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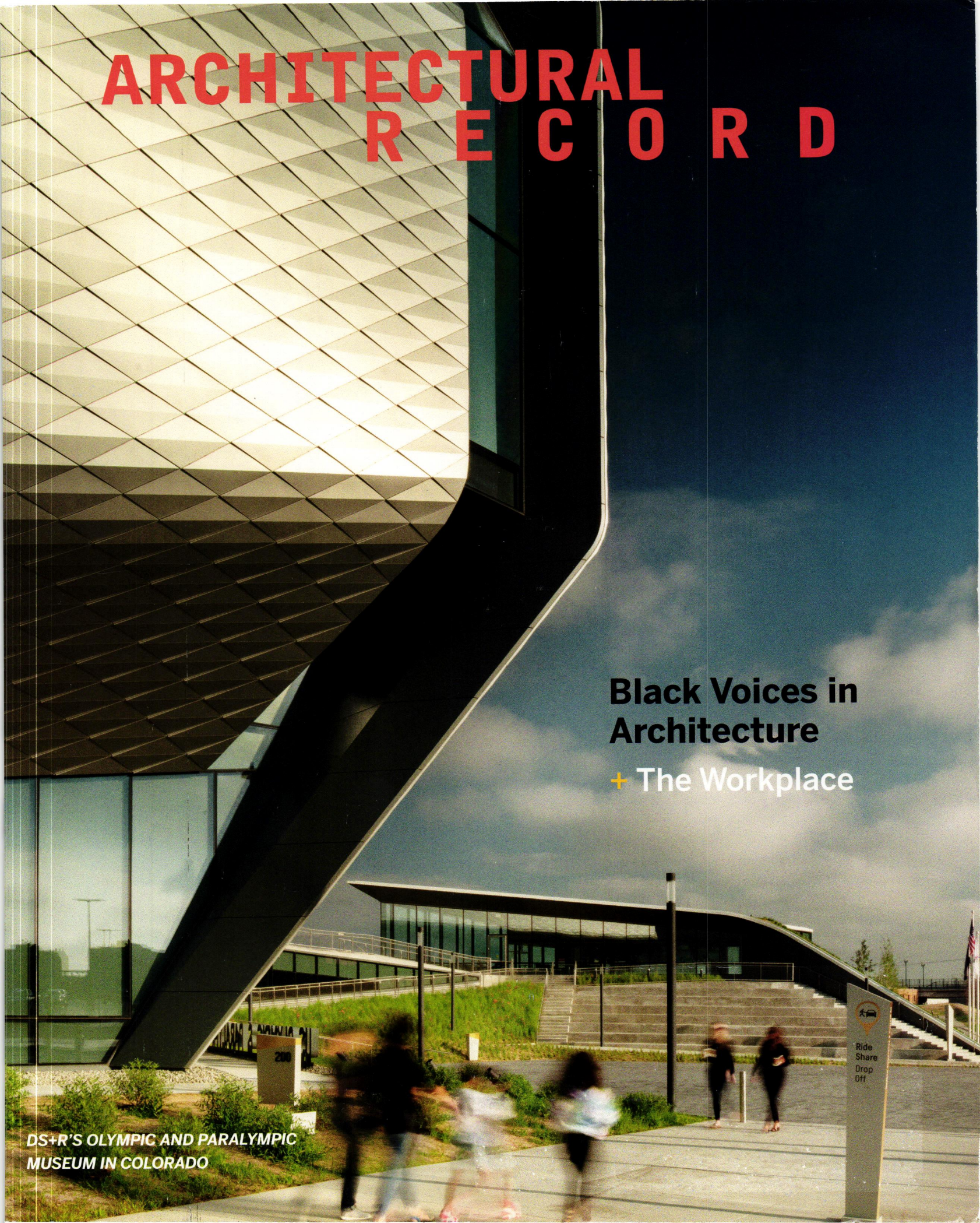

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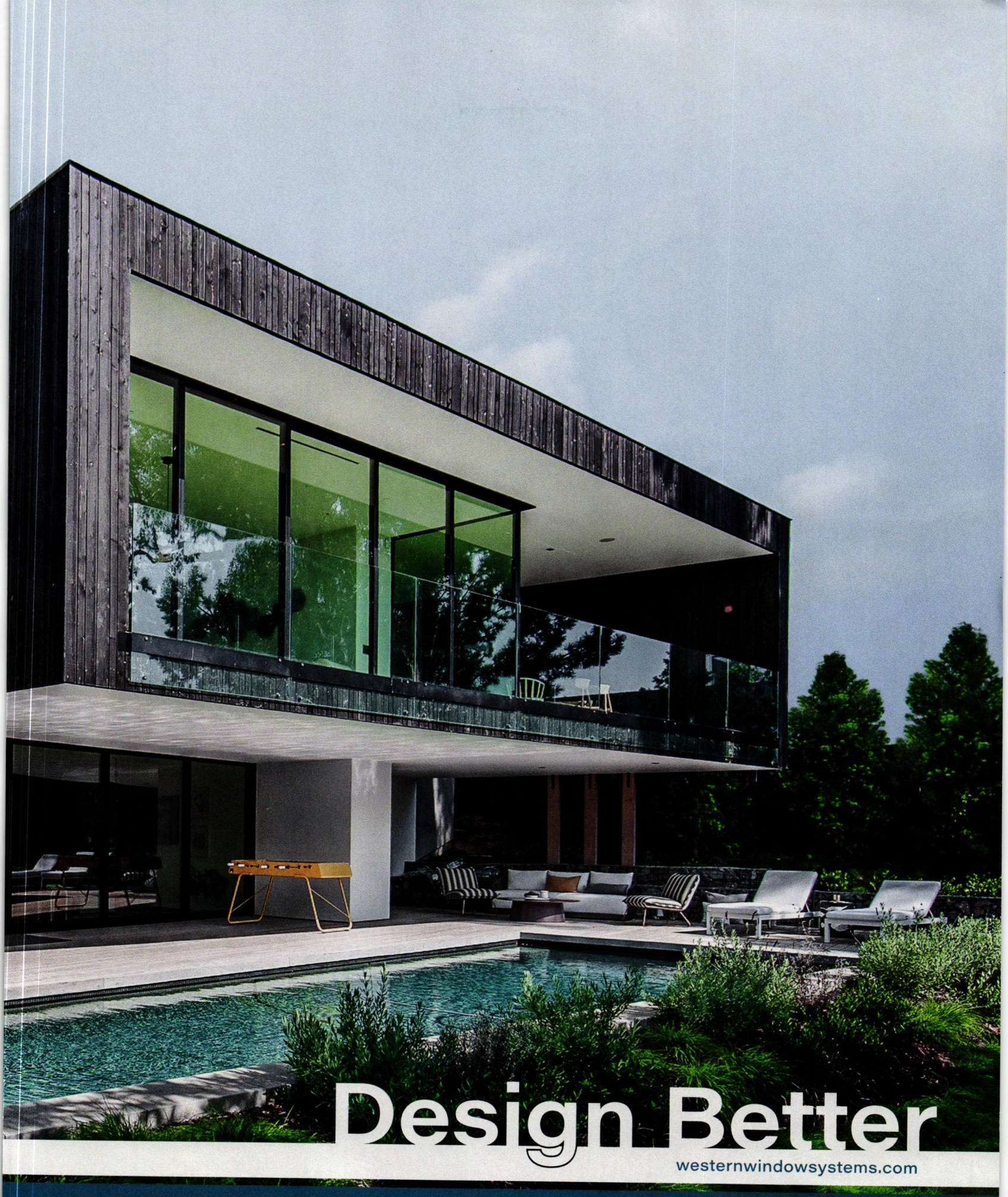
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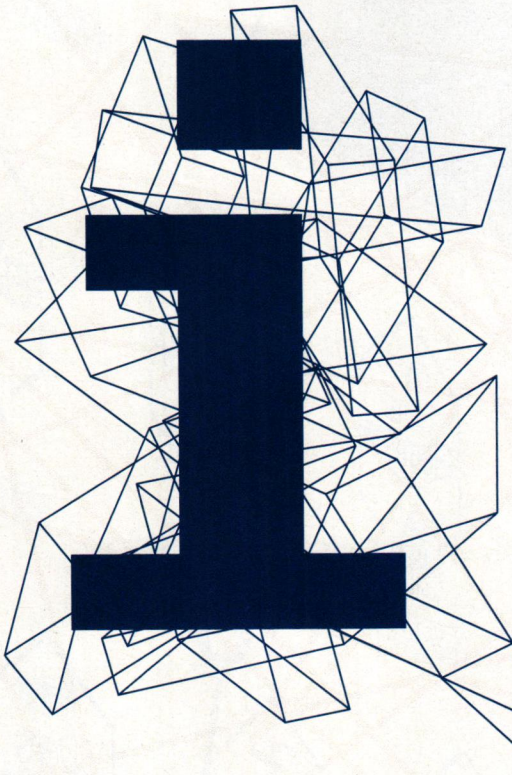

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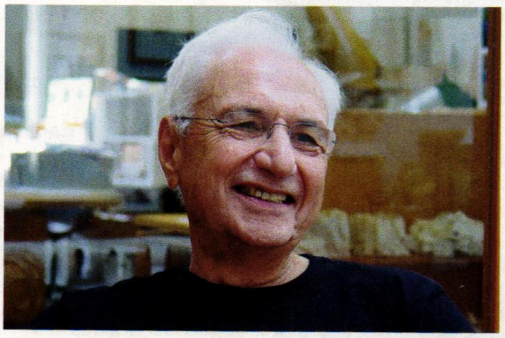

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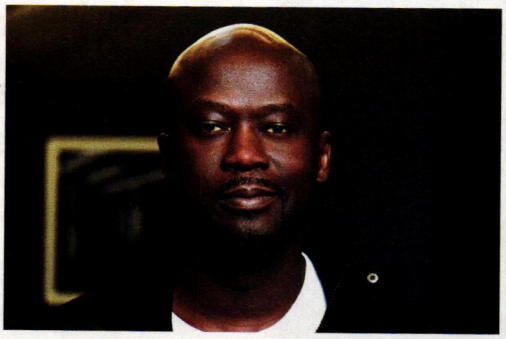

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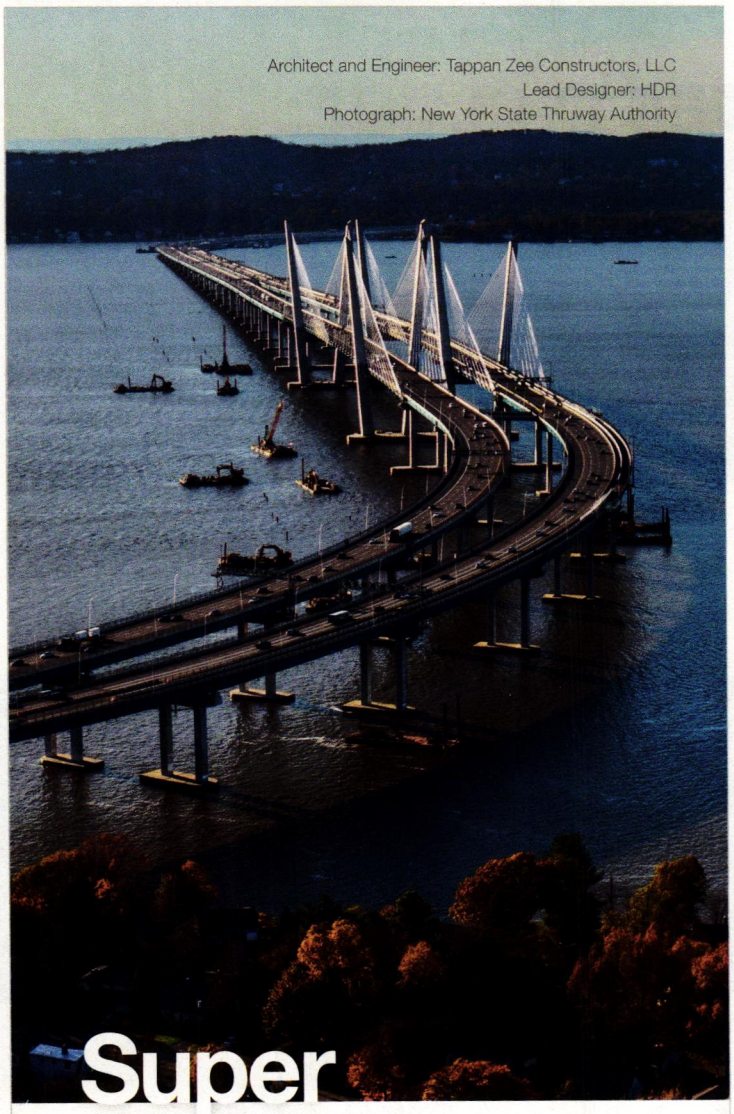

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Super Mario

The Tappan Zee Bridge, revolutionary in its day, was well past the end of its operational life. Replacing it with the new **Governor Mario M. Cuomo Bridge**, a span of more than three miles across the Hudson River, required erecting a structurally complex cable-stayed design with careful attention to the river ecosystem. The resulting "smart bridge" takes an active role in monitoring its own performance while carrying traffic—a triumph that will benefit the Hudson Valley for generations to come. Read more about it in **Metals in Construction** online.

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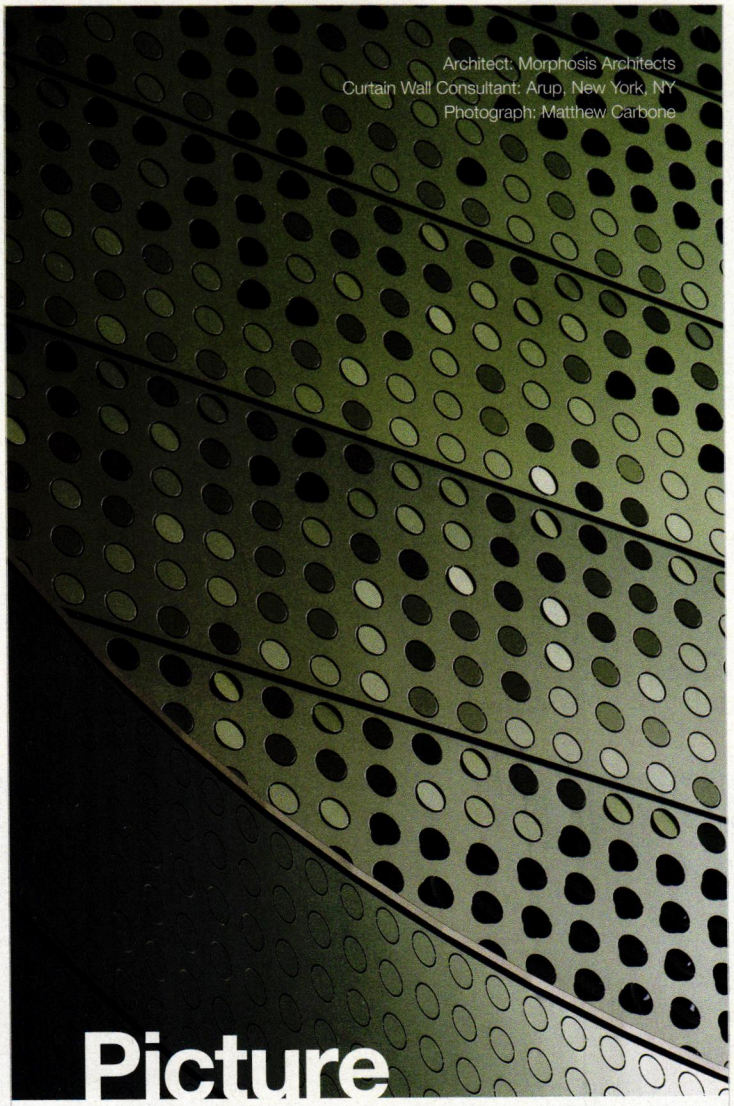

Picture Perforated

The first academic building to open on Cornell Tech's Roosevelt Island campus, the **Emma and Georgina Bloomberg Center** aims for net-zero energy performance, a mission that drives its advanced aesthetics. Designed by **Morphosis**, its facade of pixelated perforated aluminum and curved glass provides both thermal protection and inspiration for a new generation of research. Read more about it in **Metals in Construction** online.

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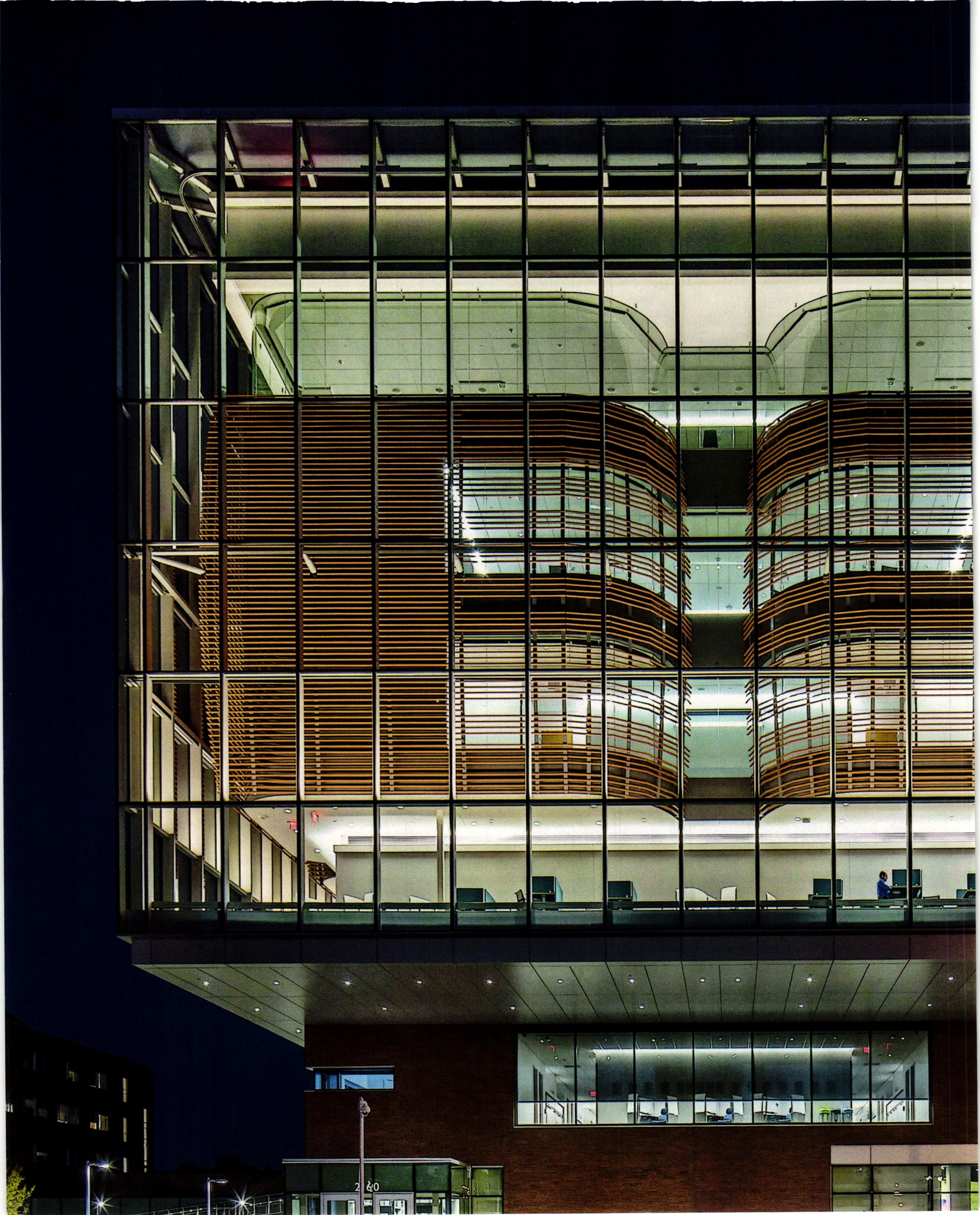

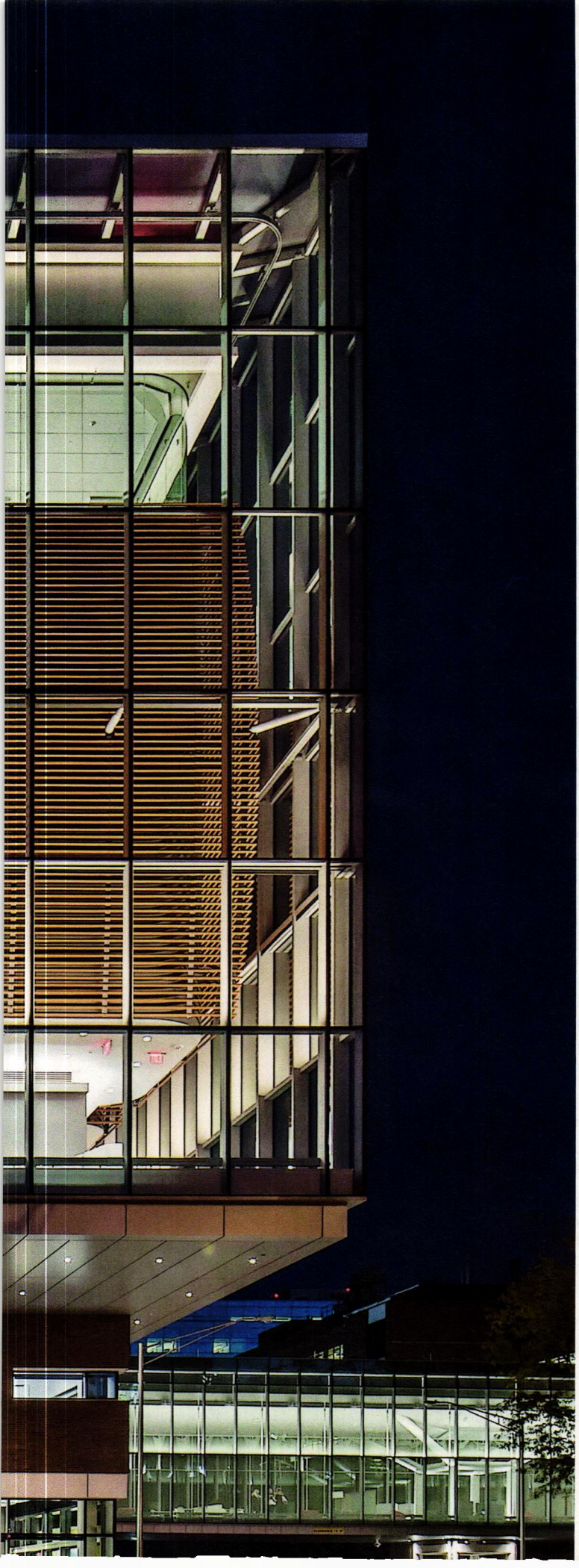

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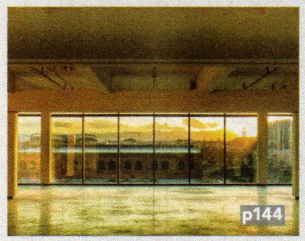

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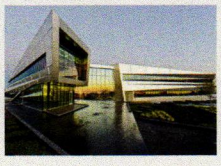

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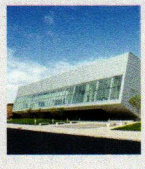

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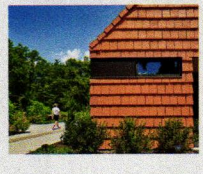

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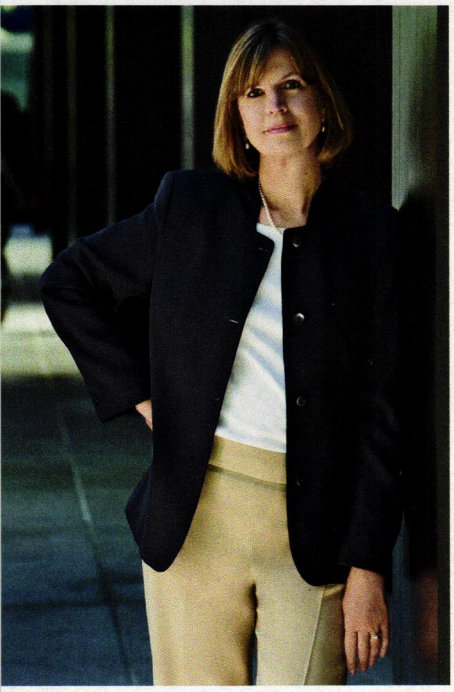

Now Comes the Hard Part: Dismantling Racism

As leading firms start to address embedded inequities in architectural culture, Black architects speak up about their work and careers.

I ONCE HAD the honor of meeting John Lewis, the late Georgia Congressman and civil rights leader, at the time he published his memoir of the movement, *Walking with the Wind* (1998). He was neither a tall nor fiery figure, but he was unforgettable, with a quiet focus and an aura that was almost holy—yet without a shred of the self-regard not uncommon in both heroes and politicians.

How he kept up his spirits—and ours—with a seemingly steadfast belief in a more equitable and just future was part of his power. In an interview shortly before his death in July, he said of the widespread demonstrations after the police murder of George Floyd, "This feels and looks different. It is so much more massive and all-inclusive. There will be no turning back."

Let's hope he is right. Like almost every institution and profession in America, architecture, in practice and in education, is grappling with systemic racism, jolted into self-examination by the vast support for Black Lives Matter and in response to the concerns and demands raised by minority designers and students. RECORD has been focusing our reporting on African Americans in architecture these past months, and giving voice to insights and experiences. In the pages ahead, we profile a number of Black architects working at various scales (page 88).

We also look at what some leading offices are trying to do to change their culture and modes of practice to bring equity and opportunity to architects of color (page 84). Gensler—once again the top U.S. firm in revenue (page 26)—has 6,000 people in 50 offices worldwide; the firm recently announced a five-point strategy to fight racism throughout the company and the industry, an especially important initiative for co-CEO Diane Hoskins, FAIA, who is African American. Other prominent firms, such as SOM and KPF, have also released action plans for confronting racism.

But changing how architects are educated, practice, and build is not quick or easy. A hundred years ago, when women first got the vote, it was almost entirely a profession of white gentlemen, and the vestiges of that clearly remain: if you look at the leadership of most of the top firms, you will see only a minority of women architects and even more rarely African Americans. As almost everyone now knows, registered Black architects make up barely 2 percent of the profession—a figure that has remained stubbornly at that level for decades. The hurdles to licensure may be one issue deterring potential minority practitioners—NCARB reports African Americans taking fewer tests last year than the year before (page 87). But Kimberly Dowdell, a stellar leader as president of the National Organization of Minority Architects, has made moving the needle a priority, pushing for Black architects to make up 4 percent of the field by 2030.

Some experts believe real change in dismantling racism cannot occur until we all comprehend the extent of white supremacy in the built environment. Says Mabel O. Wilson, a scholar of architecture and race, "In my 30 years as an academic, and also having worked in practice, I have come to really understand how much whiteness permeates what we do—from how we are educated in architecture to, really, what architecture is—the European art of building that Alberti described, a European way of understanding building." Wilson helped convene a panel of her peers for RECORD to discuss race, whiteness, and architecture (page 80).

While scholars delve into the past, and architects look to the future, activists must step up and speak out. Gabrielle Bullock, FAIA, principal and director of global diversity at Perkins and Will, calls this imperative "get into good trouble," borrowing a favorite phrase of John Lewis. Architecture is a polite profession, so looking to Lewis as a model is an exemplary idea—a perfect gentleman, he hewed to the Gandhian principles of nonviolent protest, as exemplified by Martin Luther King, but he didn't stay still and he didn't stay silent. In a final essay, published posthumously in *The New York Times*, he reminded us what King said: "We are all complicit when we tolerate injustice."

Cathleen McGuigan

Cathleen McGuigan, Editor in Chief

PHOTOGRAPHY: © MICHEL ARNAUD

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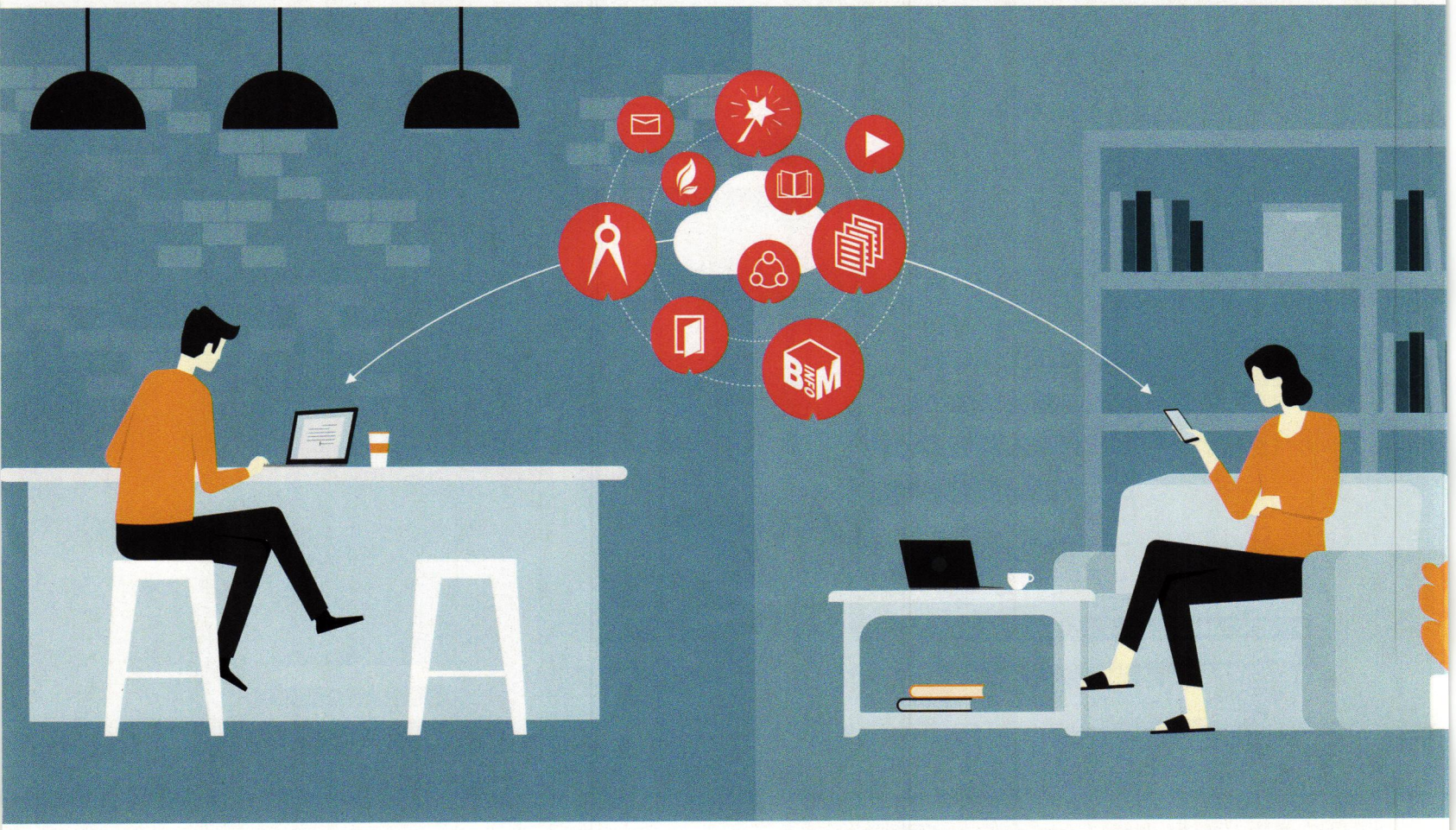

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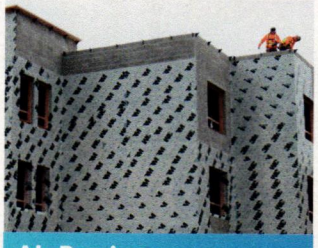

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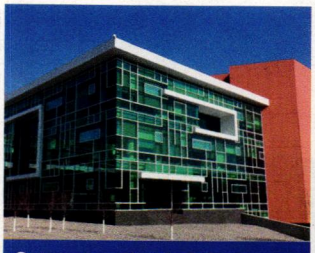

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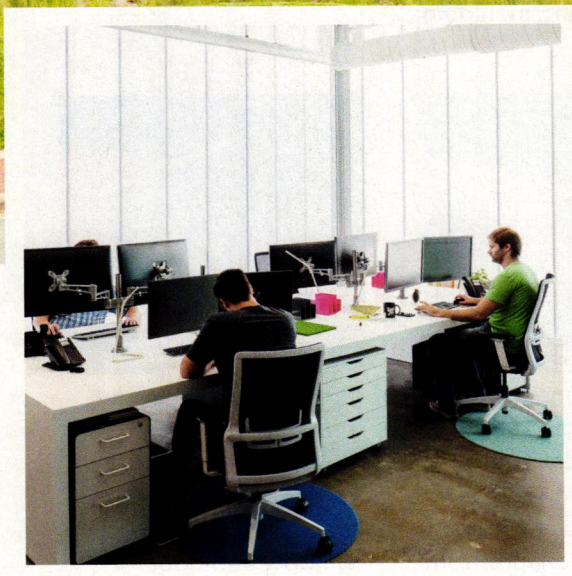

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With many homeowners in dire straits, Lebanon's conservationists now also fear an onslaught of opportunistic developers ready to snap up historic buildings for a song, tear them down and turn them into apartment blocks.

—*Nabih Bulos, Middle East bureau chief for the* Los Angeles Times, *on the aftermath of the August 4 explosion in Beirut.*

Edith Farnsworth's Mies van der Rohe–Designed Retreat

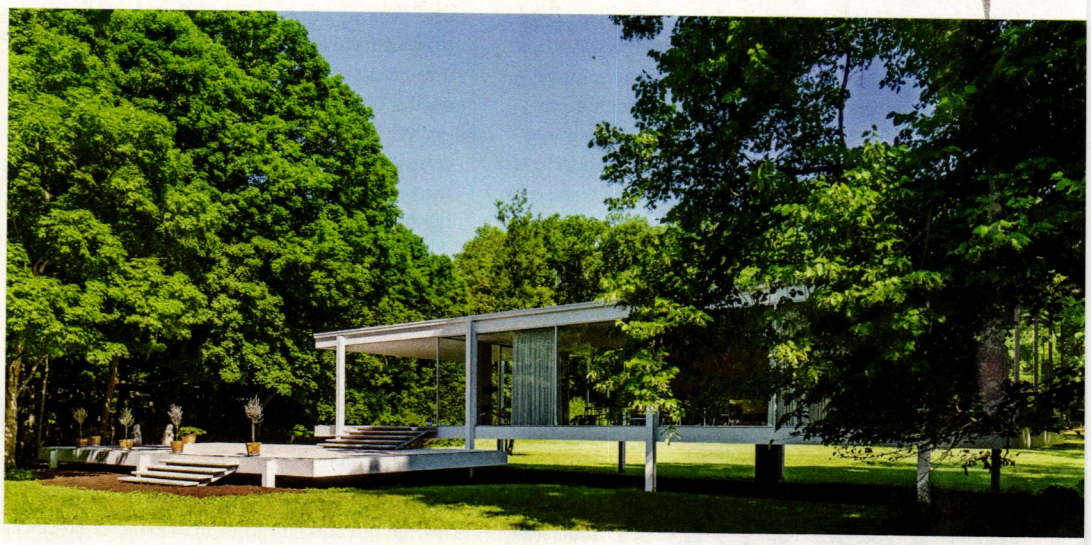
BY ZACH MORTICE

FOR THE NEXT YEAR, visitors to Mies van der Rohe's Farnsworth House in Plano, Illinois, are more likely to encounter a deer than a single Mies-designed Brno Chair.

That's because a multipart exhibition called *Edith Farnsworth Reconsidered* unfolds across nearly 60 acres of forest and riverfront land, focusing on one of the most famous Modern-architecture clients in history. At the heart of the show, which runs through December 2021, is a restoration of the house as the original owner, Edith Farnsworth, had it furnished circa 1955: with not a single piece of Mies's work apart from the glass, steel, and travertine structure itself.

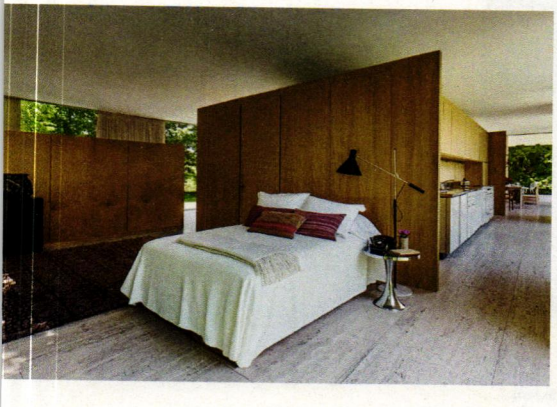
Completed in 1951, the house was a weekend getaway for the polymath Farnsworth—a medical-research scientist, classically trained violinist, poet, and translator who staked out a literary career late in life. In 1971, she sold the residence to Lord Peter Palumbo, the globe-trotting collector of canonical architecture. A year later, Palumbo hired Mies's grandson Dirk Lohan to restore it to its 1951 appearance, and, in 2003, the National Trust for Historic Preservation purchased it, opening it to the public for tours.

The collection of furniture currently in place, dubbed *Edith Farnsworth's Country House*, was selected by Farnsworth House executive director Scott Mehaffey, with assistance from Robert Kleinschimdt. (University of New Mexico architecture professor Nora Wendl assisted with curatorial responsibilities as well.) The installation presents a return to Farnsworth's more genial and humble take on the residence. Since 1972, Palumbo intended his Farnsworth to be a museum, a Mies showcase with plenty of attention to detail but little historical fidelity to what the house was. With the *Country House*, Mehaffey wanted to present it as a lived-in and intimate residence. "This was her weekend house. There were stacks of books and magazines. There was dried dog vomit," says Mehaffey: "we didn't go that far." But they did include Farnsworth's medical bag; her Olivetti typewriter, alongside copies of her poetry that Farnsworth House staff retyped; and her violin. Scandinavian furniture predominates, with woven fabric straps binding together Jens Risom and Bruno Matthson chairs. It's altogether a warmer and more humane place now than it was under Palumbo's care, when spans of travertine threatened to swallow you up. Still, Farnsworth wrote that she often felt like a caged animal on display, and even her predilection for Scandinavian *hygge* couldn't quite bridge that gap. By focusing on her vision of how to make the house livable, the curators return agency to a worldly scholar who was made a passive observer to her place in architectural history. ■









The rich textures and warm colors of the furniture (left and above, right) inspired by the house's original owner (above) complement the building's (top) crystalline austerity.

PHOTOGRAPHY: © WILLIAM ZBAREN

See daily updates at architecturalrecord.com

Gensler Maintains No. 1 Rank by Revenue

BY MIRIAM SITZ

FOR THE NINTH consecutive year, Gensler has ranked first on ARCHITECTURAL RECORD's roster of the Top 300 Firms. The annual list, compiled by RECORD's sister publication, *Engineering News-Record* (*ENR*), compares companies' architectural revenue from the prior year, as reported to *ENR* by firms that choose to participate. These figures, from 2019, do not reflect the economic fallout from the pandemic.

Gensler's total architectural revenue grew by $170 million—a 12 percent increase—to just over $1.5 billion last year. "Year after year, our business remains financially strong and debt-free," said the board of directors in the firm's 2019 annual report. "Our industry-leading revenues also give us the capacity to reinvest in our global platform—supporting unparalleled research, talent development, and design delivery." Among other practices that earn all their revenue from architecture, NBBJ saw the greatest percent increase from 2018 to 2019, experiencing 21 percent growth. "We have seen growth in sectors such as academic research and commercial science, as well as services including media architecture and urban design," managing partner Steve McConnell tells RECORD.

Two Houston-based companies entered the Top 25 this year: PBK, a 15-location practice focusing on education, health care, and sports, and PGAL, a 300-person office that saw architectural revenue grow by 87 percent—some $94 million. The firm's percentage of revenue from architecture also increased, from 70 percent in 2018 to 95 percent last year. "PGAL has been doing aviation design for almost the entire history of the firm," says CEO Jeff Gerber, noting major ongoing projects at Los Angeles International Airport, George Bush Intercontinental Airport, all three New York–area airports, and Ronald Reagan Washington National Airport. "It's that aviation expertise that really took our company to a national level."

See the chart below for a ranking of the Top 25 firms, plus photographs of several new and notable projects. ■

TOP 25 U.S. ARCHITECTURE FIRMS OF 2020

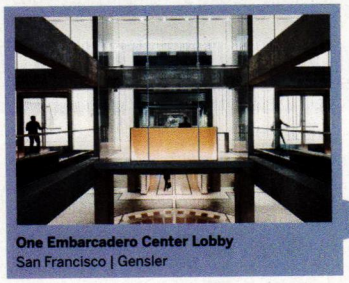
Companies are ranked by revenue (in **millions of dollars**) for architectural services performed in 2019. These data also appear in *ENR*'s Top 500 Design Firms list, which, unlike our ranking, also includes firms that do engineering exclusively. Find the full Top 300 Firms list on architecturalrecord.com.

RANK 2020	RANK 2019	FIRM, U.S. HEADQUARTERS	TYPE OF FIRM	TOTAL ARCHITECTURAL REVENUE
1	1	**Gensler** San Francisco	A	$1,523.14
2	2	**Perkins and Will** Chicago	A	$670.32
3	4	**HDR** Omaha	EA	$517.60
4	3	**Jacobs** Dallas	EA	$509.90
5	5	**AECOM** Los Angeles	EA	$439.30
6	7	**HKS** Dallas	A	$435.55
7	6	**HOK** St. Louis	AE	$429.00
8	8	**Stantec** Irvine, California	O	$367.99
9	10	**Skidmore, Owings & Merrill** New York	AE	$279.40
10	11	**Perkins Eastman** New York	O	$274.71
11	9	**IBI Group** Toronto	AE	$259.00
12	13	**CannonDesign** New York	AE	$253.60
13	14	**Populous** Kansas City, Missouri	A	$225.10
14	12	**CallisonRTKL** Highlands Ranch, Colorado	EA	$225.00
15	21	**NBBJ** Seattle	A	$220.14
16	20	**Kohn Pedersen Fox Associates** New York	A	$218.40
17	18	**Corgan** Dallas	A	$208.75
18	15	**DLR Group** Minneapolis	A	$208.3
19	41	**PGAL** Houston	AE	$201.91
20	19	**ZGF Architects** Portland, Oregon	A	$201.14
21	17	**NELSON Worldwide** Minneapolis	A	$192.00
22	16	**Leo A Daly** Omaha	AE	$169.49
23	22	**SmithGroup** Detroit	AE	$166.09
24	30	**PBK** Houston	AE	$128.70
25	23	**Gresham Smith** Nashville	AE	$128.68

Key to firm types

A Architect | AE Architect Engineer | AP Architect Planner | EA Engineer Architect | O Other

(not all combinations listed)



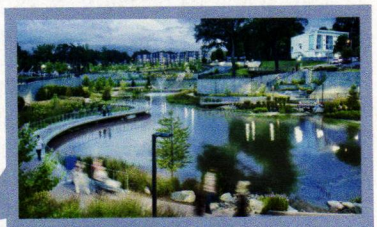
One Embarcadero Center Lobby
San Francisco | Gensler



Charles Library at Temple University
Philadelphia | Snøhetta with Stantec



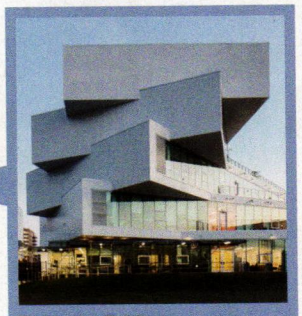
LAX Terminal 1 Renovation
Los Angeles | PGAL



Historic Fourth Ward Park
Atlanta | HDR



Amazon Headquarters (page 106)
Seattle | NBBJ



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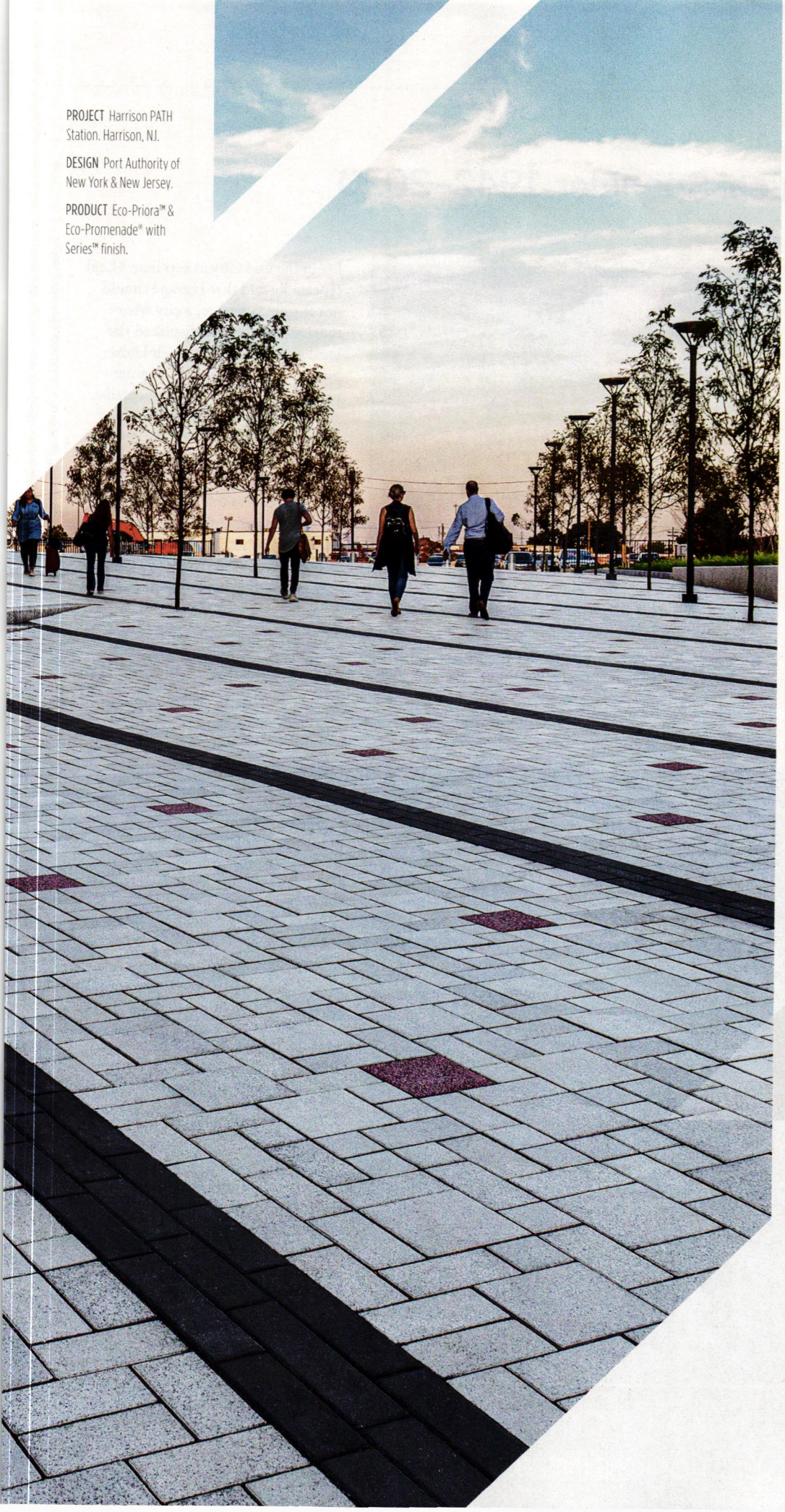

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Obituary: Eusebio Leal Spengler, 1942–2020

BY BELMONT FREEMAN

EUSEBIO LEAL SPENGLER, Historian of the City of Havana for more than 40 years and credited with the transformation of Old Havana from a derelict urban enclave into a showcase of exquisitely restored Spanish Colonial architecture and urbanism, unrivaled in the western hemisphere, died Friday, July 31, at age 77. The cause was pancreatic cancer.

