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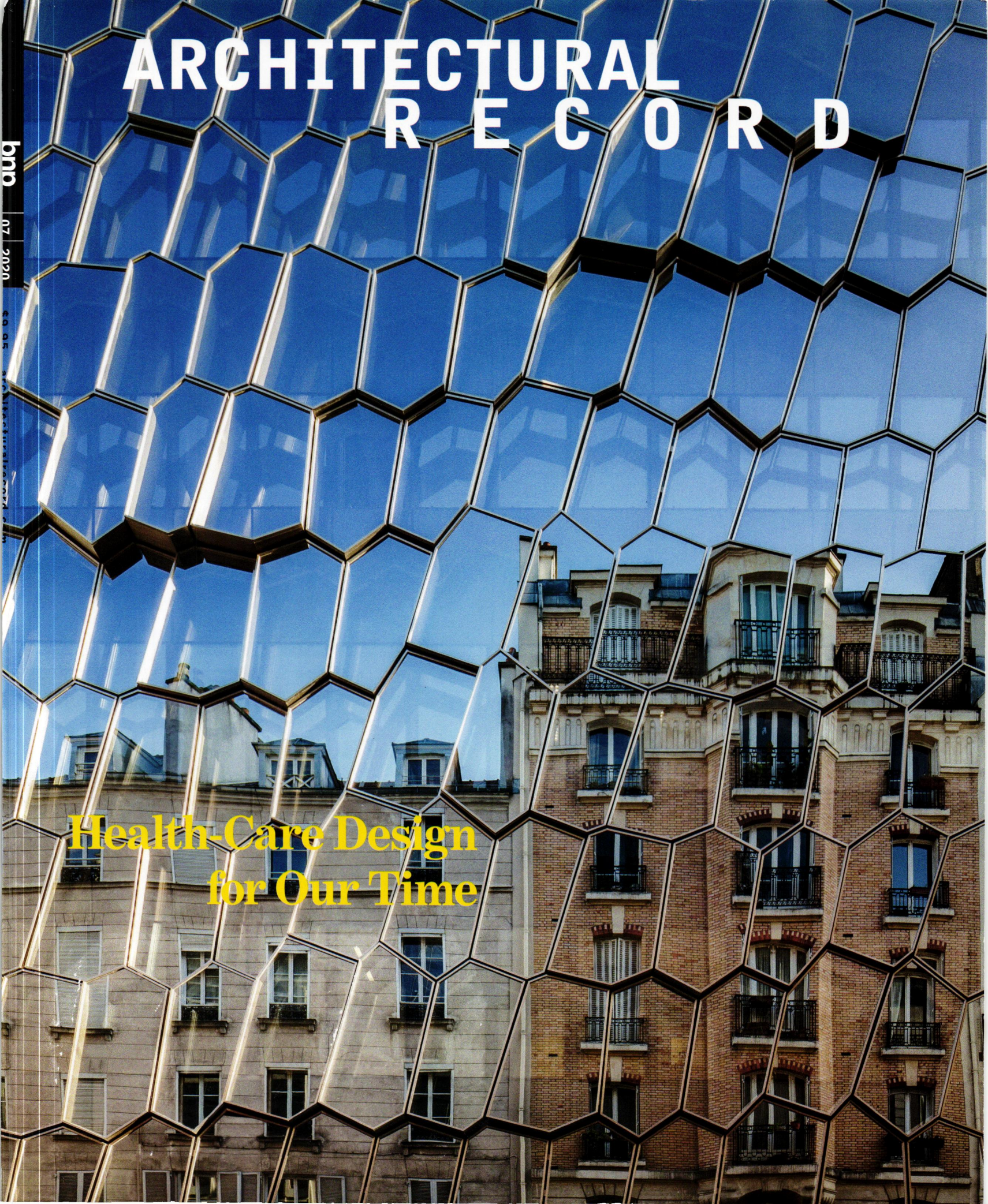

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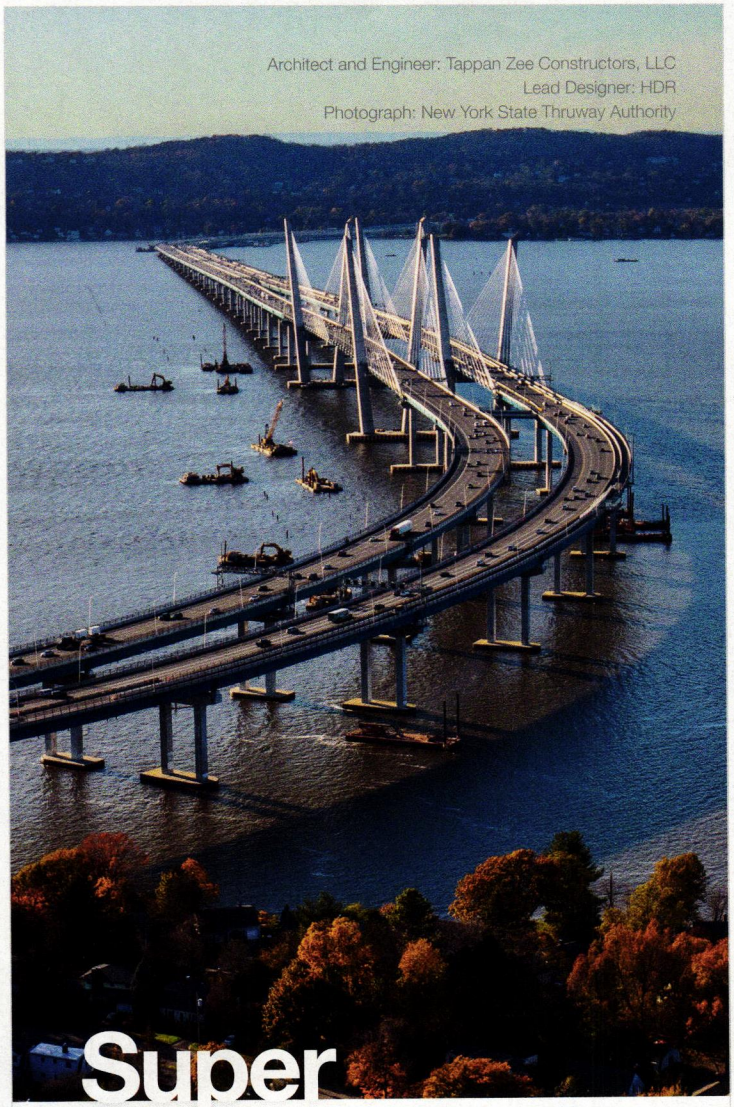

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ARCHITECTURAL RECORD (ISSN: Print 0003-858X Digital 2470-1513) July 2020, Vol. 208 No. 7. Record is published 12 times annually, monthly by BNP Media II, LLC., 2401 W. Big Beaver Rd., Suite 700, Troy, MI 48084-3333. Telephone: (248) 362-3700, Fax: (248) 362-0317.

