

Bringing together almost 300 galleries that collectively represent over 4,000 artists, the annual art show features a series of exhibitions and events held throughout the city and surrounding region over the course of five days. Design Miami's partner event will take place at the Messe Basel exhibition hall. More information at [artbasel.com](http://artbasel.com).

**Barcelona Design Week**

Barcelona

Through June 14, 2018

The 13th edition of this week-long event fea-

tures conferences, exhibitions, business meetings, and networking sessions. Over 100 activities open to the public will concern sustainability and innovation in the design and business worlds. For more information go to [barcelonadesignweek.com](http://barcelonadesignweek.com).

**Ethics in Architecture**

London

June 14, 2018

This seminar examines the best practices for sourcing materials, products, and hiring people to work on architectural projects. The discussion will be led by Resilient World's Chris McCann and will address new legislative rules from both national and international bodies. More information at [architecture.com](http://architecture.com).

**Frederick Law Olmsted: Designing America**

New York City

June 20, 2018

This screening of a documentary about Frederick Law Olmsted's designs of Central Park and Prospect Park will include a question-and-answer session with historian Laurence Cotton, who was the lead researcher, following the film. At the Brooklyn Historical Society. Visit [brooklynhistory.org](http://brooklynhistory.org).

**Medellín Design Week**

Medellín, Colombia

June 20–24, 2018

This year's event will follow the theme "the future is uncertain." Participating designers' and architects' responses to the theme will be showcased through exhibitions as well as forums, conferences, and tours that will take place throughout the city over the course of the five-day event. For more information, see [4.medellindesignweek.com](http://4.medellindesignweek.com).

**AIA Conference on Architecture**

New York City

June 21–23, 2018

The annual American Institute of Architects' conference includes hundreds of lectures, panels, and tours. Keynote speakers include David Adjaye, Sheela Søgaard, Sarah Williams Goldhagen, James Stewart Polshek, Tod Williams and Billie Tsien, and Julie Snow and Matt Kreilich, among others. More information at [conferenceonarchitecture.com](http://conferenceonarchitecture.com).

**Isle of Dogs: London's Emerging Metropolis**

London

June 26, 2018

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## dates&events

London's new Crossrail is changing the neighborhoods surrounding Canary Wharf's business district. Local politicians, stakeholders, residents, developers, and architects will be among the attendees. The event offers continuing-education credits. For more information, visit [newlondonarchitecture.org](http://newlondonarchitecture.org).

### London Festival of Architecture London

Through June 30, 2018

The month-long, citywide festival this year celebrates architectural experimentation and practice around the theme of identity. With more than 400 different events, the festival consists of exhibitions, walking tours, architectural installations, and debates. Visit [londonfestivalofarchitecture.org](http://londonfestivalofarchitecture.org).

## Competitions

### Displaced: Design for Inclusive Cities

Deadline: June 12, 2018

This competition seeks proposals for projects that can provide services like housing and community centers for refugees as they arrive in cities, with the aim of promoting safety and integration. Visit [designinpublic.org](http://designinpublic.org).

### World Monuments Fund/Knoll Modernism Prize

Deadline: June 15, 2018

A prize that recognizes successful contemporary preservation efforts of Modernist designs, this 10th edition of the awards series seeks submissions from individuals and organizations for projects or campaigns carried out within the past five years. The winner will receive \$10,000. See [wmf.org](http://wmf.org).

### BOUN Furniture Design Awards '18

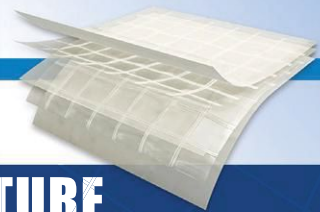
Deadline: June 19, 2018

Seeking interior furniture design concepts or built work, the theme of this competition is "live," and designers are asked to propose furniture that both serves a function and makes that function comfortable and enjoyable. More information at [boun.xyz/fda.html](http://boun.xyz/fda.html)

### Military Museum

Deadline: June 20, 2018

The Young Architects Competitions and the Italian government are seeking conceptual designs for how to transform a former military fortress on the island of Sardinia into a museum of military, marine, and navigational history. The jury includes Rossana Hu from Neri&Hu Design and awards the winning



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#### La forêt monumentale

*Deadline: June 22, 2018*

This competition calls for submissions for a temporary site-specific art installation in a forest, around the theme of sustainability. The exhibition will run from September 2019 through September 2022. For more information, go to [metropole-rouen-normandie.fr](http://metropole-rouen-normandie.fr).