Leal was instrumental in the designation of Old Havana as a UNESCO World Heritage Site in 1982, yet his period of greatest accomplishment as City Historian began later, with the collapse of the Soviet Union in 1991, which devastated the Cuban economy. Leal convinced Fidel Castro that the restoration of Old Havana could attract tourist dollars, and the government gave him extraordinary autonomy to do so. In 1994, with $1 million of seed money from the state, he established Habaguanex SA, a company focused on the development of tourist facilities (hotels, restaurants, stores), with the proceeds to be reinvested in more renovations—and not just for income-producing businesses, but also schools, clinics, and housing that would enable the quotidian life in the Old City to continue. (Leal repeatedly said that Havana should not turn into Venice, a city where tourists have largely displaced the local population.) Through Habaguanex—a robust capitalist enterprise embedded within the socialist system—and other programs, Leal and his office completed the restoration of over 300 historic buildings, from churches, monasteries, and colonial palaces to early 20th-century theaters and hotels. His office operates a center for research on materials conservation and a school to train young people in building-restoration trades.



PHOTOGRAPHY: © YAMIL LAGE/AFP VIA GETTY IMAGES; RON VAN OERS/UNESCO (OPPOSITE)

The man whom Cubans fondly called the mayor of Old Havana was born into a poor family in a working-class district of the city. After spotty early schooling, he benefited

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Leal was instrumental in the designation of Old Havana (left), with its mixture of Baroque and Neoclassical structures, as a UNESCO World Heritage Site in 1982.

from the free education made possible by the Cuban revolution in 1959. He attended the University of Havana, ultimately earning a doctorate in history. Though not trained as an architect, he developed his expertise through prodigious reading and explorations of the historic city, which had fascinated him since his youth. He was hired in 1967 by the Office of the Historian of the City of Havana to direct the renovation and conversion of the 18th-century governor's palace, on the Plaza de Armas, into a museum. There his work caught the attention of Castro's inner circle, which led to his formal appointment as City Historian and his lifelong friendship with both Fidel and Raul Castro.

Leal's genius and success were based on his keen political instincts, his common touch, and his bottomless knowledge of and love for his native city. He became one of the most prominent and trusted public figures in Cuba, a member of Parliament and the Central Committee of the Communist Party. A leading intellectual ambassador, he traveled widely to lecture at universities and other institutions around the world and collected many awards and honors.

At the time of his death, he knew better than anyone that there remains an enormous amount of work yet to do—just blocks from the pastel-pretty tourist zone of Havana, 19th- and early 20th-century historic buildings are on the verge of collapse. And, while architecture-loving visitors from all over the world have fueled the country's economic engine for decades, the Covid-19 pandemic has shut down tourism. Leal's death is a great loss for the international historic-preservation community and for the people of Havana, particularly at this moment of economic crisis, when inexorable development pressures threaten the city and a strong moral voice is needed to defend its architectural heritage. ■



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Page & Turnbull's Ruth Todd

BY MIRIAM SITZ



ARCHITECT Ruth Todd is president and a principal of the San Francisco–based Page & Turnbull, an architecture, planning, and preservation firm founded in 1973. With three offices in California, the majority woman-owned practice employs nearly 50 people, including architectural historians, preservation planners, material specialists, and designers.

Todd, who studied at Clemson University, held a Richard Morris Hunt Prize fellowship in France before becoming associate university architect for Stanford University. After a dozen years there, she joined Page & Turnbull in 2006. Todd spoke with RECORD about the complexities of preserving cultural heritage.

Our country is in the midst of a serious reckoning around racial justice, with implications for every facet of life—including design. Does this moment feel different from past periods of civil unrest?

It does. I'm old enough to remember the race riots and social movements of the 1960s, which resulted in some progress. But this feels like a moment where things are really going to happen. While the conversation is still very early, there seems to be more acceptance that change is necessary. But people are struggling with how the physical realm will reflect that.

Confederate monuments have come under fire. A common argument from those who oppose their removal is that doing so erases history. What do you think?

I think there needs to be a scholarly and inclusive dialogue so that decisions are based on rational discussions about the long-term impact on history and what's best for society. There is no one answer for all situations.

As a cultural-resources planning firm, we feel that history needs to be judged within the context of time and with objectivity. Physical evidence—even if unattractive—is important, because sometimes, without it, the lessons of history are not as evident.

It's also important to know when monuments were installed. Some came about in the early 20th century, with clear messages of white supremacy. The who, what, when, and why are crucial to understanding their message.

What are the alternatives?

If monuments are going to remain in public spaces, plans must be developed to tell the entire story. For monuments that have been defaced, there's been interesting discussion about leaving the graffiti or damage in place as a way of putting that monument in a much broader historical context.

While expressing support for removing such monuments, National Trust for Historic Preservation president Paul Edmondson told RECORD, "As preservationists, we have never been about saving everything in amber."

That's definitely our approach at Page & Turnbull. You can't preserve everything. You need room for the present and the future.

How would you describe your firm's work?

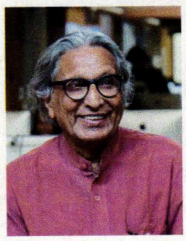
We do a tremendous amount of adaptive reuse. We think recycling historic buildings and allowing them to evolve is a healthy way of moving the physical fabric of our communities forward.

Other projects deal with cultural heritage. We're doing research now on the history and cultural contributions of Asian American and Pacific Islander communities in California, as consultants on a statewide project that plugs into a National Park Service effort. And a few years ago, we helped the City of San Francisco with a master plan for Japantown. The community was concerned about preserving their intangible assets (cultural practices handed down through generations), represented by *ikebana*, the Japanese art of flower arrangement, or Japanese bakeries, for example. The City worked to protect that heritage as physical changes to the neighborhood occur.

What is the architect's role in helping people navigate change?

So much of it is about communication and facilitation—trying to understand where people are and how resistance to change can be addressed. Architects are good visual communicators, which is a skill that should be shared to communicate with those who may not have the ability to articulate that conversation. ■

Chicago to Host Doshi Exhibition

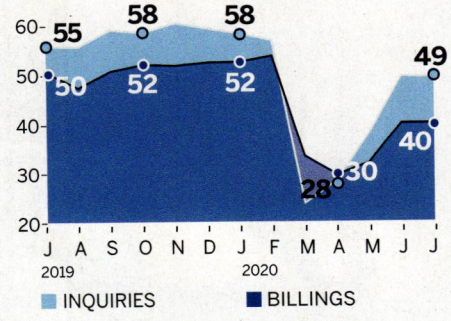


From September 9 to December 12, 2020, the gallery Wrightwood 659 (RECORD, December 2018) in Chicago will exhibit the work of visionary Indian architect, urbanist, and educator Balkrishna Doshi, who won the Pritzker Architecture Prize in 2018 (RECORD, April 2018). The show, titled *Balkrishna Doshi: Architecture for the People*, will highlight Doshi's skillful melding of Modernism with the forms and techniques of his home country. Admission is available by advance ticket only.

Italian Firm Creates Master Plan for High-Tech District in Brasília



In mid-August, the architecture office Carlo Ratti Associati released its concept for BIOTIC, a 10 million-square-foot technology and innovation district in the Brazilian capital, inspired by (and situated near) Lúcio Costa and Oscar Niemeyer's 1956 "Plano Piloto"—a UNESCO World Heritage site and exemplar of town planning. The new mixed-use development aims to intersperse pedestrian paths and greens spaces with residential, recreational, and commercial zones, while promoting environmental sustainability.



Billings Hold Steady in July

New data from the AIA show that the Architecture Billings Index held at 40 in July, unchanged from June. (A score below 50 indicates decreasing billings.) New design inquiries eased from 49.3 to 49.1, and new design contracts dropped from 44 to 41.7.

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While we're disappointed we won't be able to celebrate together in-person this year, we are pleased to offer this unique opportunity to more people than ever before. Stay tuned in the coming weeks as we will announce our 2020 honorees and make sure to join us live to hear all about their exceptional work.

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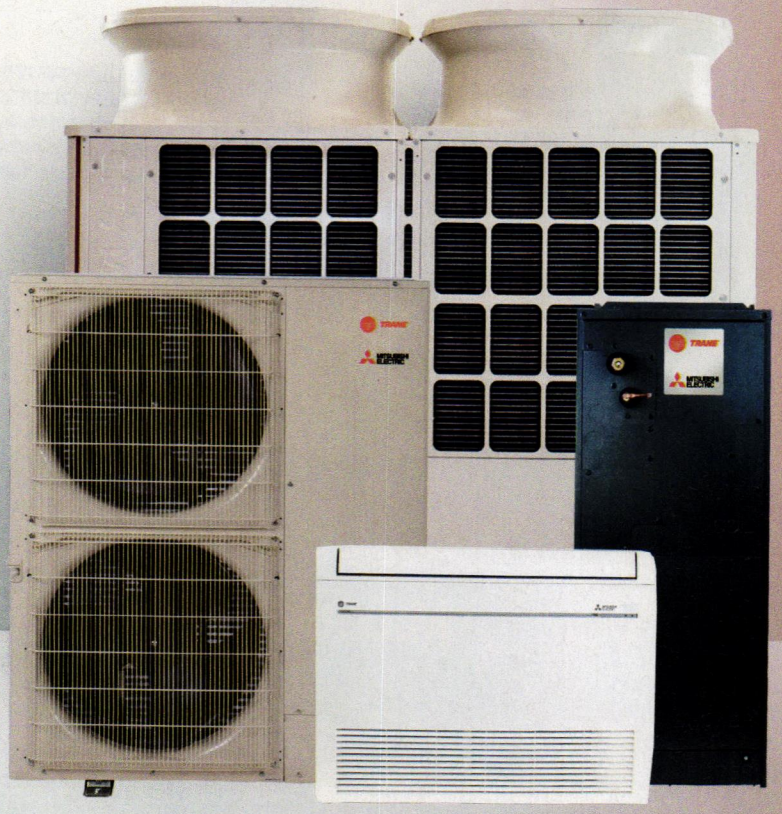

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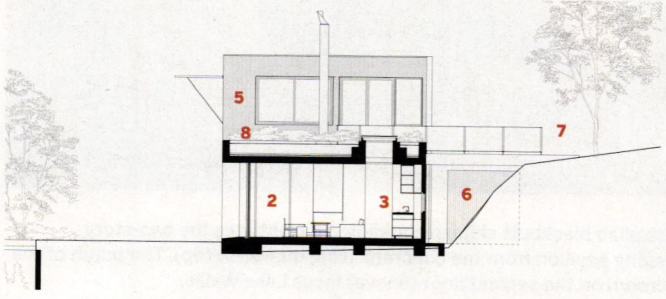
HOUSE of the Month

MATTHEW WOODWARD CREATES A CONCRETE BUT AIRY RETREAT IN AUSTRALIA. **BY WENDY MOONAN**



The house is two connected volumes that sit on a ledge carved out of a bluff (left). The one-story living/dining/kitchen space is exposed concrete with interior finishes of recycled Australian blackbutt hardwood (bottom).



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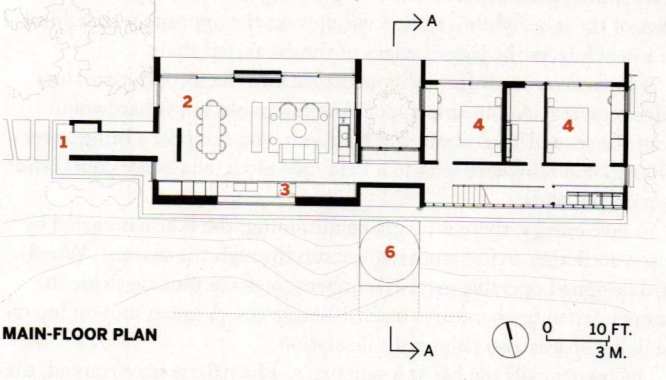


MAIN-FLOOR PLAN

1 ENTRANCE
2 DINING/LIVING
3 KITCHEN
4 BEDROOM
5 STUDY AND BEDROOM
6 WATER TANK
7 BOCCE COURT
8 GREEN ROOF



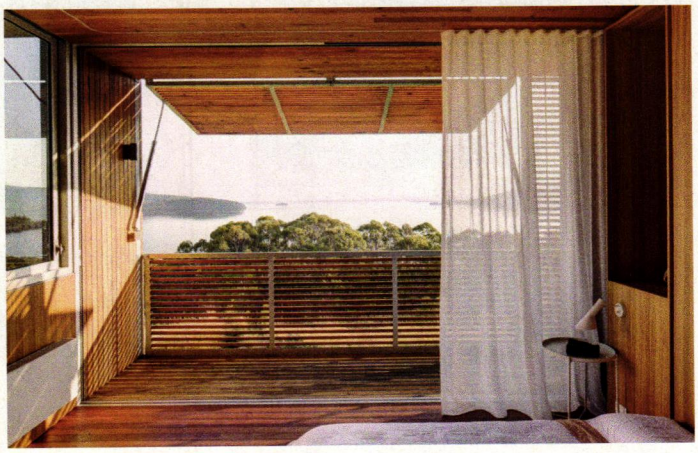
BOTH CLIENT and site were ideal. The client is an environmentally minded young builder who bought 25 acres of bushland in New South Wales, a three-hour drive north of Sydney. A forested bluff on the southern tip of Lake Wallis, the site is flanked by two national parks and is only three miles from the Pacific Ocean.

While the land has a 45-degree slope, a former owner had cut into the shale rock face of the escarpment to create a platform for a house he never built. Here Sydney architect Matthew Woodward, known to the client for his sensitivity to nature and landscape, designed a 2,050-square-foot three-bedroom weekend house facing the lake. The brief also called for minimizing energy consumption, so Woodward used such materials as recycled Australian blackbutt hardwood and poured concrete (for its thermal mass).

The rectilinear design, divided into two volumes, sits on this ledge about one level below the top of the bluff. An entrance on the west end takes you into a one-story concrete volume containing the public spaces.

PHOTOGRAPHY: © BRETT BOARDMAN





Australian blackbutt shiplap cladding differentiates the two-story sleeping pavilion from the concrete living quarters (top). The porch of the bedroom on the second floor (above) faces Lake Wallis.

Here, sliding glass doors in the living/dining area afford panoramic views of the lake, while a ribbon window on the opposite wall behind the kitchen faces the jagged edges of the excavated shale.

A breezeway leads from this structure into the second, two-story bedroom wing, clad in shiplapped Australian blackbutt hardwood. From the second-level study and bedroom, you can take a bridge over a 5,000-gallon rainwater tank to a Petanque pitch (aka bocce court) and lawn on the bluff.

To save energy, there is no air-conditioning; the house is cooled by cross-ventilation. After studying the sun through the seasons, Woodward designed operable external timber screens to provide shade in summer, when temperatures reach 100 degrees. A green roof on top of the living spaces also helps with insulation.

The owner calls the house a sanctuary. The palette is restrained, the materials and furnishings are spare, and the circulation plan celebrates views—sky and ground. Nature permeates the entirety, with the ever-changing light on the lake, the salt-spray mists rolling in from the Pacific, and bushland (or shale) out every window. ■

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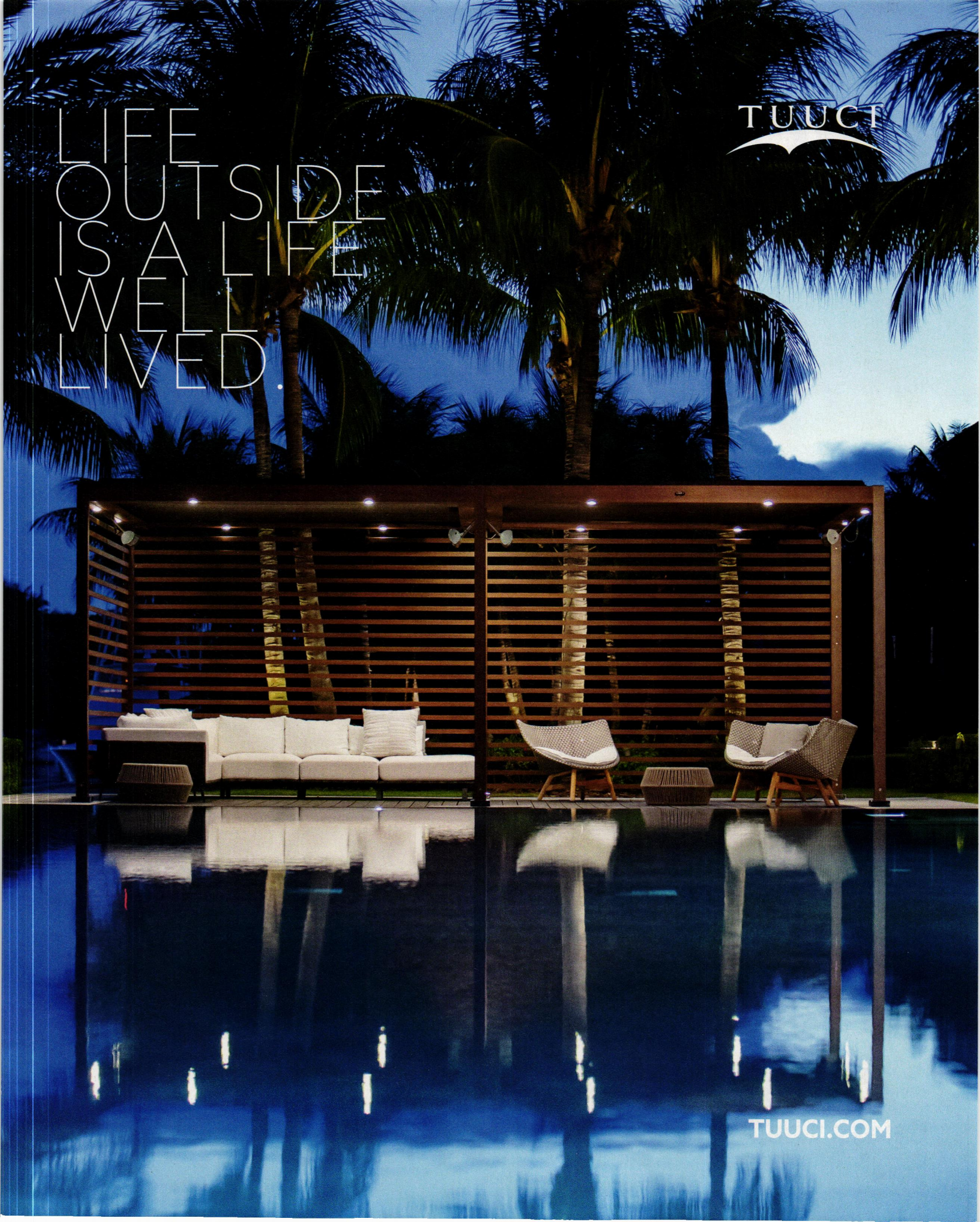
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CASE STUDY

Ellsworth Kelly Art Exhibit at University of Texas | Austin, Texas

Teamwork Leads to Unique Project at University of Texas

Ellsworth Kelly developed a clear vision for the final piece of his career as an internationally-acclaimed artist. In the building he designed, Austin, Kelly wanted to bend light in different ways through an array of 33 colored windows, 14 black and white marble panels and an 18-foot tall totem, one of Kelly's common sculptural forms. The project, constructed at the Blanton Museum of Art on the campus of the University of Texas, was hailed by *The New York Times* as "not just a summation of his work's themes but his masterpiece, the grandest exploration of pure color and form in a seven-decade career spent testing the boundaries of both."

Kelly's signature project required extreme collaboration with the design team at Overland Partners, construction teams and contractors. While Kelly was brilliant at understanding art, he was not accomplished in building design. "We had to understand who he was and what his artwork was about," said James Lancaster, the project manager for Overland. "It was a process that began with listening. Before we put pencil to paper, we had to become attuned to Ellsworth and his vision for Austin."

One of the most unique challenges architects faced was concealing the apparatus required for 21st century buildings. Kelly sought to have the art serve as the centerpiece of the exhibit. Mechanical equipment for heating and cooling needed to be concealed. All wiring to electric and technology systems, plumbing fixtures and all of the other building components also needed to be hidden. There was also a laundry list of items to meet University compliance that required installation – and concealment. "While every aesthetic decision was his, we did not simply abdicate to whatever Ellsworth asked for," said Rick Archer, the Principal in Charge for Overland. "Codes, material selection, constructability, structure and HVAC resulted in modifications to Ellsworth's original design in terms of the scale and proportion."

The largest pieces of equipment for the 2,715-square-foot structure – which cost $23 million to complete – were heating and air conditioning units. The units, roughly the size of an automobile and weighing a ton or more, needed to be installed in an 1,800-square-foot-basement. To accomplish this feat, the project utilized a large custom floor access door manufactured by The BILCO Company. The door was equipped with a special finish on the covers to make them less noticeable from the exterior and a keyed cylinder lock for added building security. The large custom door sits on the outside of the structure, next to one of only two emergency exits in the building and features

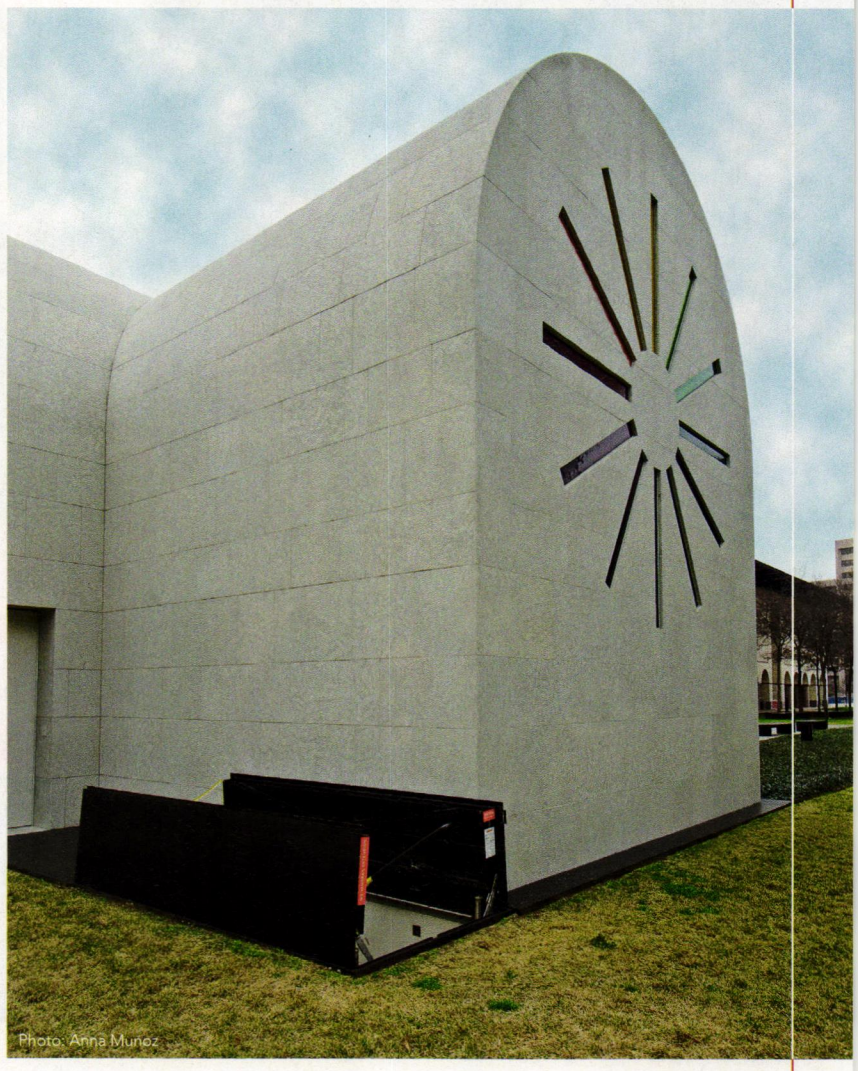

Photo: Anna Muñoz

BILCO's engineered lift assistance for one-hand operation. "Many people don't even know where there is access to the basement," Lancaster said. "We had to have access to the basement, but we also had to make the door, as much as we could, invisible."

Austin delivers precisely the objective Kelly intended when he conceived the project, which he first started working on in 1986. The building opened in February 2018, a little more than two years after his death. "Although the work is not a chapel and has no religious connection, there is something deeply spiritual that visitors experience," Lancaster said. "The interior surfaces serve as a stage of sorts, and the colored windows are the actors."

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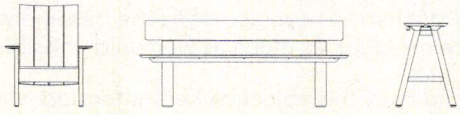

Landscape Forms and Loll Designs, a Natural Fit

As two design-led companies, Landscape Forms and Loll Designs have much in common, but one shared quality stands above the rest– a profound passion for improving outdoor experiences. With this goal in mind, the two companies again join forces to introduce Americana and Glide, two new site furnishings designed to bring a relaxed, vibrant and playful spirit to public outdoor spaces.

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LANDSCAPE

A TINY MUSEUM GARDEN BY NELSON BYRD WOLTZ DRAWS ON ASIAN AND AMERICAN INFLUENCES. **BY KARA MAVROS**



THE PEABODY ESSEX MUSEUM in Salem, Massachusetts, has history as rich as the artifacts it houses. Over the centuries, the institution has occupied a number of buildings on the site, notably a 2003 extension by Moshe Safdie. In the most recent chapter of the museum's story, a new expansion includes not only additional gallery space by Ennead Architects, but also an adjoining 3,700-square-foot formal garden by Nelson Byrd Woltz Landscape Architects.

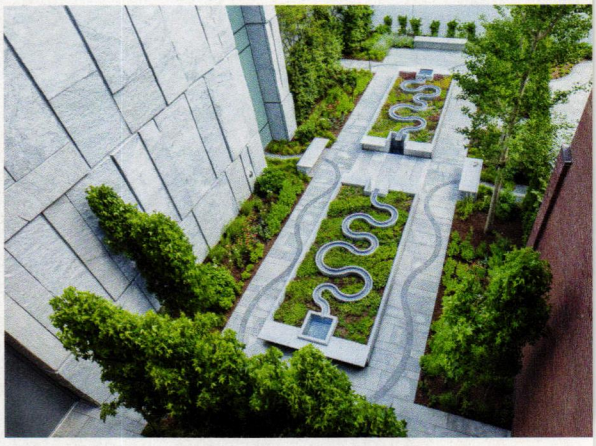
The museum was founded in 1799, as a center for members of the East India Marine Society—namely captains who had sailed Eastward to Asia—to display artifacts procured during their travels. After several mergers with other regional museums, today the Peabody houses extensive maritime, American, and Asian art collections. For its landscape design, Nelson Byrd Woltz drew inspiration from this "cross-pollination of cultures," says senior associate Mark Streiter, and translated it into the museum's horticulture.

The manicured garden—which was previously a parking lot and shares walls with the old and new buildings—is divided into three distinct sections, separated by hedges, that correspond to the cultures represented within the galleries. One area is dedicated to regional specimens from the Northeastern United States, including Christmas ferns, while another incorporates Asiatic plants, such as painted lady ferns and Japanese witch hazel. But, Streiter notes, there are plants that are native to both continents (like the rhododendron and sedum varieties, for example), so they added a convergence garden in the center for these species.

In a central garden (above and right), the curve of the fountain is mirrored by a pathway to two other sections.

Embedded throughout the granite-paved courtyard is a sinuous ribbon, hewn from a darker version of the locally sourced stone, that meanders through each of these areas, enticing visitors to follow its path through the different sections.

The curve underfoot is echoed in two water features, suggesting the museum's maritime history and the local landscape: a water wall in the North American garden and the "poetry fountain" in the "hybrid" area. Originating from two source basins at either end of the fountain, water flows through a serpentine channel and converges in a central basin symbolizing a melding of cultures, says Serena Nelson, associate at the firm. "The garden is all completely custom-built around the museum's story," she says. "It isn't just a stage for a few art pieces, like other museum gardens." ■



PHOTOGRAPHY: © DAN FIONTE./COURTESY PEABODY ESSEX MUSEUM (TOP); BOB PACKERT (RIGHT)

Minor League, Major Appeal



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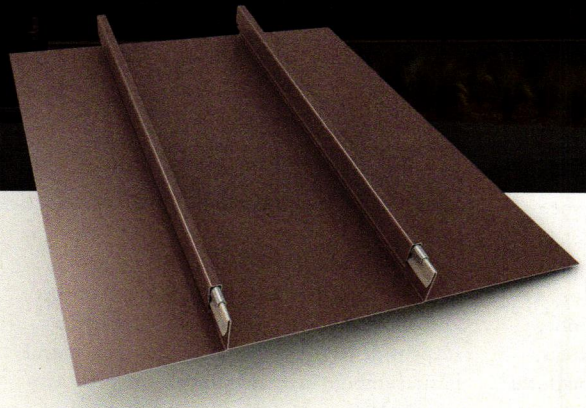
-Devin Norton, project designer, HOK San Francisco



Las Vegas Ballpark, Las Vegas Contractor: Southwest Specialty Contractors Architect: HOK, San Francisco GC: Penta Building Group, AECOM Hunt Owner: Howard Hughes Corp. Photo: alanblakely.com

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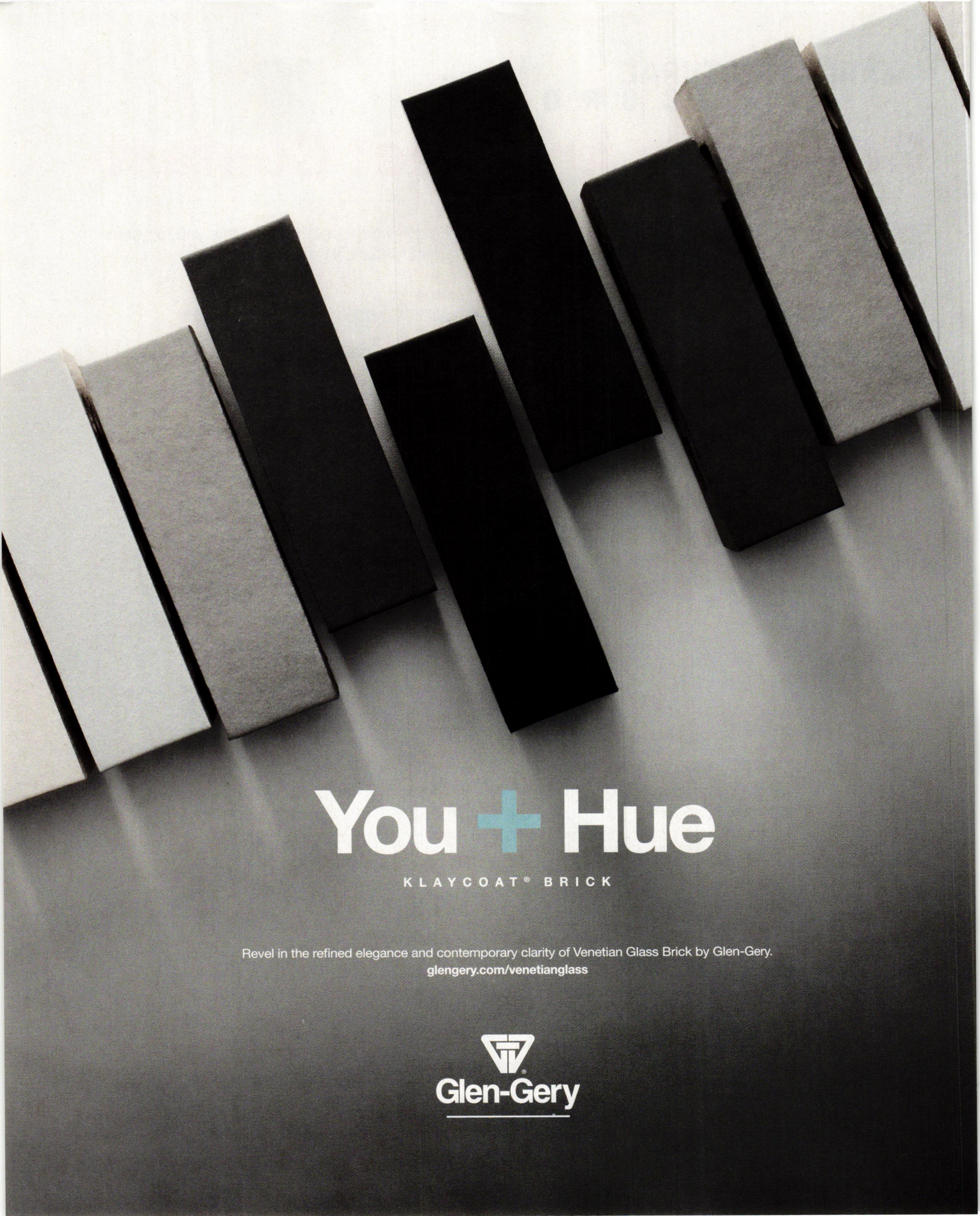
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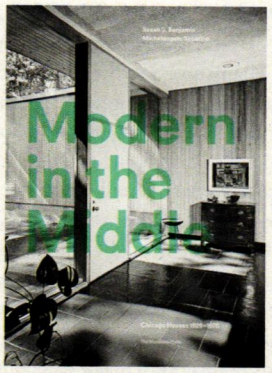
At Home in the Windy City

Modern in the Middle: Chicago Houses 1929–1975, *by Susan Benjamin and Michelangelo Sabatino. Monacelli Press, 296 pages, $60.*

REVIEWED BY PAUL MAKOVSKY



IN THIS BOOK, preservationist Susan Benjamin and architect and historian Michelangelo Sabatino survey the classic 20th-century single-family homes that defined American Midwestern Modernism. Focusing on 53 projects in Chicago and its suburbs, it includes popular icons as well as many lesser-known houses that have faded from memory. The book begins with Howard T. Fisher's "Ocean Liner" house (1929), in Winnetka, Illinois, which Henry Russell Hitchcock described as "nearly the first [house] in America to which the most rigid international standards of contemporary architecture criticism may be applied." (Fisher's firm would later serve as a training ground for architects like Lawrence Perkins and Philip Will—of Perkins and Will fame—and Edward Larrabee Barnes.) The survey ends with Stanley Tigerman's "Hot Dog House" (1975), a playful weekend house for a young progressive Chicago couple.

Of course, several Frank Lloyd Wright and Mies van der Rohe houses are featured: the Kathryn Dougherty and Lloyd Lewis House (1939) and the Muirhead Farmhouse (1951) by Wright, and the Edith Farnsworth House (1951) and Isabella Gardner and Robert Hall McCormick III House (1952) by Mies. Both designers figure as the biggest influences on generations of Chicago architects. However, the book comes alive with less familiar gems: an early Bertrand Goldberg flat-roofed house (1936) that once appeared out of place in the mostly conservative Evanston neighborhood of Colonial- and Tudor-inspired cottages; an overlooked work by Le Roy Binkley, a student of Mies, who never received the recognition achieved by many of his contemporaries; or Bruce Goff's eclectic Round House (1950) in Aurora, which incorporated materials like anthracite coal, steel, glass, cedar, and hemp. In each case, the authors briefly delve into the history of the house, the architect, the client, and even the house's current condition, making you want more.

The authors also point out the dearth of research on the subject of single-family houses designed by female, Hispanic, Asian, and African American architects in Chicago during this period—something that only started to change by the late 1960s. They include a few examples, such as the 1954 Chicago house by the talented John W. Moutoussamy—a student of Mies who also designed the Johnson Publishing Company, the only downtown Chicago high-rise by an African American—and work by Jean Wiersema Wehrheim, one of the few women architects in the book, who designed more than 150 houses, mostly in the city's western suburbs. There were other talented female architects who trained in Chicago but did not design houses in the city: Georgia Louis Harris Brown, for example, was a pioneering African American architect who practiced in Chicago during the 1940s and '50s and is recognized as only the second African American woman licensed in the U.S. She left Chicago to practice in Brazil. Daisy Ruth Igel, who undertook advanced building research under Konrad Wachsmann as a student at IIT, also returned to Brazil to design splendid Modernist houses in Rio.

Reading this book, you begin to understand Wright and Mies's huge influence on different generations of Chicago architects, but it is clear that Mies wins out, by the sheer number of projects showing his influence. The authors include on the book's front cover Keck & Keck's Maxine Weil and Sigmund Kunstadter House (1952), which was demolished in 2003, and the back cover depicts the Farnsworth House, which was saved by the preservation community that same year. It's a clever but subtle warning to the reader that, for every house saved and being lovingly restored by a new generation of homeowners, there are still many threats of demolition to houses of that era. ■

Paul Makovsky is a New York–based writer and editor, and is working on a biography of architect Florence Knoll Bassett.

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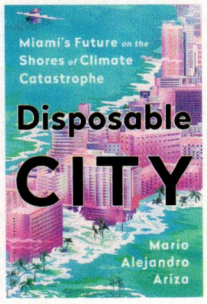
Sea Change

Disposable City: Miami's Future on the Shores of Climate Catastrophe, *by Mario Alejandro Ariza. Perseus Books, 320 pages, $17.99.*

REVIEWED BY TERENCE RILEY



MARIO ALEJANDRO ARIZA'S *Disposable City* is an extremely well-researched book on the future of Miami and South Florida in the face of the climate crisis and rising seas—scanning his footnotes alone is daunting. For those of us who live here, it's also distressing reading—each year over the coming decades will result not only in diminished coastal territory but inland inundations as well. Decades away might sound distant, but American real-estate finance is based on 30-year mortgages. This has been vague in Floridians' minds, but Ariza rules out any possible haziness about the future.

It's hard to imagine a major federal intervention at this moment; Florida would have to convince Congress that its environmental issues supersede many others. The city of Venice, Italy, comes to mind: its frequent flooding has prompted calls for the national government to take action for decades, but progress has been excruciatingly slow. In my opinion, one contentious but helpful strategy in Florida would be to rethink regulations that govern the built environment and let property owners pursue individual solutions. To do that, three official documents need radical alteration.

Miami 21, the city's current zoning code, was adopted in 2009, on the cusp of local environmental awareness. There is no mention of sea-level rise and no provision for rezoning higher density to higher ground. Ironically, the higher elevations are home to some of the poorest neighborhoods, such as Little Haiti and Liberty City (location of the Oscar-award-winning *Moonlight*). The city should quickly redesignate the most sustainable areas for new development, but also protect the interests of local property owners—a challenging proposition.

The second document is the City of Miami's Preservation Ordinance, which aims to accomplish "the protection, enhancement, perpetuation, and use of" Miami's built and natural landmarks. Preservation departments, however, do not focus solely on perpetuating individual buildings but entire neighborhoods, a difficult goal. I'd suggest creating a commission to consider, on a citywide basis, the challenges of protecting landmarks in an era of sea-level rise.

Before the destruction of Hurricane Andrew in 1992, Florida's municipalities had their own building codes; 10 years later, the state adopted the *Florida Building Code* "based on national model building codes and consensus standards which are amended where necessary for Florida's specific needs." But the current version does not address "specific needs" such as sea-level rise. Instead, a whole chapter addresses snow loading on roofs. Moreover, the code principally deals with standard types of construction: high-rise condos and single-family homes. It lacks critical imagination in terms of what may be new solutions to elevated-water conditions: Floating buildings? Buildings over expressways? Canals as infrastructure?

Each of these three documents took years to negotiate; revisions to address Florida's impending crisis need to be expedited. Hopefully, Ariza's work will serve as a clarion call for timely action. ■

Terence Riley is a Miami-based architect and former museum director.



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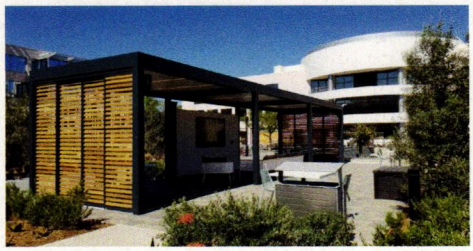

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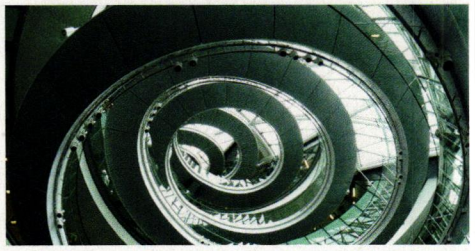

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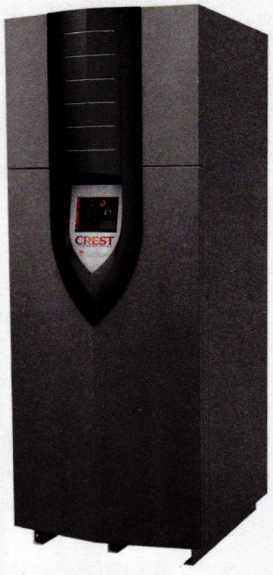
From a ventilation grille to boiler technology, these products help create effective comfort zones.