ANNUAL RATE FOR PRINT OR DIGITAL: US $48.00, Canada $72.00 and Foreign $132.00. Single Copy sales $10.00.

POSTMASTER: Send address changes to: ARCHITECTURAL RECORD, P.O. Box 1440, Lincolnshire, IL 60069.

CANADA POST: Publications Mail Agreement #40612608. GST account: 131263923. Send returns (Canada) to IMEX Global Solutions, P.O. Box 25542, London, ON N6C 6B2.

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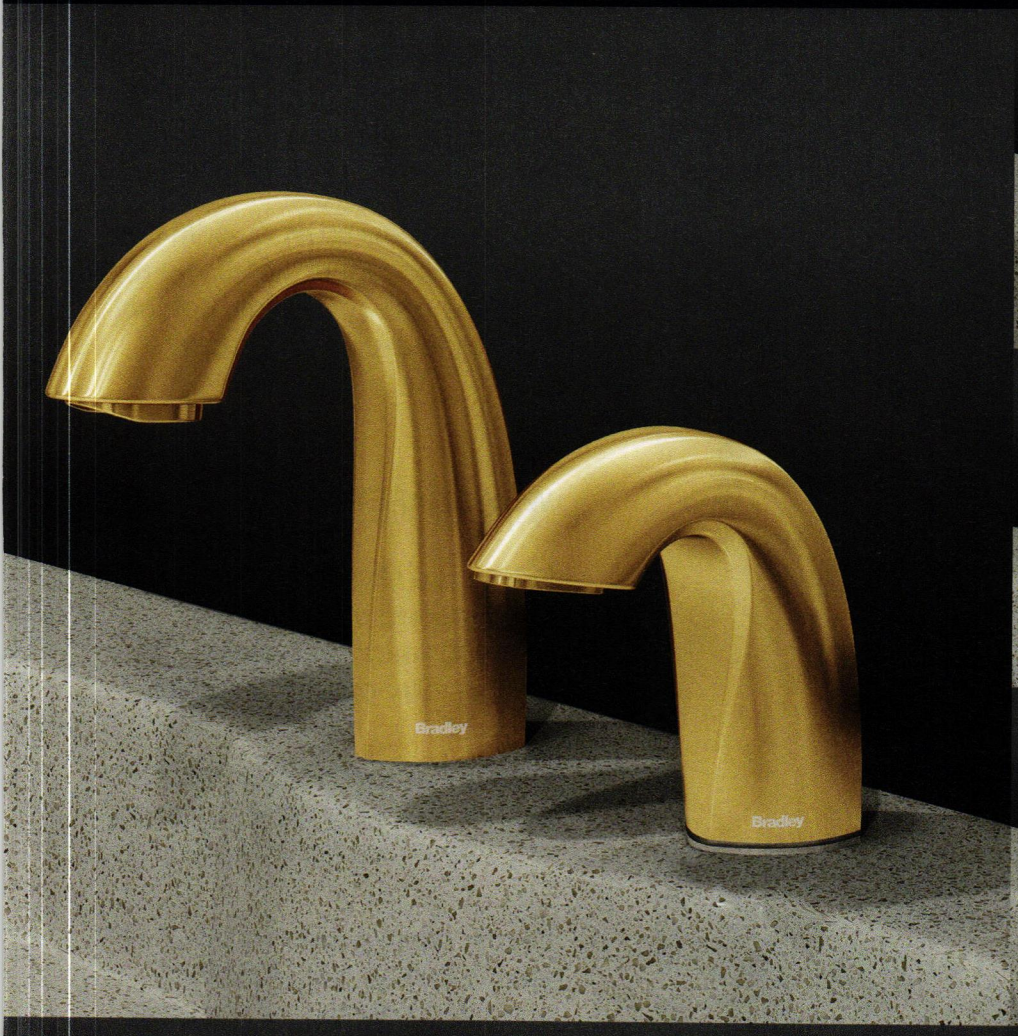

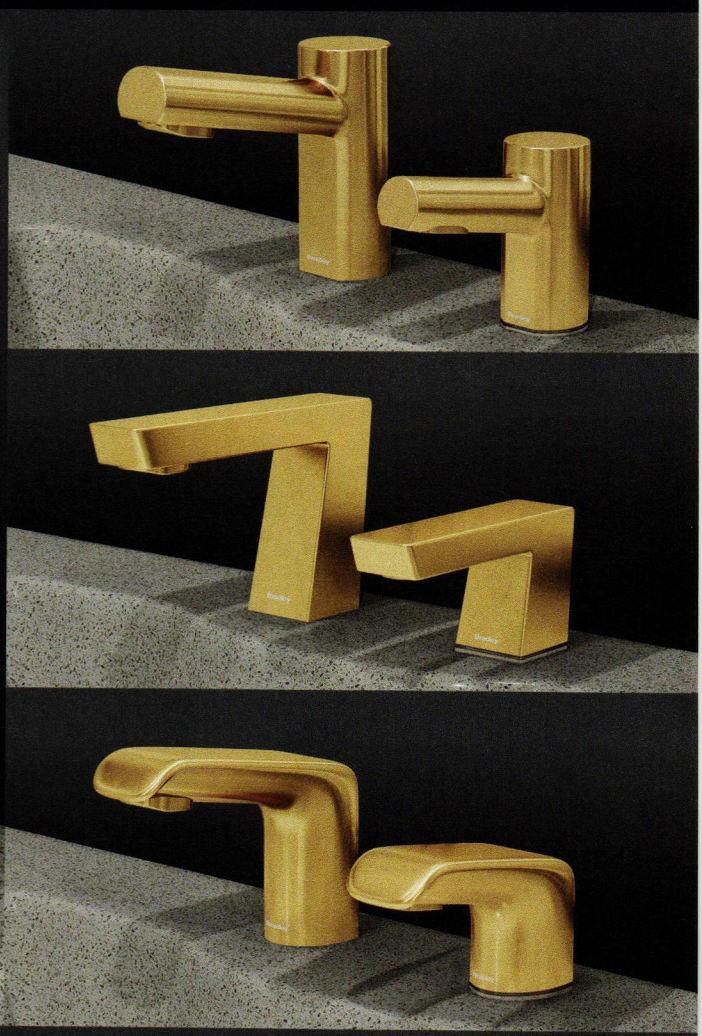

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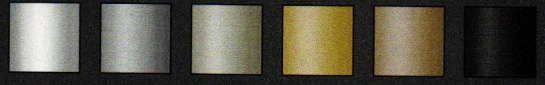

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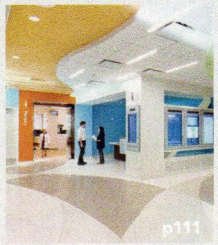