#### Seoul Education Hub

*Deadline: July 3, 2018*

This international competition for Seoul Metropolitan Office of Education Headquarter Building is soliciting design proposals for a comfortable and convenient working environment alongside an “education hub space” that will allow for flexible brainstorming and learning activities. Visit [seoul-eduhub.com/en](http://seoul-eduhub.com/en).

#### HOME Competition 2018

*Deadline: July 31, 2018*

Run by Arch Out Loud, this competition invites designers to create proposals for the future of domestic architecture. Seeking proposals for homes, the brief requires teams of up to two people to focus on the unit-level

experience for residents. Jury members include Bureau Spectacular’s Jimenez Lai, The Living’s David Benjamin, and Liam Young from Tomorrow’s Thoughts Today. See [thehomecompetition.com](http://thehomecompetition.com).

#### Climate of Dissent—PROTEST DESIGN CHALLENGE

*Deadline: August 6, 2018*

The competition asks architects to design a protest against climate change, with the purpose of calling on politicians, business leaders, and investors to take action. The protest may be spread across multiple sites and focus on a singular intervention or a toolkit for numerous designs to proliferate. More information at [studiobleak.org](http://studiobleak.org).

#### Switch: Guggenheim Museum, New York

*Deadline: August 31, 2018*

The competition seeks design proposals for a museum sitting on the same site as the Solomon R. Guggenheim Museum. If tasked with designing an iconic museum, the jury asks participants to respond with an alternative scheme that would achieve a response similar to how the public in 1959 first responded to Frank Lloyd Wright’s new design. Visit [switchcompetition.com](http://switchcompetition.com).

#### Dewan Award for Architecture 2018

*Deadline: August 25, 2018*

This annual international competition seeks proposals for a six-classroom primary school in Iraq’s historic marshlands, at which students would arrive by car or boat. More information at [dewan-award.com](http://dewan-award.com).

#### Nisshin Kogyo Architectural Design Competition

*Deadline: October 1, 2018*

The 45th edition of this conceptual competition is based on the theme “living upon the history” (of a place) and asks participants to submit drawings reflecting their interpretation of the theme into architecture. Jurors include Ryue Nishizawa, Akihisa Hirata, and Ryuji Fujimura. For more information, see [nisshinkogyo.co.jp/compe](http://nisshinkogyo.co.jp/compe).

E-mail information two months in advance to [areditor@bnpmmedia.com](mailto:areditor@bnpmmedia.com).



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PROJECT WAHAT AL KARAMA  
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DESIGNER IDRIS KHAN AND UAP

**RESEMBLING AN** enormous line of dominoes on the verge of toppling over, *Wahat Al Karama (The Oasis of Dignity)* is a memorial to fallen Emirati soldiers that sits between the Sheikh Zayed Grand Mosque and the country's armed forces headquarters. Commissioned by Abu Dhabi's crown prince, Sheikh Mohammad bin Zayed al-Nahyan, the installation was created by London-based artist Idris Khan, in collaboration with international art studio UAP. Khan, whose work addresses themes of memory and loss, wanted to make a sculpture that would encourage visitors "to feel and see the fragility of life." Together with UAP, he conceived 31 standing aluminum slabs, painted different gradations of black, that lean on each other to symbolize unified strength among soldiers. The 75-foot-high forms stretch over 320 feet and are inscribed with Arabic poems and quotations of the United Arab Emirates' past and present leaders. "The biggest challenge was to make the tablets—even at their massive scale—look as though they were touching gently," says Khan. "The minute tolerances for such huge cantilevers probably had the engineers in fits!" *Justin Chan*







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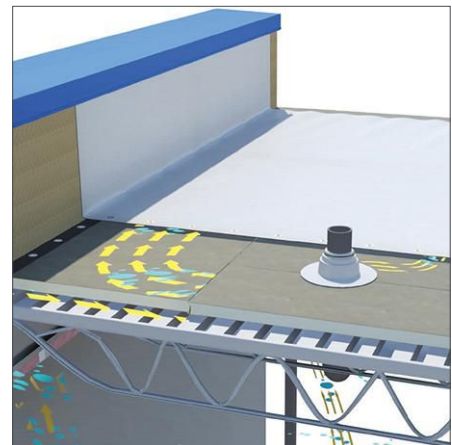


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