BY SHEILA KIM



Ariachiara

The safety of indoor air purification via ion and ozone technologies is still disputed, but if you're seeking these, this five-speed ceiling fan checks all the boxes in a sleek design. It features ionization and ozonation plus an integrated Bluetooth-controlled light and audio speaker within the mount. The fan spans 82½" in diameter and its blades are made of carbon fiber in oak or walnut veneer, or matte-black or -white lacquer.
ceadesign.it



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lochinvar.com



Sphere to Eternity

Former textile designer Annie Kantor—who previously led Maharam's custom studio—now applies eye-catching patterns and motifs to grilles and screens for the residential and light-commercial markets. Shown (above) is a 33"-by-14" floor grille, made of powder-coated steel, cut with her Sphere to Eternity pattern. The studio welcomes custom projects as well.
modmetaldesigns.com

LG Low Wall Console

Designed to cool or heat areas in residential or light-commercial buildings with space limitations, this LG air cooling and heating system comprises an indoor console, outdoor unit, and a shared refrigerant circuit between the two, expanding the installation point possibilities. and affording more design flexibility.
lghvac.com





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bigassfans.com



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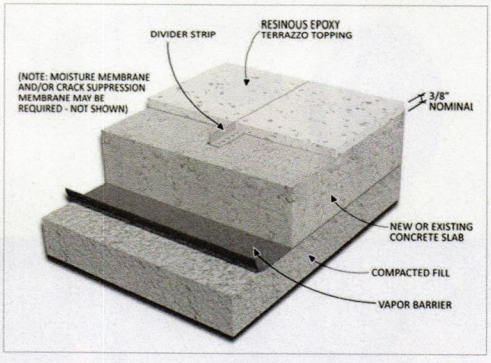

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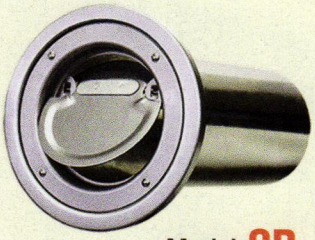

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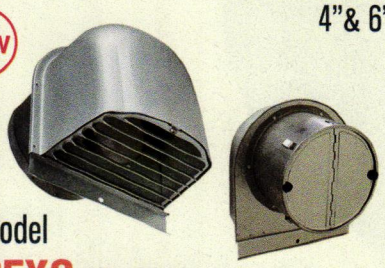
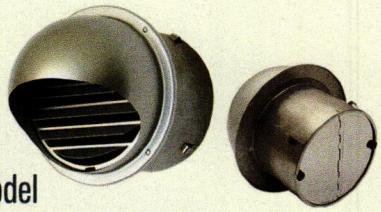


Model
CFXC 4"& 6" Aluminum



Model
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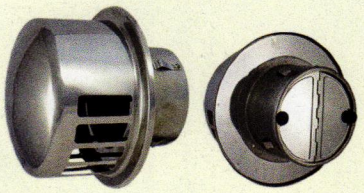

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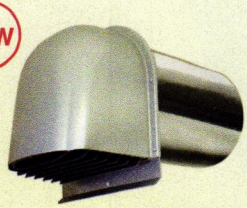

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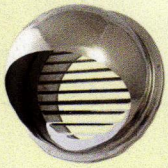

Model
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Model
SX-S
4"& 6" Stainless Steel



Model
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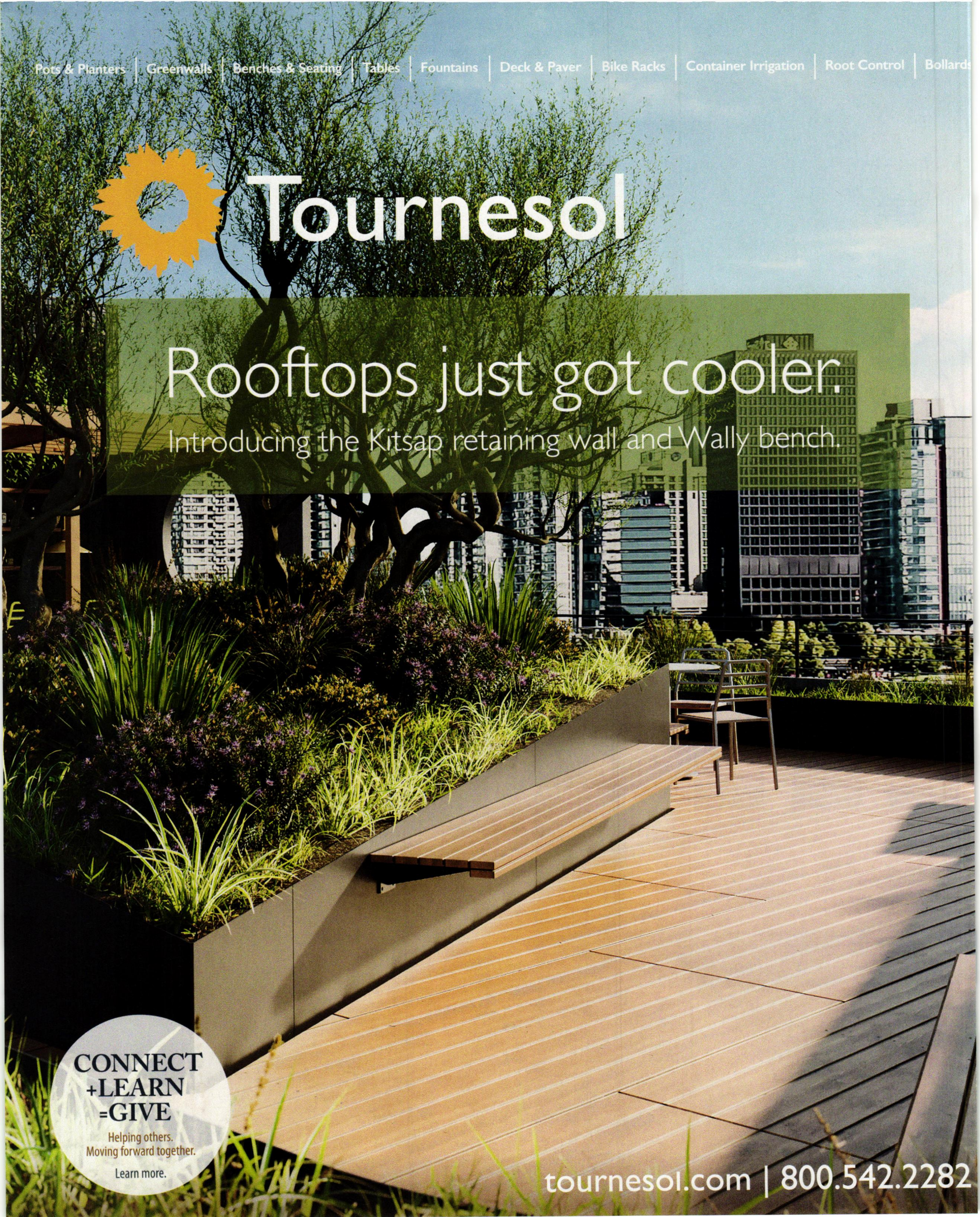
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Office Space

These standouts from a virtual NeoCon will enhance the post-pandemic workplace.

BY SHEILA KIM



Jueki

The clean lines and organic curves of the Jueki stool evoke the idea of sap oozing down a tree. Carved from solid ash, the sculptural seat is available in 18", 24", or 30" heights and an array of clear and opaque finishes, including black, denim, and nutmeg. A thin footrest ring is coated to match.
hbf.com

Quick

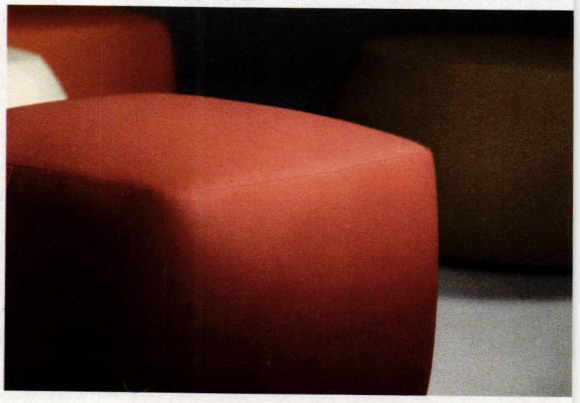
These upholstered dividers are quick fixes in carving out privacy and adding social-distancing barriers in open-plan offices. Lightweight and on casters, they're poised for frequent moving and reconfiguring. The screens come in 54" or 68" heights, 30" and 48" widths, 26 colors, and a range of fabrics.
stylexseating.com





modularBATH

CARVART's modular system for restrooms speeds up and cuts the cost of installation by offering existing coordinated bath cubicles, cladding, lockers, and integrated sinks for a prefabricated solution. Various Covid-19-related options are available. These include antibacterial surfaces and sensor-driven hands-free operation of cubicle doors.
carvart.com



Reef Pro

Sea-coral hues inspired the palette of this ink- and stain-resistant Ultra-leather series. It simulates the look and feel of supple leather in a low-gloss finish and 17 hues such as Lobster (red) and Hammerhead (gray). A portion of Reef Pro's sales is donated to the Coral Reef Alliance.
ultrafabrics.com

Havn Tables

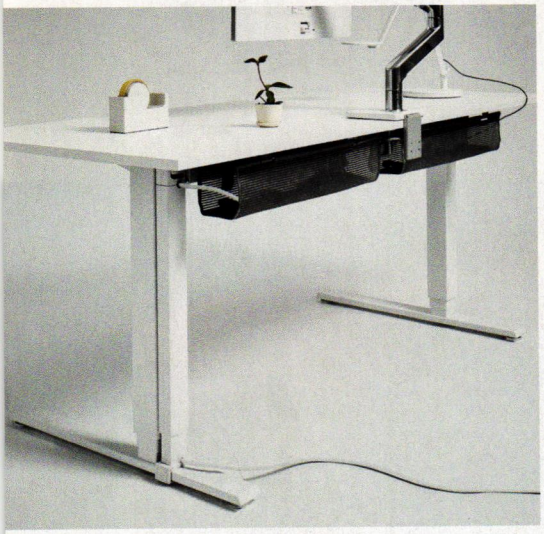
Complementing Studio TK's lounge seating of the same name, Havn occasional tables possess a minimalist-yet-warm Scandinavian aesthetic. They come in round, square, and rectangular versions in multiple formats and two heights. The top is finished with a laminate or veneer surface.
studiotk.com





Chaise Tout Bois

Vitra has reissued this Jean Prouvé chair from 1941, his only chair design to be made entirely of wood (due to metal scarcity during WWII). It was actually born out of timber chair prototyping and exploration that eventually led to his wood-and-metal–construction Standard Chair. This all-wood version boasts an even cleaner appearance, however, thanks to interlocking joinery in place of screws. Natural and dark oak finishes are available.
vitra.com



NeatUp and NeatTech

Designed with home offices in mind, these cable-management accessories help minimize clutter in a discreet way. NeatUp is an attachable channel, compatible with Humanscale's sit-stand Float and eFloat desks, that routes cables up one leg and houses an included six-outlet power strip. NeatTech is a mesh basketlike component that manages cables and cords underneath the desktop.
humanscale.com

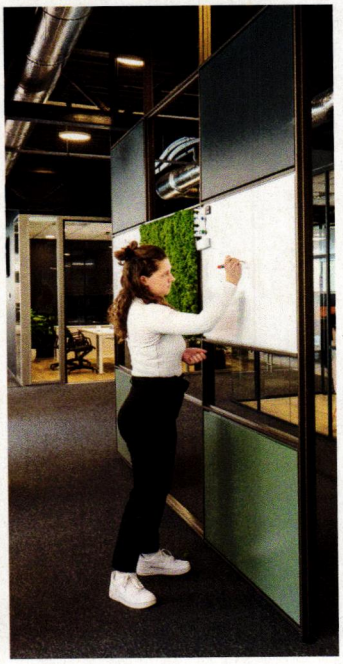


BuzziPlanter

This accessory promotes wellness by bringing greenery indoors—which can also enhance air quality—dampening sound and sized to be used as a divider. Six models include four cylindrical ones in different heights and diameters, and two pill-shaped in two heights. All are upholstered with an acoustical foam covered in a choice of textiles.
buzzispace.com

M923

Gensler collaborated with Maars Living Walls on this system to provide an appealing all-in-one solution for space division, visual and acoustic boundaries, and group productivity. It comprises high-, medium-, and low-height steel frames into which panels can be easily placed, allowing for change as needed. The panels come in a wide array of options, such as moss, cork, textile, and whiteboard.
maarslivingwalls.com



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Peak Performance

A Colorado Springs museum by Diller Scofidio + Renfro is inspired by its setting and the motion of athletes.

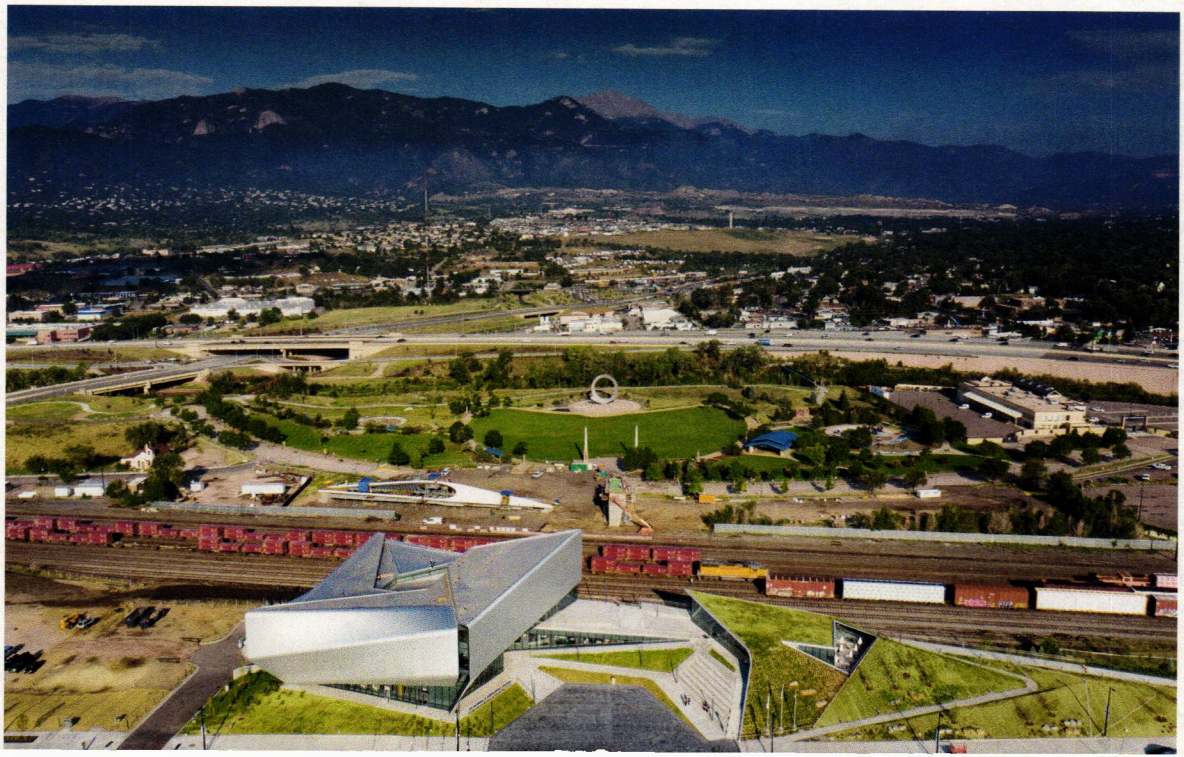
BY DAVID HILL

THE MOST DISTINGUISHING characteristic of Colorado Springs, about an hour's drive south of Denver, isn't in the city. It's Pikes Peak, the 14,115-foot-high mountain that rises dramatically to the west and dominates the landscape. Wisely, the New York firm Diller Scofidio + Renfro (DS+R) embraced the granite pile in its design of the $91 million U.S. Olympic & Paralympic Museum. "It became the defining feature of our initial site plan," says DS+R partner in charge Benjamin Gilmartin. "It's a constant reminder that you're in this breathtaking, Olympic-class kind of setting."

Located in a former light-industrial area on the edge of downtown, the three-story museum sits on a 1.7-acre triangular parcel of land overlooking an active railyard. The approach from downtown takes you due west, on a city street that dead-ends at the museum site. That was the most obvious setting for the museum, Gilmartin says, but the building would have blocked the view of Pikes Peak. Instead, the architects decided to frame the mountain by splitting the museum into two parts: a soaring main building to the south and a smaller, more earthbound structure with a café to the north. The space in between comprises a plaza that doubles as an informal amphitheater.

For the 60,000-square-foot museum itself, DS+R found inspiration in





TO REVEAL a view of Pikes Peak, architects split the museum into two parts, a main building (at left, above) and an earth-covered café structure (at right, above). The site sits adjacent to an active railyard with America the Beautiful Park on the other side (left). A pedestrian bridge designed by DS+R will cross the tracks.

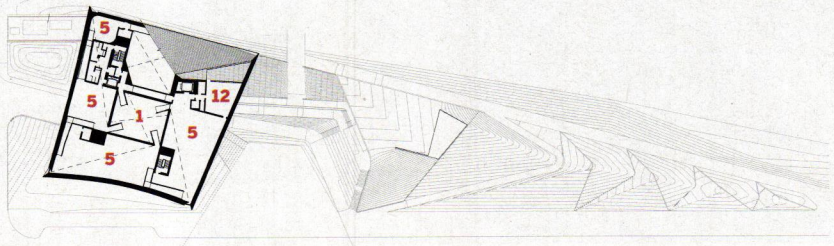
PHOTOGRAPHY: NIC LEHOUX, EXCEPT AS NOTED. JASON O'REAR (TOP).



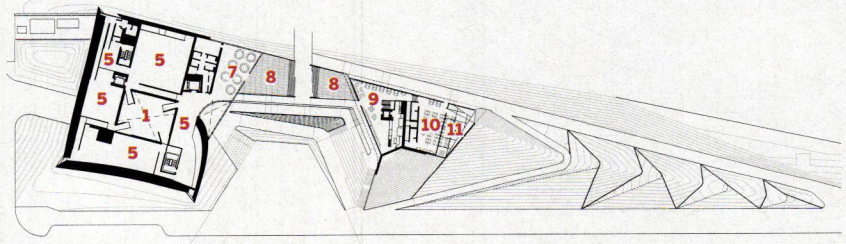
the movement of athletes—in particular, Gilmartin says, "the way they seem to shake off the bonds of gravity that hold the rest of us to Earth." The challenge was to convey that sense of dynamism in a building. And the solution the architects developed was to design a complex steel-frame structure that twists and turns upward, with four overlapping, petal-like volumes, above a mostly glazed ground floor. From above, the building evokes a pinwheel. On the facade, DS+R used more than 9,000 diamond-shaped anodized-aluminum panels, manufactured and installed with impressive precision. Each panel is unique and slightly offset to create a texture like snakeskin.

"It's almost like an Olympic costume that's stretched over the bones of the building," Gilmartin says. The surface, which wraps and curves and folds over the irregular form, appears to be in a constant state of animation, thanks to the region's intense and plentiful sunlight. Unlike the honeycombed glass fiber reinforced concrete "veil" DS+R designed for the Broad Museum, in Los Angeles, which some critics found disappointing, the Olympic museum's aluminum facade feels substantial, even elegant, with a kind of monumental solidity.

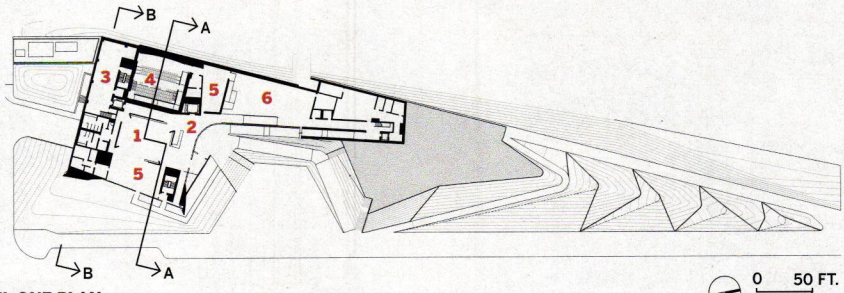
The museum, which honors both Olympic and Paralympic athletes, is fully accessible, with wide ramps that allow people of various



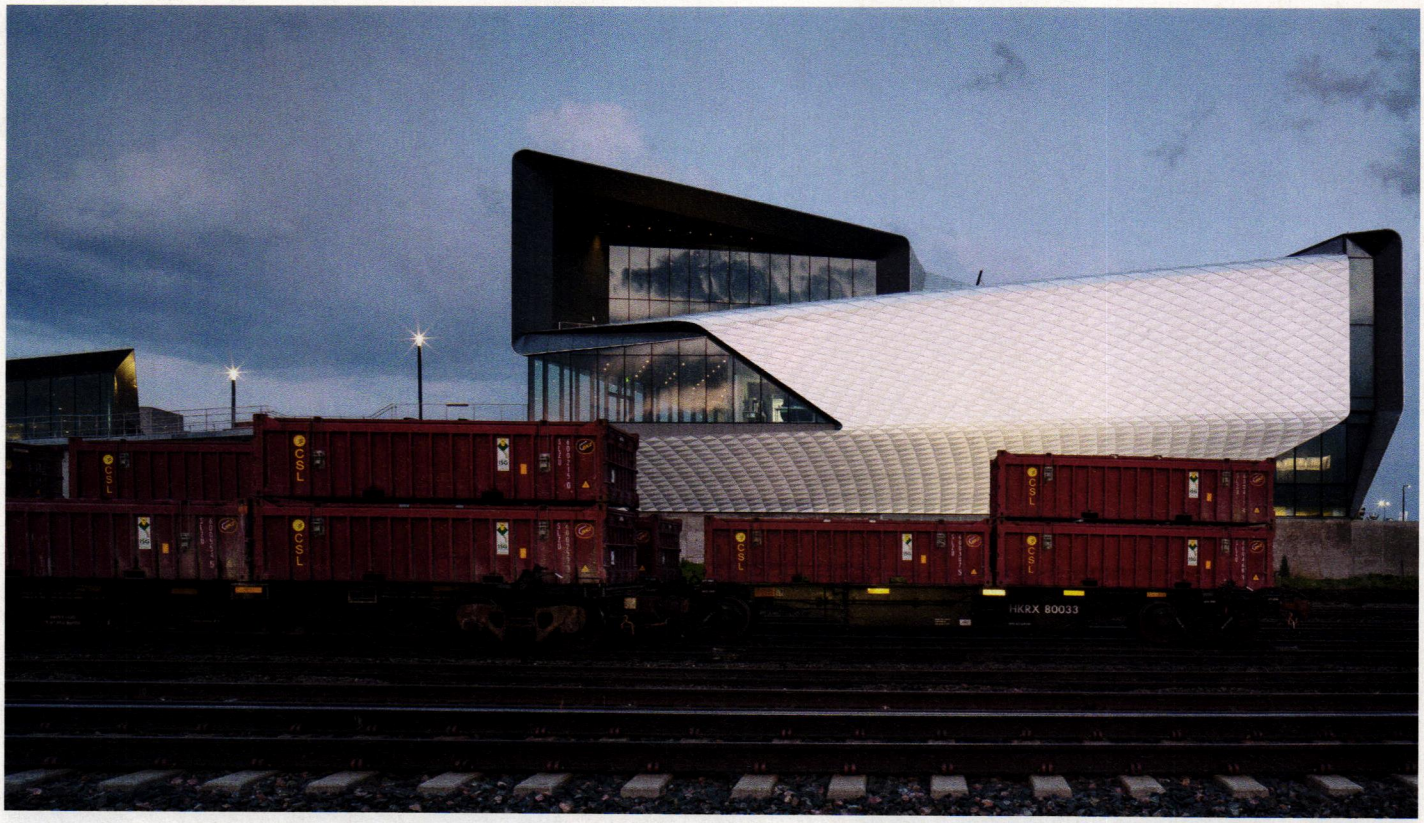
LEVEL-THREE PLAN



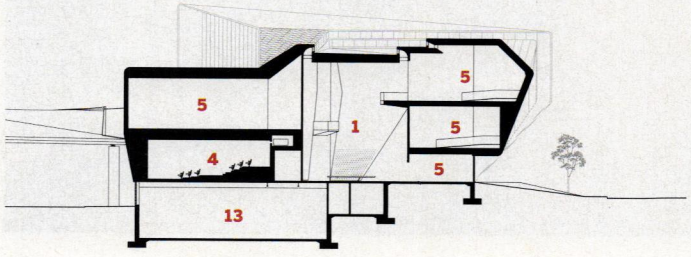
LEVEL-TWO PLAN



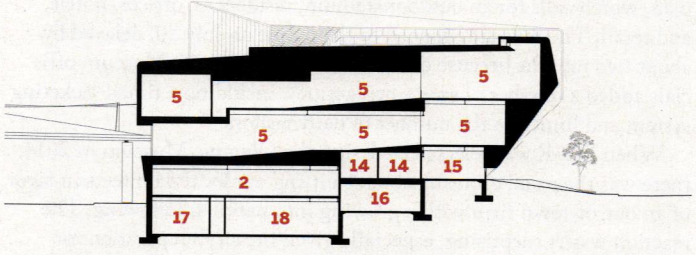
LEVEL-ONE PLAN



THE MOVEMENT of people of all abilities plays an important role both in and outside the museum (opposite) and acknowledges the presence of trains on nearby tracks (above).



SECTION A - A



SECTION B - B

0 30 FT.
10 M.

1 ATRIUM
2 TICKETING
3 ADMINISTRATION
4 THEATER
5 GALLERY
6 MUSEUM STORE
7 EVENT SPACE
8 TERRACE
9 CAFÉ
10 EDUCATION
11 COURTYARD
12 BOARDROOM
13 MECHANICAL
14 RESTROOM
15 COAT CHECK
16 LOADING DOCK
17 BOILER
18 ARCHIVE

abilities to share the same experience. (DS+R consulted with a committee of Paralympic athletes on accessibility issues early in the design process.) Visitors enter the museum through glass doors under what appears to be a giant wave of those aluminum panels. Just beyond the ticketing desk lies a 40-foot-tall atrium with perforated glass fiber reinforced gypsum screens and simple Douglas fir glulam benches. A floor-to-ceiling media wall displays ever-changing images of athletes. Visitors take an elevator to the museum's top floor and then wind their way down through the galleries, Guggenheim style, on a series of ramps. Four glazed balconies overlook the atrium at different levels, allowing visitors to pause and regroup as they move through the galleries.

The exhibition spaces, by Gallagher & Associates, contain a combination of traditional displays (there's an impressive selection of Olympic relay torches and medals); participatory activities, including a 30-meter track where visitors can compete against virtual Olympic and Paralympic athletes; and multimedia presentations. A 2,000-square-foot theater can accommodate 132 people in regular seats, with room for five wheelchairs. Two rows of seating can be removed to create an additional 21 wheelchair spaces.

Gilmartin says DS+R "pushed hard" for windows to allow daylight into the galleries. And, indeed, there's a clerestory window on the top floor that wraps around to become a vertical pane at the corner, and there are several other glass slivers that offer views of the mountains and downtown. (When the elevator reaches the top floor, visitors catch a quick glimpse of Pikes Peak through a west-facing window before exiting the cab.) But, overall, the gallery floors are cavelike, with little connection to the world outside. The best mountain views can be found in a third-floor board-



PROJECTED IMAGES and balconies at various levels animate the central atrium (above). Visitors can explore exhibition galleries (opposite, top) on all three floors and even compete against virtual athletes (opposite, bottom).

room, with 26-foot floor-to-ceiling windows and a west-facing terrace, and an event space on the second level. But neither of these is open to regular museum visitors. The lack of a panoramic view from inside the museum as part of the visitor experience is a missed opportunity.

The café, by contrast, takes full advantage of the great outdoors. Reached by a gently sloping ramp that begins just outside the museum entrance, the café itself is relatively small but has glass walls and flexible seating that spills out onto a west-facing terrace. (One dining area doubles as a space for educational programs.) From there, visitors will eventually be able to cross the railroad tracks on a pedestrian bridge, also designed by DS+R. Scheduled to open by the end of the year, the asymmetrical stressed-skin bridge—which resembles the blade of a giant wind turbine—will connect the museum complex with America the Beautiful Park. (Katharine Lee Bates wrote the words to the patriotic song after an excursion to the top of Pikes Peak in the summer of 1893.)

Colorado Springs, population 478,000, has long been home to the U.S. Olympic Committee and the U.S. Olympic Training Center, but the new museum is destined to become a major tourist attraction for the region. It's also the linchpin of a major downtown redevelopment plan, which calls for an outdoor stadium, residences, offices, hotels, and retail. The museum opened to the public on July 30, delayed by about two months because of the Covid-19 pandemic. Museum officials added a number of safety precautions, including a timed-ticketing system and limits on the number of daily visitors.

When DS+R was selected to design the Olympic Museum in 2014, there was the usual grousing about shutting out local architects in favor of an out-of-town firm with a growing international following. The reaction wasn't surprising, especially given the city's reputation for political and cultural conservatism. But it was a smart move. DS+R's bold design has been enthusiastically embraced by the city's business and political establishment.

"We're a changing city," says developer Christopher Jenkins, a member of the museum's board of trustees and chair of the building committee. "I have not heard anyone say, 'Oh, that's not us. It's too modern.' In fact, it's a source of beaming pride." ■

David Hill, a journalist based in Denver, writes frequently about architecture, design, and urban planning.

Credits

ARCHITECT: Diller Scofidio + Renfro — Benjamin Gilmartin, partner in charge; Elizabeth Diller, Charles Renfro, Ricardo Scofidio, principals; Holly Chacon, project architect; Sean Gallagher, project architect, concept design; Yushiro Okamoto, project designer; Merica May Jensen, Ryan Botts, Charles Curran, Imani Day, Roberto Mancinelli, Anthony Saby, Rasmus Tobiasen, Thunyalux Hiransaroj, Andreas Kostopoulos, Dino Kiratzidis, Emily Nguyen, Jack Solomon, Valeri Limansubroto, project team

ARCHITECT OF RECORD: Anderson Mason Dale Architects

ENGINEERS: Arup (acoustical); Kiowa Engineering (civil); ME Engineers (electrical); Jensen Hughes (fire); The Ballard Group (mechanical); KL&A with Arup (structural)

GENERAL CONTRACTOR: GE Johnson

CONSULTANTS: Ileana Rodriguez (accessibility); Gallagher & Associates (exhibition design); Heitmann & Associates (exterior envelope); N.E.S. with Hargreaves Jones (landscape); Tillotson (lighting); MG McGrath (facade fabrication)

CLIENT: United States Olympic & Paralympic Museum

SIZE: 65,750 gross square feet

COST: $91 million

COMPLETION DATE: May 2020

Sources

PRECAST CONCRETE: Continental Cast Stone Manufacturing

ALUMINUM PANELS: Lorin Industries

CURTAIN WALL: MG McGrath; Oldcastle BuildingEnvelope

METAL DOORS: Marshfield; Overly Door; Elliason; EZY Jamb (frames)

SECURITY GRILLE: Cascade Coil

SLIDING DOORS: CRL

RESILIENT FLOORING: Flexco

EXTERIOR LIGHTING: Selux; Bega; B-K Lighting; WE-EF Lighting




STOP
STOP



Design on a Diet

Proving less is more, Ross Barney Architects aims for net zero with McDonald's flagship in Disney World.

BY BETH BROOME
PHOTOGRAPHY BY KATE JOYCE STUDIOS

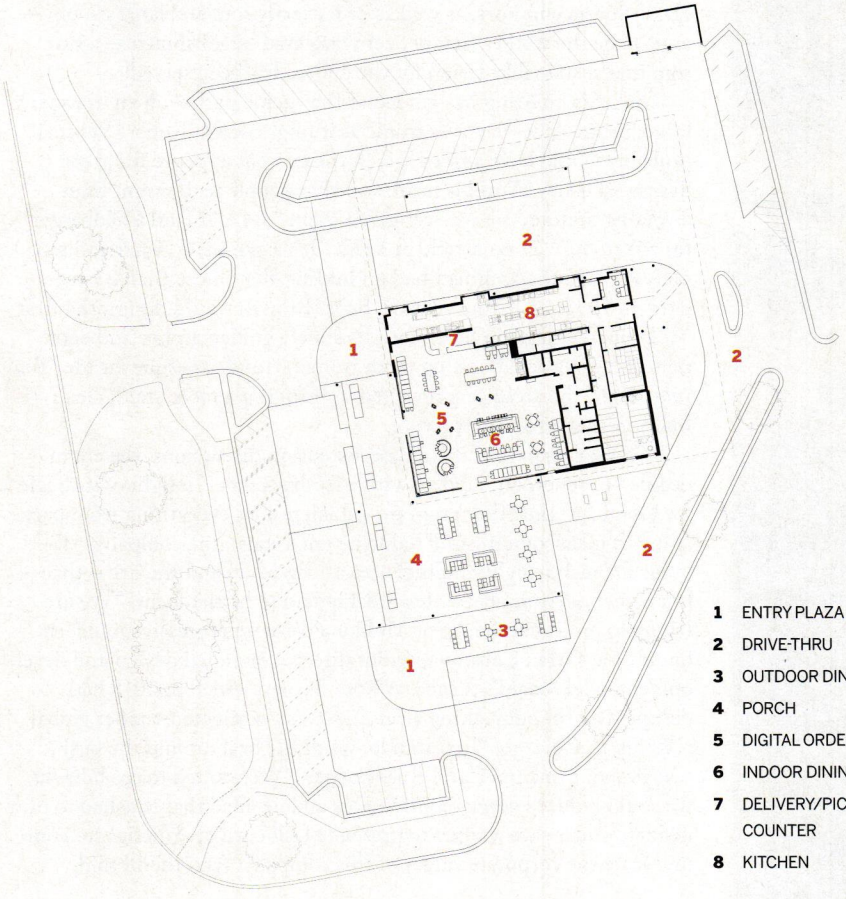
FAST-FOOD restaurants are not a building type that this magazine publishes often. But supersize chain McDonald's has been making occasional forays beyond formulaic familiarity and the double mansard vocabulary for some years now and, most recently, has created a stir with an outlet designed by Chicago-based Ross Barney Architects and located in—of all places—Disney World. The 8,000-square-foot building—a boxy volume defined by its expanses of wood louvers and glass jalousie windows, as well as its butterfly roof and large canopy—aims to be the world's first net zero fast-food establishment—a sure sign that sustainable design for the masses has been served.

That this building has landed at the theme park—on an unusually large, prime site—is not as ironic as it might seem. Robert Venturi probably would have agreed, given the current appetite for green design. "Disney World is nearer to what people really want than anything architects have ever given them," he told Paul Goldberger for a *New York Times* article in 1972. "It's a symbolic American utopia." Perhaps the architect had an inkling that, more than 25 years later, in 1998, his firm, Venturi, Scott Brown, would design the first McDonald's flagship here, with its stately golden arches and enormous Happy Meal bursting forth from a Mondrianesque facade. Ten years later, the architects revisited it, bringing a more staid, clean-lined aesthetic to the structure.

Last year, as part of their lease-extension discussions, the chain decided to renew and update with a fresh scheme. In light of its Scale for Good sustainability program (which guides everything from packaging to meat sourcing and reducing emissions), the company—famous for such naughty indulgences as Big Macs and the drive-thru—knew that environmental stewardship had to be the focus. "We are trying to project an image of McDonald's as a progressive, modern brand," says Max Carmona, senior director of global design and development. McDonald's turned to Ross Barney, which in 2018 had designed a groundbreaking steel-and-cross-laminated-timber global flagship in Chicago. "In Orlando, we didn't beat around the bush," says design principal Carol Ross Barney. "We wanted to see how far we could reduce energy requirements and decided that this had to be a net zero store—we wanted to present a billboard to America, to communicate the corporate values of this company. And then I said,

NESTLED INTO its wetland setting, the building, through its form and materiality, acts as a billboard, projecting a new image for McDonald's.





1 ENTRY PLAZA
2 DRIVE-THRU
3 OUTDOOR DINING
4 PORCH
5 DIGITAL ORDERING AREA
6 INDOOR DINING
7 DELIVERY/PICKUP COUNTER
8 KITCHEN

0 50 FT.
15 M.

FIRST-FLOOR PLAN

THE ARCHITECTS wanted the building's sustainable approach to be clearly visible, and employed off-the-grid exterior lighting (above) and a living wall at the entry plaza (opposite).

'What did I get myself into?!'"

Apparently, McDonald's makes its buildings the way it makes its food—fast: the timeline from design through construction was a year and a half. "It was like architectural calisthenics," says Ross Barney. To save time and money, the team repurposed the existing building's basic footprint, some foundations and kitchen enclosure, and utility connections.

Quick-serve restaurants tend to be energy hogs, so, to generate at least as much energy on-site from renewable sources as the building uses, the project team had to cut consumption significantly. As designed, the building is projected to consume 35 percent less than baseline, or 666,454 kWh/year. "More than anything else, that influenced the design," says Ross Barney. The team accomplished this largely by optimizing kitchen equipment, which carries the biggest loads. For example, the restaurant is using more efficient compressors and seals for refrigeration, as well as standby mode sensors for high-energy-use equipment.

The next biggest savings will come from cooling, which accounts for about 10 percent of the total load. Given the climate, the team determined that, with the right conditions,

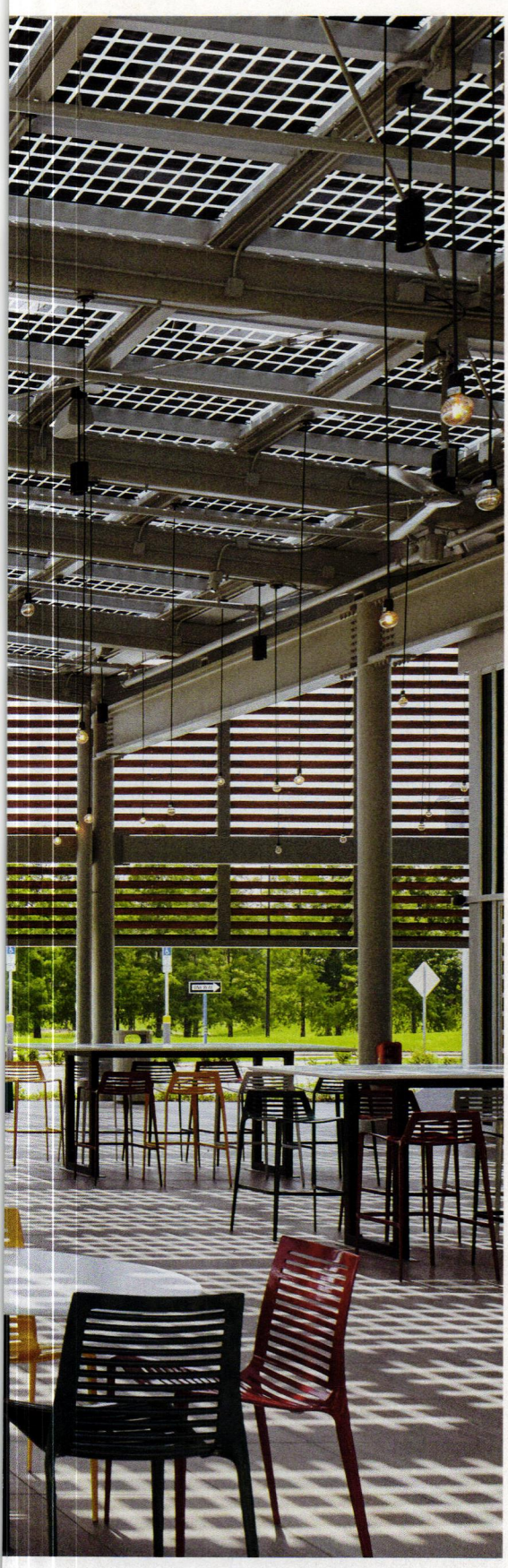


the restaurant could operate without air conditioning 65 percent of the year. So the building envelope became the focus of their attention: it had to be robust but also transparent, connecting diners with the wetland surroundings. A handsome "breathing wall" provides shading and natural ventilation. Fixed wood louvers are lightly charred to limit maintenance, points out Ross Barney (Disney's "Imagineers," who review all aspects of design projects, deemed traditional *shou sugi ban* "too Darth Vader"). Extensive operable jalousie windows are automated through the building management system to close when air-conditioning is required. A 6,000-square-foot lanai-like porch, shaded by the wood slats—and with 4,800 square feet of transparent glass building-integrated photovoltaic panels (BIPVs) overhead—provides outdoor dining.

Exploring options for on-site power generation, the team had looked at geothermal and wind but selected solar, using, in addition to the BIPVs over the porch, 18,700 square feet of standard photovoltaic panels on the enormous canopy, all of which is projected to generate 704,791 kWh/year. Off-the-grid solar-powered parking lot lighting also lightens the load.

Inside the restaurant (due to the pandemic, now only serving via drive-thru and delivery), the soaring daylit ordering and dining areas are dominated by the play of light and shadow thrown by the louvers and glass BIPVs. "We wanted it to be that simple and direct," says Ross Barney. "We wanted people to understand the sustainable values that were premising the design." For each outlet, McDonald's selects from a standard set of interiors and, for this site, employed a design by consultancy Uxus dubbed "Spirit of Family." A durable material palette, with







AN EXPANSIVE porch is shaded by wood louvers and overhead glazing with integrated photovoltaic panels (left). Inside are ordering kiosks and monitors that teach about renewable energy (above).

laminate, solid surfacing, and ceramic tile, is what you would expect for fast food, but here it has a more refined air.

The steel-frame building nestles into the lush landscape, which has been planted with all-native species. To mitigate runoff, the team specified permeable paving for the entry plaza and outdoor dining area and a 1,800-square-foot living wall. Otherwise, storm-water from the 1.5-acre site drains to two adjacent ponds, and from there is handled by the resort's sophisticated water-management system, designed to also keep mosquitos at bay—a plus for outdoor dining.

McDonald's is targeting zero energy certification through the International Living Future Institute (ILFI). It is too early to say if it will achieve this goal, since it just opened this summer and ILFI requires a year of energy data. Into the future, McDonald's hopes it will function as a laboratory of sorts, where the architects' explorations can be put to the test and perhaps replicated or adapted in other buildings.

With design, points out Ross Barney, you are constantly asking for clients' trust as you lead them into unfamiliar territory. "And that's not always comfortable, especially if you're in the role of safeguarding a brand or reputation," she says. "McDonald's was willing to go down the path with us, trying new materials and systems—and new ideas." ■

Credits

ARCHITECT: Ross Barney Architects — Carol Ross Barney, design lead; Ryan Giblin, senior project manager; Misa Inoue, landscape architect; Mordecai Scheckter, Yifan Liang, Ryan Gann, Itzi Velazquez, Jason Vogel, Shinya Uehara, design team

ARCHITECT OF RECORD: CPH — Jeffrey M. Satfield, senior vice president; John Baer, director of architecture; Jess T. Sibayan, senior architectural designer

CONSULTANTS: Goodfriend Magruder Structure (structural); WSP (m/e/p); Schuler Shook (lighting)

GENERAL CONTRACTOR: Southland Construction

CLIENT: McDonald's Corporation

SIZE: 8,000 square feet

COST: withheld

COMPLETION DATE: June 2020

Sources

CURTAIN WALL: Kawneer

WOOD: reSAWN Timber, Kebony

OPERABLE LOUVERS: Moffatt

GLASS: Vitro Architectural Glass, Moffatt

ACOUSTICAL CEILINGS: Armstrong

PLASTIC LAMINATE: Wilsonart

SOLID SURFACING: Corian

FLOOR AND WALL TILE: Crossville

PHOTOVOLTAIC SYSTEM: Sunpower, Onyx Solar

Beyond the Horizon

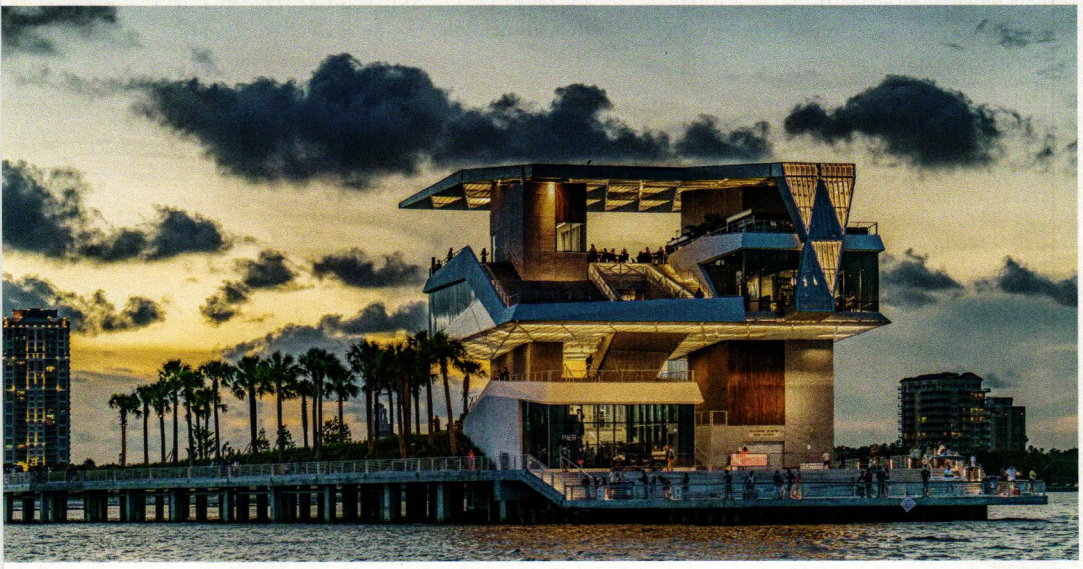
In St. Petersburg, Florida, a historic pier is redesigned by Rogers Partners for a new era.

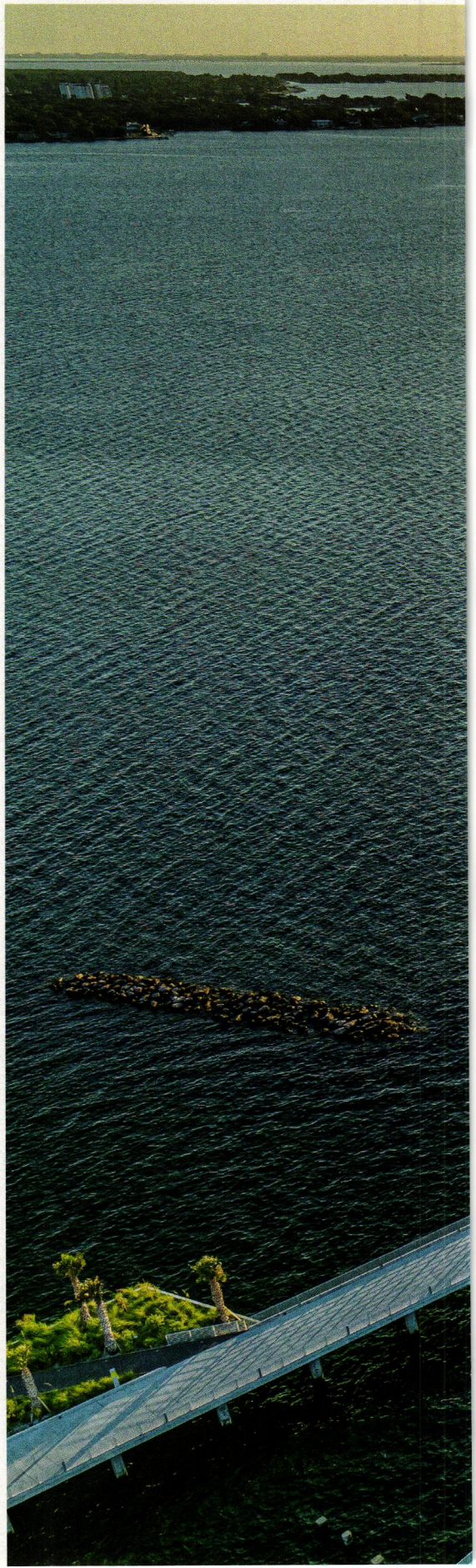
BY KARA MAVROS
PHOTOGRAPHY BY RICH MONTALBANO

ONCE A HAVEN for retirees and resort-goers, St. Petersburg, Florida— "St. Pete" to locals—has undergone a cultural and demographic renaissance in recent years. Today, bars, restaurants, and museums pepper the downtown shoreline, attracting younger residents and visitors of all ages. And now a new St. Pete Pier extends this lively scene farther into Tampa Bay.

The 12-acre public pier, designed by Rogers Partners, ASD | SKY, and Ken Smith Workshop, is a $56 million modern revision of a local landmark meant for a new generation, as part of a larger 26-acre Pier District redevelopment project.