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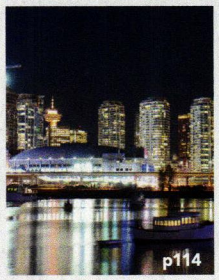

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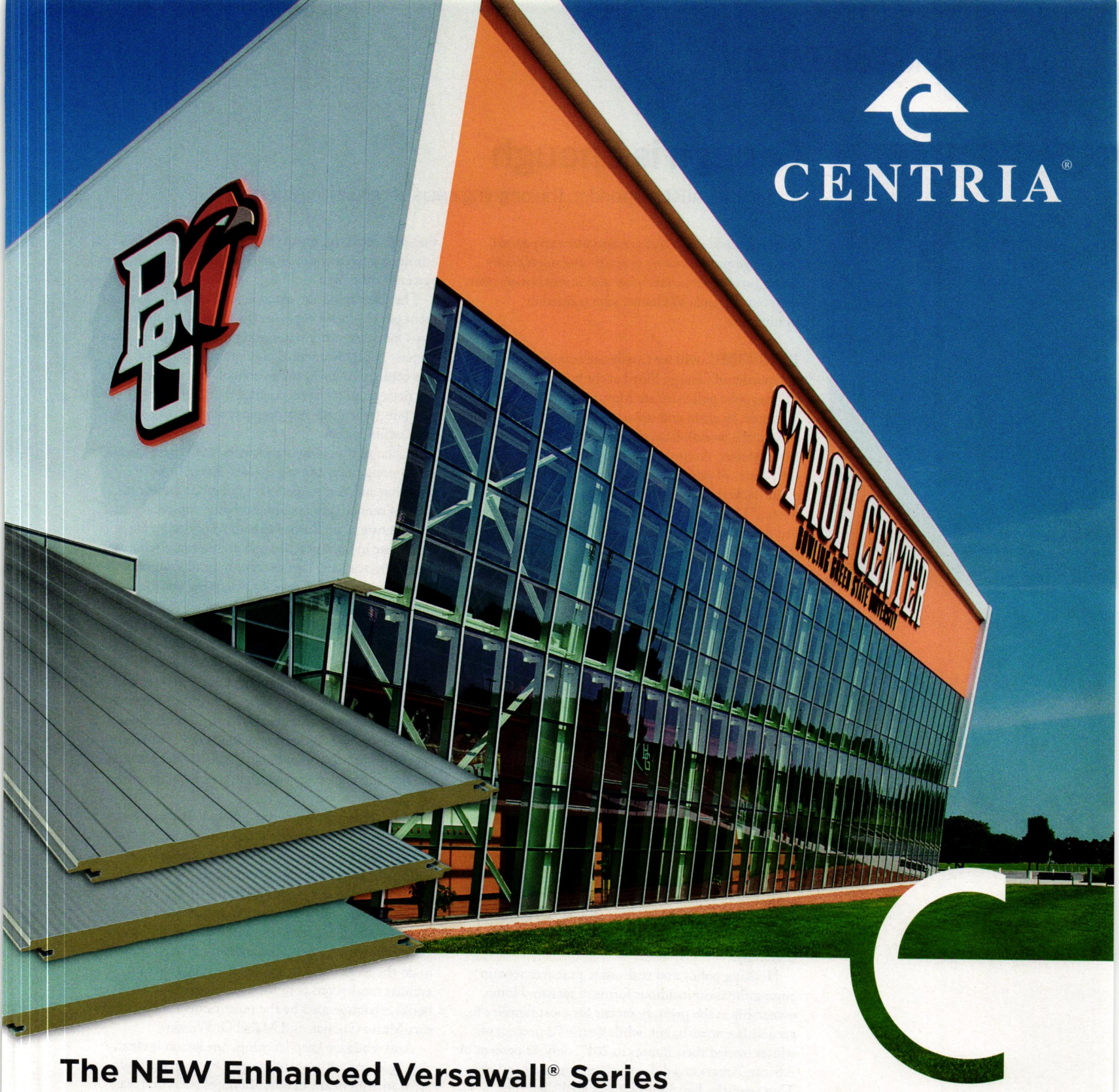

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Enough is Enough

Architects must respond to the ongoing crisis of racism in America.

Racism is a metastasis that is baked into every kernel, from planning and zoning to multi- and single family housing and conversations about public and private space. —Artist Amanda Williams, who trained in architecture

THIS TIME, will we finally see real change? Since the murder of George Floyd at the hands of the Minneapolis police in late May, tens of thousands of people, in cities and towns in all 50 states (and around the world), have marched in support of Black Lives Matter. According to the *Washington Post* in early June, 74 percent of Americans in one poll "generally backed the protestors." The *Los Angeles Times* wrote, "The most key shift is a new cultural consensus: It is no longer enough to be nonracist. People should strive to be antiracist."

In America's long history of inequality and injustice, the built environment is the most enduring symbol of racism. Not just the Confederate monuments that are being toppled in parks and on college campuses. Not just the quarters for enslaved people that tourists poke their heads into while strolling the leafy grounds of Southern plantations. Racism is embedded everywhere, from the quiet suburban streets of Satilla Shores, Georgia, where Ahmaud Arbery was killed while he jogged in late February, to the gated community in Sanford, Florida, where high schooler Trayvon Martin was shot dead in 2012. Racism marks the crumbling school buildings, the food deserts, and the patches of asphalt that pass for public space in predominantly Black neighborhoods. The recent golden age of American cities, which the COVID-19 pandemic may have brought to an abrupt close, bypassed many, if not most, urban African Americans (except those areas affected by gentrification, which often led to the displacement of longtime residents).

Housing policy and real-estate practices remain among the most insidious forms of racism. Home ownership is the primary means for most families to accumulate wealth, but, while nearly 72 percent of whites owned their houses in 2017, only 42 percent of African Americans did—the largest gap since 1968. That year, the Fair Housing Act abolished the government-backed practice of redlining that had denied home financing to generations of Black households. But a study just two years ago found banks still discriminate, with African Americans and Latinos far more likely than whites to be turned down for mortgages, even accounting for income and other factors. And last fall, an undercover investigation by the Long Island newspaper *Newsday* found that real-estate agents in that region's suburbs discriminated against potential Black homebuyers 49 percent of the time.

The discrimination extends further, as the government pays homeowners—in the form of tax deductions for mortgage interest and property tax—but not renters. A highly unequal and antiquated policy in this country finances public schools in part through a district's property taxes, an idea that dates back to the Puritans (when the only property owners, of course, were white males).

It is far past time for a reckoning with these inequities, among many others, that are an outcome of planning and design as well as policy, as a growing body of scholarship documents white supremacy in architecture. The Eurocentric roots of design are under fire in both practice and architecture schools, where the academy lags decades behind such fields as literature and history in acknowledging and elevating the value of nonwhite cultures.