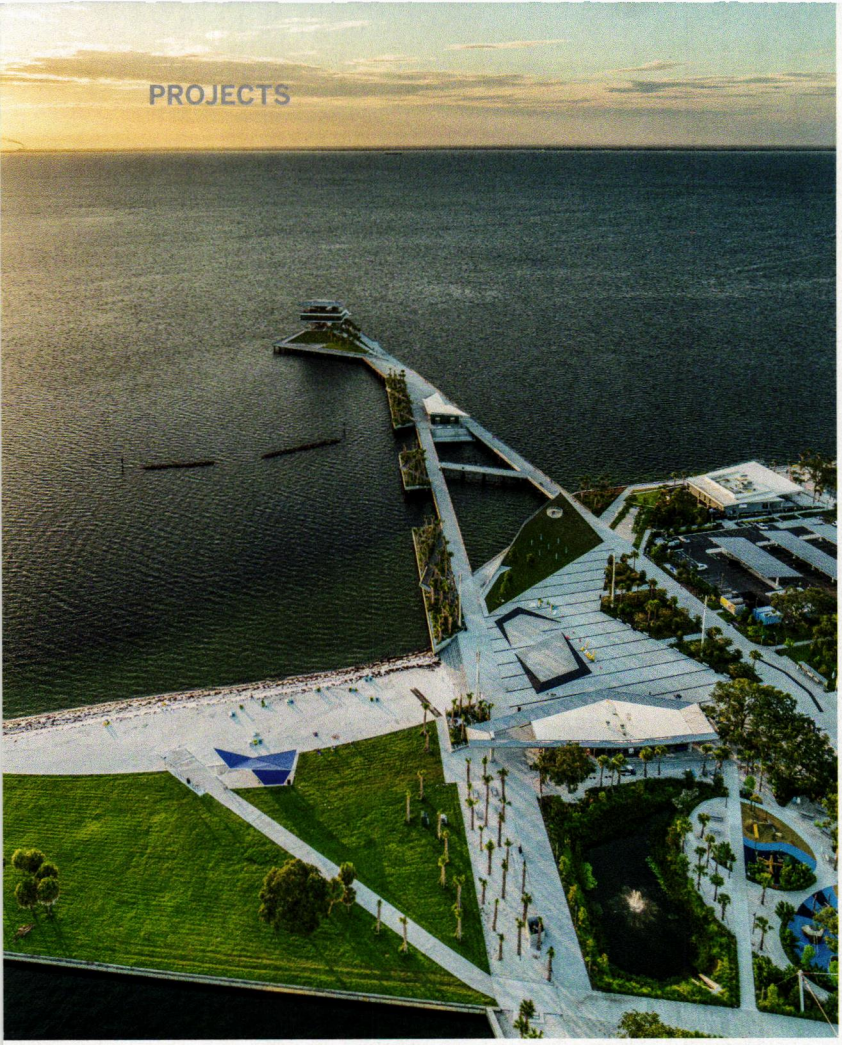
Its predecessor, built in 1973 (though the very first iteration here dates back to 1889), was a car-friendly boardwalk that culminated in a controversial inverted-pyramid building with a restaurant at the top and shops below. But by 2004, its worn-out piles were no longer sound. So the structure was demolished seven years ago, and the city launched a design competition allowing the public to decide the future of the site. A scheme by Michael Maltzan Architecture was selected by a committee, but voters rejected it in 2013. After a new competition, the committee chose a scheme by Rogers Partners, which the public approved. (Separately, W Architecture and local firm Wannamacher Jensen were chosen to design a 14-acre project on the western portion of the site, to include public art displays, a marketplace, parking lot, and access to the existing marina.)







THE PIERHEAD building, which sits a quarter of a mile into Tampa Bay, houses new retail and dining options.



ON THE east side of the central plaza—where the Rogers-team design begins—a tilted lawn (opposite, top) creates an oculus-lit grotto on the pathway below (opposite, bottom).

The Rogers team learned from the public's pushback against Maltzan's scheme, which was criticized for being too similar to the old pier. "There were certain commonalities between the initial winning competition entry and the inverted-pyramid design," says Elizabeth Stoel, associate partner at New York– and Houston-based Rogers Partners. "It was a long walk, with no shade, and no places to stop along the way."

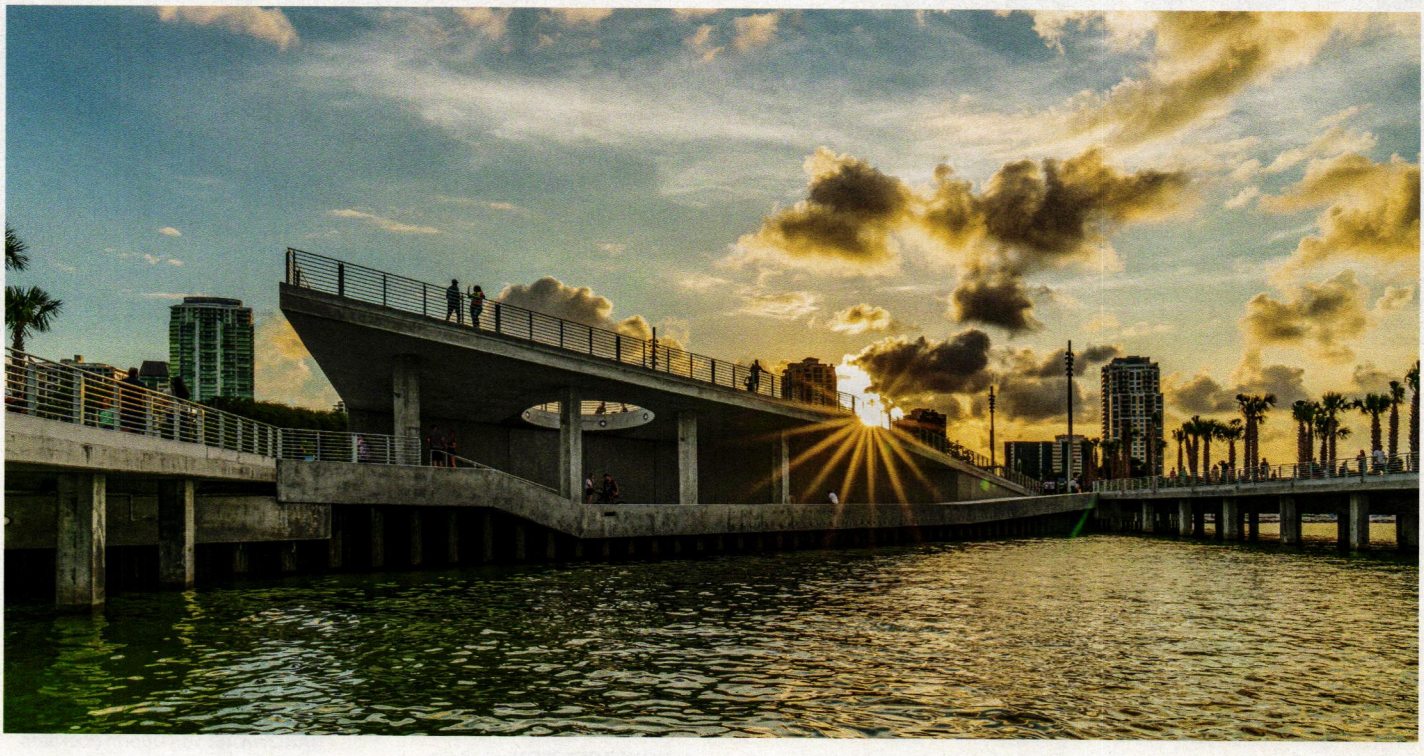
The failed competition plan "really made us listen to the community," says associate partner Vince Lee. The "green necklace" of public coastline along the downtown is what makes St. Pete so special, the architects realized, not just the pier as an isolated attraction. "It made us look at the new pier in a completely different light, as an extension of that park system," says Lee, with programs, and topography, that are much more varied than a traditional boardwalk. The firm's founding partner, Rob Rogers, calls this "the multiplicity versus the singularity."

The architects opted to make the entire project pedestrian-only, except for trams for accessibility. At the intersection of the Rogers-led scheme and the one by W Architecture, a central plaza extends north into "spa beach," where a new breakwater creates protected areas for swimmers and helps prevent erosion. From the plaza, visitors can explore a 10,000-square-foot triangular "tilted lawn," a grass-planted concrete structure that slants slightly upward, forming a viewing platform for the pierhead beyond. This feature, says New York–based landscape architect Ken Smith, "strategically and aesthetically" breaks the pier into shorter stretches. "If it were flat from land to pierhead, it would feel like an interminable distance."



SITE PLAN





These moves also establish destinations along the length of the pier, not just at the end point. "We took something that was fundamentally a horizontal experience," says Lee, "and gave it topography that allows you to have all of these different relationships to the landscape and the water." The varied plan promises new possibilities with each visit, whether that's a short jog around the perimeter or an hours-long exploration of all the pier's touch points.

The completed project includes three buildings by Rogers Partners—a casual dining pavilion, an education center, and the five-level St. Pete Pierhead, with restaurants, retail, and a rooftop bar. The new pier stands significantly higher than the previous iteration, in anticipation of storm surges and rising sea levels. While most of the old structural components were removed, a series of concrete piles in what Rogers refers to as the "wet classroom" were maintained as part of an outdoor learning experience run by the local environmental nonprofit Tampa Bay Watch. Here, the cast-in-place-concrete pier deck steps down like an amphitheater just



OUTSIDE THE education center, amphitheater steps descend to the waterline, where visitors can observe natural marine habitat on the former pier's piles (above).

above the waterline, providing an intimate experience with the bay, adjacent to the environmental education building. "Over time, habitats develop on those piles," explains Lee. "We thought that that would be an interesting overlay," to have these natural ecosystems on display at the education center. The designers also preserved four caissons that once supported the inverted pyramid building and now hold up a fishing deck at the pier's farthest point.

One critical move, according to Rogers, was rotating the new 18,000-square-foot Pierhead building slightly so that it also looks toward the downtown skyline, instead of only "dead west" into the piercing sunset over the water. The concrete structure has generous perforated metal canopies that provide shade during the day and gently diffuse recessed lighting at night. The motif of deep overhangs on the pier's structures, Rogers says, are "an homage to the modernist Florida tradition."

The Pier today blends the city's vibrant downtown with Florida's natural beauty. As Rogers himself puts it, the finished experience is a "spectacle" on the water, where the city meets the bay. ■

Credits

ARCHITECT: Rogers Partners Architects + Urban Designers

ARCHITECT OF RECORD: ASD | SKY

LANDSCAPE ARCHITECT: Ken Smith Workshop

ENGINEERS: Thornton Tomasetti (design structural and marine), TLC Engineers (m/e/p/fp, technological)

CONSTRUCTION: Skanska

CONSULTANTS: Renfro Design Group (lighting), Stantec (civil, marine, environmental), Humiston and Moore Engineers (coastal), Terracon (geotechnical)

CLIENT: City of St. Petersburg

SIZE: 12 acres

COST: $56 million

COMPLETION DATE: July 2020

Sources

METAL PANELS: MG McGrath

CURTAIN WALL: Tristar Glass

RAINSCREEN: Mataverde, Novawood (climate shield)

BUILT-UP ROOFING: FiberTite

DOORS: Oldcastle BuildingEnvelope (entrances), Cline (metal doors), Overhead Door (special doors)

HARDWARE: Von Duprin (locksets, exit devices), Schlage (locksets), LCN (closers), Hager (pulls), ASSA ABLOY, Ives (special hardware)



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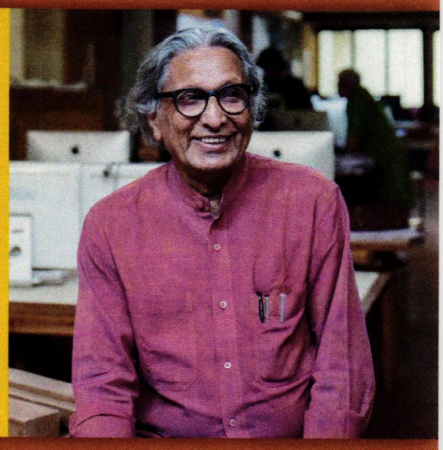
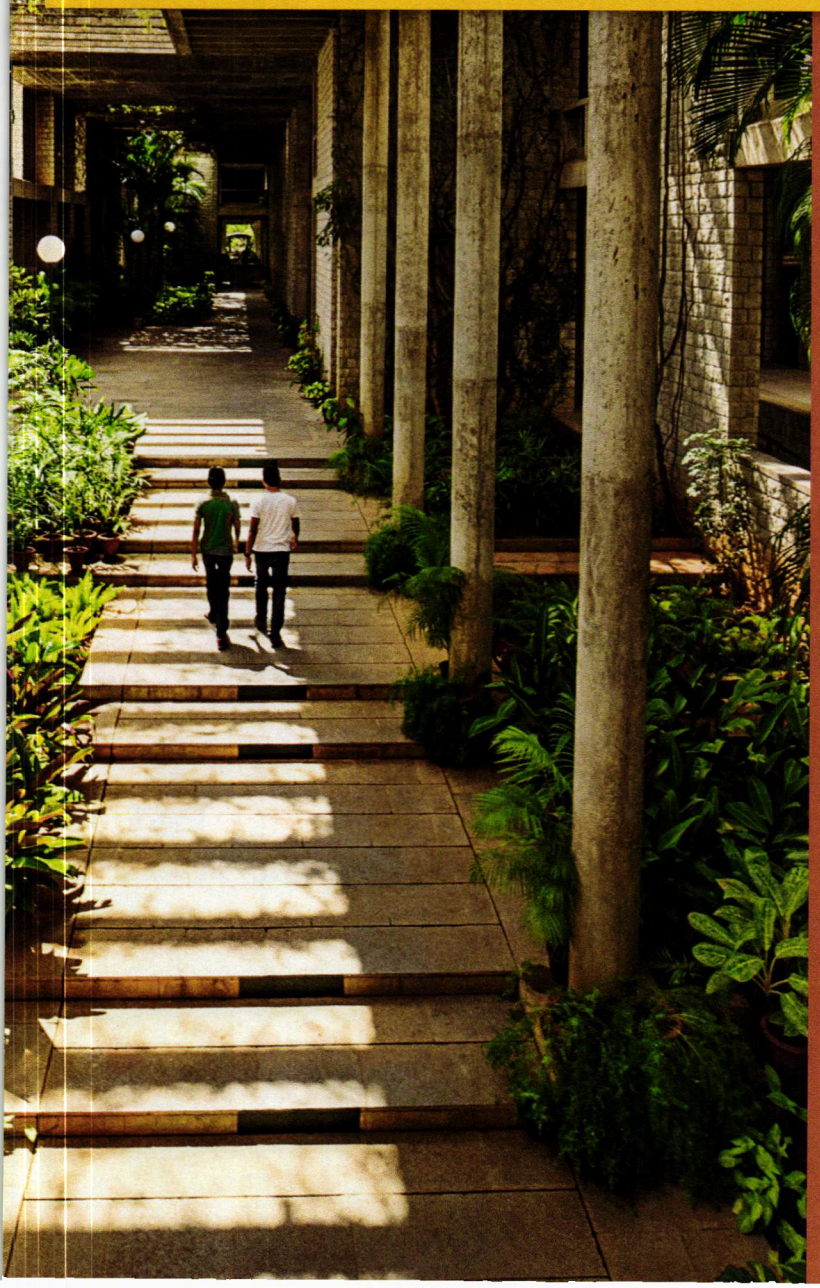
BALKRISHNA DOSHI

ARCHITECTURE FOR THE PEOPLE





Balkrishna Doshi: Architecture for the People is the first exhibition in the U.S. devoted to visionary Indian architect and 2018 Pritzker Prize recipient Balkrishna Doshi. A disciple of Le Corbusier and Louis Kahn, Doshi adapted the principles and forms of Modernism into his work with local cultures and traditions. From low-cost housing and academic institutions to urban planning projects, Doshi both humanized Western Modernism and redefined Indian architecture. *Architecture for the People* provides a rare opportunity to examine more than 20 of Doshi's projects and their enduring impact on Indian architecture and society at large.

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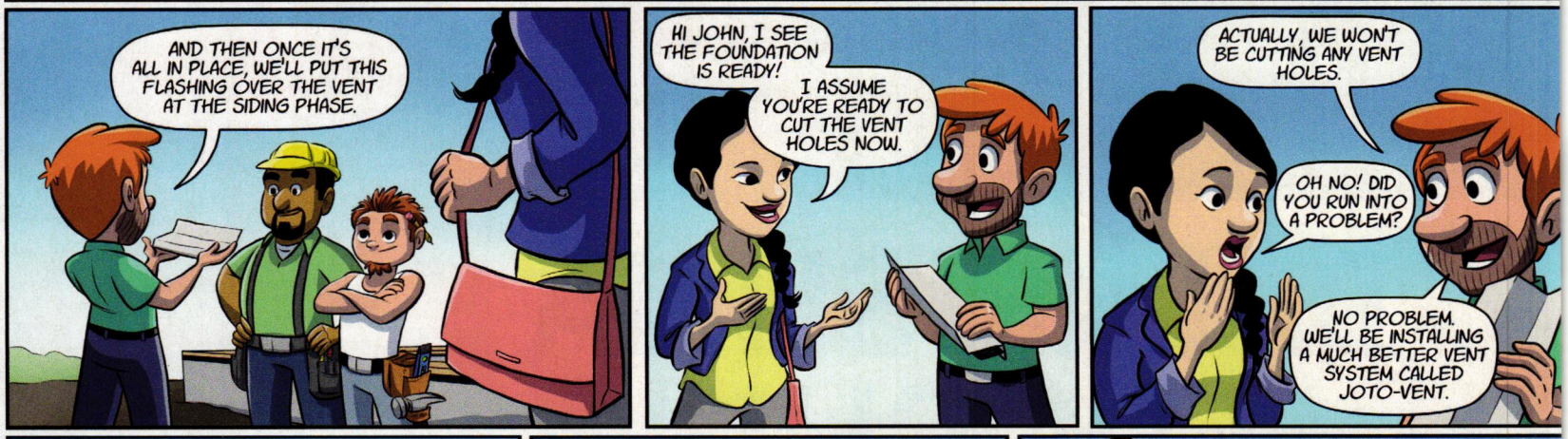
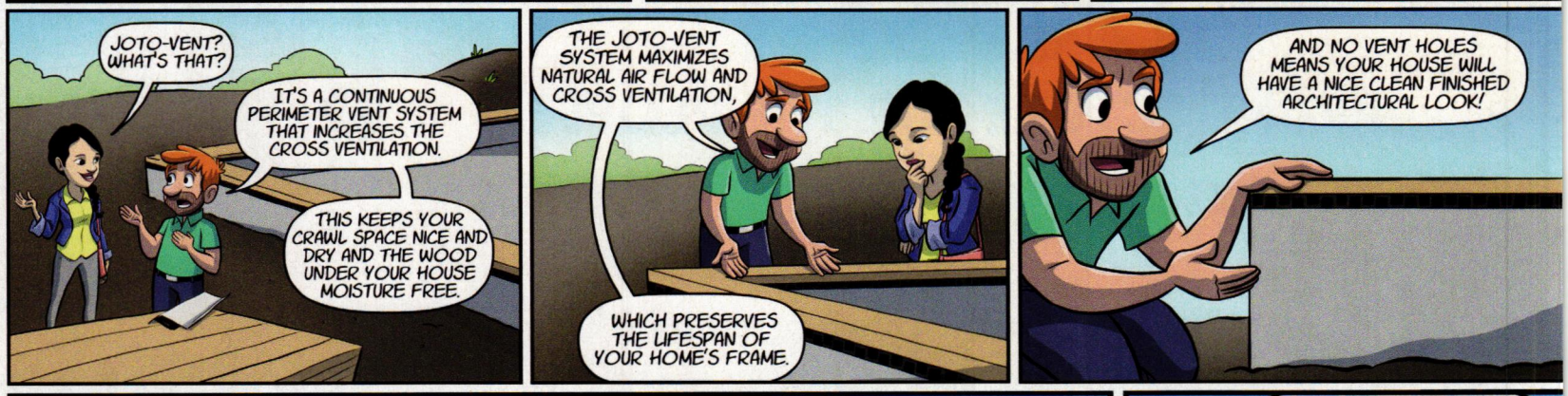
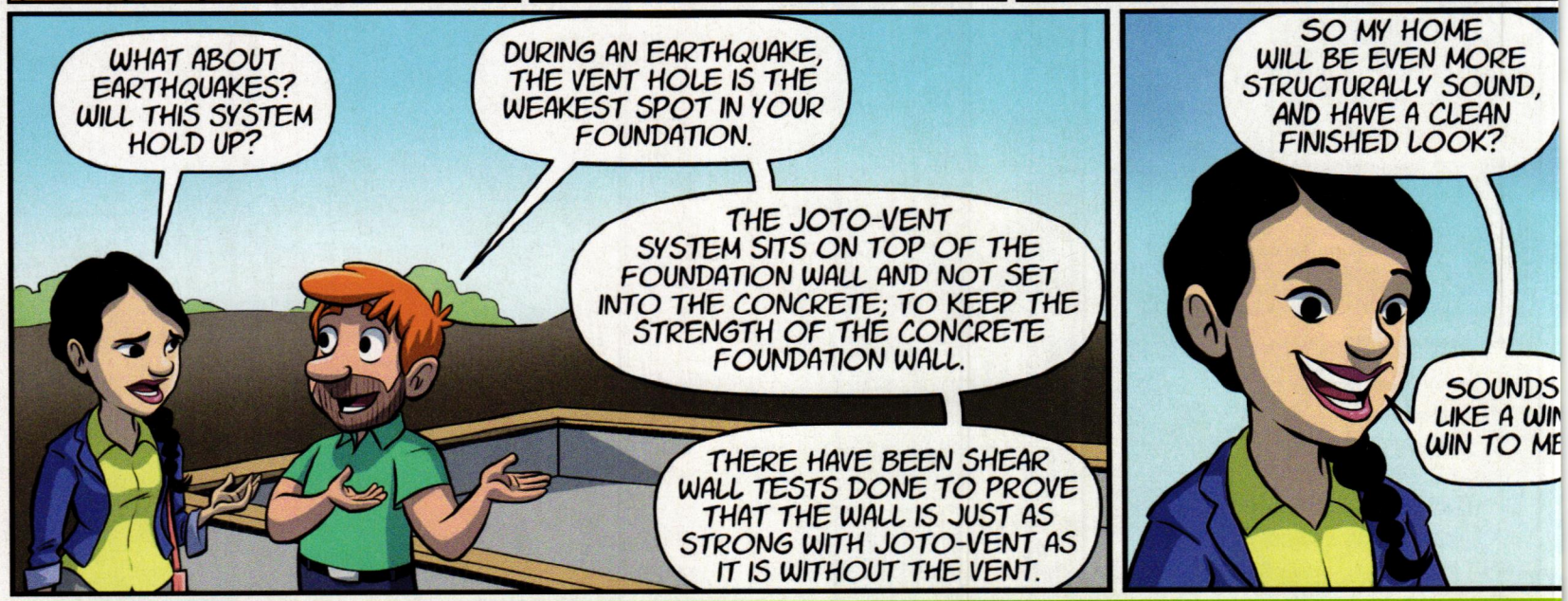
Continuous Perimeter Foundation Vents







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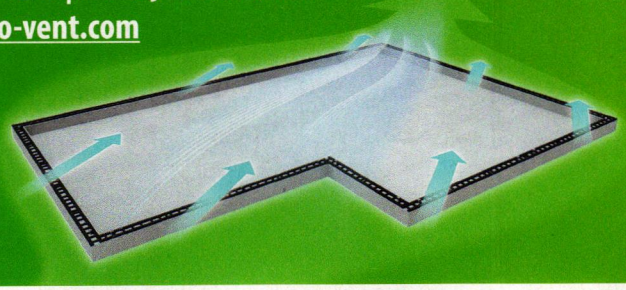

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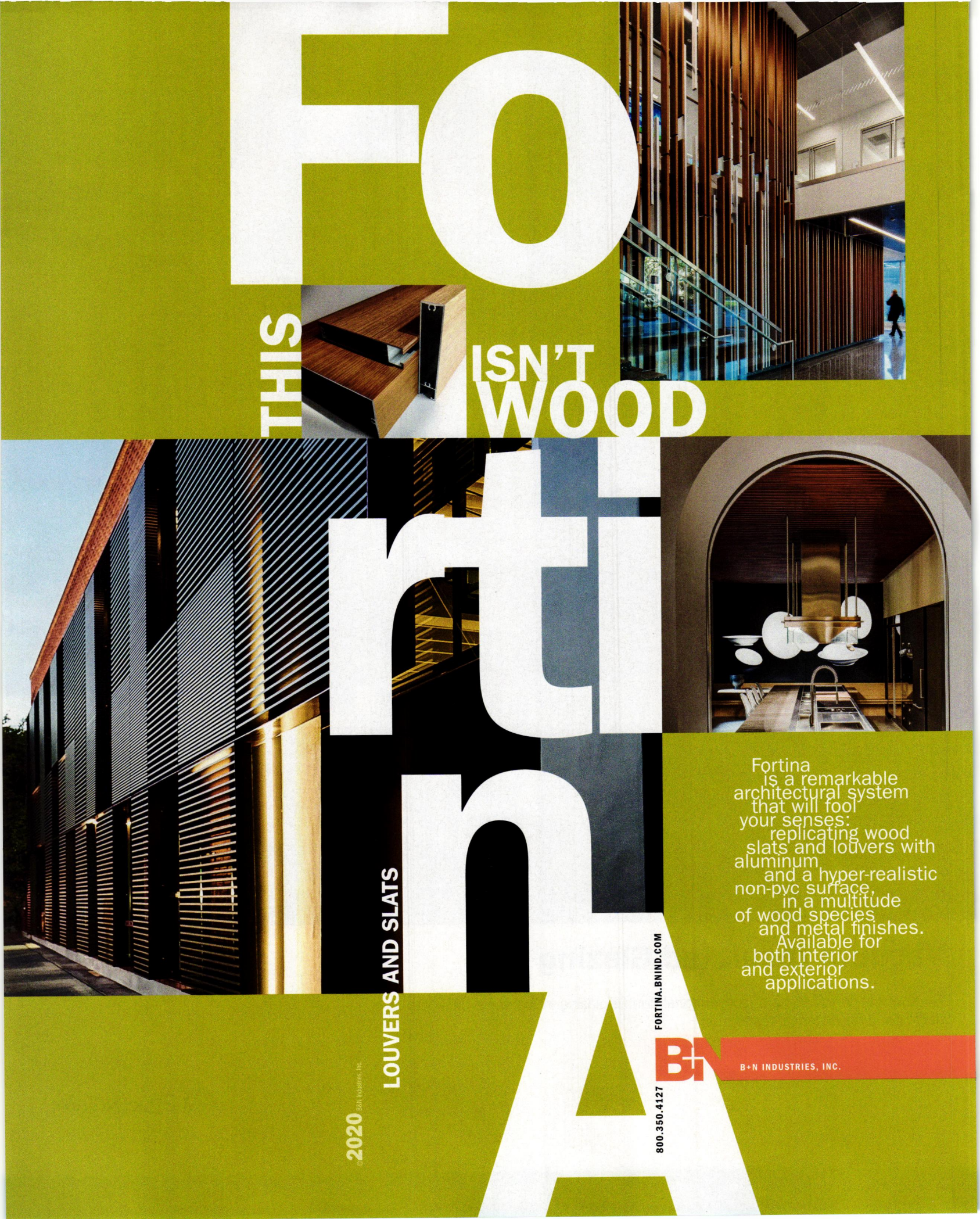
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BLACK VOICES IN ARCHITECTURE

In the months since the police killing of George Floyd, protests and demonstrations across the United States and beyond have called for an end to racial injustice—and led to difficult, necessary conversations about the insidious ways that racism has unfairly shaped our world. Architecture and the built environment are essential to this reckoning. Just 2 percent of all registered practitioners in the U.S. are Black, a figure unchanged for decades.

In the following pages, RECORD interrogates the ways that racism is embedded in the profession—from the whiteness of our Eurocentric history and built environment to education, licensure, and practice. We examine how architectural offices are responding to this time by looking for ways to diversify their staffs, listening to the concerns of minority designers, creating clear pathways to advancement and leadership—and trying to make basic changes to firm culture. We also shine a spotlight on a cross section of Black architects, exploring their work and career paths, and amplifying their voices.

For all of us in the world of architecture who believe we need to make changes, the conversation is just beginning.

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94 Dina Griffin, Interactive Design Architects

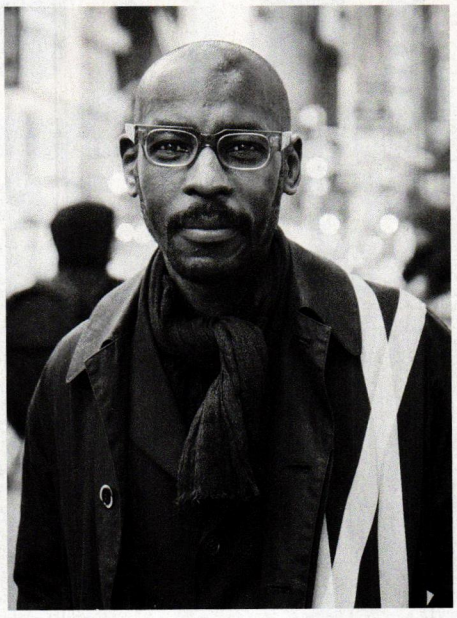
96 R. Steven Lewis, ZGF

Whiteness in Architecture

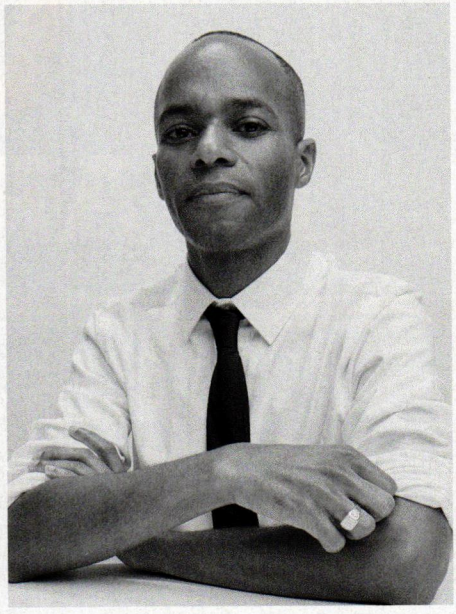
Three architects discuss the roots of racism in history, practice, and the built environment.



Mabel O. Wilson



Mario Gooden



Justin Garrett Moore

RECORD *convened a panel of three architects—Mabel O. Wilson, Mario Gooden, and Justin Garrett Moore—to explore the whiteness embedded in the built environment and the profession. Wilson is a Professor at the Columbia University School of Architecture, Planning and Preservation whose field of scholarship is architecture and race. She also has a design practice, Studio &, and is part of the team that designed the new Memorial to Enslaved Laborers at the University of Virginia (*RECORD, *August 2020). At Columbia, she codirects the Global Africa Lab with Mario Gooden, a professor of practice at Columbia and founding principal of the firm Huff + Gooden. His work engages the cultural landscape and the intersections of architecture, race, gender, sexuality, and technology. Moore, executive director of the New York City Public Design Commission, has extensive experience in urban design and planning, fostering accessibility, diversity, and inclusion in the built environment. An adjunct faculty member at Columbia, he is cofounder of Urban Patch, which supports the equitable revitalization of communities.*

Wilson, Gooden, and Moore spoke together with RECORD *editor in chief Cathleen McGuigan. The following is condensed from a fuller conversation to be found at architecturalrecord.com.*

Cathleen McGuigan: I want to begin by asking how racism has operated in and shaped architecture, both as a practice and in the environment that architecture has built.

Mabel Wilson: The idea is, typically, to be inclusive and to bring people into educational institutions and disciplines, but the challenge is that those spaces, those structures, are already racialized. And to understand that and start to talk about whiteness and white supremacy—whether the oppressor is a human or a system—is really vital for change. As people of color, we can't just continually describe what we're experiencing without everyone understanding the origins.

Justin Moore: The predominantly white, male profession needs to focus on this. What happens typically is, "Okay, we need to hear from people of color, we need to learn and we need to listen," and it becomes like a hamster wheel. Black people are tired of having that conversation over and over again—but this pivot that Mabel has introduced is having the conversation about whiteness. It's so important—it really needs to be the arrow to the heart at this critical time.

Mario Gooden: Perhaps it can be uncomfortable for those in the profession to put the mirror on themselves. We as Black architects understand those systems. But it's time for you, the profession, to really come to terms with it and own it—and then let's figure out how to dismantle it.

Mabel, the subject of whiteness in the built environment is a big part of your research and scholarship. Can you start to enlighten us?

Wilson: How does racism operate, and not just anti-Black racism, but also whiteness and white supremacy? Fundamentally, it is the power relations that the concept of race enables, in a range of practices and disciplinary

PHOTOGRAPHY: © DARIO CALMESE (LEFT); SHADRACH (MIDDLE); COURTESY JUSTIN GARRETT MOORE

frames. In my 30 years as an academic, and also having worked in practice, I have come to really understand how much whiteness permeates what we do, from how we are educated in architecture to, really, what architecture is. I see architecture as the European art of building that Alberti described, a European way of understanding building.

Brunelleschi, you know, designed his famous dome not long before Christopher Columbus sailed, right? So at a moment of colonial encounter and the rise of Renaissance humanism comes this sense of the European understanding himself in relationships to others. So race has to be conceptualized. It is not natural but a construct. Yet it has real implications in terms of how architecture is created within those relationships of the nation state and the bodies of knowledge of philosophy, technology, racial science—and they all have their own impacts on the discipline of architecture and on the discipline of architectural history. In the West, the concept of the past is riddled with racial assumptions about who was civilized, who was progressive and modern and who was primitive, who was ahistorical and left behind.

And when we have to read Adolf Loos on ornament and crime in school, it is a racial narrative of white European cultural superiority, of what it means to be civilized and modern, but it's rarely taught that way at all. It's taught as a polemic to remove ornament and advance beyond folk culture, so that it's about "progress." Thus it's important to recognize how deeply race is embedded in the discipline, and also in civil society—all the things that shape us as beings, our ontology and epistemology in the ways we know the world.

Gooden: Whiteness is at the heart of architecture as a discipline. People tend to think of white supremacy as being about people in white hoods. But white supremacy is a hierarchical system of patterns and practices that continuously privileges the white subject and consistently disadvantages the Black body and people of color. This really goes back to the foundation of architectural theory rooted in Vitruvius's ideal man—a white male European subject—that is formulated and inscribed in architecture in Vitruvius's Ten Books on Architecture. So the discipline of architecture as a system of orders and rules that we follow is all predicated upon that ideal subject.

And then when we come to Modernism, which assumes what I call the myth of the universal subject, we are still dealing with white male European subjectivity. This stems from Hegel, who wrote in his *Philosophy of History* that the Negro lacks subjectivity, consciousness, and had nothing to provide to civilization. Hence from the Enlightenment to today, European epistemology is based upon this white subject that we continue to perpetuate in architecture schools. Even for schools that claim the mantle of experimentation, the conditions of white supremacy continue within the confines of the discipline. And discipline means to follow a set of rules, a set of orders, or else you are subjected to retribution, punishment, or the assessment that your work doesn't belong.

So other bodies are excluded—Black bodies, brown bodies, people of color—if they aren't following those orders, and that they are somehow in need of bringing back into the discipline. We've heard a lot in the last 10 to 15 years about the re-disciplining of architecture and that architecture should not be engaged in cultural critique or critical theory. Those voices made the claim that architecture needed to be brought back from its margins. This was and is really a kind of conservative backlash and desire for reinstating the privileged white male point of view—away from, for example, discussions from the late 1970s through the '90s of architecture and gender, architecture and sexuality, and architecture and race.

In my 30 years as an academic, and also having worked in practice, I have come to really understand how much whiteness permeates what we do, from how we are educated in architecture to, really, what architecture is.

–Mabel O. Wilson

Wilson: Can I just add what I always describe as the boys jumped into cyberspace? With people adopting the computer and paperless architecture in the '90s—and the guys with their algorithms. In a way, with the adaptation of parametrics and fabrication, there was a recuperation of masculinity. And that jump flattened any understanding of what became known as identity politics—race, feminism, and sexuality—in architecture.

Mabel and Mario, please talk about the Global Africa Lab that you codirect at Columbia University, where you break with that European-centric model.

Gooden: When we started Global Africa Lab about seven years ago, it was really looking at the world in terms of architecture and urbanism through the lens of what had been excluded from architecture—and that is the African subject or the Negro subject that Hegel had excluded.

The lab is not just about the African continent, it's about the diaspora. Our work has been on the continent, yes, but it's also been in Detroit, in other places in the States, in South America, and in Europe. The majority of the world exists in the Global South. Architecture and building had been going on there for centuries before Europe. So the question is, what can we learn from those places that have not been brought into the discourse of architecture?

Wilson: And while those places in the diaspora weren't brought into the discourse of architecture, they were still necessary for architecture's imagination. Africa is central to the creation of whiteness and the concept of Europe through constant scientific, cultural, and historical comparison with those colonized in Asia, Africa, and the New World. There was even the incorporation of and desire for African motifs in Modernism—masks and textiles—whose legacy has been studied more thoroughly in art history, for example. Part of what Global Africa Lab is trying to examine is that modernity is not possible without the African continent. African people, resources, land, and culture are how the modern is imagined and how the project of the transatlantic slave trade literally builds the wealth of capitalism as racial capitalism.

You cannot have an industrial revolution in England without the mills' receiving cotton from India and Jamaica. The lab is trying to foreground that history but also looking at what is happening in the urban spaces of Rio de Janeiro, Detroit, Dakar, and Cape Town.

Justin, you work extensively in urban design and planning— how have our cities come to be so imbued with racism?

Moore: The conversation about white-supremacy racism is important, but we equal-

ly need to put the focus on the racist—not only the *ism* or the system. One of the ways that architecture and the built environment work is by distancing and "othering." We talk all the time about the policies—whether it's redlining or urban renewal, or the disciplines being regulated—that then become abstract systems of racism. But we don't spend enough time talking about the racist white people that built those systems. It's still acceptable for individuals to not take responsibility for that. So, was Robert Moses a complicated figure? Was Thomas Jefferson a complicated figure? That conversation is not had enough.

There is a gap between being racist and there being racism. Very often we see people operating in ways that are racist but they would never self-identify to say, "I'm being racist." They'll say that "racism is the system that I'm operating within. That's not me, that's not my action." That kind of reflection doesn't happen.

That's why we see difference and racism persist in systems and structures like policing. And when we discuss urbanism, we see the same things, but scaled up and exaggerated, into operations that radically are transforming and shaping space. We get the collective, environmental version of "othering." The white suburb versus the inner city, all of these dynamics are just so ingrained and embedded. And through language, through practice, through culture, all of that racism is acceptable—regardless of the very tangible, real, visible, negative impacts. What is it about white people or people who are in power or have agency that allows that?

To shape space or to control capital or to create conditions—what we're doing as designers constantly is manipulating how space and people operate. That's our job. And architecture is very smart about new ways to exploit and categorize people.

What specifically have been your own encounters with racism in architecture?

Moore: For me, the most violent or vile example is erasure. Think of "blight" elimination or urban renewal. There's a pipeline problem, yes—not enough Black kids have exposure to architecture and get in the field. That is true. But once you are in this field, the understanding of your culture, your kind of knowledge, your value is just completely erased. It puts one in this very difficult space, emotionally and mentally, where it's very challenging to find power, a base and a platform for your work, because, over generations, if not centuries, there has been this complete destruction of everything that is connected to you. I have many, many different versions of erasure, but I just want to talk through a couple of them to understand how wide-scale and systemic it is.

In Indianapolis, where I grew up, there's this really wonderful project called Fall Creek Homes, done by an organization called Flanner House. In the '30s and '40s, they did a lot of social-service work in the Black community. Different supporting organizations, such as the Quakers, developed an incredible community-redevelopment plan that included parks and flood-mitigation design for the neighborhood.

And it included self-help housing construction, with Black leadership and Black architects—Hilyard Robinson was the architect—and with a complete conception generated by how these Black people in this community chose to make urban space. It's a great story. I did seven years of education in architecture and design at presumably elite schools. And I learned a lot about what white men think about cities and what white men think about Black people in cities, and about what white men did to Black people in cities and what Black people couldn't do in cities.

The majority of the world exists in the Global South. Architecture and building had been going on there for centuries before Europe. So the question is, what can we learn from those places that have not been brought into the discourse of architecture?

–Mario Gooden

And every time as a student I would challenge and push my knowledge of Fall Creek, I would get, "Oh, that's interesting, but let's talk about this instead." That literally happened to me over and over again in my career. But this was my history—I found out later in life that my grandfather was one of the people who did that work—and yet it was absent, erased. I get in trouble for saying this, but the Black people that we learned about were typically sort of contorted into being European, or Modernist, or being near-white, frankly. Their work was considered valuable.

A second form of erasure is, when you're in offices, you are constantly erased. Because of all the dynamics and systems at play, very often Black people are in some form of disadvantage. It's just hard, because you're doing your work, and you're bringing your value and knowledge, but it's not seen as valuable. It may not be reflecting things that the dominant culture cares about and can relate to. What you're presenting is simply not right—it happens in school, it happens when you go into an office.

Gooden: This also operates in very subtle ways. To be Black and in architecture, you cannot be mediocre: to be visible, you have to be excellent. And you have to be excellent at every second of every moment of the day. This is a very subtle but heavy burden that we, and our Black students, are carrying every day. When I grew up, this is one of the first things my mother taught me. I know Justin's parents probably told him the same, as Mabel's did as well, that you have to be twice as good. Yet, sometimes, even with excellence, you can still be invisible.

How can the profession work toward an anti-racist position? What has to happen?

Wilson: When Obama became President, we as a nation claimed that we were post-racial, but we clearly are not. And that's a very difficult thing to comprehend because, if race structures the world for everyone and not just for Black people, the trick that racism does is that it makes itself transparent—especially to those who can claim "the wages of whiteness," David Roediger's term for white privilege, and cannot perceive how race operates or that they are racialized too.

And people don't like to bring up race, because it makes them uncomfortable and you, quite frankly, don't like or want to shame people. But we all have to be accountable, so when someone is erased, someone else has done the erasure. How then should someone be accountable for those actions and the institutional frameworks that allow those actions to occur, to be validated?

I've heard people say, "Why should I be accountable for the sins of my father? Slavery, Jim Crow is in the past." But I would say that, if you're white, you benefit from that

history. You have opportunities, advantages, and wealth. And even if you're poor and white, according to statistics, you will still possess more wealth than most Black people. This historical difference in wealth is what allows white Americans to live well and then pass that wealth on to the next generation. And at the other end of those benefits and privileges, we find the historical legacy of deprivation and struggle, when you don't have those opportunities and will not inherit wealth because of slavery and Jim Crow segregation. We have to look at who benefits and who struggles.

We need a holistic accounting of the impact of race in the U.S. I think there are ways to be critically distanced in order to begin to understand and articulate that legacy—but as Black people, we can't be the only ones to do that work. It has to be done by those who benefit from whiteness. That is the work that has yet to be done.

Gooden: The profession is in crisis, and perhaps it has been for a very long time. It's in crisis not only because it has been complicit with the systems that we've been talking about, but also because it's given away its agency to capital in terms of developers and in terms of how the city gets formed. Just take New York City, for example, in which the architects have ceded their influence to the developers of Hudson Yards, or to the super-rich commoditization of architecture along Billionaires Row on 57th Street.

The other truth is that it's very difficult to enter the profession unless you come from money. But because of structural racism and white supremacy, Blacks did not have the ability to acquire wealth through homeownership, for example, because of redlining. Therefore there was very little to pass from one generation to the next, and the wealth disparities between Blacks and whites are enormous. So, unless you're white and you have a lot of money, it's very difficult to enter the profession.

Hence, how do you support other modes of practice and recognize those as being just as important to the built environment? Practitioners may not be working for developers, but they are working in, let's say, cultural practice, trying to formulate different ways of questioning the discipline and making buildings in the public realm. Furthermore, professional organizations have to question themselves, and by that I mean the AIA, for example, really needs to question what it is that it's supporting and what it is that it's propping up.

Moore: It is an everyday, common, and accepted practice that you could be paid well, with a lot of public money, to have white people in a room making decisions about what happens to Black people. I think that is unethical and the discipline has to revise, review, evaluate all of its codes of ethics and how it operates to enforce those unethical practices in the built environment, especially as they connect to people, our society, and the work that needs to be done.

Wilson: Architecture in the West has always been allied with power and wealth, whether it's the monarchy, the state, or private capital, and the church. As architects how we work is speculative. We're always thinking about the future, which is why architecture allied easily with modernity's concept of progress. Through our drawings we project the future, and that space of projection allows us to imagine that what we're doing is always morally good and will make the world better. But if that was the case, then how do you explain "poor doors"—separate entrances for affordable-housing units in high-rise development buildings in New York City? Or a past failure like Pruitt-Igoe housing in St. Louis? Buildings are erected, but there is no social investment—no financial resources for maintenance. You end up with constant structural neglect and wholesale degradation of Black life in America.

To shape space or to control capital or to create conditions—what we're doing as designers constantly is manipulating how space and people operate. That's our job. And architecture is very smart about new ways to exploit and categorize people.

–Justin Garrett Moore

Gooden: We as a profession now also have to recognize the full humanity of who we're designing for—and, within the schools and within the profession, we can't proclaim that we are champions of the environment, designing for sustainability or for climate change, and not understand the relationships between race and climate change.

How do we get young people of color more interested in the profession so that people who are designing our world reflect our diverse society?

Moore: I have a positive story about how I got into architecture. I went to a probably 95 percent Black high school in Indianapolis. At the time, the school was getting a new gymnasium, and the MWBE contractor, Jimmy Beard, said to the architects on the project, "In order for me to work on this, you're going to hire students from this school to work in your office." So, as a 15-year-old Black kid, and as Ferguson-like protests against police violence flared in my neighborhood, I started working 40 hours a week as a summer intern for Jim Schellinger at CSO Architects in Indianapolis.

I think they paid me something like $8 an hour—probably twice the minimum wage at the time. And it was great to have that early exposure, to see what people do, and to make some money. I got behind the curtain of the wizard of Oz—and saw that what these people were doing was not magic or completely exceptional. I saw and understood that I could do it too. Providing opportunities for young people does not cost a lot except for a little money and making some time to care. This is something that a good number of the firms that read your magazine can do tomorrow.

Wilson: But in practice, and in academic institutions, the conversation around whiteness has never happened. And until that does, real change can't be instituted, because you can't understand how race operates to produce inequalities. You're just trying to place the bandaid on something that's a far deeper social wound and problem.

Moore: The final thing I would say circles back to the question of personal responsibility: that people need to do more than only say what can I do, or join a group, or go to a meeting or march. It needs to expand to the personal reflection, conversation, and evaluation that people need to engage around the issues of whiteness and anti-Black racism, and to really try to challenge themselves and each other. It's uncomfortable and it's going to take time, energy, and resources. This work shouldn't only be happening with allies or only happening with Black and brown people. It needs to happen at a much broader scale and with more people being willing to do the work. ■

Firms Face Racism

Practices are starting to grapple with discrimination, but the hard conversations—and fundamental changes—are just beginning.

BY SARAH AMELAR

THERE ARE pivotal moments in history that we look back on in terms of "before and after." The tragic police killing of George Floyd feels like a turning point of that magnitude—though we don't know yet how profoundly transformative its impact will be. For our nation's architectural community—with African Americans comprising only 2 percent of its registered professionals—the broader response has underscored the pressing need to confront inherent racism in our own industry. In the aftermath of Floyd's death, many firms and AIA groups expressed solidarity with Back Lives Matter and vowed to make changes. What has evolved since then? It's not too soon to ask what substantive, or concrete, measures are under way.

An essential starting place for many offices has been the unprecedented engagement in difficult conversations about racism and racial bias. "For seven years, as the global diversity director at Perkins and Will (P+W), I've guided our strategy and philosophy for advancing a more diverse and inclusive culture for ourselves and for the profession more broadly—but the one part that was always too difficult for people to discuss was race," says Gabrielle Bullock, a firm principal (and one of only 478 registered, Black, female architects in the U.S.). But now that dialogue has cracked wide open.

Company-wide virtual meetings have brought together many of the 6,000 coworkers at Gensler, 1,684 at P+W, 1,200 at SOM, 411 at Kohn Pederson Fox (KPF), 185 at Ennead, and so forth. Ongoing discussions—taking place remotely—have spanned from observations and questions to expressions of anger or pain from Black employees regarding experiences of discrimination and bias in their lives. And there's been much focus on the pervasive nature of white privilege. "People have shared very personal stories, and I've heard white colleagues respond: 'Oh, I never knew that—I had no idea.' For a lot of people, it's been an education,' says Shepley Bulfinch president/CEO Carole Wedge, also chair of the AIA's Large Firm Round Table (LFRT). More informal sessions and private, even anonymous, one-on-one talks have spun off from the big forums (which have sometimes engaged outside facilitators). "Safe space"—a "no-judgment" environment, where anyone can speak without risk of repercussion—has been crucial.



SOM held a week-long externship, pre-pandemic, in its Chicago office, with a Drury University student (above, second from left) and a group of the firm's urban designers.

But before many of the forums took shape, across the country, something else critical happened: grassroots activism by predominantly young employees emerged and prompted change. At SOM, that catalyst was an impassioned call-to-action letter, dated June 3, from the firm's Black/indigenous/people of color (BIPOC) community, in alliance with the National Organization of Minority Architects (NOMA).

SOM's directors, who had begun discussing the national uproar among themselves, embraced the BIPOC appeal. At KPF, a similarly youthful rank-and-file campaign drew support from the highest levels, sparking the founding of KPF Public, a collaborative within the firm, seeking diversity,

equity, and inclusion (DEI), both internally and through outreach—to include firm-wide education about racial injustice; expanded efforts to increase diversity and opportunity for people of color at KPF and across the industry; and the active pursuit of projects that contribute to more equitable cities. "The momentum for change is coming from the bottom up, but, to be sustainable, it has to be supported by leadership and established as core values," says Bullock. "What feels different from the past—both inside and outside our profession—is that it's not just Black and brown people talking about systemic racism. It's everyone."

Cultural upheaval in the midst of a global pandemic may have played a role. "Covid seems to have peeled back a layer, making us all vulnerable," observes Ennead partner Molly McGowan. "One benefit of having to connect on virtual platforms may be the comfort, almost fearlessness, young people have with speaking out on screens—and now Covid has opened up frank conversations among other generations as well." As FXCollaborative (FXC) HR director Shannon Rodriguez points out, the profession's stark reckoning "with MeToo, not so long ago, gave us all experience with uncomfortable conversations—and taught us a lot about safe space."

While most practices interviewed for this story reported percentages of Black architects/designers exceeding the national statistic, their figures hover in the single digits, failing to reflect the full 13.4 percent of our nation's African American population. Notable exceptions were Moody Nolan, the nation's largest Black-owned practice (page 88), where African Americans comprise nearly 20 percent of its architectural/design staff, and—at the other end of the spectrum—two of the 12 firms approached currently employ no Black architects/designers (information shared regretfully and on condition of anonymity).

The major obstacle, many say, to achieving greater diversity in the profession is the "pipeline" challenge—the shortage of African Americans pursuing careers in architecture and completing the education, training, and licensure (page 87). To begin addressing this early on, outreach to schoolchildren in underserved areas is growing, with more practices joining those already engaged in mentorship programs such as ACE and those spearheaded by NOMA.



The momentum for change is coming from the bottom up, but, to be sustainable, it has to be supported by leadership and established as core values.

—Gabrielle Bullock, Perkins + Will

Among NOMA's many initiatives are paid architectural internships and Project Pipeline camps that teach sixth- through 12th-grade minority students architecture's fundamentals, with a stated mission to "empower [them] to effect change in their communities through design . . . and ultimately create more licensed Black architects." The 2030 Diversity Challenge, a collaboration between NOMA and LFRT, seeks to double the number of registered Black architects to 5,000 in the next decade. In that spirit, many practices have committed to long-term relationships with and active recruitment from architecture schools in historically Black colleges and universities (HBCUs), as well as other programs with largely BIPOC student bodies.

To address the financial burdens of architectural education and registration, some firms have been subsidizing licensing costs. KPF and other practices have also provided tuition assistance to some employees returning to graduate school. Gensler offers a Diversity Scholarship, among other grants; and P+W joined its partner, the late Phil Freelon, in 2016, in founding a fellowship fund at Harvard's Graduate School of Design, and is now developing a similar program for HBCUs. Meanwhile, "the 60 LFRT members have committed to donating [a total of]

To help achieve greater diversity within the profession, NOMA held a career fair at its 2019 conference in Brooklyn. Perkins and Will was among the firms hosting a booth (above).

PHOTOGRAPHY: © SOM (OPPOSITE); COURTESY NOMA



KPF is expanding work on issues of diversity and social justice, and carrying on existing efforts, such as hosting ACE Mentoring events, here in early 2020 (above).

$50,000 annually for five years to build the NOMA Scholars Program," says NOMA president Kimberly Dowdell, who has created frameworks for smaller firms to contribute as well. Her President's Circle Corporate Membership initiative, for instance, beginning at the $1,000 level, "buys" donors an introductory number of hours with a DEI consultant—and, the more they give, the more hours they get.

Within practices themselves, firm culture has been undergoing scrutiny: What steps can be taken to ensure all minorities feel they belong and are not merely tokens? A number of offices are planning to enhance training and mentorship of BIPOC staff and create clear, open pathways to advancement and achievement of leadership roles. There's also been renewed commitment to supporting diversity more broadly (which, in many practices, already includes LGBTQ, women's, NOMA, and Latino alliances). Ennead, for example, recently added Juneteenth to its official day-off holidays, and SOM plans to honor such annual milestones as the anniversary of Whitney M. Young's historic address to the 1968 AIA convention. Firms are also revising internal codes of ethics; making bias-awareness training mandatory; and establishing objective processes, criteria, and goals for monitoring progress.

The 2030 Diversity Challenge, a collaboration between NOMA and the Large Firm Roundtable, seeks to double the number of registered Black architects to 5,000 in the next decade.

While large firms might have deeper pockets, more modest-sized ones have also stepped forward, as did FXC in cosponsoring a Black Lives Matter street mural in Lower Manhattan, contributing to minority organizations, and matching employees' own donations. No matter what a firm's means may be, says Pei Cobb Freed partner Michael Bischoff, "it's important to come together to harness the power of the collective."

Clients and the character of work pursued have been under reconsideration as well—with increasing emphasis on projects with social purpose, including pro bono work. KPF, for example, joined an effort to assist, through design and logistical interventions, in the recovery of a marginalized part of Brooklyn's Bedford-Stuyvesant neighborhood, a zone hard hit by Covid. "It has such urgency, you can feel the energy in the office—people really want to be involved," says KPF president James von Klemperer. "Now the goal is to make such initiatives part of our everyday work." Meanwhile, says Effenus Henderson, a Seattle-based consultant who is developing global standards for DEI in architecture, as well as other industries, "clients—particularly governments or universities—are increasingly demanding a level of diversity, equity, and inclusion from their architects. It's being built into the bidding process."

This summer, several practices drafted action plans—some as internal working documents, others as more public statements—including Gensler's five-point "Strategy to Fight Racism" and SOM's 34-point commitment. Though firm-specific, the manifestos share similar goals. "Ultimately, the change must be embedded in our industry, the way environmental sustainability has been," says Wedge. "It has to be a total, integral, and long-term commitment."

In the hard work ahead, the ongoing conversation will need to produce sustained action and a true sea change. Many remain, as Bullock describes herself, "pessimistically optimistic . . . but hopeful." Recently, reflecting on the words of late civil rights leader John Lewis, she said, "Two of his sayings really stuck with me: 'Find a way to get in the way' and 'Get into good trouble.' In other words, we can't just sit on our laurels, it's not someone else's problem to solve—it's incumbent on all of us. And it's going to be messy, and it's going to be difficult. But, if not now, when?" ■

PHOTOGRAPHY: © JOHN CHU/KPF

A Road Too Far

Is the slog to licensure impeding diversity in architecture?

BY JAMES S. RUSSELL, FAIA

AS AMERICANS have taken action to try to end racism and institutionalized biases, the spotlight inevitably turned to architecture, which has had a poor record of advancing women and people of color. That quest for equity has resurrected a recurring debate over the elaborate, years-long licensure process, which Monica Ponce de León, dean of the School of Architecture at Princeton University and principal of her firm MPdL Studio, characterizes as "not a path but a series of roadblocks."

The typical road to registration begins with a four-year undergraduate degree and two-year master's degree in architecture (or a five-year Bachelor of Science in architecture), then 3,000 hours in the Architectural Experience Program (AXP), which takes four years, on average, says the National Council of Architectural Registration Boards (NCARB). While working, candidates also must pass the six rigorous tests of the Architect Registration Exam (ARE). That takes a mean of 2.5 years, for a total slog of 12.7 years.

Ponce de León says that both the work-experience requirement and the ARE "perpetuate discrimination and inequity."

Recently licensed architect Imani Day is an associate at Gensler's Detroit office, where she works on community-oriented design projects and teaches architecture at the University of Detroit Mercy. She is the 463rd Black woman to become a registered architect—ever. Although she has benefitted from abundant opportunities at Gensler, "many of my peers moved away from architecture," she says, citing low pay and lack of mentorship to thrive in those other firms. Her anecdotal experience is consistent with NCARB data, showing the number of women architecture graduates declining steadily through each stage of the process. Latinx, Black, and Asian candidates fell away in significant numbers as well. People of color were 31 percent more likely to stop pursuing licensure than white candidates.

Day found the ARE especially challenging. Each test costs $235, but retakes and study aids push the cost much higher. "I was very passionate about getting licensed," says Day, who, like many candidates, failed several tests before passing them all. (Only one of the six tests has a pass rate much higher than 50 percent.) Even though her firm helped offset some of the costs associated with study materials, bootcamp programs, and testing, she estimates it took upward of $6,000 to pass the ARE.

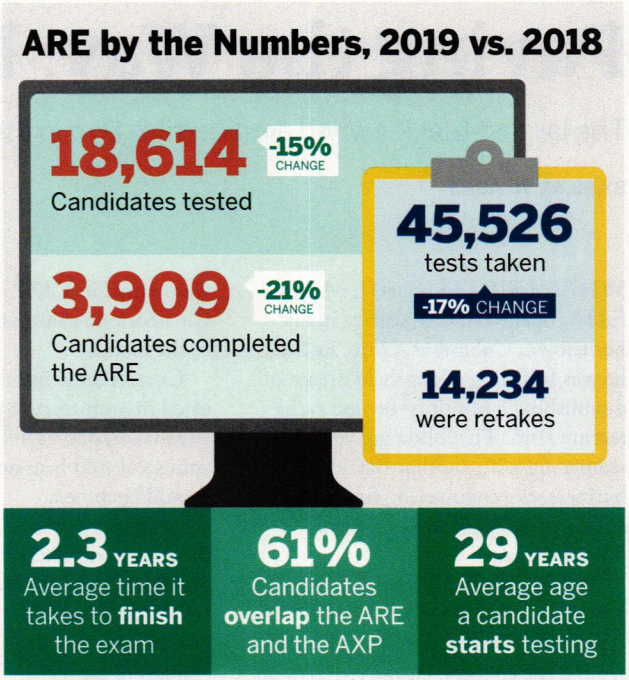
In a joint survey conducted by NCARB and the National Organization of Minority Architects, no more than 28 percent of respondents (across demographic groups) reported feeling confident they could afford the ARE, with Black and Latinx candidates expressing the greatest cost sensitivities. The survey also found that high numbers of African American candidates had witnessed or experienced discrimination at work.

The AIA supports reducing the burdens of licensure, "but we need a standard that says an architect has arrived at a basis of knowledge," says executive vice president and CEO Robert Ivy. He would like to see the cost of education reduced and applauds NCARB's new Integrated Path to Architectural Licensing (IPAL) program. For instance, some accredited schools offer evening classes, allowing students to study at night and work at firms during the day so that they can satisfy AXP requirements. Students also take the ARE while in school, so that they can graduate with most or all of their license requirements complete.

Wentworth Institute of Technology, Boston, is the latest institution to offer IPAL. Most students should be able to complete the Institute's five-year professional degree as well as licensure exams and work requirement in six years, says architecture department chair Mark Mulligan. With fewer years in school, income earned, and Institute support for testing, "it makes a difference when you can begin your career without huge debt." He is excited about IPAL's possibilities.

Ponce de León argues that "architecture should follow the model of the legal profession and eliminate practical training from the process." While NCARB CEO Michael Armstrong says that the "difficulty, time, and expense" of licensure in architecture is similar to other professions, this does not appear to be the case. A professional engineer license can be obtained after a bachelor's degree, two tests, and work under a licensed engineer for at least four years, and the bar exam is a series of tests taken over two days, with no work-experience requirement. "Law wants you to join the profession right away," says Casius Pealer, who has degrees in both architecture and a law, and who directs the Real Estate Development program at Tulane University. Compared to law, he says, architecture licensure feels akin to a "serf-like process."

Pealer notes that NCARB's imprimatur is becoming less relevant as architects' paths broaden. Social-impact work, for instance, goes beyond rigid definitions of health, safety, and welfare, to develop design, project-development, and citizen-engagement skills that directly contribute to eliminating racism and helping communities thrive. Pealer says many of his Tulane students are more motivated to complete LEED accreditation. If you are deferring preferred career experiences for six or seven years of testing and irrelevant work experience, says Pealer, "it can get absurd." ■



DATA COURTESY NCARB

Paving the Way: Moody Nolan

The largest Black-owned architecture firm in the U.S. is run by a father-son team.

BY PILAR VILADAS

WHEN CURTIS (Curt) J. Moody, FAIA, opened his own office in his hometown, Columbus, Ohio, in 1982, he was fulfilling a long-held dream of establishing a minority-owned architecture firm. The following year, he teamed up with another Black-owned business, the engineering firm Howard E. Nolan & Associates, to create Moody Nolan.

Today, Moody Nolan is the largest Black-owned architecture firm in the U.S., with 230 employees in 11 offices around the country. (It ranked 57th on ARCHITECTURAL RECORD's 2020 list.) The office's demographic mix is 40 percent female and 21 percent Black (nationally, only 2 percent of licensed architects are African American). Its buildings, many of which employ a modern vocabulary with angular forms and an abundant use of daylight, are designed for a client base that includes civic, corporate, education, healthcare, hospitality, residential, and sports and recreation sectors. In January of this year, Curt's son Jonathan Moody, AIA, who joined the firm in 2011, was named its CEO; Curt became chairman of the board.

Curt became interested in architecture as a teenager, but a school counselor told him he should become a draftsman, because there were no Black architects. An athletic coach said that his grades weren't good enough to pursue architecture, but Curt proved him wrong. He studied architecture and city planning at Ohio State University, graduating with a B.S. in 1973. He did not get a master's degree, so he worked for local firms for nine years before taking the licensing exam and going out on his own. His mission was "to do projects the size of the firms I had worked for, as the lead firm, unlike most minority-owned firms," which, he adds, "were criticized for being too dependent on government agencies. We developed a portfolio of private-sector projects."



Jonathan and Curtis Moody now work together at Moody Nolan (above). Legacy House opened in Columbus, Ohio in 2019 (below).



Of course, Jonathan Moody grew up around architecture. He got his B.Arch. at Cornell in 2007, earned a master's degree a year later from UCLA, and then spent three more years in Los Angeles, working at the Yazdani Studio of CannonDesign before joining Moody Nolan. "I let the group know early on that Jonathan would eventually replace me," Curt says. "What I didn't know is that we'd be able to work together, and work on the transition of leadership."

Jonathan notes that today "there are more people who understand the inequities" Black architects have endured. "We're in the conversation, as opposed to being talked about as if we were in the other room." Still, he says, "how far to push is always an issue." Curt bemoans the fact that the percentage of Black architects is still where it was 50 years ago. "We're seeing some increased level of diversity at the client level," he adds, "but we have to consider whether a client will receive us in the professional way we want to be

PHOTOGRAPHY: © SAM BROWN (THIS PAGE, OPPOSITE, MIDDLE); BRAD FEINKNOPF (OPPOSITE, TOP); JASON KEEN (OPPOSITE, BOTTOM).

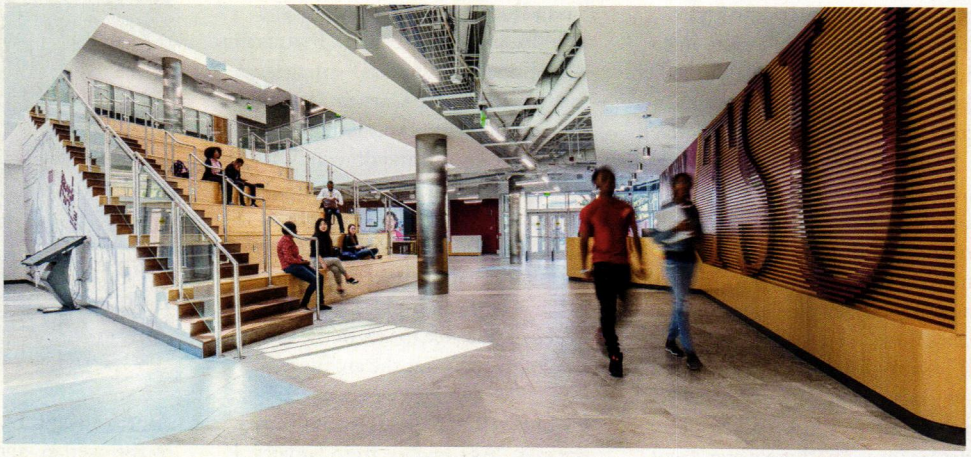


received. Our firm's history helps."

Moody Nolan's emphasis on diversity has paid off. Curt says, "More minority firms have come out of our office than out of any other firm" in Columbus. Jonathan recalls that he and his father, speaking at a National Organization of Minority Architects (NOMA) seminar last January, met a Black architecture student who was reluctant to enter the profession, since it doesn't welcome students like him. But after hearing the two men speak, the student changed his mind. Young people, Jonathan adds, "should not leave their voices behind."

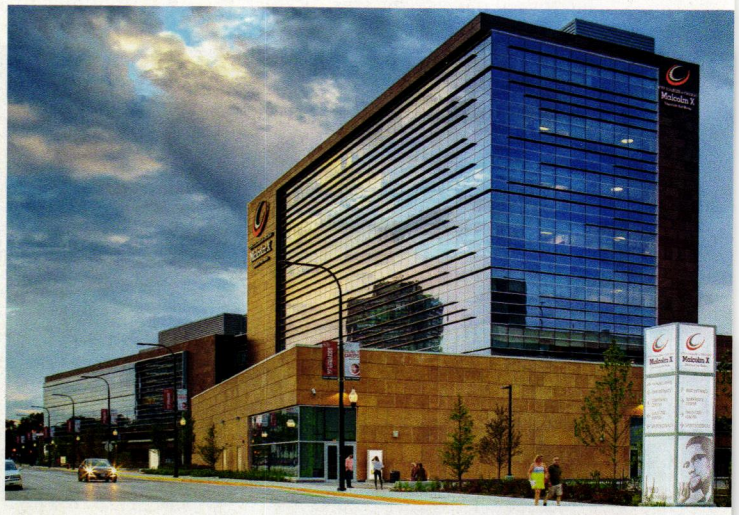
Among Moody Nolan's recent projects that serve minority communities is the 545,000-square-foot Malcolm X College and School of Health Sciences in Chicago (2016), which provides learning and support spaces for future health professionals. Moody Nolan was the architect of record, with associate architects Tilton Kelly + Bell, and programming and exterior schematic design by CannonDesign. "We were the first African-American firm to lead a project of that size in Illinois," Curt notes.

In addition, the firm's Martin Luther King Branch Library in Columbus (2018) provides 18,000 square feet of library space, serves as a community center and gathering spot, and offers much-needed Internet access to an underserved part of the city.



The Texas Southern University Library and Learning Center in Houston (2019) is a 137,000-square-foot library at a historically Black university that had not, Curt says, "been getting high-quality design. We wanted to do something for a growing institution."

One of the firm's most interesting projects is small in size but big in impact: the Legacy House in Columbus (2019). Moody Nolan bought the land, built and furnished the 750-square-foot, three-bedroom house, and turned the mortgage-free deed over to a family chosen by a local agency. The firm plans to build a similar house in every city where it has an office; one in Nashville broke ground this year, and another will be built in Chicago next year. As Curt Moody explains, "We wanted to do something for someone who could never return the favor." ■



The Martin Luther King Branch (2018) is a dynamic addition to the Columbus Metropolitan Library in Ohio (top). Light fills the lobby of the Texas Southern University Library and Learning Center (2019) in Houston (middle). The Malcolm X College & School of Health Sciences (2016) is located on Chicago's near west side (above).

Flexible Sole Practitioner: Nina Cooke John

The New York–based architect tackles everything from renovations to community engagement.

BY ALEX KLIMOSKI

WHETHER SHE is working on the renovation of a Manhattan apartment or a proposal for a multifamily housing prototype in Newark, architect Nina Cooke John's design approach is anthropological in nature. At the crux of her eponymous practice, which she established in 2018, is a fascination with how people appropriate and modify the spaces around them in an ad hoc manner. This is apparent in her earliest work: her thesis project at Cornell University, where she received a B.Arch. in 1995, explored how leftover space between buildings in the Bronx and Brooklyn could be transformed into "urban porches"—places for musical storytelling—for the predominantly Caribbean communities residing there. "I did get some pushback," Cooke John, who was born and raised in Kingston, Jamaica, recalls. "Since it wasn't a single building at a particular location, there weren't any big formal moves," she says. "Rather, it was about taking what you've been given and programming it in a way that benefits a larger group."

Cooke John was initially enrolled in the undergraduate architecture program at City College in Upper Manhattan, where she had family nearby. In her first year, her teacher Susan Rodriguez—with whom she would later work at Polshek Partnership (now Ennead Architects)—suggested that she transfer to Cornell. "I went from taking the subway late at night, with my T-square and drawings, to this totally different collegiate environment," says the architect, who lived in the university's Ujamaa residence, a dormitory that celebrates the rich heritage of Black people around the world. "I was able to weave the intense studio life, which is the architect's experience, with the really interesting life of Black students at the university," she says. "As someone from Jamaica, I was beginning to understand Black American culture, and was fascinated by the overlaps and differences."





For Planned Parenthood of Metropolitan New Jersey (left), Cooke John renovated the existing waiting room, incorporating custom woodwork and colorful scalloped vinyl floor tiles for a residential feel.

Cornell's multicultural setting and theory-driven curriculum inspired in Cooke John a broader interest in academia. After a stint working at Voorsanger and Associates, in New York, she earned a Master of Science in Advanced Architectural Design from Columbia's GSAPP, continuing her exploratory research on the urban environment. It wasn't until she had her first child that she transitioned from a role designing big cultural projects at Polshek—such as the New York Botanical Garden masterplan and the former Biltmore Theater—to becoming a full-time academic, traveling each week to and from her home in Queens to Syracuse University in upstate New York. She then took up teaching a studio course at Parsons (she now leads an interdisciplinary design class there) and freelancing with a friend before establishing Studio Cooke John. Being a single practitioner has allowed her to

PHOTOGRAPHY: © LISA RUSSMAN PHOTOGRAPHY (BOTTOM); BALL AND ALBANESE (TOP AND OPPOSITE, TOP)



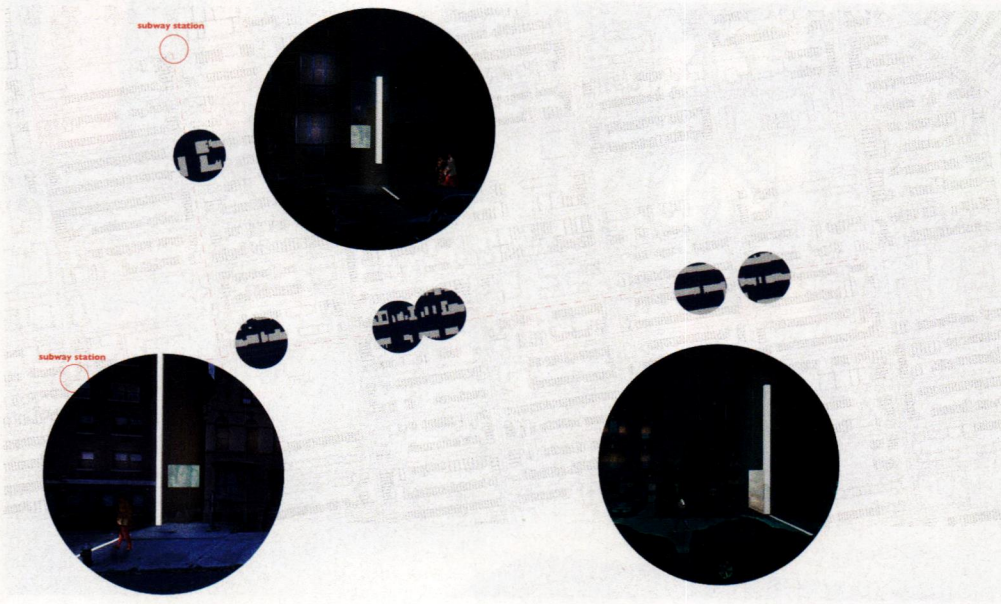
Striking out on her own has allowed Nina Cooke John to better balance professional and personal time, and has presented the opportunity for her design thinking to evolve.

divide her time between work and family, she says; small-scale residential projects, such as apartment combinations and additions, as well as office renovations, provide the right balance.

Striking out on her own has also given the opportunity for her design thinking to evolve. Cooke John has recently started pursuing projects with more urban engagement, which has meant more competitions. She has plans to expand her entry for a recent competition, for the City of London, focused on improving the city's nighttime economy. Her idea considers the cultural stigmas and safety implications tied to women's experiences walking to and from public-transit hubs alone at night; she envisions a prototype for multisensory mini-installations—using devices such as glowing poles of light to illuminate dark areas, and an app to track women's movements, informing friends and families of their whereabouts—that could be integrated within desolate urban environments to make women feel more at ease when out alone after dark.

"When I was in school, architects weren't really exploring concepts of community engagement," says Cooke John. "But over the past decade, I've noticed people starting to listen more, and talking not just about formal context but about the cultural context of a place, and how to respond to that in a particular way—which has been encouraging." In fact, the architect's undergraduate thesis project reappeared at the New York Center for Architecture's 2018 exhibit *Close to the Edge: The Birth of Hip Hop Architecture*, which was curated by her brother, architect Sekou Cooke, who teaches at Syracuse.

Although Cooke John is interested in projects in the public sphere, she emphasizes the fact that she is not restricted to this type of work. Currently, she is designing a ground-up vacation home in the Caribbean, as well as the upcoming Flatiron Public Plaza installation sponsored by the Van Alen Institute, which aims to foster connections between pedestrians, and she just finished the interior for a Planned Parenthood facility in New Jersey. "The assumption often is that Black architects are only interested in urban engagement, and that shouldn't be," she says. "There are so many people doing great things at such different scales. One thing the profession can come to understand during this moment of cultural reckoning is the diversity within the practices of Black architects across the country and the world." ■



A gut renovation of a Manhattan apartment (above). A competition submission looks at the experiences of women walking alone in London after dark (below).

Motor City Design Engine: Rainy Hamilton

Hamilton Anderson Associates revitalizes urban areas "one house, one block, one neighborhood at a time."

BY JACK MURPHY

RAINY HAMILTON JR., president of Hamilton Anderson Associates (HAA), discovered that he was destined for a career in architecture "early in life," as one of his friends likes to brag. By elementary school in his hometown of Detroit, Hamilton's passion was drawing. He pursued this interest at Cass Technical High School and then at the University of Detroit Mercy School of Architecture. Afterward, Hamilton worked for Schervish, Vogel, Merz and then the SmithGroup prior to establishing his own practice in 1994.

Hamilton cofounded HAA with Kent Anderson, a landscape architect whom he met at his first job (and who has since left the firm). The pair quickly got work. Since then, the office has handled a variety of project types but consistently focuses on public buildings and landscapes. Hamilton's identity as both an African American and a Detroiter is a part of HAA's story, and that, along with the integrity of the office's projects, established their reputation. "We grew the practice by doing the work that we thought was meaningful in Detroit," he explains.

The firm—both the staff and scale of projects—has increased in size and prominence. With about 45 employees today, the office's portfolio includes civic and academic buildings, notably the Detroit School of Arts and projects for Wayne State University and Michigan State University, where, in addition to the design of Wells Hall on the East Lansing campus, the firm completed the site design for Zaha Hadid Architects's Broad Museum (RECORD, November 2012). The office has collaborated on work for Detroit's airport and HOK's design of the Little Caesars Arena, where the Pistons and Red Wings play. While it has some nationwide work—such as interiors and hospitality projects for MGM International—HAA continues to be deeply engaged on rebuilding Detroit, and other urban areas, says Hamilton, "one house, one block, one neighborhood at a time."



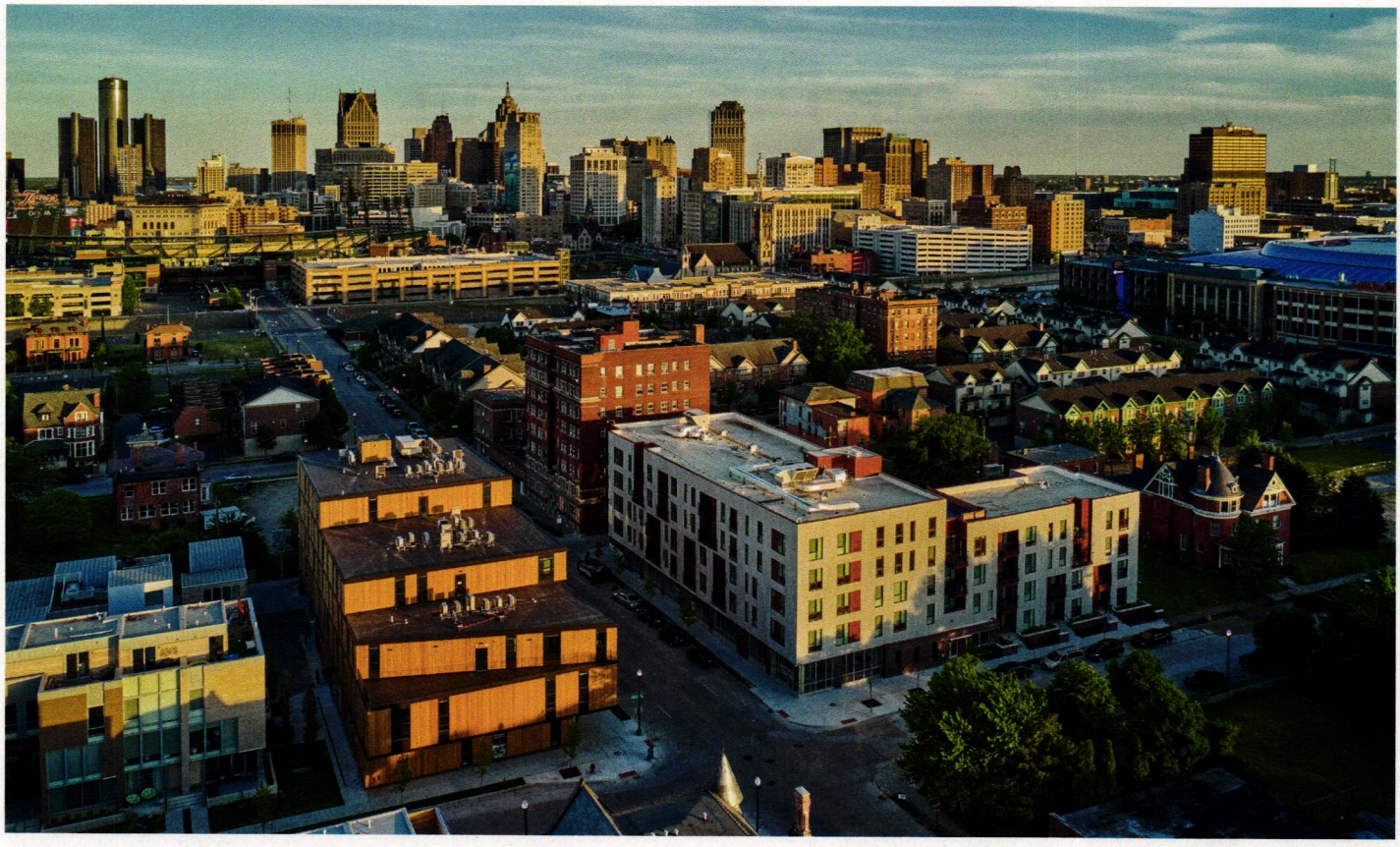
Hamilton (above) has worked to promote women and minorities into leading roles in the firm (below).



This has translated to helping design the architecture of Detroit's economic resurgence, including several new mixed-use developments in the city. At Elton Park, they added four multifamily residential buildings and a set of townhouses that respond to the historic Corktown neighborhood. At City Modern in Brush Park, HAA led the planning process, provided the site design, and is the architect of two new multifamily residential buildings, including 124 Alfred. The office is also the Architect of Record for the Perkins and Will–led Motown Museum expansion, which will provide space to properly exhibit and celebrate the history of the legendary record company. The first phase, a renovation of the existing bungalows of Hitsville U.S.A. along West Grand Boulevard, is now under construction.

HAA has actively worked to ensure that its leadership includes BIPOC men and women. "I am focused on bringing people on and allowing them to grow as much and as fast as they want," says Hamilton. "I want to groom our people to be able to run their own practice one day." The firm also operates Rogue

PHOTOGRAPHY: © ERNEST SISSON (2); JASON KEEN (OPPOSITE, 2)





The firm provided planning and site design for the City Modern project (above), and was the architect of two of the complex's multiunit buildings, including 124 Alfred (left).

HAA as an outlet for advocacy, fabrication, and civic art. In addition to design awards, HAA has received the AIA Michigan Firm of the Year twice, most recently in 2019.

In advising young designers, Hamilton encourages them to "learn all aspects of what an architecture practice has to do to be in business." This entrepreneurial attention was instilled in Hamilton early on: his father came to Detroit from Mississippi to work in automotive factories, and later started a successful landscaping company. As a young man, Hamilton worked with his father and remembers the care he took, even with out-of-the-way corners of a yard that might go unseen. "If you're hired to do a job, you do a good job," he recalls as a lesson, and applies the same attitude to the cultivation of Detroit's future.

The architect is encouraged by the widespread outrage and peaceful protests following the murder of George Floyd this summer. He shared his thoughts and experiences with his office during an emotional online meeting, the staff scattered remotely because of the Covid pandemic. HAA is a mission-driven company, and Hamilton wanted to reaffirm that "we're all in this fight for equality and justice together." As a sci-fi fan, he appreciates *Star Trek*, but, "before you can reach for the stars, you've got to come together as a people," he says. "How do we get to be a better society if we're still discriminating against any race or any class of people?" In a June blog post, Hamilton called out the racial injustice and discrimination that "has been the silent yet ever-present ill of this country. To see companies, both large and small, finally speak publicly and take a position for inclusion and equity for all is a momentous time in our history." ■

Rise to the Top: Dina Griffin

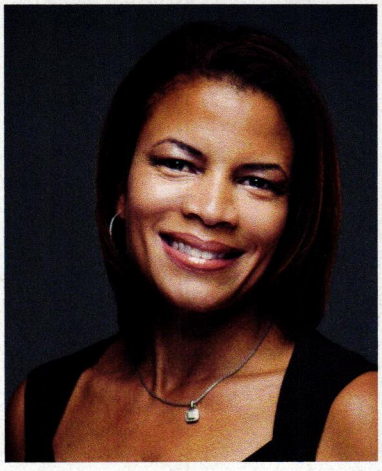
The president of Chicago's Interactive Design Architects took a leap of faith and never looked back.

BY ANNA FIXSEN

ARCHITECT DINA GRIFFIN'S career is a rich tapestry of defining moments. There was the moment as a teenager growing up on Chicago's South Side when she elected to take an architectural drafting class instead of home economics. There was the moment during college at the University of Illinois at Urbana–Champaign when a caring professor encouraged her not to drop out of the architecture program. There was the moment in 1994 when she received her architectural license—something only a handful of other Black women in the state of Illinois had achieved at that time.

Then there was the day in the spring of 1998 when Griffin decided to accept a job at a young Chicago office called Interactive Design Architects. At first glance, it was everything her former employers (large, well-oiled firms with hundreds of employees) were not, right down to the dingy gray carpet. But here, the studio's principals assured her, Griffin would be able to run her own building projects. "I took a huge leap," she recalls, "and I have not looked back."

Today, Griffin is president of Interactive Design Architects (IDEA, for short), overseeing a nine-person office alongside partners Charles Young and Robert Larsen. The firm's 28-year history is one solidly rooted in Chicago. Young, a former principal at Hammond Beeby and Babka, had worked on the Postmodern design of the Harold Washington Library with city architect Kendall Fleming in the late 1980s and early '90s. The pair realized that their combined skill sets and contacts were the recipe for a successful architectural practice. They set up IDEA in 1992 with a goal of providing hands-on expertise to clients, and with a commitment to remaining a minority-owned business.



IDEA was architect of record for the Modern Wing (below) of the Art Institute of Chicago, completed in 2009.

In the decades since (Fleming eventually left the practice), the IDEA team has left its stamp on some of the city's most cherished places. In the mid-aughts, it served as architect of record alongside Renzo Piano to construct the Art Institute of Chicago's soaring Modern Wing. The firm has designed several innovative animal habitats for the Lincoln Park Zoo, including an open-air penguin cove. And in 2016—its crowning achievement to date—IDEA was announced as the associate architect for the Obama Presidential Center in collaboration with Tod Williams Billie Tsien Architects | Partners. "Working with IDEA has been terrific; we have a similar ethic and a deep belief in getting things done right," Williams and Tsien told RECORD. "With her quiet, gentle presence, Dina is a powerful woman—a voice to be heard."

Despite the wealth of prestigious projects (not to mention professional relationships with a Pritzker Prize–winner and the former President and First Lady), a few others stand out to Griffin personally. Early in her tenure at IDEA, she worked on the design of HUD-funded senior housing in Robbins, Illinois, a south Chicago suburb. Griffin made sure to select the best finishes and the best materials her budget would allow for the interiors; she wanted it to feel like a home. After the project was completed, she recalls residents—mostly people of color—telling her, "We feel like we're living on the Gold Coast"—one of Chicago's most affluent neighborhoods. It brought tears to Griffin's eyes, she says.



IMAGES: COURTESY OBAMA FOUNDATION (OPPOSITE, TOP); CHARLIE YOUNG/IDEA (BOTTOM); IDEA (2)



The firm is associate architect of the Obama Presidential Center (above) in Chicago, working with design architects Tod Williams Billie Tsien Architects | Partners.

"That, to me, made it all worthwhile."

Last year, IDEA wrapped up another project close to Griffin's heart: a permanent home for the Bruce D. Nesbitt African American Cultural Center at the University of Illinois at Urbana–Champaign, her alma mater. The mission of the center, established 50 years ago, is to serve and support Black students. To design a building on campus—the place that "made me who I am," Griffin says—and to be the first female graduate to do so, was a full-circle moment, "especially considering I almost quit architecture," she adds.



Last year, the firm completed a project at University of Illinois at Urbana–Champaign, the Bruce D. Nesbitt African American Cultural Center (left).

Griffin's own journey and a desire to bring more diverse voices to a profession sorely lacking them has fueled her tireless work within professional organizations, namely through her past and current roles with the AIA's Chicago chapter, the Illinois Architect Licensing Board, and the National Organization for Minority Architects. She likes to cite a sage word of advice she received from her mentor, the late architect Alan A. Madison: "You can't kick the dent out of the can from the outside."

Lately, that dent has seemed especially deep. In the wake of the killing of George Floyd at the hands of police, IDEA's leadership issued a powerful call to action: "We are hurting, we are angry, we are at a loss for words," they wrote. "As architects and designers that help shape neighborhoods, places and spaces, we have opportunities to help make a difference."

Griffin believes supporting and championing young people holds the power to effect systemic change—both in and out of the profession. She attributes her own success to such mentors. When aspiring architects approach her, Griffin encourages them to forge their own paths and not feel pressured to take "traditional" routes. "Ask questions and advocate for yourself," she tells them. "Speak up, because no one else can." ■

"With her quiet, gentle presence, Dina is a powerful woman—a voice to be heard."

–Tod Williams and Billie Tsien

Mover and Shaker: R. Steven Lewis

The peripatetic urban designer has long advocated for Black architects in the profession.

BY JAMES GAUER

R. STEVEN LEWIS gets around. Since earning a B.Arch. at Syracuse University in 1979, the peripatetic 63-year-old architect has bounced from New York to Los Angeles to Washington, D.C., to Detroit and back to L.A., working in both the public and private sectors. He is now a principal leading the urban-design practice for the Los Angeles office of ZGF, where his projects include a $1 billion State of California office complex in Sacramento.

One constant in his journey has been an awareness of the role race plays in architecture. Lewis learned this from his father, Roger C. Lewis, an architect at the Lewis-Turner Partnership in New York. "I was close to my father," he says, "and often accompanied him to work when he and his Black colleagues were launching their practices in a hostile and, frankly, racist environment. I remember going with Dad to the NYC Department of Buildings for a plan review. The blue-haired lady behind the counter assumed my father was a messenger delivering prints and told him to 'just put the drawings over there.'"



Lewis joined his father's office, and then moved to Los Angeles and worked briefly for his architect uncle, David E. Crompton, before teaming up with Roland Wiley and Steven Lott, both Black architects, to form RAW International, focused on corporate interiors, retail, and showrooms. "California had not yet banned affirmative action, so we advertised ourselves as MBE (Minority Business Enterprise)," says Lewis. "We were lucky. We got tenant-improvement work at the new L.A. Produce Market, and then the new Pacific Design Center, so we got to design showrooms."

In 2004, Lewis left RAW to begin a four-year term as program manager at the Federal GSA Office of the Chief Architect in Washington, D.C. There he plugged into the Design Excellence Program, which was, he says, "creating a legacy of civic architecture for our time." He also spent a year as a Loeb Fellow at the Harvard Graduate School of Design, where he focused on racism in the architectural profession and organized a symposium on the subject. In addition, he worked with GSD students to design a community center in South Africa.

In 2008, Lewis returned to Los Angeles, where he took a series of private-sector management jobs and established a consulting practice, Thinking Leadership, in 2011. Then, in 2016, he left to join the Detroit planning department as design director under Maurice Cox, with the ambitious mission of helping to revitalize the city's outlying neighborhoods. He also became a professor of practice at the University of Michigan's Taubman College of Architecture and Urban Planning. Yet, even at this high point in his career, racism reared its head. "I went to a community meeting," he recalls. "A colleague introduced me to a big local architect, who looked right past me and extended his hand to one of my staff, who was white."

When Lewis decided to go back to L.A. two years ago, he was offered a job at ZGF, an office he had known

R. Steven Lewis (above) is a principal with ZGF. In 1998, Lewis's firm, RAW International, was ZGF's associate architect for the California Science Center in Los Angeles (below).



PHOTOGRAPHY: © TIMOTHY HURSLEY (BOTTOM); COURTESY ZGF (TOP AND OPPOSITE)



"ZGF, acutely aware of the underrepresentation of Blacks in the profession, saw in me qualities that could help the firm evolve into a more just, equal, diverse, and inclusive organization," says Lewis, who was the recipient of the AIA's Whitney M. Young Jr. Award in 2016.

since the mid-90s, when RAW was ZGF's associate architect for the California Science Center in Exposition Park, Los Angeles. "Years later," says Lewis, "Ted Hyman, managing partner of ZGF, invited me to give a keynote address to the AIA Large Firm Round Table. Apparently, what I had to say caught his imagination, and the renewed romance began. I believe ZGF, acutely aware of the underrepresentation of Blacks in the profession, saw in me qualities that could help the firm evolve into a more just, equal, diverse, and inclusive organization."