That the profession does not reflect the diversity of the communities it serves is overwhelmingly obvious. While African Americans make up about 14 percent of the U.S. population, about 5 percent of architecture students and only 2 percent of licensed architects identify as Black. That structural racism continues to be expressed in a wide range of building types—from prisons and police stations to exclusionary housing complexes—is an urgent issue for all architects.

Many of us who are white join our Black colleagues in seeking to end racial injustice. At RECORD, we are reporting on African American perspectives and experiences in architecture, continuing to add voices and ideas across our platforms (page 13).

Yet we who are white also cannot pretend to understand Black experience—and when we ask for guidance, we are often, and rightly, told that we have to do the work of listening and learning (look on architecturalrecord.com for a list of articles and books recommended by the practitioners and professors Mario Gooden and Mabel O. Wilson).

And while we keep learning, one lesson is clear: the ranks of architects must open up to many more African Americans in education, practice, and leadership—and must collaborate with Black communities to push for real change in the built environment.

Because finally, enough is enough.

Cathleen McGuigan

Cathleen McGuigan, Editor in Chief

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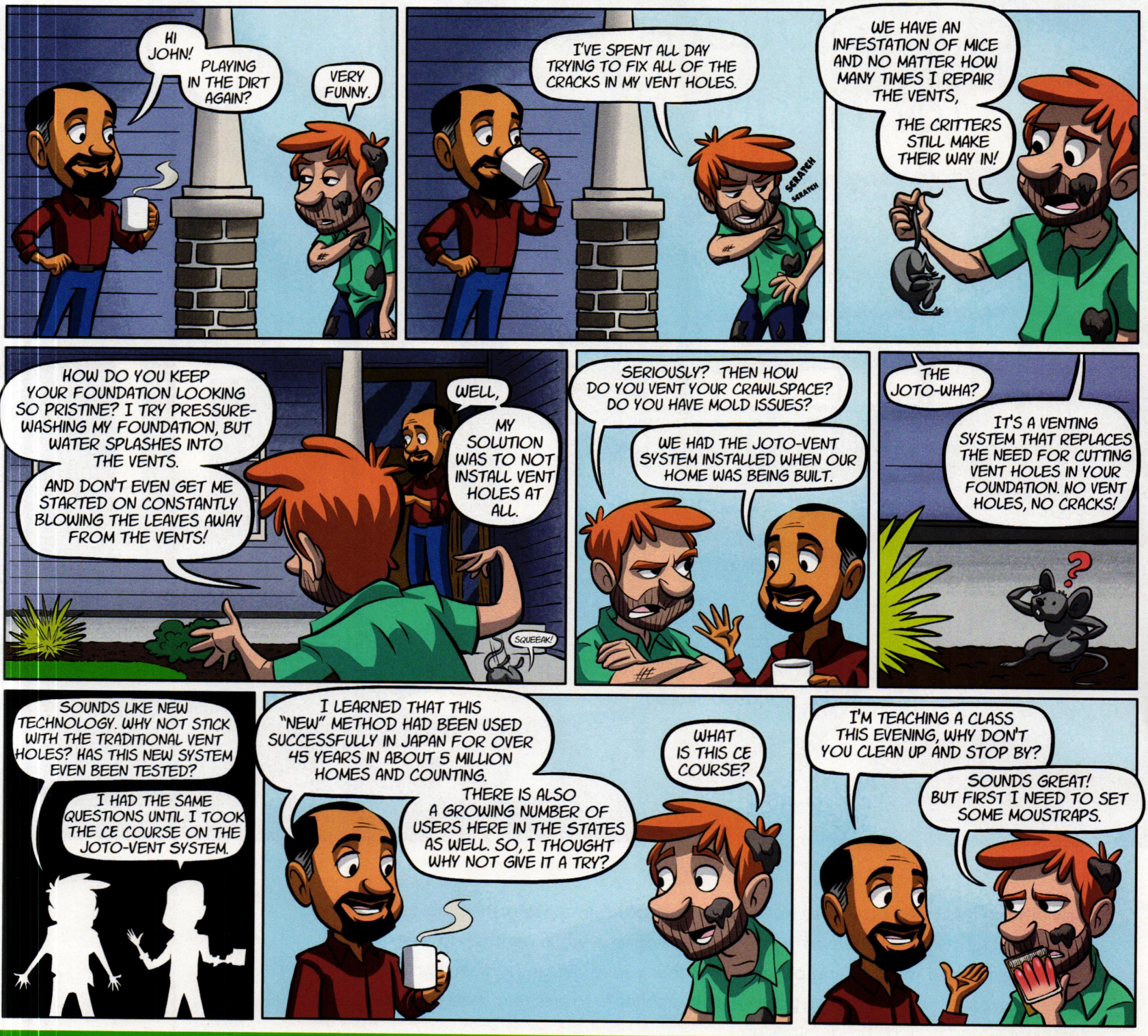

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I can't breathe.

—*Eric Garner, July 17, 2014, and George Floyd, May 25, 2020, before they were killed by police officers.*

Designers Confront Structural Racism in the Profession

BY MIRIAM SITZ

"A MAN WAS lynched yesterday." Between 1920 and 1938, a flag bearing those words flew from the window of the NAACP's headquarters in New York each time a Black person was lynched in this country. On May 26, the organization posted a black-and-white photograph of that banner to its Instagram account, with a caption demanding justice for George Floyd—the Black man killed by Minneapolis police the previous day.

More than half a century after the civil-rights movement, and over 400 years since the first enslaved Africans arrived in Virginia, protests and cries for an end to racial injustice and police brutality have swept across the globe as the United States once again grapples with its original sin. Within the field of architecture, where demographics skew toward white male homogeneity, many are beginning to interrogate the ways that systemic racism has shaped the profession and the built environment. (Read new essays and conversations on this topic on RECORD's website.)

The National Organization of Minority Architects (NOMA) was quick to issue a statement in the days following Floyd's death. Kimberly Dowdell (RECORD, May 2020), the 2019–20 president, brought into sharp focus the stakes of the current and longstanding crisis: "Before we can confidently advocate for greater economic opportunities for architects of color, we need to ensure that those very people are first able to breathe."

On June 5, thousands of protesters marched from downtown Minneapolis (above) to the site of George Floyd's arrest. A 1936 photograph shows the NAACP's flag (bottom) flying over Fifth Ave.

Artist Amanda Williams, who earned her B.Arch. from the Cornell University School of Architecture, Art, and Planning, describes the racist foundations of the built environment as "a metastasis baked into every kernel, from planning and zoning to multi- and single-family housing and conversations about public and private space." Born, raised, and based in Chicago, Williams was aware of the relationship between race and urban design from a young age. "My limitations and movements were formed by planners, designers, and society telling me that there were places that I should and should not be before I was even born," she says.