Lewis has been active in the National Organization of Minority Architects (NOMA) for nearly 40 years and served as president during 2009–10. Currently, he is editor of NOMA magazine for the second time. "Advocacy," says Lewis, "has been an integral part of my identity, both as an architect and as a Black man." To recognize his ongoing work for equality in architecture, the AIA gave Lewis its Whitney M. Young Jr. Award in 2016.

How does Lewis continue his efforts for Blacks in architecture today? "I talk to people," he says. "I approach white colleagues in a way that's reasonable and credible and doesn't hammer them into a defensive position." But Lewis doesn't just talk. He finds opportunities in large projects for Black subcontractors. He facilitates partnerships with Black-owned firms. He encourages the AIA Large Firm Roundtable to give money to historically Black colleges, recruit Black interns, and establish JEDI (Justice, Equity, Diversity & Inclusion) "banks" within their firms. This allows firm members to be active in JEDI work—attending a Black Lives Matter march or giving a talk in an inner-city high school—and then bill that time to the JEDI bank just as they would bill it to a project. And at ZGF, in particular, "we're changing recruiting and interview protocols to diversify the firm further. Then, once Black architects are in the firm, we're creating a clear path for advancement." With his own rich and varied career trajectory, that is obviously something Lewis knows about. ■

Lewis is overseeing the urban design for the Richards Boulevard Office Complex for Sacramento's Department of General Services. Lewis (below) leads a ZGF team meeting in LA.



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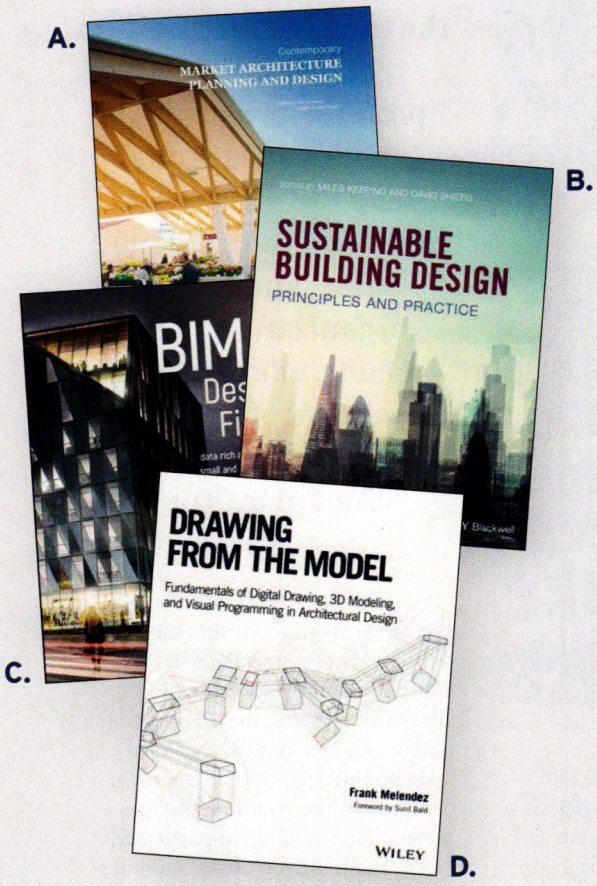

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Amazon in the Regrade, Seattle
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Lap of Luxury

MetroOffice Architetti designs a finely crafted production facility for the Celine brand of high-end leather goods, overlooking the hills of Tuscany.

BY JOSEPHINE MINUTILLO
PHOTOGRAPHY BY MARCO CAPPELLETTI



LIKE OTHER French luxury brands, Celine has moved the manufacture of its leather goods to the Italian countryside. Skilled craftsmanship still thrives amid the hillside towns and vast vineyards of Tuscany, for example. There—a cradle of couture companies both French and Italian—a number of new production facilities have been built in recent years, including the latest for Celine.

Fabio Barluzzi and Barbara Ponticelli, the husband-and-wife team behind Florence-based MetroOffice Architetti, have created a niche working within the fashion world. After completing an earlier project for Celine in the Chianti region of Tuscany, which included the renovation of two warehouses connected by a bridge, they were invited to compete for the design of a much larger commission, a new 47,000-square-foot building to house 250 artisans and office workers.

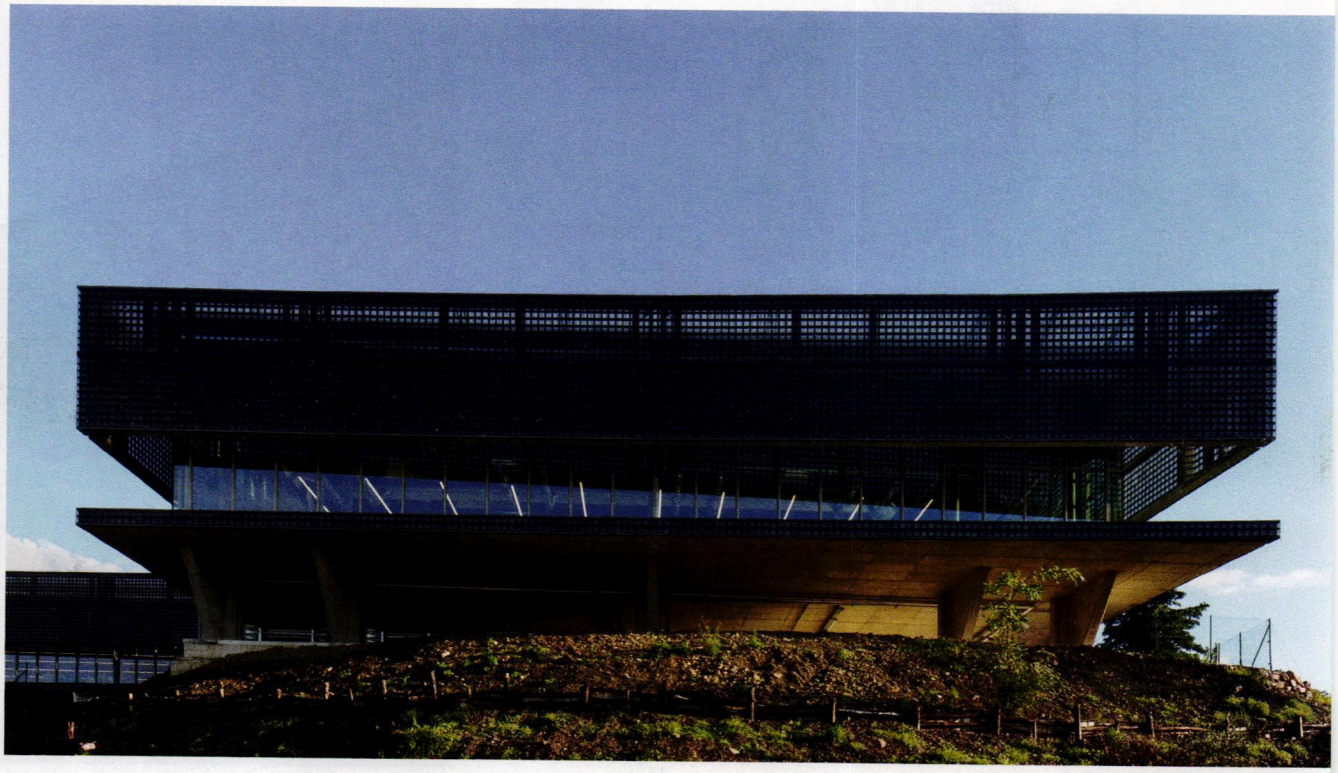
The company spent three years finding just the right spot—not too close to other factories producing similar goods—in Radda in Chianti, a small town about 20 miles southeast of Florence. In that time, MetroOffice secured the job to design a structure, called "La Manufacture" by Celine, that would replace a long-abandoned, and slightly larger, warehouse on the site.

"Our task was to transfer the identity of the brand to the production facility," says Barluzzi—a straightforward exercise in someone else's hands, but MetroOffice took a nuanced approach. The resulting building, like the company's edgy clothes and accessories, is a sleek-meets-classic concoction, eschewing glamour for industrial chic. "We wanted to recover something that was there before," explains Ponticelli, referring to the earlier shed that was demolished.

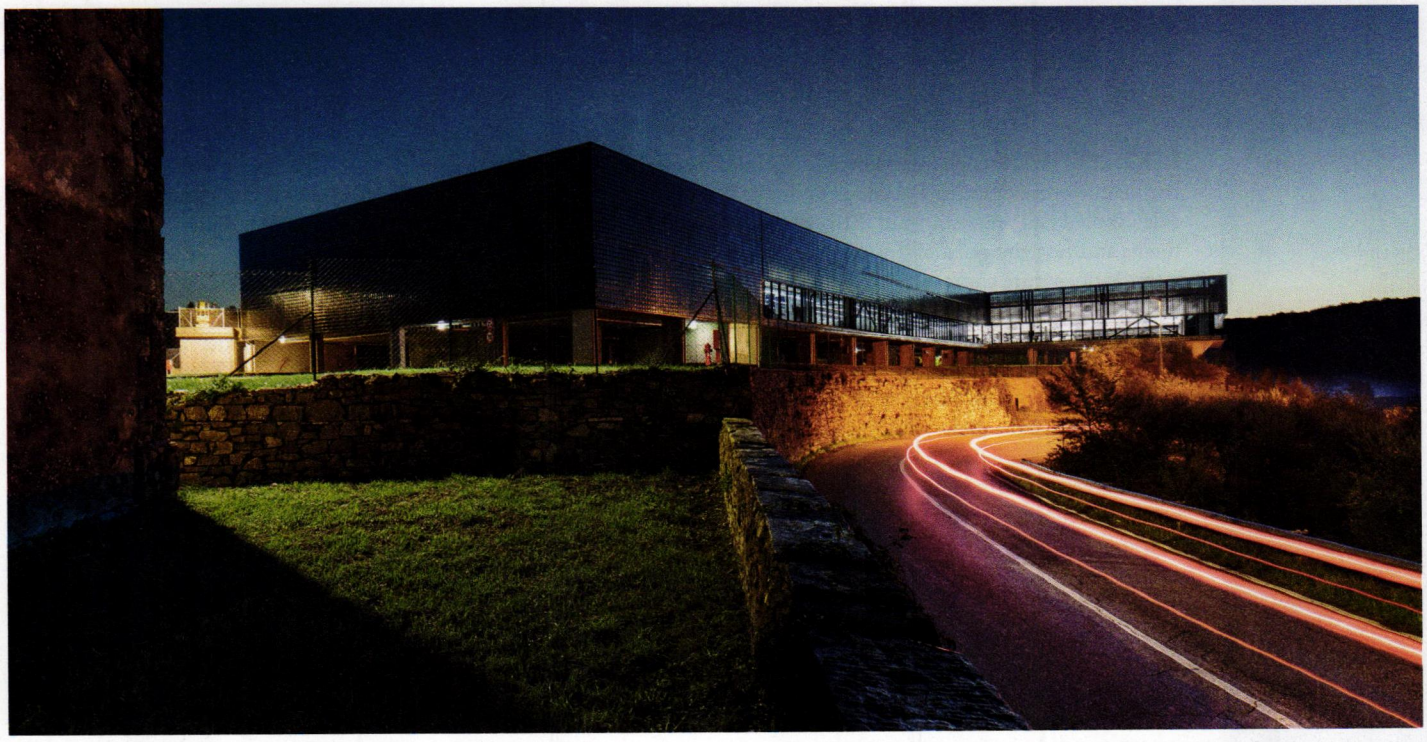
The couple also jokes that they were often reminded by the client, "It's not a museum, it's a factory." They took inspiration from the old manufacturing and storage buildings of the area, combining two of the common components of those, brick and large windows, into the signature element of their structure—glass block. The east, west, and south facades of the new L-shaped building are covered in 33,000 such blocks.

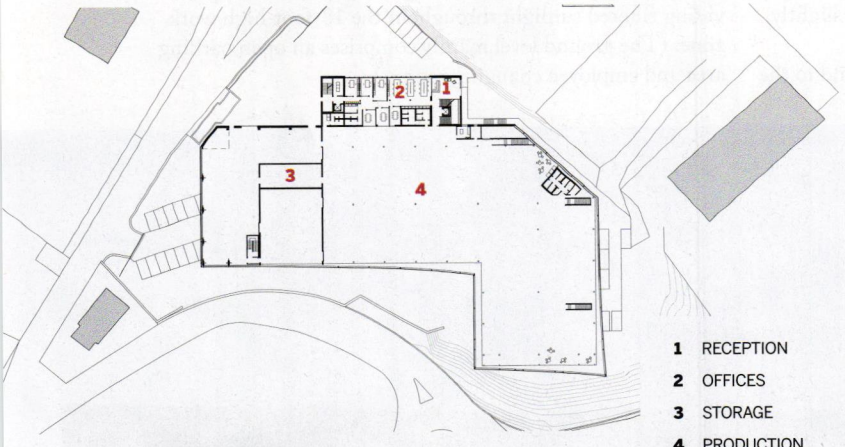
The swaths of gray glass block are suspended over the upper half of the three-story building, several feet in front of the clear glass curtain wall, and several feet above the floor level of the main production area, opening up unobstructed views of the surrounding countryside while providing filtered sunlight throughout the 18-foot-high work zone. (The ground level mainly comprises an open parking area and employee changing rooms.)



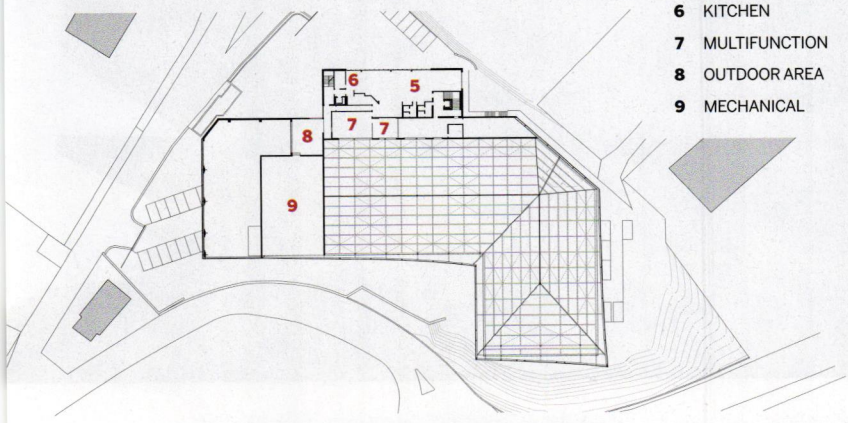


SEEN FROM the main road, an overhanging volume accommodating the production area is wrapped in glass block that filters light to the inside (left and above).





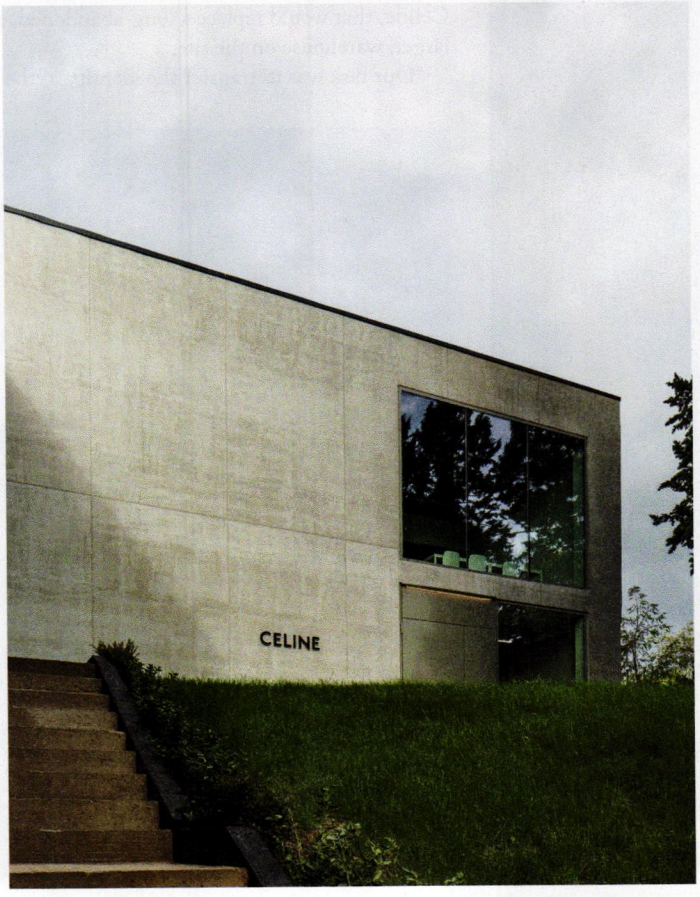
MAIN-LEVEL PLAN



UPPER-LEVEL PLAN

0 80 FT.
25 M.

1 RECEPTION
2 OFFICES
3 STORAGE
4 PRODUCTION
5 CAFETERIA
6 KITCHEN
7 MULTIFUNCTION
8 OUTDOOR AREA
9 MECHANICAL



THE CRYSTALLINE L-shaped building is nestled in the countryside (top). Its north facade is concrete (above).

THE GROUND LEVEL features an open parking area (above). The glass block, supported by a grid of metal rods, is suspended several feet in front of the clear glass curtain wall, producing a double facade (right).

The architects made several visits to Spain, where the glass blocks were manufactured, reviewing countless samples before arriving at ones with just the right curvature and tint, based on the solar modeling MetroOffice conducted. "This is the largest glass-block facade that facility has produced," Barluzzi says.

Though the structure is rather uncomplicated—poured concrete slabs, steel columns, composite-wood roof beams topped by a metal roof and 4,300-square-feet of solar panels—the installation of the individual glass blocks that were shipped to the site, much like the fashioning of an intricate leather bag, required a rare kind of skilled labor. "They were mounted by hand almost entirely by one man," recalls Barluzzi. The blocks are arrayed in a grid, separated by ¾-inch mortar joints and supported by a combination of wood and metal rods to form large panels. "The technology is simple, but the aesthetic is just what we were looking for."

The double facade also offers an old-fashioned way of naturally heating and cooling the building for most of the year, allowing air to rise through its gap into openings within the operable portion of the curtain wall. "They only needed to turn on the heat seven times











WORKERS in the production area have unobstructed views over the Tuscan landscape (opposite, top, and above). An industrial aesthetic of concrete floors and minimal finishes is carried over to the storage rooms (opposite, bottom left) and dining area (opposite, bottom right).

last winter," Barluzzi points out of the passive system in combination with other sustainable strategies. "It was a bit of a gamble, since we had never done anything like that before, but thankfully it worked out."

The industrial aesthetic is carried over to the interiors, where concrete floors are polished and exposed, and colors and finishes are kept to a minimum, letting the large machinery used for cutting and sewing leather take center stage. As in most workplaces in Italy, a generous dining area is part of the work culture, and here, on the north side of the building where concrete and clear glass make up the facade, the cafeteria has expansive views to the lush green landscape beyond.

The open floor plan of the L-shaped production area also gives each of the workers astonishing vistas in multiple directions over the terraced vineyards for which Chianti is famous. According to Ponticelli, "We wanted to create a seamless connection with nature and the unique surroundings." The factory, which only opened late last year, had slowly been building up to capacity when Italy was hit hard by the coronavirus in March. After a month-and-a-half-long shutdown, it has slowly resumed production of those coveted leather bags and accessories with more than enough socially distant space for the 130 workers currently on-site.

As most companies rethink the workplace in the wake of Covid-19, La Manufacture offers a few simple lessons for making great employee spaces—high-quality craftsmanship, natural light and ventilation, and unobstructed views. A hillside location in Tuscany also helps. ■

Credits

ARCHITECT: MetroOffice Architetti — Fabio Barluzzi and Barbara Ponticelli, principals

ENGINEER: Politecnica (mechanical, electrical, and structural)

GENERAL CONTRACTOR: Ing. Ferrari

CONSULTANTS: Interprofessionale (management, site construction); Studio Ballardini (overall structure, glass-block facade); L2i Engineering and Consulting (site construction supervision)

CLIENT: Celine Production

SIZE: 47,000 square feet

COST: withheld

COMPLETION DATE: October 2019

Sources

GLASS BLOCK: Bormioli Luigi

METAL PANELS AND DOORS: Aries Inox

FLOOR AND WALL TILE: Ceramica Vogue

LIGHTING: Lucenova, 3F Filippi, Disano

FURNITURE: Vitra, Sinetica, La Palma, Aries Inox


enterprise
commercial trucks
enterprise
commercial trucks
ISUZU

Prime Reboot

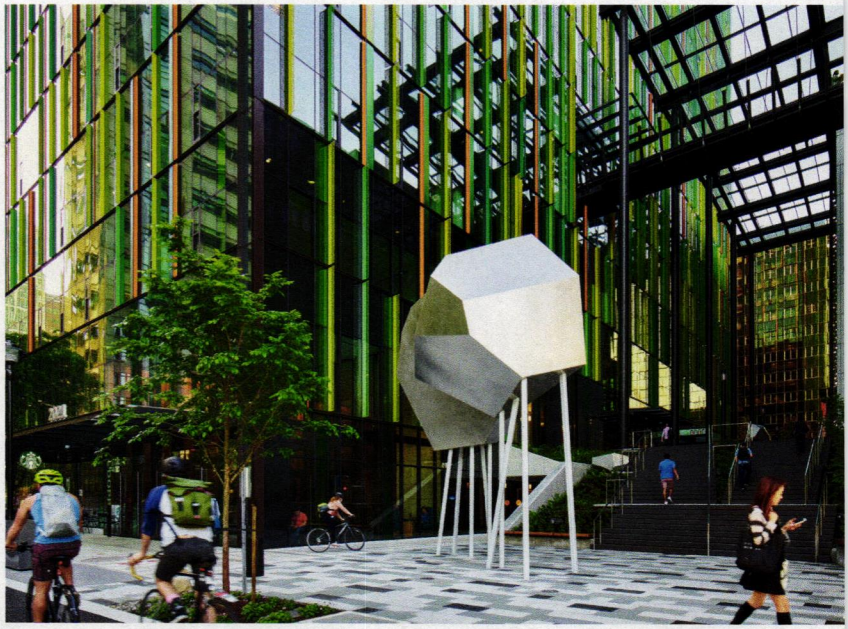
Amazon jump-starts the transformation of an underdeveloped commercial area in downtown Seattle with a new headquarters by NBBJ.

BY LINDA C. LENTZ

WHILE AMAZON was dominating the news with its search for a city to host a second headquarters a few years ago, the tech giant's first purpose-built campus was taking shape in Seattle's Denny Triangle neighborhood (also known as the Denny Regrade for the leveling of its eponymous hill more than 100 years ago). Completed last summer, the 3.3 million-square-foot complex, designed by the local office of NBBJ, spans three blocks with six distinct buildings activated by public paths, verdant plazas, ground-floor shops, dining venues—even dog parks. The result is a dynamic workplace for employees that integrates into its urban setting with engaging places for the community and passersby.

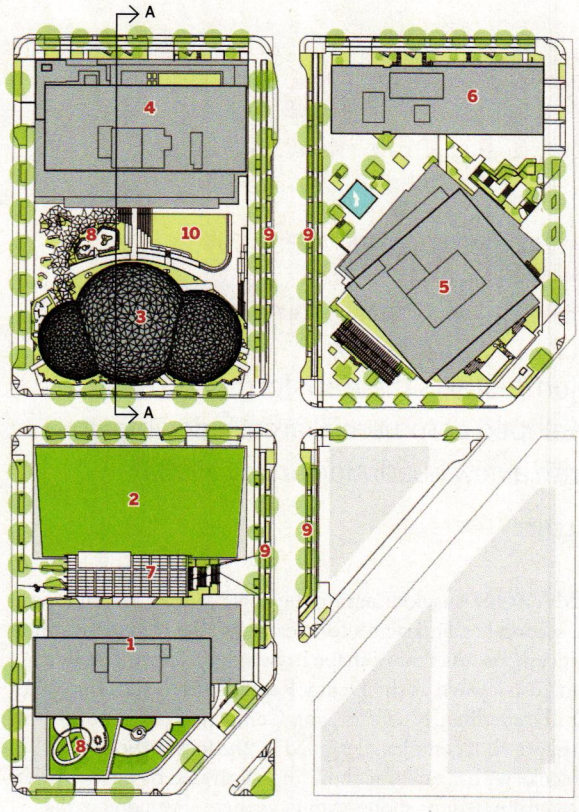
The groundwork was laid in 2011 when Amazon vice president of real estate John Schoettler invited NBBJ to do a feasibility study for a facility somewhere in what was, at the time, a neglected 12- to 14-





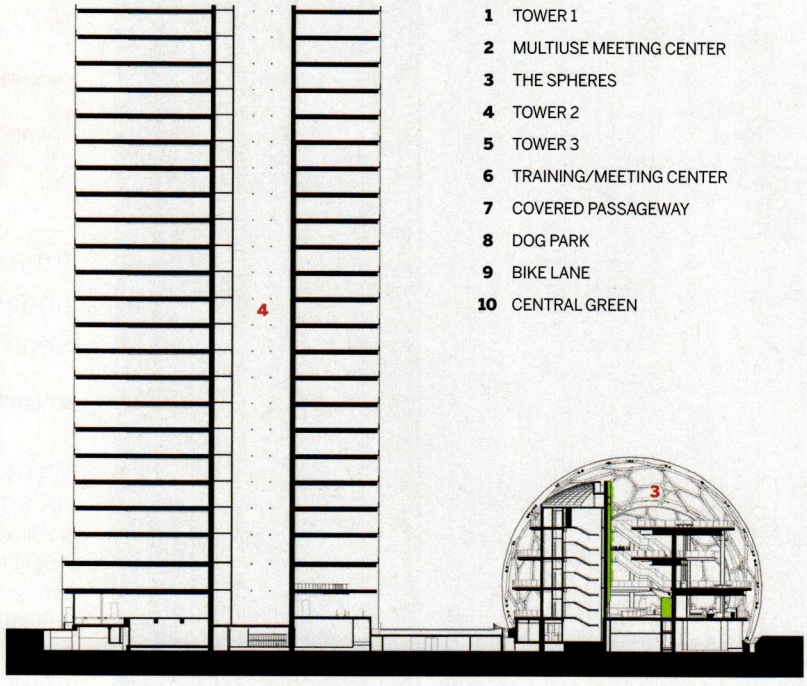
PHOTOGRAPHY: © SEAN AIRHART (LEFT); KEVIN SCOTT (RIGHT)

AMAZON'S HQ1 straddles a main thoroughfare (left) with three unique towers and lower ancillary structures amid myriad public-transporation options. NBBJ-designed bike lanes on both sides of the street lead to a dedicated storage area, with lockers and showers, in each tower (above).



SITE PLAN

0 100 FT.
25 M.



1 TOWER 1
2 MULTIUSE MEETING CENTER
3 THE SPHERES
4 TOWER 2
5 TOWER 3
6 TRAINING/MEETING CENTER
7 COVERED PASSAGEWAY
8 DOG PARK
9 BIKE LANE
10 CENTRAL GREEN

SECTION A - A

0 50 FT.
15 M.

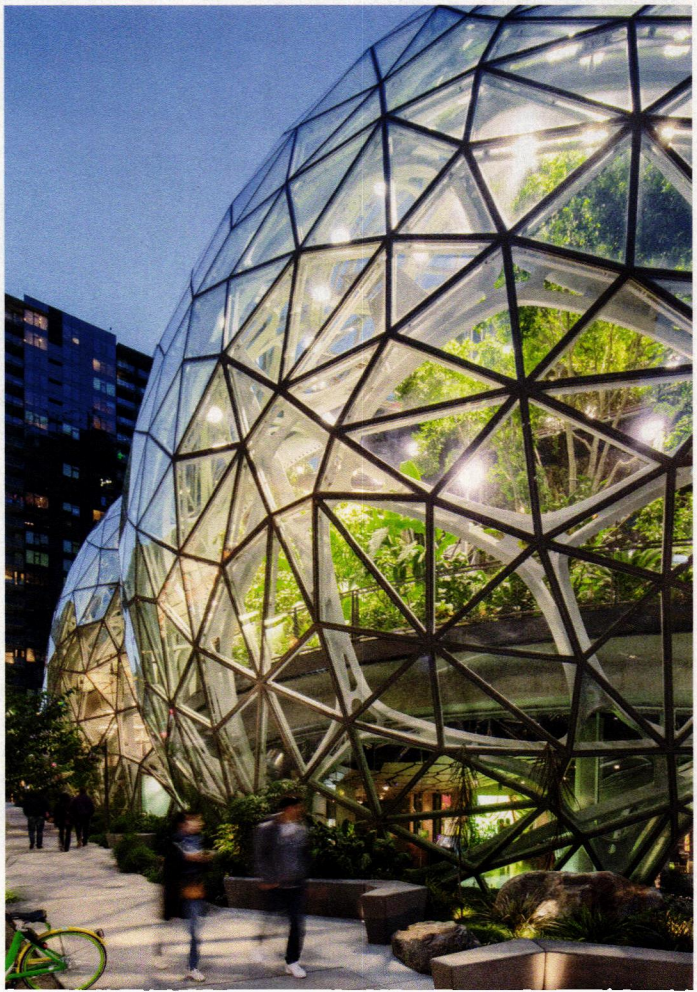


block area dominated by boarded-up movie theaters, cheap motels, and surface parking lots. The company had been renting space around town and was ready to expand with the kind of legacy project it couldn't realize while leasing. The architects zeroed in on the triangular three-block site for its proximity to downtown businesses and existing Amazon locations. The zoning here would accommodate the company's high-density requirements—with allowances for up to 500-foot-high structures—and the site was strategically positioned at a transportation hub, bisected by bike lanes, light-rail, streetcar, and bus lines, and close to major highways. So Amazon requested a master plan that allowed for phased construction and occupancy, says principal in charge John Savo.

The executives wanted to take advantage of being in the city, says Savo, "so they asked us to build a neighborhood, not a campus, with buildings that look different from each other" and connect to the urban fabric. Working with Seattle's Design Review Board and its Design Commission, the architects developed a robust schematic design to demonstrate massing, materials, and programming, with two buildings on each 360-by-230-foot block: one 38-story tower and a low-rise ancillary

PHOTOGRAPHY: © BENJAMIN BENSCHNEIDER (LEFT AND OPPOSITE, TOP); SEAN AIRHART (OPPOSITE, BOTTOM)

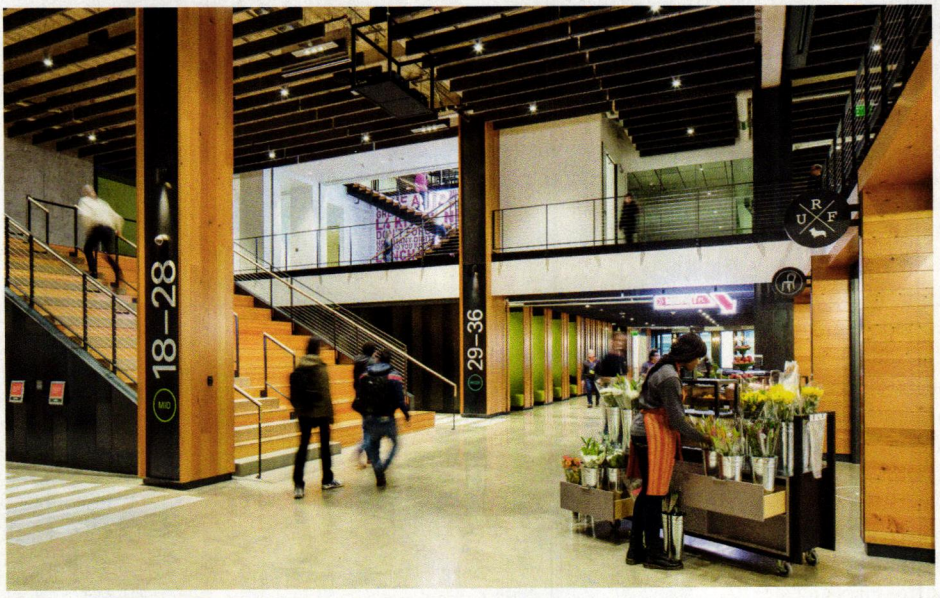
THE PROJECT navigates elevation shifts with terraced grounds, like the landscaped stair between Tower 3 and a connected training center (opposite). The popular central green (above) is flanked by the Spheres (right), a glowing biophilic space for employees, guests, and the public.



structure, with through-block public space between them. The presentation emphasized the value of eliminating a zoning requirement for an alley on each block—typically used for trash pickup, loading docks, and garage access—to create pedestrian connections and open outdoor areas. By doing that, "we could rotate the towers to space them for views and to establish a sun pocket at the center of the three-block area," says design principal Dale Alberda. Understanding the benefits, the city gave the go-ahead. It also approved the installation of operable windows—an Amazon must—at guardrail height, even in the towers.

Construction began in 2014 and was sequenced from one block to the next. Each is differentiated by a unique grouping of glass and steel buildings with concrete shear cores and outdoor zones that flow easily across avenues from one to the next, facilitating employee—and pedestrian—movement among and through them. Seattle is a city of hills and, though this area had been regraded, the site's elevation still shifts 15 to 17 feet on each block. The architects took advantage of the topography by establishing multistory podiums in the towers with access at the different levels and seven stories of below-grade parking. Then they varied the grounds with terraced spaces accessed via ramps, stairs, and entrances along the slope. All the buildings look outward and invite passersby and "Amazonians" to enter and visit the local retail and food businesses on the ground floors or to proceed up to the next level, via public elevator, escalator, or stair, where the general population can exit to the outdoors and employees can enter the workplace.





AMENITIES include community and company dog parks (the latter, top) and Centers of Energy at the base of each tower where "Amazonians" can grab a coffee, convene in a booth, or even purchase flowers at a marketplace (above). The second tower features colorful glass fins outside (opposite, left). Inside, moving and fixed stairs lead to the employee zone, where dogs are allowed (opposite, right).

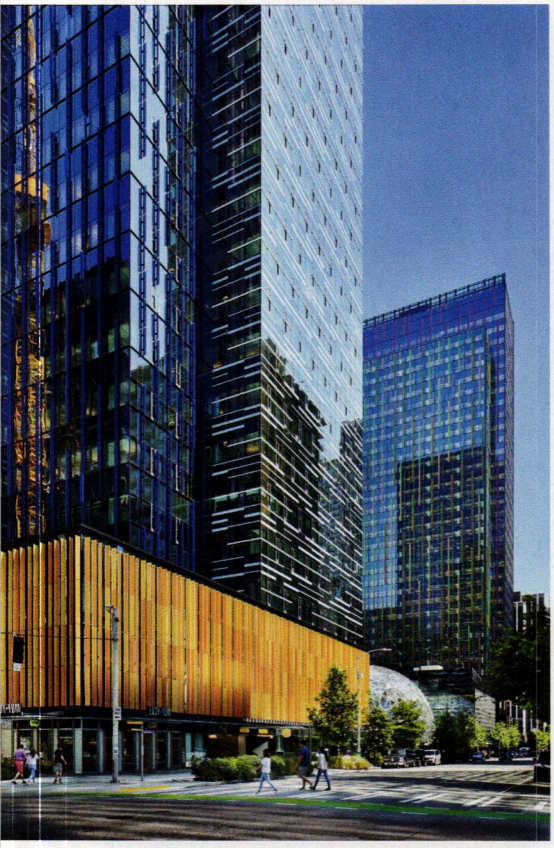
"The community expressed a desire to see color," says Alberda, so the first completed tower is articulated by multihued aluminum fins. It connects via a footbridge to a five-story meeting center. A path, protected by an 85-foot-high glass roof, provides passage between streets. The second tower has graphic horizontal banding with vertical glass fins in blue and orange, and shares a grassy plaza, used for a farmers market, with the Spheres (RECORD, March 2018), a 60,000-square-foot greenhouse-like environment where Amazon employees and guests can work, eat, and relax surrounded by thousands of plants curated to thrive in people-friendly conditions. To the east, the third tower features copper- and rose-tinted bands, and sits on the diagonal amid arbors, fountains, and waterfalls. Its low-rise counterpart is accented with rust-colored ribbons of striated aluminum, and houses a daycare center on the ground floor, with flexible training areas above.

In keeping with the informal vibe typical of tech culture, there are no lobbies. Instead, employees pass through what Amazon calls Centers of Energy (COE) before reaching the upper office floors. Located on the first four or five levels above grade, the COE have internal stairs to encourage walking, and offer markets, cafés, IT services, and casual spots to work or gather. According to Alberda, "Rather than dispersing amenities throughout each building, we concentrate them here to encourage employees to mix, talk, and share ideas." There is one perk not located in the COE, however: dedicated bicycle parking in each tower, with lockers and showers. Due to the popularity of two-wheel commuting here, the NBBJ team developed tree-lined bike lanes on both sides of the project's main downtown thoroughfare, which lead into these facilities. This pathway is now a municipal prototype, says Alberda. In another civic collaboration, the architects worked with the client, the city, and an adjacent data center (unrelated to Amazon) to implement district energy, whereby all of the buildings in this LEED Gold–certified project get hot water from the heat generated by the data center.

"This whole end of town has been stimulated by this development," notes Alberda. "There was nothing beyond it when we began. Now there are young Amazon employees who want to live near their work, so developers are erecting high-rise apartment buildings as fast as they can." And though the company helped overturn a tax to support the city's growing homeless population a couple of years ago—a crisis critics attribute to Seattle's corporate influx—there is a sign it's addressing the problem. While Amazon did not respond to RECORD's questions, a recent Associated Press report says that the company created a permanent facility for a local homeless shelter in its newest building (by Graphite Design Group), adjacent to this site.

"Placing its headquarters in downtown Seattle made a strong statement about wanting to be part of the community," says Alberda. "And it has become a popular gathering place. On sunny days, before the pandemic-related shutdowns and quarantine, the central green was full of people all the way up the stairs, where they liked to sit and eat lunch. Hopefully, in the near future, that will happen again." ■

PHOTOGRAPHY: © SEAN AIRHART (THIS PAGE AND OPPOSITE, RIGHT); BENJAMIN BENSCHNEIDER (OPPOSITE, TOP)





Credits

ARCHITECT: NBBJ — John Savo, principal in charge; Dale Alberda, principal/lead designer; Craig Synnestvedt, project manager; Matthew Somerton, principal/lead interior architect

WORKPLACE INTERIOR DESIGN: IA

Engineers: Magnusson Klemencic (structural); Coughlin Porter Lundeen (civil); WSP, McKinstry (m/p); Stantec (electrical/acoustical); Arup (fire and atrium smoke control)

GENERAL CONTRACTOR: Sellen Construction

CONSULTANTS: Site Workshop (landscape and water features); Ron Gagliardo, Ron Determan (horticulture); Arup (facade); Schuler Shook (theater); Graelic (parking)

CLIENT: Amazon

SIZE: 3.3 million square feet

COST: withheld

COMPLETION DATE: July 2019

SOURCES

STRUCTURAL SHELL: Canron (spheres)

CLADDING: Pohl; SAPA; Walters & Wolf; Reider; Enclos (spheres glazing system)

GLAZING: Viracon; DeaMor (canopies)

WINDOWS: Alliance Window (single-hung)

DOORS: Skyfold; Turner Exhibits

INTERIOR FINISHES: Ceilings Plus; Armstrong; Snaptex; Daltile; Zodiaq; DuChateau; TerraMai; Móz Designs; Forms+Surfaces; Rimex Metals


MCCOLLEGE
107 ST

Clean and Lean

A building in Edmonton, Alberta, by Dub Architects emphasizes translucency, linearity, and sustainability.

BY SUZANNE STEPHENS
PHOTOGRAPHY BY DOUBLESPACE

IN A COMMERCIAL MARKET, you don't usually think a developer of a spec office building will value design quality over the most expedient solution. But it can happen. In the case of a 10-story high-rise in Edmonton, Alberta, Gene Dub, principal of Dub Architects, owns the development company—Five Oaks—that constructed it in accord with his firm's design. The skinny, 52,000-square-foot tower, which sits on a narrow 50-by-150-foot site in downtown, displays an elegance in its proportion and detail, yet the glass-and-concrete structure is economical—costing barely over $11 million (U.S.)—and ultra-sustainable, with reputedly one of the largest solar-paneled vertical walls in Canada.

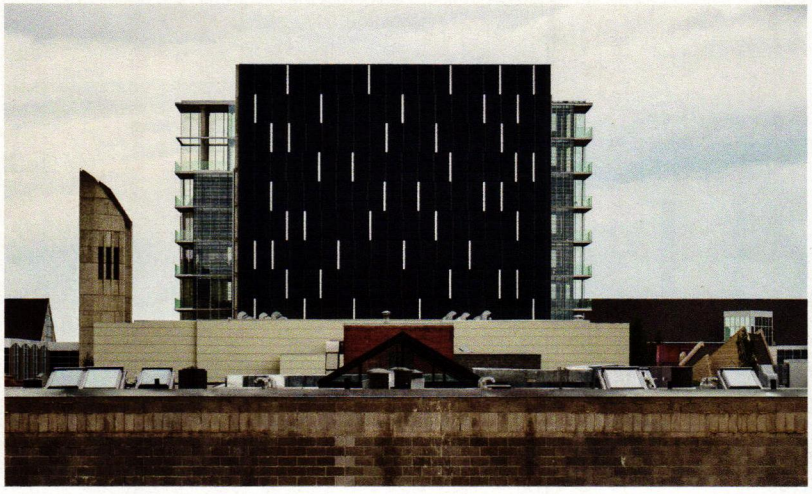
While Dub and Five Oaks were building the Edge, as they call it, the architects received a separate commission for a new facility for MC College, a school that trains hairdressers, fashion designers, and beauty specialists. But as MC (once known as Marvel College) saw the Edge going up, the institution decided that was the place to be. A corner lot and the lean profile of the tower lent the school a visibility for its varied programs, which include offering inexpensive haircuts by student clippers to the outside world. Since MC only needed eight floors, it bought the building and leased back the top two floors to Dub Architects, who had decided to move in.

Dub took advantage of the low height of a warehouse next door to install solar panels on the south wall of the new building's upper floors. The 560 photovoltaic panels, which feed into the city's electrical power grid, provide 80 percent of the electrical load for the building. To avoid the visual monotony of a dark wall clad with conventional solar panels, the architects organized the PVs in a random pattern interspersed with slivers of aluminum. While the vertical solar wall is not tilted at the usual 50-degree angle and may look less efficient for gathering the sun's rays, Gene Dub points out that its perpendicular position has the advantage of being self-cleaning by way of precipitation.

Since Dub had previously remodeled this adjoining 1950s brick warehouse for work/live lofts for apartments, with two floors added on top, some of its architectural vocabulary relates well to the new structure. Specifically, the proportion and linearity of the steel framing elements, Dub says, influenced the architectural treatment of the larger tower next door. This connection shows most dramatically on the west end, where the entrance facade bears the sign of the school. Here the architects emphasized its narrow width by means of vertical aluminum grilled louvers and drainpipes that give the elevation an attenuated linearity reminiscent of Howe and Lescaze's unbuilt-sky-



THE NARROW ENTRANCE facade is on the west, 50-foot-wide end of the corner site (opposite). It is flanked on the south by a wall of solar panels that rise above a four-story building next door (above) renovated previously by Dub.





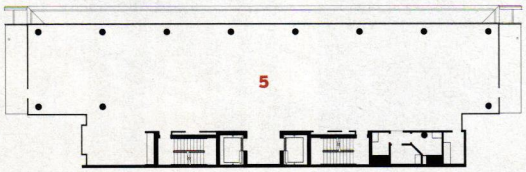
scraper designs for New York's Museum of Modern Art (1931–33).

While the architects have recessed the glass walls behind balconies on both the west and east ends, they pushed out the shimmering, planar glass expanse on the north face to the edge of the building envelope. Here it presents a strong luminous face to the city and allows ample daylight to permeate the shallow open-plan interiors of the concrete column-and-deck structure.

Visitors arriving at the entrance find a spacious ground-floor lobby, 23 feet high, which accommodates school events, student exhibitions, and sales of student fashion work. A mezzanine overlooking the area is connected by an evanescent cable-supported stair with steel treads. On the top two floors, Dub carved out an atrium within his office's duplex and connected the floors by another airy cable-supported, open-riser stair.

To amplify the sense of space throughout, the architects exposed the ceilings, leaving a 12-foot floor-to-floor height, and then placed heating and cooling ducts on the edges of the concrete beams. Because of the cold, often subzero winters, they used both insulated triple and quadruple glazing, butt-jointed to cut down on heat loss, and designed the balconies with thermal breaks. Used as outdoor meeting rooms in warm weather, these perches on the two ends of the building mean that doors can be opened to permit fresh air to flow through the entire floor.

Not surprisingly, the Covid-19 pandemic has required certain changes in the school's program: MC cut its enrollment from 250 to 120 students this fall, and elevators carry no more than two persons at a time. Some of the plumbing for beauty treatments was altered, but most modifications are minimal. Already each floor had its

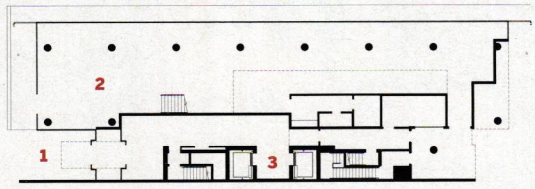


LEVELS 4 - 8 PLAN

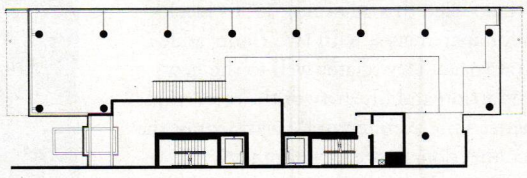


LEVEL-NINE PLAN

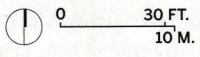
1 ENTRANCE
2 LOBBY
3 ELEVATOR
4 BALCONY
5 OPEN-PLAN TEACHING
6 OFFICES



GROUND-LEVEL PLAN



MEZZANINE-LEVEL PLAN



THE SOUTH-FACING PV-paneled wall (opposite, top) and and the north-facing glass expanse (opposite, bottom) present two different aspects of the sliver-like building. Inside, the architects took over the top two floors for their offices (above), which are arranged around an atrium space and connected by a cable-supported stair. MC's fashion workshop receives ample light from the glazed wall on the north (right).