Much of Williams's work—which has been featured in exhibitions from the Chicago Biennial to the Venice Biennale—deals with the complexities of race, place, and value. "It's extremely painful to have to admit that most of the country was built on unpaid or low-wage labor," she says. "But when you bring in a group of people to be free labor, and then emancipate them after the physical ground they walk on has been divvied up and given to everyone else, then, literally, there's nowhere for Black lives to be, so of course they don't matter."

In the weeks since Floyd's killing—the latest in a long and growing list of similar tragedies—many professional groups, firms, and schools have released statements in support of racial justice. But for Tiffany Brown, a project manager at SmithGroup's Detroit office and NOMA executive-board member, many of those words fell flat. "There was no empathy behind them, no purpose. It was, 'Maybe we should say something.' But when you look at those companies, do they have Black leadership? Black people on their executive board or board of directors? Maybe a few, but minuscule numbers in relation to the amount of staff they have."

The lack of representation in professional

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Tiffany Brown (left, at right) founded the mentorship program 400 Forward (Record, August 2018) to encourage young Black women to pursue architecture.

leadership and education, especially, has emerged as a top concern for many designers. "Maybe there is a parallel to be drawn between the lack of Black perspectives within the architectural 'we' and the inability of the architectural profession to find a suitable response to the current state of social justice," wrote architect and educator Sekou Cook in an essay RECORD published online last month.

"I don't understand how you can have a conversation or lead a studio about any major American urban center without one person there from that environment, who can give you a different perspective," says Williams. "Just whose Black lives matter to you? Whose Black lives are you talking about? If you can't see them, then that is the problem."

To help right these systemic wrongs, Tiffany Brown is encouraging young people to pursue architecture—in particular, those from backgrounds similar to her own. "I was born in a development that was created by racist urbanism," she says. "Somehow I made it to where I am, but generation after generation, there are so many who do not, because of the built environment and the way that our neighborhoods and cities are designed."

Architect Pascale Sablan, a senior associate at the firm S9 Architecture in New York, argues that equality should be woven into the fabric of a firm's culture. "We can't say we're only going to start fighting for justice when it's time to build a monument, memorial, or museum," she says, suggesting actions like volunteering, making contributions, and hiring for greater diversity. She founded Beyond the Built Environment, an organization that addresses inequality by profiling Black architects, curating exhibitions, and creating a database of Black professionals for others in—or considering—a career in architecture.

But there are no easy solutions for such complex and deeply rooted injustices. "Nobody wants to hear this answer, but what you need to do now is the work," says Williams. "You've got to do the reading, you've got to have the tears—by yourself. You've got to understand why it happened, and then make personal decisions." ■

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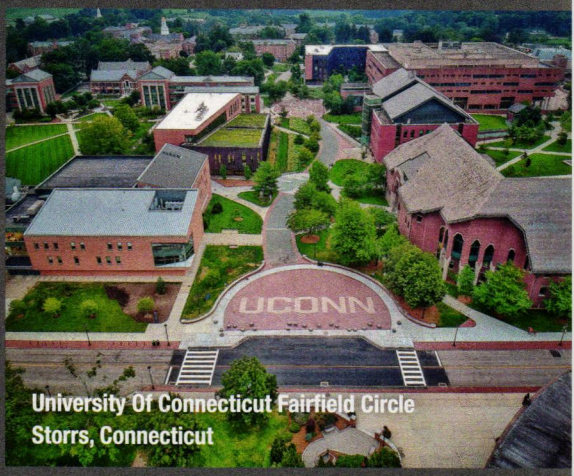

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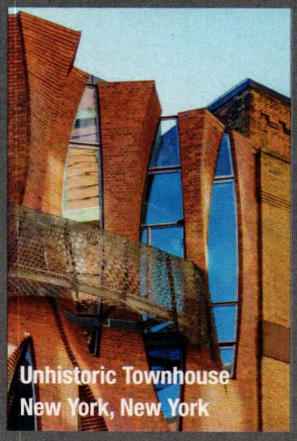

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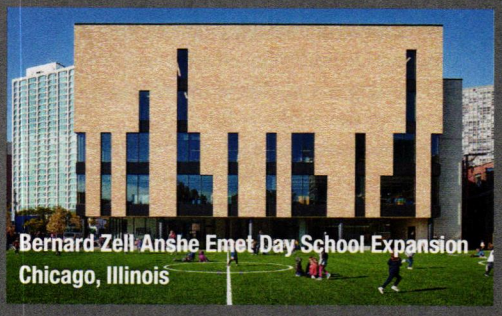

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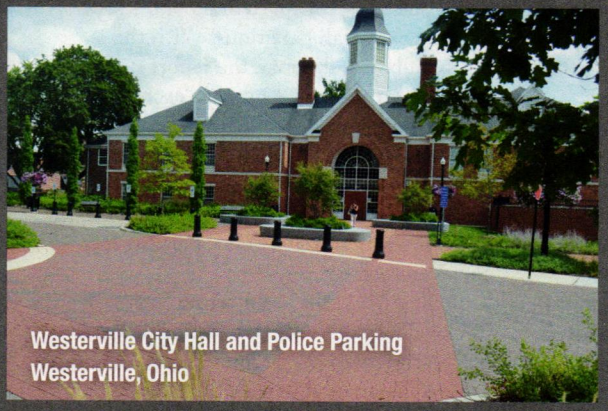

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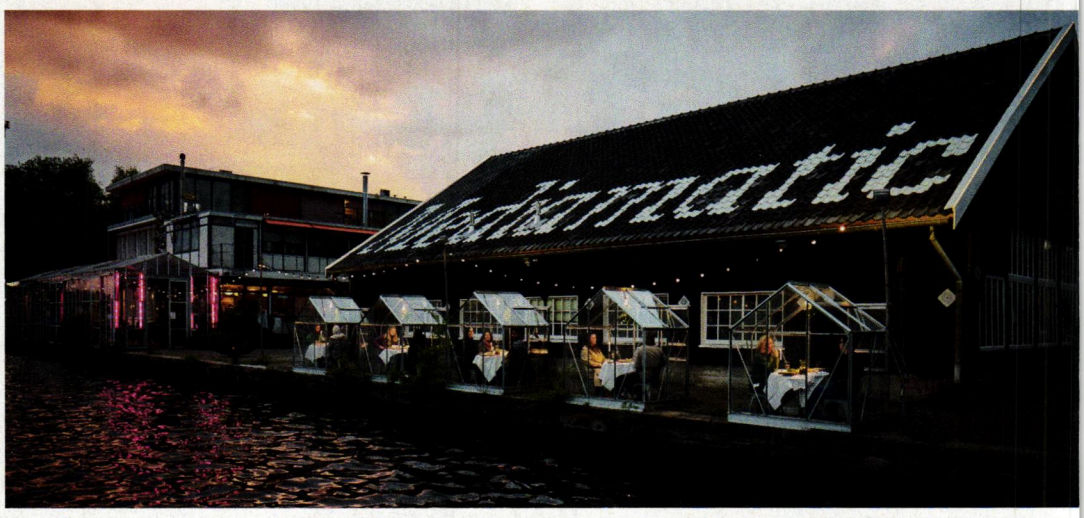
Safer Dining During—and After—the Pandemic

BY JENNA M. MCKNIGHT

AS RESTAURANTS begin to reopen across the country, many design firms are exploring how to make them safe for patrons and workers alike in the midst of a pandemic. Proposals range in scope and scale, from al fresco dining kits to plexiglass "hoods" that surround patrons as they eat. In all instances, the goal is to limit potential viral exposure and to help occupants feel protected. "It's all about building a level of trust," says Adam Harding, a partner at Roth Sheppard Architects in Denver, who recently helped organize a panel discussion with AIA Colorado about restaurant design in the COVID-19 era.