ON THE NORTH FACE of the Edge, glass is pushed to the building envelope (left) but recessed behind balconies on the west and east ends. At night, the illuminated concrete column-and-deck structure acts as a beacon for the school.

own HVAC system, and the sense of space and light prevails, along with the ability to social-distance in an open plan subdivided by modular wall systems.

From the vantage point on top, Dub says, "we have been surprised to be here and watch the weather change during the day." Since founding his firm in 1975, Dub has often worked in historic buildings he has renovated. So this is a bit different, and it's also convenient, since the commute is short: Dub lives in one of the apartments next door, which are joined to the tower by underground parking. While it is no doubt ironic that the "reward" for designing a spec building so well was losing the commission to design a separate building for the school, both parties seem to be quite happy with the result. ■

Credits

ARCHITECT: Dub Architects — Gene Dub, principal and design lead; Ales Novotny, job captain; Walter Di Tommaso, Norman Kloever, Stephen Smolski, team

ENGINEERS: Read Jones Christoffersen (structural); Vital Engineering (mechanical); TWS Engineering (electrical and civil)

GENERAL CONTRACTOR: T.C. Biggs Construction

CONSULTANTS: Design North Landscape Architecture (landscape)

CLIENT: Five Oaks

SIZE: 52,000 square feet

COST: $11 million (U.S.)

COMPLETION DATE: March 2019

Sources

INTERIOR AMBIENT LIGHTING: LumenWerx Via 2 Direct

METAL PANELS: Cascade Building Supplies

METAL/GLASS CURTAIN WALL, GLAZING, AND GLASS ENTRANCES: Envision Building Innovations

PHOTOVOLTAIC PANELS AND SYSTEM: SkyFire Energy; JA Solar

STRUCTURAL THERMAL BREAKS: Halfen HIT

SBS ROOFING: Christensen & McLean Roofing

DEMOUNTABLE PARTITIONS: DIRTT Modular Wall System

PAINT: General Paint

FURNITURE: Allwest Furnishings (office); Teknion (reception)

ELEVATOR: Thyssenkrupp

DOWNLIGHTS: Eaton Halo

PLUMBING: American Standard, Toto

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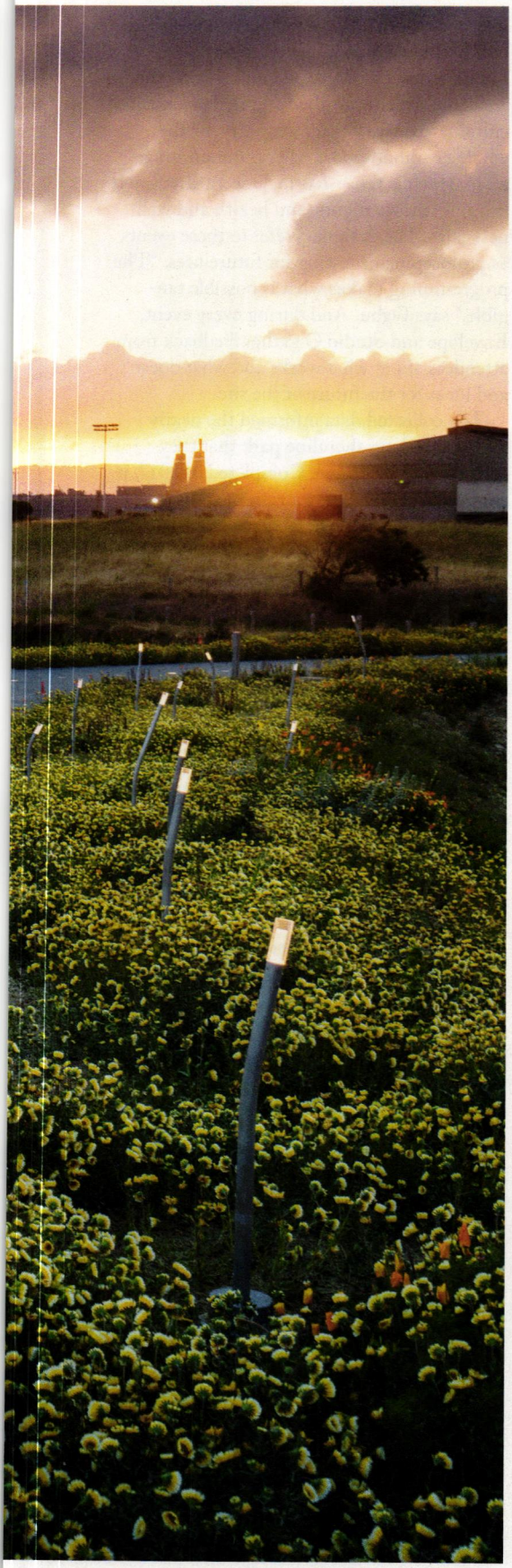
THE DESIGN of a shoreline park (above), at the edge of a former power plant site in San Francisco, was informed by data collected at the many events that the firms Envelope and Studio O have held on the empty lot, including one conducted in collaboration with StoryCorps that documented the history of the neighborhood and the reflections of residents (opposite).



People Power

Architects give a voice to those often overlooked in the design process.

BY JOANN GONCHAR, FAIA

COMMUNITY ENGAGEMENT has played a long-standing part in the making of public spaces, civic buildings, and high-profile development projects. It is often a precondition for approvals or funding. But that doesn't mean that the result responds to a neighborhood's needs or desires. The traditional process often consists of a series of perfunctory community meetings where little genuine dialogue or evaluation occurs. Such forums, says designer Liz Ogbu, principal of Oakland, California–based Studio O, are "super-transactional. They are simply a box to check."

What's more, the usual engagement methods rarely work to the advantage of vulnerable or lower-income communities, say advocates of a more inclusive process. In her 2018 book, *Resilience for All: Striving for Equity Through Community-Driven Design*, Barbara Brown Wilson says the typical methods rarely represent greater neighborhood interests. According to Wilson, an assistant professor at the University of Virginia's School of Architecture, "The result is irrelevant public infrastructure at best, and resident displacement at worst."

But there are effective and equitable examples that architects and planners can look to. An inventive process is being employed in Bayview-Hunters Point, an historically blue-collar Black neighborhood on San Francisco's southeastern shoreline. Here the utility PG&E tore down an outmoded and polluting power plant in 2008 after nearby residents fought for decades for its closure. The plant's dismantling was a double-edged sword: though in one sense it was a victory for the community and activists, it also raised the specter of gentrification, since demolition and environmental cleanup freed up 34 acres of waterfront property for potential development.



PHOTOGRAPHY: © TOM FITZGERALD (OPPOSITE); ANNE HAMERSKY (RIGHT)





AT EVERY EVENT held on the lot where the PG&E plant once stood, including an annual circus (left), information about the community's desires is collected (below). The new waterfront trail, which is open all hours of the day, includes soft, motion-activated lighting (top).

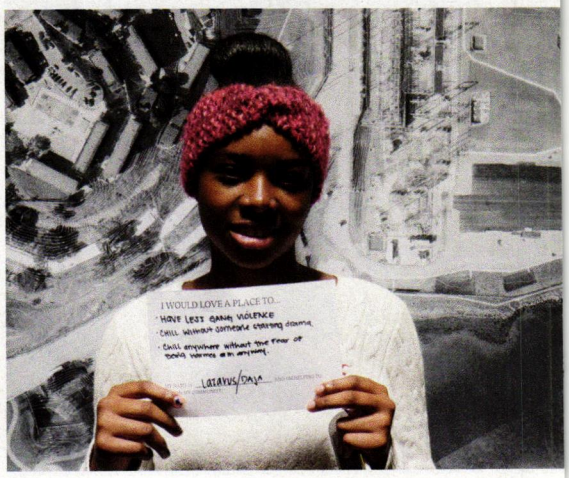
Yet because the site could not be sold or developed immediately, neighborhood residents had an advantage. The parcel is a complex agglomeration of land entitlements, lease agreements, and easements to be untangled—which meant the utility had an immense piece of asphalt-capped land, encircled with razor wire, just sitting there. So in 2012, PG&E hired Envelope Architecture and Design, a Berkeley, California–based architecture firm, to activate a portion of the site with interim uses and to design a permanent park along the water's edge, providing legally required access to the shoreline.

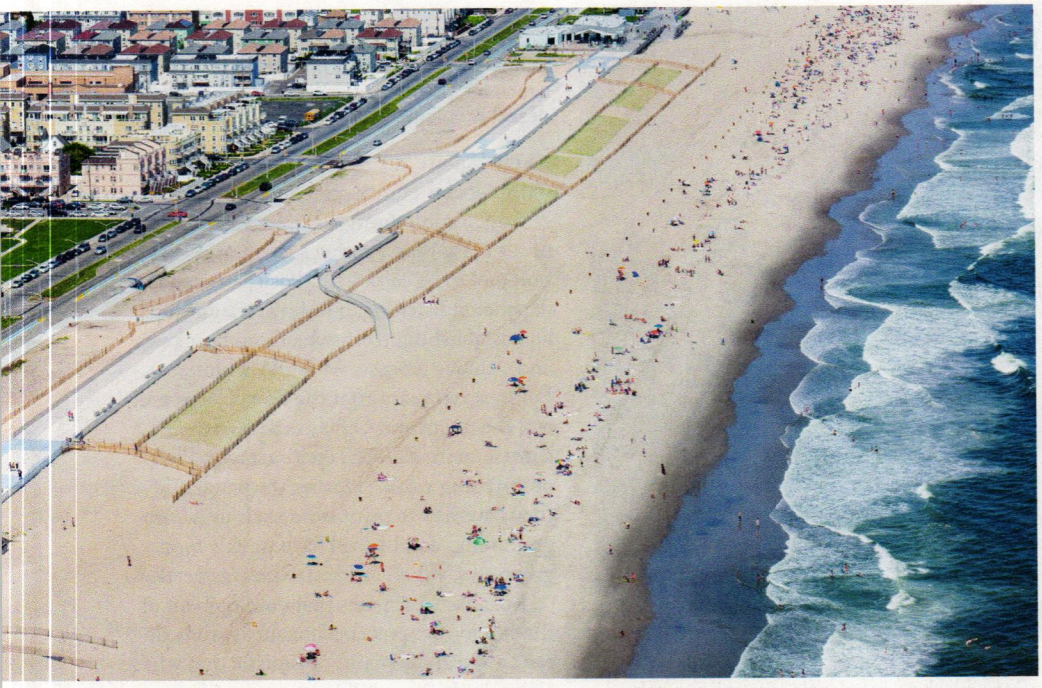
Douglas Burnham, Envelope's founding partner, says his pitch was to "transform the site into a beloved place from something that had been feared." The strategy resembled his Proxy project in San Francisco's formerly gritty Hayes Valley, where he created a group of social and commercial spaces in shipping containers on two disused lots. Conceived as temporary, Proxy has been operating for nearly a decade.

For the PG&E project, Burnham teamed up with Ogbu, who has extensive experience in public-interest design. Almost immediately, Envelope and her Studio O began holding events on a 2.5-acre portion of the site, an area since dubbed NOW Hunters Point. An early program was conducted in collaboration with StoryCorps, the oral history nonprofit. Inside a temporary recording booth, the team documented Bayview-Hunters Point's history and culture and the residents' dreams for the future. The project culminated with a listening party for the whole neighborhood. Other programming—all of which is free—has included a circus, job training, movie nights, and health and wellness fairs. The designers refer to these events as prototyping or testing for future uses. "The programming makes what is possible tangible," says Ogbu. And during every event, Envelope and Studio O gather feedback from attendees about what works and what doesn't and ideas for the future of the site.

The collected data informed the nearly 2,000-foot-long shoreline park that they subsequently designed. Completed in 2017, it connects two existing waterfront trails and is 100 feet wide—considerably roomier than was required—allowing areas for informal gathering and organized activities, while providing an alternate circulation path, something community members said would make them feel safe and secure. The park, planted with native wildflowers, grasses, and shrubs, includes such features as a series of metal screens that recount the history of the site and the neighborhood, a zone with concrete and wood benches for outdoor religious services or for school groups to hold classes focusing on the ecology of the bay, and an overlook that doubles as a spot for fitness instruction. The path is open 24/7 and includes soft, motion-activated lighting.

While proponents of deep engagement generally prefer alternatives to community meetings, some say that such venues can be effective if they are properly structured. "You have to set the process up so that people can bring their own experiences to the table," says





THE DECK of WXY's boardwalk in Rockaway, New York, incorporates features that respond to community feedback, including the wavelike shape of the precast planks (below) and giant letters that spell out the name of the beach, visible from the air (left).

Claire Weisz, founding principal of WXY Architecture + Urban Design, a New York–based firm known for its public work that addresses social and environmental concerns. She points to WXY's replacement of a boardwalk destroyed during Hurricane Sandy in 2012 in Rockaway, a peninsula in the New York borough of Queens that separates Jamaica Bay from the Atlantic. Here the engagement process preferred by the clients—the city's Economic Development Corporation and the parks department—were community meetings that would address stakeholders' concerns about configuration, access to the beach, and materiality.

Completed in 2017, WXY's boardwalk extends for 5.5 miles along the ocean side of the peninsula. To provide protection against future storms, the project team put forward what it calls a "double dune" scheme: the 40-foot-wide path for strolling, running, and cycling would be made of precast-concrete structural elements and decking. The whole would be raised 3 feet above the 100-year-flood plain and bolstered by planted sand berms to either side.

During the meetings, as Weisz recounts it, some attendees voiced concerns that the boardwalk would be little more than an elevated concrete sidewalk. Others expressed a desire for something that was uniquely suited to Rockaway, one suggesting that it be clearly identifiable to passengers in planes taking off and landing at nearby JFK Airport. Meanwhile, some wanted to make sure the designers understood that the boardwalk would be used at all times of day and all year round—not just when the beach was open for swimming. In response, WXY designed wavelike decking and, with graphic designers from Pentagram, integrated giant letters that spell out "Rockaway" into it. The words, in a font that works with the squiggly planks, are in ocean-blue so that they stand out from the other, sand-colored planks, and are legible from the air. And, through materials research, they identified a "glow-in-the-dark" aggregate that they added to the ocean-blue concrete. It emits a subtle light in the evening, evoking the bioluminescence of jellyfish and other sea life.

Adam Lubinsky, WXY's managing principal, cites the linear nature of the project as one reason the inclusion process was effective: the boardwalk stretches through nine distinct neighborhoods, each with its own demographic. "We were able to hold meetings all along the peninsula in local venues and draw from each area," he says. The team tapped a number of Rockaway-based nonprofits that helped with outreach, to ensure meaningful participation.

Weisz and Lubinsky say the project also benefited by pairing with another project—the firm's conceptual plan to improve existing parks throughout Rockaway. Although that had its own dedicated community meetings, the master-planning effort meant the boardwalk was seen as part of a larger whole. "Residents could step back and consider many of the broader open-space needs, from resilience to recreation," says Lubinsky. What is more, a kit-of-parts strategy for the precast elements and other components enabled the boardwalk's completion for $120 million less than the $461 million budget. The savings made funds available for improvements to the local parks, many of which hadn't seen investment in decades, says Weisz. Designs for revamping several parks are now under way by WXY and other firms.

There are, of course, other means to elicit useful information. Jeff Davis, senior principal with Architectural Nexus, a firm with offices in Salt Lake City and Sacramento,



PHOTOGRAPHY: © ALBERT VECERKA/ESTO; TOM FITZGERALD (OPPOSITE, TOP); ANNE HAMERSKY (OPPOSITE, MIDDLE); ENVELOPE (OPPOSITE, BOTTOM)



A LIBRARY AND recreation center in Stockton, California, by Architectural Nexus, will have a demonstration kitchen, an edible garden, and space for a farmers market, to address a food-desert problem.

IMAGE: COURTESY ARCHITECTURAL NEXUS

California, recommends seeking out community members at events such as children's soccer matches or town fairs. "Go to them, find their networks, and you'll get better feedback," he says. By relying on this method for a combined library and recreation center about to start construction in Stockton, California, the architects found, perhaps unsurprisingly, that community members wanted a building that allowed access to the outdoors, fostered collaboration, and included a technology center. They also learned that the surrounding neighborhood was a food desert, despite Stockton's location in the Central Valley, where most of the country's produce is grown. So Architectural Nexus and its library consultant came up with the idea of including a demonstration kitchen for cooking classes. An edible garden and an area for a farmers market are also planned.

How to effectively include communities in the design process is a skill, and there are programs for architects who want to learn alternative approaches to engagement. The Open Architecture Collaborative (OAC), successor organization to the now-defunct Architecture for Humanity, started Pathways to Equity in the fall of 2018, to help design professionals embrace culturally aware processes and recognize their own unconscious biases. "Just because we want to design for a community doesn't mean we know how to design *with* a community," explains Shalini Agrawal, director of programs for OAC. Fellows in the program have included architects, landscape architects, planners, and affordable-housing developers, among others. These professionals have not been limited to early-career practitioners from small firms or those hoping to do pro bono work, as one might expect. Sandy Mendler, the regional education-practice leader for Gensler's San Francisco office, was a member of the first class of fellows and sees potential for applicability to her work. "Universities want to be more porous and more welcoming to the surrounding community," she notes.

In addition to such programs, there are tools that can guide project teams toward a more effective response to a neighborhood's needs and desires. One is the Social Economic Environmental Design (SEED) Evaluator, a program of Design Corps, a three-decade-old nonprofit that aims to use architecture to make positive change in underserved communities. The Evaluator is a framework for documentation and measurement based on five principles, including advocating for those who have a limited voice in public life, promoting an inclusive design process, and conserving resources and reducing waste. The idea is not to codify those principles, explains Brian Bell, Design Corps founder, but "make them actionable." The certification process allows teams to select three priorities critical to their project from a list of possible focus areas, such as emergency shelter, access to green jobs, and political planning and policy. They must then articulate how these will be addressed, and finally measure the outcomes. In addition to the stand-alone program, project teams can use the SEED process to comply with a social-equity pilot credit in LEED.

Still, a community-focused design process needs more than a rating system or certification tool to be successful. Positive outcomes depend on listening, building relationships, and establishing trust, which can be a long and arduous process. At NOW Hunters Point, seven years after the StoryCorps project, Burnham and Ogbu, as part of their contract with PG&E, continue with their prototyping work. (During the pandemic, they have had to pivot from their usual programming, and instead have weekly food giveaways, which residents said was needed.)

Burnham estimates that development of the full former power-plant site is still a decade away and remains optimistic that whatever is built there will incorporate ideas articulated during the ongoing engagement process—including affordable housing, a job-training facility, or a community center. "We've given the residents a toehold in a place that should be theirs," he says. "Hopefully, we've set the stage for something that will be supportive of community." ■

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Learning Objectives

1. Describe shortcomings of traditional methods of community engagement.
2. Outline alternative approaches that promote equity and inclusion.
3. Explain how these more inclusive approaches have been employed on recent projects and describe the outcomes.
4. Discuss certification frameworks and training programs that can support effective community engagement.

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Landscape Architecture: Creating Exterior Spaces

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Pop-up plazas, such as this one in Cedar Rapids, Iowa, designed by Seth Gunnerson, provide flexible design options for creating outdoor spaces in urban areas.

Photo courtesy of Bison Innovative Products

Landscape Architecture: Creating Exterior Spaces

Materials and strategies for enriching the outdoor experience

Sponsored by Bison Innovative Products, Endicott Clay Products Company, Pioneer Landscape Centers, Skyco Shading Systems, and Thermory USA | *By Elena M. Pascarella, RLA, ASLA*

Landscape architecture by definition is the practice of designing the outdoor environment. The American Society of Landscape Architects (ASLA) provides a detailed explanation of this term, stating that landscape architects have a significant impact on both the natural environment and the people who live in the surrounding communities.

In designing outdoor spaces, landscape architects can play a vital role in contributing to the development of the health and well-being of communities. This is accomplished by:

- Improving and regenerating the environmental conditions;
- Providing outdoor environments that are beneficial to people's health; and
- Planning and designing outdoor spaces that generate significant social and economic benefits to communities.

The Sustainable SITES Initiative, which was developed in 2008 through a collaborative, interdisciplinary effort of the ASLA, the Lady Bird Johnson Wildflower Center at The University of Texas at Austin, and the United States Botanic Garden, now provides voluntary guidelines and a rating system for designers to assess the sustainable design, construction, and maintenance of landscapes. The U.S. Green Building Council (USGBC) has incorporated certain SITES credit content into iterations of its LEED green building rating system, and SITES has also adapted LEED credits as part of its latest (v2) rating system.

Key design criteria of both SITES and LEED that are focused on sustainability in the design of outdoor spaces include Materials Selection, Environmental Quality, Human Health and Well-Being, and Energy and Optimization. This course will explore the ways in which designers can create attractive and sustainable outdoor environments that meet LEED and SITES criteria while also providing both social and economic benefits for the projects and their surrounding communities.

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Learning Objectives

After reading this article, you should be able to:

1. Identify the key sustainability criteria (both LEED and SITES) that apply to materials used in outdoor environments.
2. Discuss some of the products and systems that are available for designing exterior plazas, gardens, decks, and roof terraces.
3. Explain the product compliances that meet sustainability criteria for both LEED and SITES.
4. Describe the ways in which outdoor spaces can be designed to benefit human health and wellness.

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Thermally modified wood was used in the design of this pool deck for a private residence.

MATERIALS FOR DESIGNING OUTDOOR SPACES

There are a number of products that provide designers with flexibility in the design of outdoor spaces. Modular decking and pavement systems provide landscape architects with a variety of surface options for creatively designing outdoor spaces both on the ground and on rooftops. Modular cubes and outdoor structures, such as pergolas, provide opportunities for creating privacy and separation by presenting options for vertically defining outdoor spaces.

On the ground level, modular pavers can be used to define entrances, pathways, parking spaces, sitting spaces, and large open areas. Modular wood elements can be mixed with pavers or used by themselves to create unique aesthetics. Modular cubes provide spaces for plantings in rooftop gardens, decks, or parklets. Modular pergola structures provide opportunities to create outdoor rooms for shade and privacy. And all of these modular systems can be utilized in the design of rooftop gardens and decks.

Surfaces for rooftop and ground-level spaces can be designed using wood, stone, structural porcelain, crushed rock, artificial turf, grating, or concrete to create unique custom looks. All of these materials can be applied either on a rooftop when utilizing a pedestal support system or over a prepared ground-level subgrade.

THERMALLY MODIFIED WOOD FOR DURABILITY, AESTHETICS, AND SUSTAINABILITY

Thermally modified white ash, scots pine, and spruce woods are sustainable alternatives to tropical woods or composite products. The wood is harvested responsibly in Northern Europe and the United States from naturally renewable forests, making it a long-lasting alternative to tropical woods without sacrificing durability or dimensional stability. The wood is responsibly harvested by sourcing from a number of different locations around the world, thus leaving each forest healthy and thriving. This wood is also shipped via water, which is a more fuel-efficient mode of transportation than freight train and nearly 10 times as efficient as trucking.

White ash, scots pine, and spruce woods are chosen as most suitable for the thermal modification process for the following reasons:

1. These are fast-growing species and thus more replaceable. This makes them a more sustainable wood species because they can be harvested responsibly, thus helping to appreciate the existing logging infrastructure as well as reduce carbon footprint.
2. These wood species yield the best results via the thermal modification process, achieving a Class 1 Durability rating.

The thermal modification process uses only heat and steam, creating cellular alterations that occur on both a chemical and cellular level in the wood. The sugar content and water-absorption capacity of the wood are altered in the thermal medication process, thus modifying both cellulose and hemicellulose cells.[1] Cellulose is made up of smaller units of glucose, and hemicellulose is made up of shorter carbohydrate structure, monosaccharides.[2] Hemicellulose has the higher oxygen content so the cells of this cellular group can be altered by slightly burning these specific cells within the wood before burning the other cellular groups. This sequential burning process causes a reaction that creates additional heat within the wood. This thermal modification process uses the steam to control the burning process. This produces wood boards that are rot resistant for 25-plus years. It also produces wood with greater structural integrity of the fibers and dimensional stability. Aesthetically, it provides a simple, beautiful, timeless wood product that gets better with age.

Thermally modified wood goes through an extensive testing process for rot resistance, dimensional stability, termite resistance, strength, formaldehyde content, and fire spread. This testing ensures wood boards that are durable, and moisture and rot resistant. The process takes anywhere from a week to several months depending on the test. This thermal modification process is very detailed and computer controlled to ensure the same result literally every single time the wood is processed through the testing chamber

Only select northern hardwoods from U.S. and European forests, which are renowned for their well-documented sustainable forestry practices, are used to produce thermally modified woods. This fact normally satisfies the customer's desire for an eco-friendly product, and FSC certification becomes unnecessary. However, FSC certification is offered on a case-by-case basis. This is done on a special-order basis and depends on the product needed and the size of the order and whether the FSC material is available. The FSC woods require a 25 percent price premium and an extra 12–14 week lead time to source the raw material especially for the order.

Some softwoods used in the thermal modification process are certified by the Program for the Endorsement of Forest Certification (PEFC), a European-based certification system that is not widely known in the U.S. market. These softwoods are sourced from Scandinavian forests, which are closely managed and extremely sustainable, but they are not FSC certified.

Design Applications for Modular Wood Materials

Thermally modified white ash, spruce, and scots pine decking, cladding, and porch flooring offer great versatility to landscape architects. Because of its high durability and low maintenance requirements, thermally modified wood offers great versatility for the design of exterior surfaces whether for porches, outdoor decks, or roof patios, as thermally modified wood can withstand foot traffic as well as harsh weather conditions and still retain its aesthetic character and smooth finish.

Each fiber of the board is modified using the thermal modification process of heat and steam to achieve rot resistance to the core of the board. This provides decking, flooring, and cladding with a Class 1 durability rating. Class 1 durability is a European rating system that rates exterior wood products and their expected lifetime use. Class 1 is the highest possible rating, and it means that without any additional maintenance and with proper installation, the wood would remain resistant of rot for a minimum of 25 years or more. White ash and spruce are classified as Class 1 durability. Class 2 durability ratings indicate that the wood is resistant to rot for 20 years or more. The scots pine wood is classified as Class 2.

As a comparison with other wood species, ipê from Brazil and old-growth Burmese teak have Class 1 ratings, while most other



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tropical rainforest species attain Class 2 ratings or less. Domestic old-growth cedar can be classified as Class 2, although currently harvested cedar is mostly tertiary growth and meets a Class 3 standard, which indicates resistance to rot for 15 years or more.

In addition to durability, thermally modified wood provides a product with a rich, natural color that is not the result of a stain. Left untreated with UV-protectant oil, the boards will slowly age to a platinum grey finish. In addition, each board goes through a milling process that produces an extremely smooth finish, thus eliminating roughness and splinters.

Design and Construction Flexibilty with Wood

Thermally modified wood products provide extensive flexibility for both designers and contractors. Wood used as decking is durable, dimensionally stable, and retains a smooth finish. The wood can be pre-oiled or unoiled. It comes in widths of 3.5–7.5 inches and has a thickness of 0.79–1.65 inches. Thermally modified wood boards can be installed using clips, screws, or PaCS. PaCS are strips on the underside of each wood board that allow the installer to just click the board into place. The installer simply presses down on the custom developed clip strip, and the board clicks into place. The wood boards are pre-grooved with tracks for the clips so alignment is automatic. There is no need for drill bits or screws, thus creating a clean look with no hazards to bare feet.

As an example, ash decking was used by Michael Van Valkenburgh Associates in the design of an outdoor deck for a project along the Arkansas River 2 miles from downtown Tulsa, Oklahoma. The hot summers and riverfront location inspired many of the design elements, including pedestrian land bridges and the outdoor dining deck.

Photo courtesy of Bison Innovative Products



A pedestal system supports modular wood tiles.

Design Flexibility with Versatile Modular Pedestal Systems

Pedestal systems can be utilized over any structural surface: on structural concrete, rigid insulation, or roof membranes for rooftop decks, plazas/terraces, compacted grade, pavements, pool surrounds, or within water features. These pedestal systems are comprised of two major components: pedestals and tiles/pavers. The pedestals are designed to elevate and support a variety of surfaces, including structural porcelain, stone, granite or concrete pavers, wood tiles, composite materials, fiberglass grating, or conventional joist and plank systems.

The pedestal system offers tremendous design flexibility coupled with ease of installation. An adjustable pedestal system provides a unique and viable alternative to traditional deck-building systems for the following key reasons:

1. They are available in a range of heights and weight-bearing capacities to suit a variety of applications.
2. They are one of the most labor- and cost-efficient methods of creating a flat, level structure over a sloped surface.
3. They use a gravity system that protects roofing and waterproofing materials without damaging or harming the surface below.
4. They can support decks over occupied spaces, allowing room for electrical systems, duct work, or irrigation to pass underneath the surface material.

The pedestals can be made from high-density polypropylene plastic (comprised of 20 percent post-industrial recycled content) that is 100 percent recyclable. The recycled material content of the pedestals provides points toward both LEED and SITES certification. The pedestals are screw adjustable and easily leveled with tapered base leveling discs and/or shims, allowing the creation of level rooftop surfaces over a variety of conditions, including sloped surfaces. The pedestals can elevate and support wood tiles, concrete pavers, and a variety of other surfaces when sophisticated, commercial-grade decking is required. They are also sturdy enough to support site furnishings such as planters, tables, benches, and/or structures such as pergolas.

Design Options using Pedestal Deck Systems

The pedestals come in residential, commercial, and industrial grades, with each grade having different characteristics. Deciding which systems to specify is dependent on the support and elevation requirements of the installation. These pedestal systems provide designers with options for creating valuable outdoor spaces for owners and their clients, customers, and visitors. Rooftop decks are a way for residential, hospitality, or public spaces to differentiate themselves from the competition.

A pedestal system is also an ideal method to incorporate a water feature application onto a rooftop garden. The system conceals the water supply beneath the pedestals and surface materials and allows water to drain to the surface below for recycling. Additionally, the pedestal supports are impervious to water, mold, and most chemicals.

These pedestal systems also provide designers with the opportunity to include recessed lighting below the surface. Lighting can be selectively located to enhance the ambiance of the environment and improve visibility and safety during nighttime and/or dark conditions.

Ground-level and street-level sidewalks and storefronts can be expanded through the design of mini-decks, parklets, or pop-up parks, all of which enhance urban communities. These mini-decks, parklets, and pop-up parks can be designed using pedestal systems and modular wood tiles placed over existing ground and street-level spaces. These exterior spaces provide areas that support social connections, mental restoration, and physical activities that meet criteria under Site Design: Human Health and Well-Being in the SITES guidelines.

Fastening kits and splines facilitate quick and secure pedestal deck system installations. The fasteners attach kerf-cut wood tiles, concrete, and stone pavers or paver tray-backed porcelain tiles to the pedestals without penetrating or damaging the selected surface material. While the fasteners are hidden, they can be accessed to allow for the removal of individual wood tiles or pavers if roof maintenance, drain access, or tile replacement is required. Some pedestal systems can also be designed to resist wind uplift. It is important to consult with individual manufacturers and engineers for confirmation on the capabilities of their systems.

Modular Wood Tiles for Ground or Rooftop Applications

Typically made from dense hardwoods, wood tiles are commercial grade and available in responsibly harvested standard and FSC-certified species. Wood species include fused bamboo, cumaru, garapa, ipê, mahogany, and massaranduba. Hardwood tiles contain


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a rich variety of graining and coloration, are exceptionally dense, and are resistant to insects. Wood tiles can be crafted from premium-grade remnants and harvested in an environmentally responsible method designed to preserve the economic viability of rainforest hardwoods.

The density of tropical hardwood species allows for minimal maintenance. If maintaining the wood color is desired, wood tiles can be periodically cleaned and sealed. Left to weather naturally, the wood tiles will develop a silvery-gray patina. Because they weigh one-third as much as concrete pavers, wood tiles are a good alternative when surface material weight is a concern. The tiles can be laid in a parquet or linear pattern, or mixed with pavers, river rock, stones, plank decking, or other options to create unique aesthetics.

Because they are modular, the wood tiles meet SITES criteria 5.3: Design for adaptability and disassembly. The wood tiles also meet SITES criteria 5.8 because they support safer chemistry.

Site Furnishings for Enhancing Landscape Spaces

Site furnishings such as benches, tables, and planters provide enhancements to any outdoor space, as they provide more inviting areas for leisure activities and social interaction. Modular planters provide flexible options for the addition of plantings in roof gardens, small urban spaces, pocket parks, and around building plazas. Planters are available in a variety of materials, including metals, cast stone, concrete, resin, fiberglass, and wood. Metal aluminum planters offer the durability of metal with a lighter weight, making them easy to move as well as place onto rooftop decks.

Modular cubes that are constructed of lightweight, recycled aluminum are durable, low maintenance, and designed to withstand extreme temperatures. This makes them ideal for rooftop locations that are subject to extreme winds, sun, and weather. These cubes are painted using an industrial-strength powder-coating technology developed with modern aesthetics in mind. Powder coating is a dry finishing process that is applied electrostatically and cured under heat, creating a more resilient finish than conventional paint. The process does not emit any volatile organic compounds (VOCs) into the air and allows the aluminum planter cubes to be coated with any RAL (a color-matching system used in Europe) paint code color.[3] The aluminum planter cubes typically contain 20 percent recycled content, are 100 percent recyclable, include drain holes and irrigation sleeves, and are made in the United States. They come in a variety of size and color choices, providing a number of design options for landscape architects.

Modular wood cubes provide another material option for introducing plants onto a rooftop garden or a ground-level exterior space. Ipê wood planter cubes and ipê wood planter cube tops offer a selection of modular design options to incorporate seating, storage, and planters into a ground-level or rooftop space. With the long-lasting durability of dense hardwoods, these wood planters and tops can withstand harsh environments. The warm wood tones and varied grain patterns provide a natural complement to wood decking. The wood planters have a polyurethane lining and drainage holes, making plant care and maintenance easy. Custom sizes and species are available as well. As a storage unit, they can be used for seasonal items like cushions or throw pillows.

Lightweight aluminum trays expand the design options for rooftop environments. Used as a containment system for architectural rocks or other deck elements, the low-clearance aluminum trays integrate seamlessly with the modular planters and wood tiles, providing designers with a palette of materials for designing rooftop environments. The trays are corrosion resistant, made in the United States, and available in a variety of standard and custom size options that offer modular integration with a pedestal deck system.

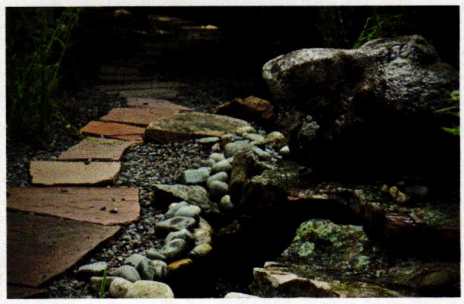
NATURAL STONE MATERIALS AS DESIGN ALTERNATIVES

Stone is a natural product that can be sourced locally. It is not manufactured and is a sole-source product. It contains no harmful toxins or chemicals so it provides an environmentally friendly and healthy element for landscape projects. Stone is used for its strong physical properties, and it can be crushed and broken and sorted into various sizes for a variety of uses.

Natural stone refers to a number of products that are quarried from the earth. These products include granite, marble, limestone, slate, travertine, sandstone, quartzite, and others. Depending on the quarrying operation and extraction process, the stone can be of varying sizes and shapes.

Natural stone materials can include small decorative landscape rocks, river rocks, cobble and beach pebbles, rip rap, and large boulders. These materials provide a variety of design alternatives for the landscape architect, and because they can be locally sourced, they help projects meet LEED and SITES criteria.

Photo courtesy of Pioneer Landscape Centers



This landscape setting uses a combination of natural stone materials. Flagstone is placed on a gravel base. Cobble or river stones are used as edging around a small water feature. Large moss rock boulders provide a means for a waterfall into the small pool.

Decorative rock is used extensively in southwestern landscapes, as it provides a xeriscape surface alternative to lawns, thus conserving on water use. There are many varied colors and sizes to decorative rock due to the geological diversity of its origin. However, decorative landscape rock is also being used in more northern climates as landscape architects look to reduce lawn areas. River rock and cobble have been shaped and smoothed by the force of water friction and also have a use in xeriscape projects. In many northeastern areas, these rounder natural stones are used in the construction of bioretention areas for rainwater management.

Rip rap and larger boulders are sized from 3–4 inches and larger. These natural stone materials are used in landscape designs both for decorative design purposes and as structural elements for erosion control. They can be used to retain steep slopes where vegetation is not practical due to maintenance issues or potential erosion issues. Moss rock is a type of flagstone or sandstone that is covered with moss or lichen. The rock itself is usually brown and red in color hues. As a naturally sourced stone, it is available in a variety of shapes and can be used to add texture and color to a landscape.

These natural stone materials provide alternatives for landscape treatments to control erosion, construct rain gardens and bio-retention areas, and, in the case of moss rock, create natural pathways or patios. Natural stone has a range of sizes depending on the type of stone.

Decorative rock ranges in size from ¼-inch to 1½-inch river rock or crushed rock. Cobble stone or larger river rocks range in size from 2–12 inches. Rip rap ranges in size from 3–12 inches. Boulders/moss rock range from 12 inches and larger.



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MATERIALS FOR PATIOS, WALKWAYS, AND WALLS

Natural stone materials for patios, walkways, and walls include flagstone, strip stone, dimensional stone, and ledgestone. Flagstone is a flat sedimentary stone that is available in a number of colors and textures and suitable for use in pathways, patios, pool decks, or as veneers to create outdoor table and bench surfaces. Dimensional stone or strip stone can be cut into modular shapes and used for outdoor patio surfaces, pathways, or walls. Landscaping ledgestone is crafted from a variety of natural stones ranging from slate to marble. It can be cut into flat panels or rectangular block shapes and is suitable for use as cladding for outdoor projects such as outdoor kitchens. Color options include black, brown, rust, cream, and white.

Natural gravel has many useful landscape applications and provides a pervious surface that also controls erosion. Depending on the quarry source, natural gravel is available in a range of colors, including brown, rust, grey, and black as well as a color mix. The size of gravel ranges from peastone (¼–⅜ inch) down to a very fine stone dust material. Gravel materials can be used for walkway and driveway surfacing and as a base material for pavers.

SYNTHETIC GRASS AS AN ALTERNATIVE TO LAWNS

Synthetic turf has become popular as a surface for sports fields, as it reduces maintenance, eliminates the use of fertilizers, and allows for more frequent use of the fields. Synthetic grass is also becoming more popular in southern and western states for commercial and residential properties that would like a natural green lawn year round but have water restrictions. Synthetic grass requires minimal water (usually just to reduce heat buildup), and there is no need for fertilizer. Most synthetic grasses come with a warranty of 10 years.

The installation process requires an infill base of permeable materials (gravel, peastone) over which the turf is laid. The synthetic turf is usually placed in layered systems of permeable materials. The turf infill layer is placed over a drain pad, which is then placed on a sand layer. Underneath the sand layer is a landscape filter fabric, which is placed over a permeable base material. On roof gardens, synthetic grass can be laid over a pedestal system deck. When measuring for turf areas, add 10–15 percent more to the area to ensure coverage.

Photo courtesy of Endicott Clay Products Company



Multiple colors and patterns can help to humanize pavement scales, as seen at this plaza located in San Clemente, California.

CLAY PAVERS: AN ENVIRONMENTALLY FRIENDLY MATERIAL OPTION

Clay pavers provide the landscape architect with both quality material performance and design flexibility. Clay is an environmentally friendly raw material that has been used to fabricate bricks and clay pavers for hundreds of years. Clay pavers are fired at temperatures exceeding 2,000 degrees Fahrenheit. This process of firing provides designers with pavers that are non-fading and resilient to wear and staining. Because of this high-heat firing process, the pavers never need sealing to retain their color. And because there are no dyes used in the fabrication process, the cost of clay pavers is less than pavers that are comprised of other materials, such as concrete.

Design Flexibility of Clay Pavers

Clay pavers come in a variety of sizes and types, including permeable pavers, relieved edge lugged pavers, pool coping pavers, Danish hand-molded pavers, bullnose paver threads for stairs, and ADA-approved detectible warning pavers. Clay pavers are used in both pedestrian and vehicular applications, including patios, pool decks and pool copings, large outdoor plazas, walkways, and driveways. Their relatively small size creates a pavement surface with a human scale. The small size also allows for the nuances of different colors, textures, and patterns to be clearly seen when standing from one vantage point within a pavement field.

Clay pavers are available in a wider range of colors. Due to the natural color of clay, the most common colors are the reds and browns of earth tones, but clay pavers are also available in buff, black, and gray. The color is typically consistent through the body of the paver, as it is fired in through the entire paver. Clay pavers are also highly resistant to weathering and fading due to their vitrified composition. As clay pavers are made from natural materials, there may be inherent color variations in pavers due to different production runs. For designers, the color variations can be addressed in a field panel and designing patterns from different production lots. Using different colors helps to break down the scale of the very large pavement areas. Borders can be laid in a different color from the field, thus adding interest to the design. Patterns that flow, repeat, and intertwine can also be added.

The texture for pavers and paver treads is wire cut. Wire-cut brick pavers are formed by slicing a brick-sized piece with a wire tool from a larger bulk- length of clay. The clay is formed and fired as a large rectangular piece, and it is then sliced into several small brick-sized pieces by pushing the wire-cutting tool through the clay. This slicing process by the wire cutter leaves a rough surface on the brick as it is pushed through the larger piece of clay. The wire-cut rough surface texture provides more secure footing for pedestrians during rain events. Some clay pavers can also be manufactured with raised bumps on the surface to serve as tactile and detectable warning strips, which are required for ADA compliance at crosswalks.

Pavement texture can be created not only by the surface texture but also by the treatment of the edges. Clay paver edges can be square, round, beveled, or relieved. Edge treatments can be uniform along the entire paver edge or variable, such as with pavers that are made to look historic. Fired pavers can also be tumbled to create "distressed" edges.

Due to their size and color variation, clay pavers can provide designers with great flexibility in the creation of outdoor spaces. Varied pavement patterns can be achieved using herringbone bond, running bond, stack bond, and basket-weave patterns. Pavement patterns should be selected based on the horizontal loads to be received and the proposed setting bed. Setting beds of bituminous sand are the most prone to horizontal movement or paver creep, so a herringbone bond pattern would be more appropriate for these types of setting beds, as this pattern best distributes horizontal forces, thus reducing the potential for paver creep. Patterns with continuous joints (running bond) do not distribute horizontal loads as well, and when using these patterns, they should be oriented perpendicular to the direction of traffic to reduce the possibility of paver creep.


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Permeable clay pavers have quarter-inch lugs around the edges. These lugs maintain the joint spacing between the pavers. The joints as well as the subbase under the pavers are filled with crushed stone. Rainwater will run off the paver surface into the joints and percolate down into the subbase of crushed stone, eventually permeating down through the subgrade into the groundwater table.

In segmental paving applications, chippage can occur when pavers move against each other. This is usually due to improper installation techniques. When paver spacers are used along the edges of clay pavers, the chippage issue is eliminated. The paver spacers create and ensure the needed spacing between each paver to accommodate jointing sand while providing the crisp appearance of square edge pavers. Paver spacers come in both cross and T configurations. Each side of the spacer measures 1¾ inches high by 1 inch wide by 3/32 inch thick. There are four sides or segments to the cross-style paver spacer and three sides or segments to the T-style paver.

Construction and Design Standards for Clay Pavers

When designing an outdoor space using clay pavers, the designer must consider the intended use of the space, and select the appropriate type of paver and detail the appropriate construction application and setting bed. ASTM provides standards for pavers depending on the intended use. Pavers manufactured in the United States must comply with consensus standards published by ASTM International. Two ASTM standards provide the requirements for clay pavers for exterior use. They are ASTM C902: Standard Specification for Pedestrian and Light Traffic Paving Brick and ASTM C1272: Standard Specification for Heavy Vehicular Paving Brick.

The pavers meeting ASTM C902 are suitable for patios, walkways, interior floors, plazas, residential driveways, and commercial driveways. Pavers meeting ASTM C1272 are used in areas that will receive heavy vehicular traffic, such as streets, commercial driveways, and industrial applications.

The intended use of the area designed for clay pavers will dictate the appropriate setting bed. Setting beds provide a means of adjusting paver heights, as there can be slight dimensional variations in pavers. Setting beds can be of sand, bituminous, or mortar depending on whether the area is intended for pedestrian and light vehicular use or heavy vehicular use.[4] The setting bed supports the pavers and distributes the load to the base material. Bases can be of aggregate, asphalt, cement-treated aggregate, or concrete, again depending on the intended use and application of the clay pavers.

Winter Maintenance Considerations

For maintenance in cold climate areas, snow removal and deicing applications should be evaluated for areas designed with clay pavers. Blades on snow equipment should be set high enough so as not to scrape the pavement surface in a manner that causes chipping. Rubber or urethane blade edges can also be used. If snow is intended to be stockpiled onto areas with clay pavers, the load capacity of the pavement must be adequately designed. There are a number of chemical products available for preventing and removing ice from pavements. Calcium magnesium acetate and urea are products that perform well and reduce potential staining of the pavement surface. Calcium magnesium acetate performs more effectively at lower temperatures. Rock salt is not recommended as it contains calcium chloride, which may cause efflorescence on the pavers.

Clay pavers can be laid over hydronic snow-melt systems, which eliminates the need for ice melt applications and in some cases can eliminate the need for plowing or snow clearing. Hydronic snow-melt systems consist of plastic tubing networks that are laid below the pavers, usually cast into a concrete slab. Sometimes the tubing is incorporated into the bedding material underneath the pavers. A heated liquid is pumped around the tubing system during near and subfreezing conditions to maintain a pavement temperature that is slightly above freezing. This prevents the accumulation of snow and ice.