Some firms are utilizing their expertise in health-care design to help restaurants rethink their operations. MASS Design Group—a nonprofit firm that has built medical facilities in Haiti, Rwanda, and elsewhere (see page 40)—recently produced a detailed report with guidance for businesses adapting to an unprecedented situation. Informed by the firm's prior research on infection control, and combined with interviews with restaurateurs and virtual tours of eateries, the document outlines a range of measures to mitigate contagion spread in a dining environment.

Caitlin Taylor, an architect and farmer who directs the firm's Food System Design Lab, notes that many of the challenges facing dining establishments are spatial in nature. Her firm's report proposes specific solutions for each zone of a restaurant. For instance, in the back-of-house spaces, MASS recommends separate areas for food preparation, employee lockers, and deliveries. In terms of public seating, the firm envisions movable tables placed 6 feet apart, and booths separated by extra-tall partitions. With the future of bars unknown, the report suggests converting those areas into an "exchange space" where takeout orders can be organized and picked up. It also encourages signage and sanitation stations; improved air filtration and circulation; and expanded outdoor seating to sidewalks, parking lots, and even rooftops.



Diners at Mediamatic Amsterdam sit along the waterfront in greenhouse-like structures (above). Rockwell Group's modular outdoor-seating kits expand dining space to the outdoors (bottom).

In New York, the architecture firm Rockwell Group—which has designed over 300 restaurants since its founding in 1984—worked in partnership with the industry group NYC Hospitality Alliance to conceive an adaptable, modular system for al fresco dining that includes fencing, plywood floor decking, service and sanitation stations, and a flexible seating module. The kit also features accessories such as fans, umbrellas, and lighting fixtures. To demonstrate its application, the firm envisions deploying the system at one restaurant in each borough. Set up on sidewalks—and, in some cases, in streets and parking spots—the components are arranged in a way that provides at least 8 feet of space for pedestrian traffic, with areas wide enough to accommodate emergency vehicles. Built to withstand the elements, the kits can "last as long as the restaurant and city deem necessary," architect David Rockwell tells RECORD. And some designers and clients are adding a creative twist to the outdoor-dining approach. In Amsterdam, a canal-side restaurant called Mediamatic ETEN has stationed small greenhouse-style dining pavilions along the water that each contain a round table and two chairs.

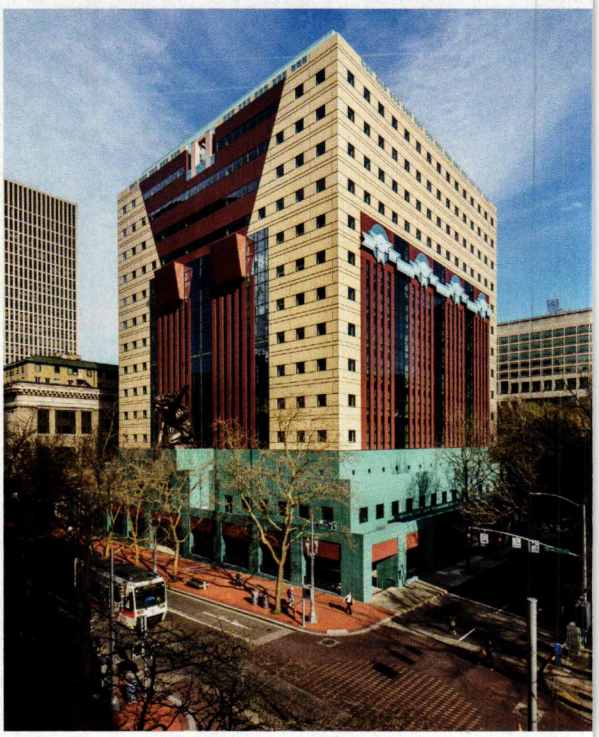
Others are keeping their focus indoors, like French designer Christophe Gernigon, who created a plexiglass hood that hangs from the ceiling to cove seated diners. Called PLEX'EAT the transparent, easy-to-clean hoods essentially serve as giant face shields for small groups or individuals. Beyond restaurants, the designer imagines the hoods being used in places such as lobbies, offices, and casinos.

Whether any of these solutions will be temporary or permanent remains to be seen, as vaccine development is still in progress. In the meantime, Harding hopes the pandemic—and innovations in the built environment—will have an enduring impact on restaurant design, since health and safety should always be top priority. "As architects and designers," he says, "I hope we think proactively and don't go back to our standard ways." ■

IMAGES: © WILLEM VELTHOVEN (TOP); ROCKWELL GROUP (BOTTOM)

The Portland Building's Ongoing Saga

BY RANDY GRAGG



EVER SINCE the drawings were unveiled in 1980, the Portland Building in Oregon has drawn plaudits and catcalls. Designed by Michael Graves with Emery Roth & Sons and considered to be among the world's first public Postmodern buildings, the municipal-services structure's garlands and colors seemed to be an Oz-like technicolor moment in the dreary movie of monochromatic Modernism. Vincent Scully commended the finished work in 1982 for the way the "detailing and color relate to the pre-International Style buildings in the city," and its attempt "to revive the urban fabric." But, as the pop-star building glowed brightly in the pages of *Time*, *Newsweek*, and *People*, the client, the City of Portland—and its 1,500 employees working inside—suffered.

The architecture's failures have been well documented, from darkly tinted, cell-block-sized windows to water infiltration through the concrete walls, which left carpeting stained and moldy. Graves long blamed the many functional flaws on the budget. As one of the earliest public projects to use a contractor-led "design-build" process, the Portland Building became a 15-story study in value engineering. Its most defining features—the jaunty salmon/teal/cream-colored array of Mayan-inflected columns, keystones, and garlands—relied on materials befitting a community stage set: paint, tile, and stucco.

Politicians and pundits have long brayed for demolition. In defense, Portland preservation architect Peter Meijer wrote its successful 2011 nomination to the National Register of Historic Places. (Such a listing highlights its architectural relevance, but doesn't guarantee it will stay in place forever.) City officials grudgingly chose to renovate,

The renovation of Michael Graves's Portland Building by DLR Group includes an aluminum curtain wall over the concrete structure (opposite) and a terra-cotta rainscreen on the podium (left).