Clay Pavers for Special Applications and Conditions

Clay pavers can be used to cover suspended decks and as permeable paving systems. When used as a pavement surface on a suspended deck, the designer must consider the prevention of water penetration into the structure and deal with elastic deflections. A waterproof membrane should be designed into the structural slab to prevent water penetration. Horizontal drainage mats with a 2 percent slope will help with water drainage. If the structural slab is located over a habitable space, insulation may be required to prevent heat loss in the building. Both foamed concrete and extruded polystyrene have been used for insulation layers depending on the application and intended use of the structural slab.

Clay pavers used as permeable pavement will reduce or delay rainwater runoff into drainage systems. The permeability in the surface is achieved by creating wider joints that are filled with permeable aggregate in place of sand. The pavers are also laid over a permeable setting bed and base of aggregate and stone. The water can thus penetrate through the joints into the base layer and be stored in the base layer until it infiltrates into the subgrade.

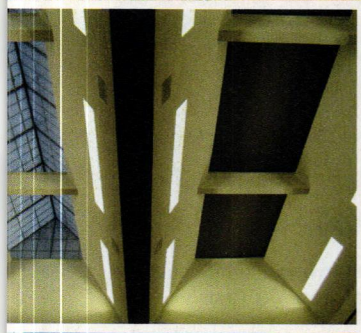
Clay pavers can be used in a wide variety of applications, and with the variety of textures and colors, they provide designers with a number of options for creating inviting and durable pavement surfaces. As clay is a natural material, it meets LEED and SITES criteria that provide points for regional materials. Those clay pavers that are used for rainwater management help to meet LEED criteria 6.1 and 6.2 for Stormwater Design. And using clay pavers in creating plazas, walkways, patios around building exteriors, and streetscapes will provide designers with possible points for LEED Pilot Credit 14: Walkable Project Site, LEED Pilot Credit 78: Design for Active Occupants, and SITES criteria 6.4, 6.5, and 6.6 under Human Health and Well-Being.

EXPANDING OUTDOOR SPACES WITH OUTDOOR STRUCTURES

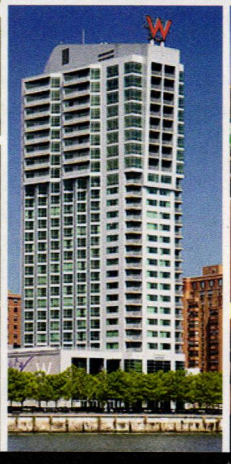
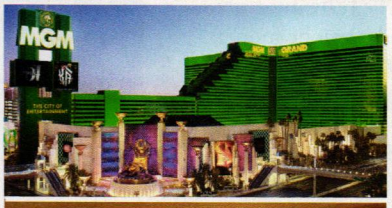
Current design strategies put a great deal of emphasis on expanding outdoor living spaces, as outdoor environments provide both mental and physical health benefits. Outdoor structures can be extremely flexible in size, configuration, and design, giving architects and designers maximum creative options in designing outdoor environments. Outdoor structures are available with decorative options to control sun shading, wind and bug protection, and privacy, thus providing protection from sun, rain, wind, and flying insects and extending the use of outdoor spaces.

Outdoor structures are engineered so that they can enhance recreational and work environments for health-care, hospitality, commercial, and residential settings. These outdoor structures are designed to withstand and function in a number of weather conditions, as the roof louvers and side panels keep out sun, rain, and wind. These







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Motorized Pergolas

structures are designed for hurricane-force wind loads, with a Miami-Dade rating for certain sizes, and have temperature and rain sensors built in so that roof louvers will automatically close at the start of a storm. Side panels can be either shade screens or glass panels, and both help to buffer against wind.

The outdoor structures are available in a number of sizes and design options. Sizes range up to a maximum size of 14.75 feet x 20 feet to even larger if pergola structures are joined. Pergola structures include:

- Square design models that have either a tilting and/or retracting louvered roof or an inoperable stretched fabric ceiling with a drainage system above.
- Incline design models that have retractable fabric roof coverings.
- Frame-only structures with no louvers or fabric coverings. These models allow for the planting of vines on the structure.

Structures are constructed of powder-coated aluminum with stainless steel hardware. The shade fabric is fire rated.

Options for Enclosing Outdoor Structures: Shades and Sliding Panels

Outdoor structures offer a sun-protection roof system through louvers. Louvers work via rotating blades, with each blade channeling water to the beam. The extruded aluminum blades rotate up to 150 degrees and thus enable the user to decide how much sun protection and/or ventilation is required. The closed louver blades form a waterproof roof under normal shower conditions. A gutter system drains the rainwater in the beams and down the columns of the outdoor structure.

Designers have the option of having up to five glass skylight blades in the louver system. The skylight blades obviously let in more sunlight during the day. There is also an option of having LED louver blades to provide nighttime lighting for the interior of the structure. Other LED options include cove-mounted up and/or down lighting and vertical column lighting on the inside corner of columns in either white or RGB color. All of the LED options are dimmable.

Shades offer wind and rain protection along the sides of the outdoor structures. Shades are operated using the same remote control and employ a "zipper" roll shade system that secures the fabric edges on the sides to keep wind and bugs outside. The zip shades come in various sizes. The Medium size option is 157.5 inches wide x 106.35 inches high. Large size options are 236.25 inches wide x 133.75 inches high. The fully integrated zip shades can be hidden inside the beam as an option for maximum passage height under the beam, or shades can be surface mounted in a matching headbox as another option depending on conditions and structure type.

Photo: John Shaw



An outdoor structure can extends design opportunities within the landscape as well as provide health benefits to users.

Shades have a locking zipper side channel, which allows the shade to keep out wind, rain, and insects. Side channels were originally created for Japanese bullet trains, when speeding through tunnels pushing a shock wave of air that would blow roller shades out of their side channel. Now perfected for exterior use, the zipper fabric lock keeps the shade flat and smooth, and seals the edges to keep bugs out. It can even keep golf balls from breaking windows.

Shades can be mounted either on the interior or exterior of the outdoor structure, but the exterior mounting provides several advantages that also help to meet LEED and SITES criteria:

1. With exterior shades, the heat stays outside the structure. The designer can use darker fabric colors to improve shade visibility without concern of heat buildup on the interior of the structure because of the locking zipper side channels.
2. Exterior-mounted shades keep the mechanicals on the exterior of the structure so they are not visible from the inside.
3. Exterior-mounted shades keep the interior of the structure and the windows cleaner if a combination of exterior shade and glass panel are used for the outdoor structure.

All exterior shades meet 80-mph wind resistance against the windows and 31-mph wind resistance in the open. They meet a Wind Class EN13561. A wind-resistance class is determined for every outdoor shade, screen ,and blind system, accredited after strict laboratory testing as specified in the European Standards. The EN13561 references the testing standards for External Blinds and Awnings. Wind-resistance classes are set based on wind speeds:

- Class 1 = wind speed 28 km/h (beaufort scale 4 – 40 N/m)
- Class 2 = wind speed 38 km/h (beaufort scale 5 – 70 N/m)
- Class 3 = wind speed 49 km/h (beaufort scale 6 – 110 N/m)

Note: The Beaufort wind scale was developed and named for British admiral Sir Francis Beaufort (1774–1857) who developed the scale in 1805 to help sailors estimate the winds via visual observations. The scale starts with 0 and goes to a force of 12. Hence the term N/m, which stands for Nautical miles.

The shades have hidden electrical wiring and use a smooth side channel for stability. Both the louvers and shades are motorized and UL electrical listed. Medium shades can also be solar powered because of a photovoltaic cell that can be mounted on the shade enclosure or nearby.

Continues at ce.architecturalrecord.com

Elena M. Pascarella, RLA, ASLA, *is a practicing landscape architect, continuing education presenter, and consultant engaged in a private practice based in Rhode Island. The firm's portfolio can be viewed at* ***www.landscapeelementsllc.com****.*

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PRODUCT REVIEW

Landscape Architecture: Creating Exterior Spaces

Bison Innovative Products

Image courtesy of Bison Innovative Products



Rooftop Deck Systems

Manufactured in the United States with 20 percent post-industrial recycled materials, Bison Pedestals create level decks over sloped surfaces. Bison Pedestals elevate and support wood tiles, pavers, site furnishings, and a variety of other surfaces. Bison Wood Tiles are commercial grade, constructed from sustainably harvested hardwoods, and available in standard and FSC-certified options.

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Endicott Clay Products Company

Photo courtesy of Endicott Clay Products Company



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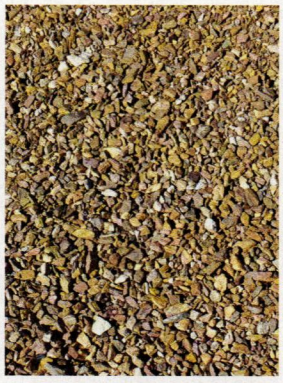

Exclusive Arizona Brown Decorative Rock

Arizona Brown is the newest addition to the Pioneer decorative rock, rip rap, and boulder collections, and it is sure to be the go-to material for projects throughout Arizona. Mined in the heart of Yavapai County, Arizona Brown brings to mind the spirit of the Southwest.

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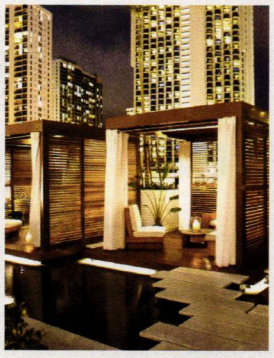
Skyco Shading Systems

Photo courtesy of Skyco Shading Systems



Camargue Louver Structure

The Camargue structure by Skyco can shield you from sun, wind, rain, and flying pests, essentially making the outdoors as comfortable as can be. The operable louvered roof can open for air or sun but also gutter away any rainfall, keeping occupants and furniture dry.

www.skycoshade.com

Thermory USA

Image courtesy of Thermory USA



Benchmark White Ash

Benchmark White Ash is the natural result of Thermory's modification process. Each board is thermally modified using heat and steam, resulting in enhanced rot resistance, a high degree of dimensional stability, and a deep rich color. Benchmark White Ash is an ideal alternative to tropical woods in performance and appearance.

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Building and energy codes directly affect the design of all buildings, particularly their exterior walls and entrances.

Photo courtesy of GFF Architects

Building and Energy Code Updates

The design of exterior walls and glazed entrances are a particular focus

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

Across all 50 of the United States, and in many countries around the world, model building codes have been adopted that are developed by the International Code Council (ICC). Referred to as the International Codes or I-Codes, they include a coordinated family of building safety codes, such as the International Building Code (IBC), the International Residential Code (IRC), the International Energy Conservation Code (IECC), and 12 other specialty codes. All of these documents are the result of a very comprehensive, ongoing process to review, assess, and update them using a three-year cyclical process. There are literally tens of thousands of people involved through this very transparent method that the ICC terms a "governmental consensus process." It points out that this "process leaves the final determination of code provisions in the hands of public safety officials who, with no vested financial interest, can legitimately represent the public interest." In this course, we look at the code development and updating process with an eye toward the role that design professionals, code enforcement officials, the construction industry, and material suppliers all play. We also delve into some specific examples of code-defined issues related to the building envelope and energy conservation. The intent is to provide a broader understanding of how the I-Codes can be an effective tool for staying up-to-date on how buildings can best promote the health, safety, and welfare of the occupants, users, and general public.

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Learning Objectives

After reading this article, you should be able to:

1. Explain the code development and updating process as embraced by the International Code Council and its members to codify safe buildings.
2. Assess the issues related to energy performance that have driven the creation of energy codes and other standards to protect both people and the environment.
3. Identify specific building code issues being updated in the 2021 codes related to overcoming water-related problems in exterior walls.
4. Recognize the different components and elements of glazing systems that affect performance and code compliance for successful buildings.

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CODE DEVELOPMENT PROCESS

How does a change come about to the codes? Ultimately, it starts with the 64,000 members of the ICC. Memberships are categorized by Individuals, Corporate, Governmental, and Associates, each of which carry corresponding benefits and voting rights. Not surprisingly, a substantial portion of the members are code enforcement officials or staff of jurisdictions having authority to enforce the codes. Members also include design professionals (architects, engineers, etc.), corporations (both non-profit and for-prof it), construction companies, product manufacturers, and others with a direct interest in the codes. In addition, a professional ICC staff of 500 employees across nine offices manages and maintains the workings of the ICC as directed by its governing Board. The typical three-year-long process that is used by all of these people to change or update the codes is outlined as follows.

Stage One: Code Development Committees

Anyone can apply to serve on one of the code development committees, with applications reviewed by the Codes and Standards Council. Final recommendations are made to the ICC Board for appointment. Members of the committees fall into any one of three categories: 1) general members, including governmental regulatory agencies; 2) users such as building owners, design professionals, insurance companies, private inspection agencies, and academics; or 3) producers, meaning builders, contractors, manufacturers, and distributors. The committees are typically broken down by specialty topics related to the I-Codes, and it is the role of the committee members to bring their expertise and professional knowledge into the discussion and review of their code-related topics.

Changes or updates to any of the I-Codes can be proposed by anyone using an online platform known as cdpACCESS. ICC staff members monitor and review such proposals and assign them to the appropriate Code Development Committee. It has been observed that market forces, design advances, product research and development, academic research, and other factors often cause changes in the design and construction field to happen first. As these changes become more commonplace, the I-Codes need to be kept up-to-date to address them appropriately. Hence, it is ultimately the charge of the committees to keep the I-Codes updated and relevant to the design and construction industry while continuing to safeguard public health, safety, and welfare.

Stage Two: Committee and Public Hearings

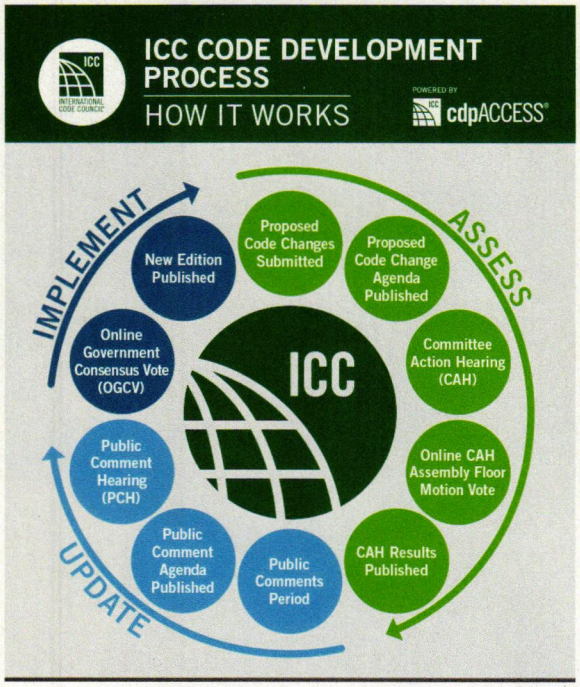
With committees in place and proposals received, the process of review begins with Committee Action Hearings. Using an inclusive series of presentations, discussion, and debate, the committee delves into the details of the proposed change and its impact on the codes. Upon completion, the committee then votes on each proposal in one of three ways: approve, approve with modification, or disapprove. In the first two cases, the proposal will move forward for public review, while a disapproved proposal typically ends there. However, any participant in a particular proposal process can challenge the committee actions. In that case, ICC members can vote on the challenge online and, if approved by voting, the proposal automatically moves forward to public review.

With proposals fully vetted by the committees, the public comment period begins with anyone able to submit public comments online in response to the committee action hearings. In-person public-comment hearings follow next, leading to those eligible voters present discussing and voting on each of the code-change proposals. In this case, eligible voters include only those who work in government agencies protecting the health, safety, and welfare of the public with no financial stake in the outcome.

Stage Three: Final Voting and Publication

The final step is for the full online governmental consensus vote to take place. This final vote is actually a combination of the in-person public-comment hearing votes and the online votes of eligible voters. A separate Validation Committee reviews all of the votes, and it is then left up to the ICC Board to confirm the final results. The proposals that have thus been successfully vetted, modified (if appropriate), and voted on are then slated for inclusion within the next update of the relevant code. The proposals that do not receive enough votes are therefore not included in the code update.

Source: International Code Council



The International Code Council (ICC) code development process requires a three-year cycle for updates.



Photo courtesy of TAMLYN

Water-resistive barriers (WRBs) and drainable walls are required by code to protect exterior wall assemblies and prevent the problems of water penetration.

The updated editions of the I-Codes are published every three years and made available to the public. Subsequently, the next three-year cycle of code review and development begins again.

ENERGY CODES

Energy performance in buildings is a good case in point of the design and construction industry moving out in front and the codes needing to be updated to keep pace. Since the 1980s, there has been a concerted movement that has taken hold in design, construction, product manufacturing, and



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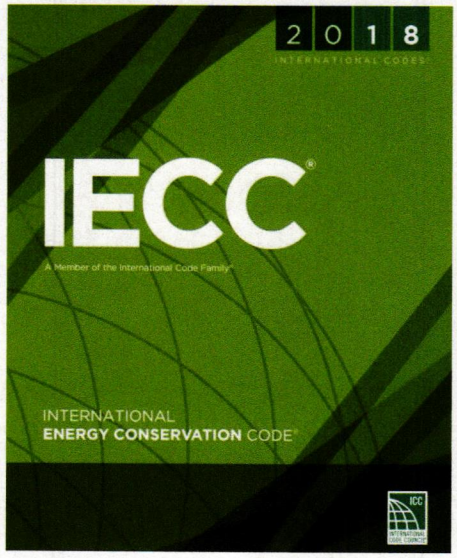
building operations to reduce the amount of energy used in buildings. Energy codes emerged during this time—not to regulate energy consumption (i.e., there are no violation orders issued if a monthly utility bill is too high), but to regulate design and construction so that energy usage in buildings is better controlled. This control falls into two categories; 1) energy conservation, which is the act of reducing the amount of energy needed in the first place, playing out most notably in a better-performing building envelope (insulation, air sealing, glazing traits, etc.); and 2) energy efficiency, which means reducing the amount of energy required to power equipment, lighting, etc. and still achieve the desired outcomes (heating, cooling, light levels, etc.). Taken all together, we refer to the energy performance of a building as a combination of the conservation and efficiency measures that achieve a measurable outcome. The IECC addresses all of these aspects of energy performance. It also recognizes that different climate zones exist around the country that directly impact the energy performance in buildings.

Outside of the IECC, there are numerous organizations that have been addressing the issues related to energy performance in buildings. The non-profit organization Architecture 2030, for example, has done an excellent job of communicating data from public sources that identify buildings in the United States as responsible for nearly half of all energy usage and 40 percent of carbon emissions. Relatedly, more than 70 percent of the electricity generated in the United States is consumed in buildings. This information has helped many people realize the significant impact that reduced energy usage in buildings can hold—almost as much as the impact from both transportation (cars, mass transit, airlines) and industry (other than construction) combined. Accordingly, many well-known voluntary programs such as the Architecture 2030 Challenge, The AIA 2030 Commitment, LEED, ENERGY STAR for Buildings, Passive House, The Living Building Challenge, and others have all emerged and evolved within the past 20 years to become an integral part of mainstream building design.

Pushed by this movement, the IECC has undergone a number of revisions and updates in this time focused on establishing the "code minimum" level of energy performance while still allowing these other voluntary programs to go beyond that level. Note that the health, safety, and welfare significance of the IECC is more than just a concern for the environment in general related to air quality and climate change. It is also based on addressing the adequacy of the supply of energy to buildings. The energy crisis of the 1970s demonstrated that real or imposed shortages of energy supply posed a significant threat to the public (think about how long is too long when experiencing a power outage). Virtually all buildings now rely on energy to operate the heating, cooling, lighting, appliances, electronics, and equipment. If that supply is compromised or interrupted, so is the safety and quality of life of the people who are in those buildings.

It is not surprising then that other relevant documents outside of the IECC have been developed almost concurrently, including the following.

Source: International Code Council



The 2018 International Energy Conservation Code (IECC) reflects the latest "code minimum" standards for energy performance in buildings.

ASHRAE 90.1

The American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) has long been involved in optimizing the engineering of energy-using equipment in buildings. It has also recognized the significance that the building envelope has on the amount of energy needed to operate that equipment, both in terms of capacity and in the amount of time it needs to run. As such, ASHRAE has committees and work groups made up of members and associates to generate some recognized standards for building design. ASHRAE 90.1: Energy Standard for Buildings Except Low-Rise Residential Buildings is meant to apply to most commercial, industrial, and institutional buildings. The ICC has recognized this standard as "equivalent" to, albeit not identical to, the requirements of the IECC. Hence, it is a recognized alternative to use when showing code compliance for nonresidential buildings. While there are indeed differences between ASHRAE 90.1 and the IECC, a building designed to meet the minimum standard of either one should yield approximately the same overall energy performance.

California Title 24

In the state of California, the codes are referred to as the California Building Standards Code, which is embodied in the California Code of Regulations, Title 24. It is commonly referred to simply as Title 24 and includes 1) some adopted I-Codes as written; 2) some I-Codes with adaptations to suit California; and 3) some California-generated standards to suit particular state concerns. As such, the Title 24 codes are generally more stringent, particularly in regards to energy performance and seismic issues, than the model I-Codes alone. This means that the "code minimum" threshold for energy performance can be expected to be higher in California than elsewhere in comparable climate zones. It has also been observed that other states, particularly those in the Pacific Northwest, have begun to follow California's lead and are starting to incorporate their own state adaptations to the model codes.

Continues at ce.architecturalrecord.com

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

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PRODUCT REVIEW

Building and Energy Code Updates

C.R. Laurence

Photo: Andy Caulfield



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Entice merges all-glass aesthetics with full-frame thermal performance. Featuring ultra-narrow 1⅛-inch vertical stiles, it provides clean sightlines while producing U-factors as low as 0.43 using thermally broken framing. Entice has the unique ability to support door handles—including panic devices—on 1-inch insulating glass units with proprietary through-glass fittings.

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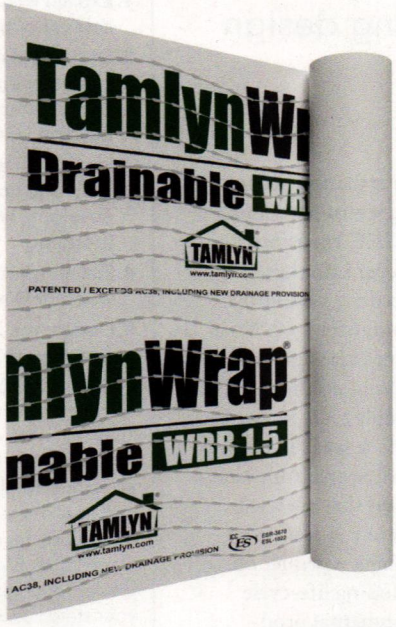

TamlynWrap® Drainable WRB 1.5

TamlynWrap® Drainable WRB 1.5 is a unique moisture management product that combines a high-performance WRB with a unique, patented, and noncompressible drainage pattern. The design can remove 100 times more water from a wall versus standard wraps. This patented technology is omnidirectional, offering installation flexibility compared to other available options.

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Photo: © Oz Architecture/JC Buck; courtesy of WoodWorks



Located in downtown Denver, Platte Fifteen is a five-story workspace that incorporates a mass-timber frame built using glue-laminated timber (glulam) beams and columns as well as cross-laminated timber (CLT) floor and roof panels.

How to Calculate the Wood Carbon Footprint of a Building

Expanding the possibilities of wood building design

Sponsored by Think Wood | *By Edie Sonne Hall, Ph.D.*

From an environmental perspective, it is widely known that buildings matter. Buildings consume nearly half the energy produced in the United States, use three-quarters of the electricity, and account for nearly half of all carbon dioxide (CO_2) emissions.[1] The magnitude of their impacts is the driving force behind many initiatives to improve tomorrow's structures—from energy regulations and government procurement policies, to green building rating systems and programs such as the Architecture 2030 Challenge. The focus on energy efficiency, in particular, has led to widespread improvements, so much so that many designers are now giving greater attention to the impacts of structural building materials. This greater attention has revealed that greenhouse gas (GHG) emissions associated with materials used in buildings and construction account for 28 percent of building sector emissions and 11 percent of global GHG emissions.[2]

Are we able to dive deeper into these numbers to find ways to reduce a building's carbon footprint in meaningful ways? What are the methods used to measure building material carbon footprint and do they tell the whole story? Are there simple tools to assess material choices? This course seeks to address these and other questions by explaining the principal methods and tools that are used to assess carbon footprint in the context of building materials. It includes a primer on product terminology, including life-cycle assessment (LCA), environmental product declarations (EPDs), carbon footprint, embodied carbon, and whole-building LCA (WBLCA) tools. It explains how biogenic

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Learning Objectives

After reading this article, you should be able to:

1. Explain what a carbon footprint is in the context of building materials.
2. Describe the difference between life-cycle assessment (LCA), environmental product declaration (EPD), and whole-building LCA.
3. Identify different whole-building LCA tools and how they can be used to develop a whole-building carbon footprint.
4. Define what is and is not included in a wood EPD and why.
5. Discuss the biogenic forest carbon cycle, and ways to track and assure forest sustainability in North America.

To receive AIA credit, you are required to read the entire article and pass the test. Go to ce.architecturalrecord.com for complete text and to take the test for free. This course may also qualify for one Professional Development Hour (PDH). Most states now accept AIA credits for engineers' requirements. Check your state licensing board for all laws, rules, and regulations to confirm.

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carbon is treated in standard LCA methodology and dives into the forest side of the equation, explaining basics of the sustainable forestry cycle. This course also highlights some ways to track and assure wood comes from sustainable forests in North America and why demand for wood products supports investment in forest management.

WHY BUILDINGS MATTER

The growing urgency to address climate change was underscored in a 2018 Special IPCC report warning that in order to allow time for the earth to adapt to a warming climate, carbon emissions need to be further reduced to be in line with a 1.5 degrees Celsius warming, not 2 degrees Celsius as originally discussed. They warned that a 2 degrees Celsius temperature rise could raise sea levels to such a height that another 10 million people would be at risk of flooding. To stay within 1.5 degrees Celsius warming, global GHG emissions need to decline 45 percent below 2010 levels by 2030 and reach net-zero emissions by 2050.

The building sector has a critical role to play in what happens over the next 30 years. Not only do buildings account for almost 40 percent of global GHG emissions, but the increasing urbanization of the population means that 2.48 trillion square feet of building is expected to be added to the global building stock by 2060. This number is essentially double the current building stock, making the choice of materials in buildings over the next decades that much more important.

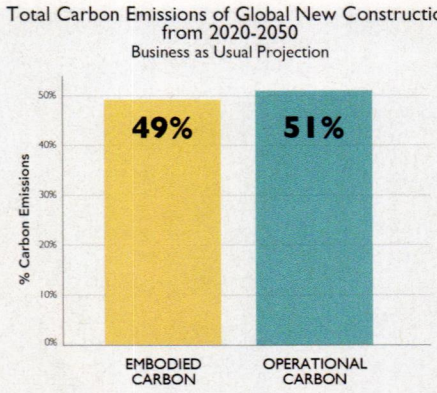
Architects and engineers are setting aggressive goals to help reduce emissions. Architecture 2030 has issued the following challenge to the global architecture and building community for embodied carbon: "The embodied carbon emissions from all buildings, infrastructure, and associated materials shall immediately meet a maximum global warming potential (GWP) of 40 percent below the industry average today. The GWP reduction shall be increased to: 45 percent or better in 2025; 65 percent of better in 2030; zero GWP by 2040."[3] The 2030 Challenge is widely adopted in the United States and globally by individuals, professional organizations, and governments. It has been adopted into federal, state, and local government legislation and has become standard practice in many AEC firms. It advances the use of low-carbon/carbon-sequestering materials, building materials with high-impact potential for emissions reductions, and whole-building approaches to emissions reductions.

Similarly, the structural engineering community has set the SE2050 goal to promote, design, and construct net-zero embodied carbon structures by 2050 (se2050.org). "Signing up to the SE 2050 Commitment Program requires creating a firm-wide plan to reduce the embodied carbon of your structural systems, tracking your progress, and evaluating and reducing the embodied carbon impacts of the design decisions you make on your projects."

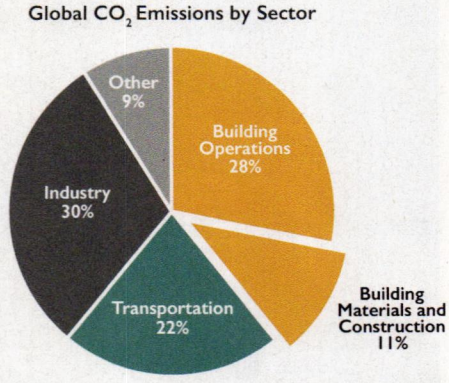
CARBON FOOTPRINT IN THE CONTEXT OF BUILDING MATERIALS: A PRIMER ON THE TERMS

Understanding a material's impact at every stage of its life is essential for designers looking to compare alternate designs or simply make informed choices about the products they use. Life-cycle assessment (LCA) is an internationally recognized method for measuring the environmental impacts of materials, assemblies, or whole buildings from extraction or harvest of raw materials through manufacturing, transportation, installation, use, maintenance, and disposal or recycling.

An LCA is sometimes described as cryptic and complicated. Yet, what is involved is simply a thorough accounting of resource consumption, including energy, emissions, and wastes associated with production and use of a product. For a "product" as complex as a building, this means tracking and tallying inputs and outputs for all assemblies and subassemblies—every framing member, panel, fastener, finish material, coating, and so on. To ensure that results and data developed by different LCA practitioners and in different countries are consistent, LCA practitioners must adhere to a set of international guidelines set forth by the International Organization for Standardization (ISO).



Source: © 2018 2030, Inc./Architecture 2030. All Rights Reserved. Data Sources: UN Environment Global Status Report 2017; EIA International Energy Outlook 2017. www.architecture2030.org



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Edie Sonne Hall, Ph.D., has more than 20 years of experience in forestry, with expertise in carbon accounting, ecosystem services, life-cycle assessment, certification, and environmental and sustainability policy across local, federal, and international domains, working with the largest landowners in the world through to family farm forest organizations.

Embodied carbon in construction materials accounts for 11 percent of global GHG emissions and will be responsible for almost half of building sector's new emissions over the next 30 years. Embodied carbon is different than operational carbon, which is the result of energy used to operate a building once it is completed. The focus of this CEU is on embodied rather than operational carbon.

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MEC Headquaters in East Vancouver, British Columbia, Canada

All images courtesy of National Glass Association

High-Performance Glass Solutions

A systems approach to efficient building envelopes

Sponsored by National Glass Association | *By Jessica Jarrard*

In our modern world, designing, specifying, and constructing high-performance buildings is no longer optional. Rigorous building codes require it. Owners and occupants increasingly demand it. And our global sustainability depends on it. "Anyone who can see the data on climate can see that something has to change when it comes to carbon emissions," says Josh Wignall, director of marketing for EFCO Corp. "And we need to do it quickly."

Increased carbon in the atmosphere leads to climate change, which causes drastic temperature fluctuations, droughts, severe tropical storms and hurricanes, and rising sea levels. Intense storms, heat waves, driving rain, and heavy snow can wreak havoc on building exteriors, leading to unwanted air and water intrusion that can cause a building's materials to decay at a much faster rate. Unwanted heat gain and loss can also be problematic, creating higher energy costs and putting more strain on the mechanical system, which will then use more energy, generate more greenhouse gases, and perpetuate the cycle of climate change.

Glass facades, as well as their framing systems, are part of the building envelope, which

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Learning Objectives

After reading this article, you should be able to:

1. Define the qualities of high-performance glass systems and how they promote energy efficiency.
2. Explain how performance and aesthetics can work together to promote building occupant comfort.
3. List factors to consider when specifying glass and glazing options for security applications or occupant protection.
4. Describe how codes and standards help specifiers pick the right products.

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is the first line of defense on a structure. In the past, glass was not ideal for large expanses of buildings because it did not provide insulating properties that could prevent unwanted solar heat gain or loss. Older buildings often have smaller windows and solid doors instead of full facades made of glass and glazing. Thanks to the advancements in glass technology and glazing, glass is now much more energy efficient. By treating large glass expanses and the framing as part of the entire building system, architects and installers can ensure that glass and glazing contribute to the high performance of buildings rather than detracting from it.

INTRODUCTION TO GLASS, GLAZING, AND THE SYSTEMS APPROACH

When specifying glass, architects and designers must consider many factors in addition to energy efficiency and thermal protection. These include safety, security, and proper daylighting for occupants.

Glass

First, let's introduce some common glass types and their applications. We will discuss annealed glass, heat-strengthened glass, tempered glass, and safety glass.

Annealed Glass

Annealed glass is popular in residential construction and sometimes used in commercial construction applications. Annealed glass is cooled slowly to prevent any residual stress in the body of glass. It can be cut, machined, drilled, edged, and polished, unlike tempered or heat-strengthened glass.

Heat-Strengthened Glass

Heat-strengthened (HS) glass undergoes heating and cooling processes in manufacturing, making it twice as strong as annealed glass of the same thickness and configuration. According to ASTM C 1048, heat-strengthened glass must have a surface compression between 3,500 and 7,500 psi for a thickness of up to 6 millimeters. Due to its greater resistance to thermal loads (when compared to annealed glass), it can resist most wind and thermal stress loads.

When HS glass is broken, the fragments are typically larger shards and may remain in the glazing opening. Large broken shards can cause injury to occupants, therefore HS glass is not a safety-rated glazing, as specified by ANSI Z97.1 and CPSC 16 CFR 1201. Because it can withstand wind load and thermal stress, HS glass is intended for general glazing and is often used in commercial applications. HS glass cannot be cut or drilled after heat strengthening.

Fully Tempered Glass

Tempered glass undergoes a thermal tempering process and is approximately four times stronger than regular annealed glass of the same thickness and configuration, making it ideal for commercial applications. Per ASTM C 1048, the surface compression of fully tempered glass must be 10,000 psi for thicknesses up to 6 millimeters. When fully tempered glass passes ANSI Z97.1 and/or CPSC 16 CFR 1201, it is often referred to as a "safety tempered glass" because it meets the requirements of various code organizations for safety glazing. If fractured, the glass will break into smaller pieces, making it less likely to cause serious injury in most applications.

Next we will discuss various types of safety glass, including monolithic safety tempered glass, single lite with film/plastic, laminated, laminated insulating glass units (IGUs), and multi-ply.

Monolithic Safety Tempered Glass Lite

Monolithic safety tempered glass is a single glass lite but also safety tempered. Safety tempered glass is approximately four times stronger than regular annealed glass and called "safety glass" because, when fractured, it breaks into smaller pieces, which makes it less likely to cause serious injury. Monolithic safety tempered glass is also great for daylighting because it allows sunlight to penetrate the building. This glass is best suited for areas that require safety glazing per IBC Chapter 24.

Single Lite with Film/Plastic

A single glass lite with an applied film or plastic that passes the ANSI Z97.1 and/or CPSC 16 CFR 1201 testing is also considered safety glazing because it will break and be contained in the glazing opening. A single glass lite with film or plastic will also allow for proper daylighting. This glass is more secure than standard single safety tempered glass lites.

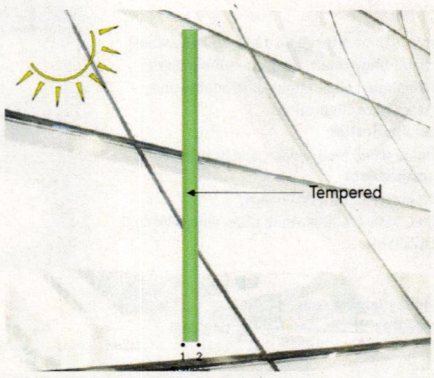

Illustration of tempered glass

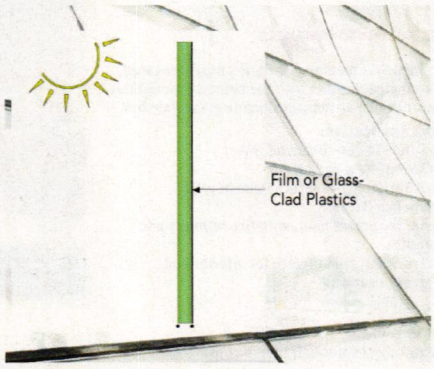

Illustration of single-lite glass with film or plastic

Laminated Glass

Laminated glass is made up of two or more lites that are permanently bonded under heat and pressure with one or more plastic interlayers to provide extra protection. This type of glass is great for areas that need added protection, such as entry doors or glass areas in banks, waiting areas, or other public spaces where safety is a concern. Another safety feature is that, when broken, the glass stays contained instead of vacating the glazing opening.

Continues at ce.architecturalrecord.com

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

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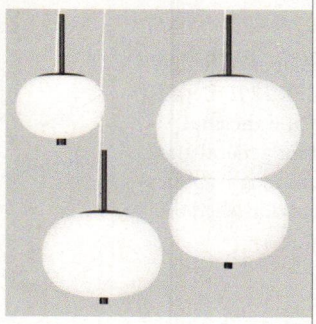

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Product Application:

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Performance Data:

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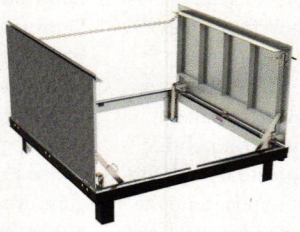

Floor access doors provide safe and reliable access for maintenance personnel to equipment stored underground or below/between building floors.

Product Application:

- Ellsworth Kelly Art Exhibit at University of Texas, Austin, Texas

Performance Data:

- Engineered lift assistance for easy one-hand operation
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DATES & Events

Ongoing Exhibitions

Barkow Leibinger – Revolutions of Choice
Berlin
Through October 4, 2020
This retrospective at the Haus am Waldsee shows over 25 years of work that demonstrates material exploration. Models and installations are presented on both floors of the exhibition space and in an adjoining outdoor sculpture park—including the Serpentine Summer House from 2016, Thicket, and the Kinetic Wall. For more information, go to barkowleibinger.com.

The Shape of Abstraction: Selections from the Ollie Collection
St. Louis
Through October 11, 2020
This exhibition at the Saint Louis Art Museum presents paintings, drawings, and prints by five generations of Black artists, starting in the 1940s. The exhibition includes Norman Lewis's gestural drawings, Sam Gilliam's paintings, James Little's experiments with color, and Chakaia Booker's prints, and more. See slam.org.

RAIMUND ABRAHAM: Angles and Angels, Drawings Models Prototypes
Vienna
Through October 18, 2020
The MAK (Museum of Applied Arts) presents works by Austrian-American architect Raimund Abraham. The exhibition presents over 50 sketches, collages, models, furniture prototypes, and designs—for both realized and unrealized projects—that explore the dynamics of the individual and sociopolitical challenges he faced. The works on display originate from the archive of Una Abraham, the collection of the Architekturzentrum Wien, the MAK Contemporary Art Collection, and a Viennese private collection. See more at mak.at.

Yves Klein: Les Elements et Les Couleurs
Massignac, France
Through January 29, 2021
Taking place at the 2,500-acre private estate's La Laiterie art space is a career-spanning showcase of 60 essential works by Yves Klein, the French artist best known for his signature color, Klein Blue. The documents and films on display, which include Architecture de l'air, his utopian vision to build more flexible cities from the elements of fire, air, and water, explore his spiritual connections to both nature and the cosmos. More at yvesklein.com.

Events

AIA Austin Homes Tour
Austin, Texas
October 16–19, 2020
The 2020 event will be held virtually and feature houses by the following local architects: Alterstudio Architecture and Mell Lawrence Architects (combined project), baldridgeARCHITECTS, Tim Cuppett Architects, Charles Di Piazza Architecture, Mark Odom Studio, Thoughtbarn, Jobe Corral Architects, Studio 512, and Hugh Jefferson Randolph Architects. Ticket holders will have online access to resources including pictures, plans, models, videos, and

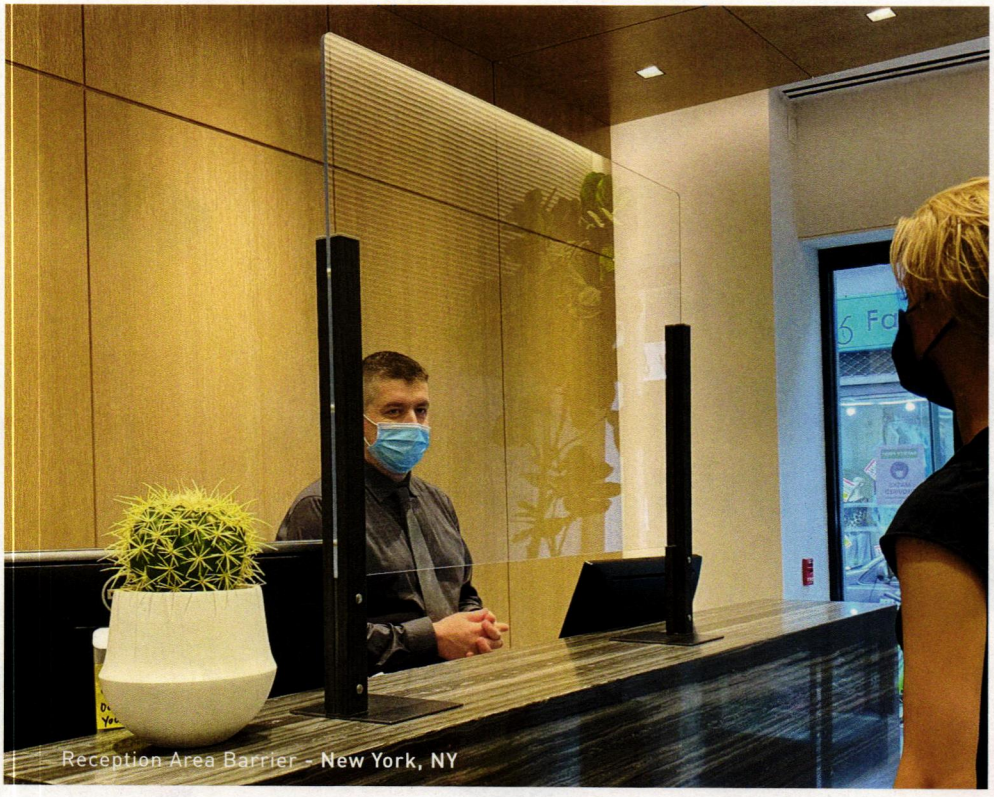
360-degree virtual walk-throughs, with live sessions from architects and collaborators. Visit aiaaustin.org.

Open House Chicago
Chicago
October 16–25, 2020
The Chicago Architecture Center has reconfigured its annual event for outdoor and online attendance this year; more than 20 Chicago neighborhoods and two suburbs will be highlighted, focusing on areas prioritized by the city's INVEST South/West initiative. Attendees can supplement their self-guided exploration with free resources available online and through an application for mobile devices in order to select routes, learn more about buildings and sites of interest in each neighborhood, and participate in online programming. Walking tours by Chicago Architecture Center will continue throughout the festival. For more information, go to openhousechicago.org.

Competitions

Future of British Railway Stations
Deadline: September 15, 2020
Network Rail and the Royal Institute of British Architects have launched an international competition to provide architects, engineers, and designers the chance to reimagine small to medium-size British railway stations so they can better serve the needs of passengers and their communities. In developing proposals, entrants are encouraged to consider how future stations can deliver value and achieve net zero emissions. See details at architecture.com.

Reimagining Museums for Climate Action
Deadline: September 15, 2020
This competition invites you to think about how new approaches to the design and organization of the museum experience can amplify and accelerate climate action at various scales, enabling museums and society to move fur-



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ther and faster together toward a net zero or zero-carbon future. Proposals that address climate justice and green futures are welcomed. The competition is free to enter and open to anyone over the age of 18. See more at museumsforclimateaction.org.

2020 Architecture Drawing Prize
Deadline: October 2, 2020
The World Architecture Festival's competition showcases the art and skill of architectural drawing. Architects, designers, and students can submit in the following categories: hand-drawn; digital; and hybrid, combining the two. A special prize, focused on the global lockdown during the Covid-19 pandemic, will be awarded to one of the above categories based on a drawing completed during lockdown or a drawing relating to the changes that Covid-19 will bring to architecture. Submissions across the three categories will be evaluated on the basis of their technical skill, originality in approach, and ability to convey an architectural idea. Drawings can be entirely speculative or relate to real projects. The winners and short list will be decided in late October and then go on display at a dedicated exhibition at the Sir John Soane's Museum in London until February 2021. See worldarchitecturefestival.com.

The Ken Roberts Memorial Delineation Competition (KRob)
Deadline: October 22, 2020
KRob honors hand and digital delineation by professionals and students throughout the world. All entries must be architectural or spatial in nature and can include but are not limited to orthographic drawings, conceptual diagrams, renderings, or animations. Exploration and innovation in singular techniques are encouraged. While there is no limit to the number of entries one can submit, submissions awarded in past Ken Roberts competitions are not eligible. Sketchbooks will not be accepted; a single, clearly marked page within the sketchbook may be entered. See more at krobarch.com.

The Forge Prize
Deadline: November 1, 2020
This competition, offered by the American Institute of Steel Construction, recognizes emerging architects for designs that embrace steel as a primary structural component and capitalize on steel's ability to increase a project's speed. U.S.-based architects who are either currently seeking licensure or have been licensed for fewer than 10 years may enter. The 2021 winner will take home $15,000 and have the opportunity to present their idea both live on YouTube and to an audience at the Architecture in Steel conference. Go to forgeprize.com.

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



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SNAPSHOT



SHoP Architects designed 335 Madison, a coworking tech campus in Midtown Manhattan, to feel decidedly "not techy," says SHoP founding partner Corie Sharples. To achieve this, the New York–based firm has completed several phases of a seven-story interior renovation of the building. In 1913, this was the site of the Biltmore Hotel but was replaced by a bank headquarters. SHoP's aim is to make its public area evoke a "grand, old hotel lobby" again, with a soaring 30-foot atrium, using warm, rich materials such as wood and marble "to erase that corporate bank feeling," explains Sharples. Common areas and amenities on the main levels, including retail, a café and bar, and a fitness studio are open to the public (or will be again, post-Covid-19). SHoP also expanded the entryways at street level to make the public spaces "more welcoming, accessible, and visible," especially to commuters passing through the adjacent Grand Central Terminal, says Sharples. *Kara Mavros*

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