PHOTOGRAPHY: © JAMES EWING/JBSA

and global firm DLR Group began the $195 million redo in 2016; it recently finished ahead of schedule. The team calls this effort a "reconstruction"—every component is new except the original poured-concrete frame and walls. Before his death in 2015, Graves outlined changes he thought should be made: replacing the tinted glass, lighting the building's dreary arcade, and converting the parking garage and its cavernous entrance, which faces a park, into something "joyous." DLR heeded the advice and, working with Patrick Burke of Michael Graves Architecture & Design, took even bolder action.

Most dramatically, DLR wrapped the entire concrete cubiform mass in a unitized aluminum curtain wall that waterproofs and adds insulation. The firm clad the podium with a terra-cotta rainscreen instead of the original teal tiles. New windows replace the dark glass and increase light transmission 10-fold. The lighter glass in the six-story vertical flutes of Graves's graphic rendition of columns allows new conference rooms on each floor to be brightly daylit. The relocation of the HVAC system to the roof opened the second floor to new meeting rooms bountifully lit by windows. The parking garage's entrance is now glass, with public gathering spaces behind it.

But controversy dogs the Portland Building once again. Despite Portland Landmarks Commission's unanimous approval of DLR's design, the State Office of Historic Preservation may delist it from the Historic Register owing to the radical change of materials. To Meijer, the Register nomination author, the reconstruction is an "open and sore wound." He thought the original materials could be kept, and provided drawings to make the case. A representative from the state office said the agency has not yet set a time for delisting.

DLR's approach and the potential consequences foreground a fundamental question in the preservation of landmark Modernist and Postmodernist buildings, many made with materials that fail, are discontinued, or fall short of today's performance demands: what's historic—the building with its original materials, or the design concept? ■

UVA Community Gathers in Protest at New Memorial

BY MIRIAM SITZ

ON FRIDAY, JUNE 5, members of the University of Virginia (UVA) community came together at the institution's new Memorial to Enslaved Laborers to remember George Floyd, the Black man killed while in police custody in Minneapolis on May 25. Demonstrators kneeled in silence for almost 9 minutes—the length of time that former Minneapolis police officer Derek Chauvin, who has been charged with murder, kneeled on Floyd's neck.

Attendees affiliated with UVA Health wore white coats, signifying their support of the "White Coats for Black Lives" movement, which works to eliminate racial bias in the practice of medicine and recognizes racism as a threat to the health and well-being of people of color.

Boston-based architecture firm Höweler + Yoon collaborated with architect, educator, and activist Mabel O. Wilson (who was one of RECORD's 2019 Women in Design award winners), artist Eto Otitigbe, UVA professor Frank Dukes, and landscape architect Gregg Bleam to design a structure honoring the memory of the enslaved laborers who built UVA's campus.

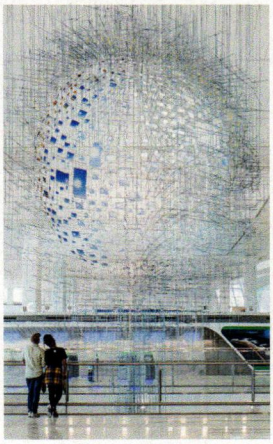
The team conceived of the circular form as a place of assembly, Wilson tells RECORD. "It feels very gratifying and quite powerful to see that the Memorial has become a site of protest and a way of connecting with history," she says. "Even though it's not officially open, it instantly became that. It's been a real testament to the power of architecture."

But that's not to say that the profession is off the hook, Wilson continues. "We need an understanding of how architecture is very much complicit in injustice. If we're going to do work around justice, we also have to understand that our own discipline is problematic."

Originally slated to be inaugurated on May 8, the official opening was postponed due to the pandemic. A new date has yet to be announced. ■

Christo, 1935–2020

The Bulgarian-born conceptual artist who, with his wife and partner Jeanne-Claude, transformed urban landmarks and swaths of nature with ambitious installations, died in New York on May 31 at the age of 84. Christo and Jeanne-Claude largely worked with fabric, covering Berlin's Reichstag in silvery cloth in 1995 and using nearly 2 miles of saffron textile to create a walkway (right) across Italy's Lake Iseo in 2016.

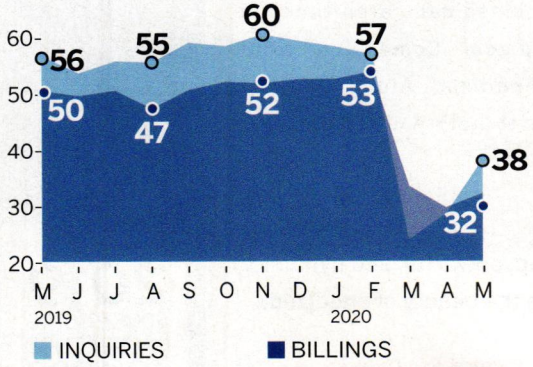


New Artwork Unveiled at LaGuardia Airport

Four large-scale site-specific works of art have been installed in the new arrivals and departures hall of the Queens, New York, airport's renovated Terminal B, which opened in mid-June. Developer LaGuardia Gateway Partners and the Public Art Fund commissioned the pieces by artists Jeppe Hein, Sabine Hornig, Laura Owens, and Sarah Sze (left) as part of the $8 billion overhaul of the New York airport—the largest public-private partnership in U.S. aviation history.

School of Architecture at Taliesin Breaks with Frank Lloyd Wright Foundation and Relocates

In mid-June, following months of uncertainty, the educational institution founded in 1932 by the American architect announced its separation from the Frank Lloyd Wright Foundation and plan to move to two facilities in Arizona. The sites, Cosanti and Arcosanti, belong to the Cosanti Foundation, which late theoretical architect and onetime Wright apprentice Paolo Soleri established in 1965 with his wife, Colly.



Billings Ease Slightly from Historic Low in April

The AIA reports that the Architecture Billings Index (ABI), a leading economic indicator for nonresidential construction activity, moderated slightly in May, from an all-time low of 29.5 in April to 32. (A score below 50 indicates decreasing billings.) Inquiries into new work moved from 28.4 to 38; and new design contracts, from 27.6 to 33.1.

PHOTOGRAPHY: © SANJAY SUCHAK, UNIVERSITY OF VIRGINIA OFFICE OF COMMUNICATION (LEFT); STEFANO RELLANDINI (RIGHT, TOP); NICHOLAS KNIGHT, COURTESY SARAH SZE (RIGHT, BOTTOM)

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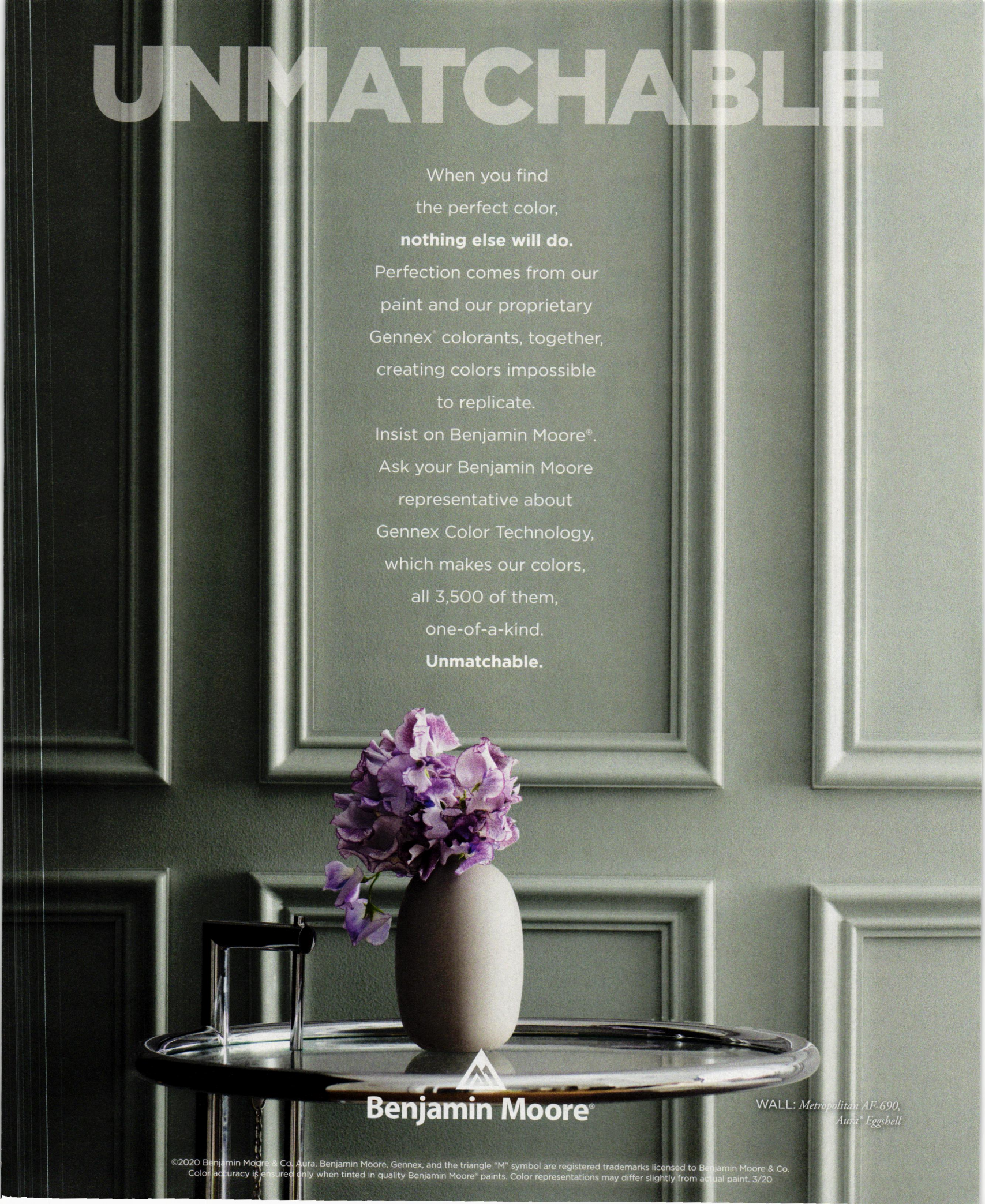

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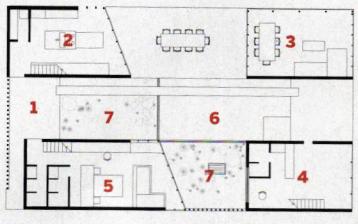
HOUSE of the Month

SIMPLE FORMS AND LOCAL MATERIALS ARE ALL ARCHITECT ALFONSO QUIÑONES OF BAAQ' NEEDS FOR A BEACH HOUSE IN MEXICO.

The beach house is composed of four volumes of wood and concrete (top). Folding panels open onto the rocky Pacific beach (left). The cluster is arranged around an open courtyard (above).

1 ENTRANCE
2 KITCHEN
3 LIVING/DINING
4 STUDIO
5 BEDROOM
6 POOL
7 GARDEN



FIRST-FLOOR PLAN

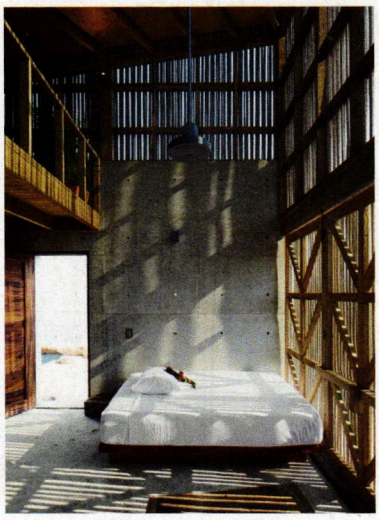
SECOND-FLOOR PLAN

0 12 FT.
4 M.

PHOTOGRAPHY © EDMUND SUMNER

A VACATION HOUSE that Mexico City architect Alfonso Quiñones built for his family offers an intriguing low-budget—if slightly idiosyncratic—solution to outdoor living. Quiñones, whose office is named BAAQ', designed a cluster of four detached slatted-wood volumes organized around a courtyard and pool for his four children, wife, and himself. Totaling 2,600 square feet of interior space, the compound sits on a 7,500-square-foot property fronting a rocky beach on the Pacific Ocean, six hours by car from Oaxaca and about half an hour from the town of Puerto Escondido.

The separate structures all offer easy access to the outdoors and good sight lines through the compound to the ocean, along with a sense of privacy to the occupants, Quiñones explains. Each of the four pavilions' ground floors accommodates a different programmatic space, such as the



Ladderlike stairs (far left) connect the levels. An upstairs bedroom overlooks a double-height studio/ bedroom (left).

kitchen, the living room, and a study, while bedrooms occupy the levels above. One cabin contains bedrooms on both floors.

In constructing this rustic retreat, which cost $280,000, the architect took interesting shortcuts: "You don't need windows to see the ocean from inside the house," he says. The reason: he clad the pine-frame structure in louvers made from the trunks of palm trees. By artfully arranging the reed-like stems of "palm bone," as he calls it, Quiñones created gaps for ventilation and views. Wood folding panels provide physical as well as visual access, while spindly canopies projecting from the huts offer shade.

Although he used reinforced concrete for low structural walls and the plinth, the architect has favored natural materials. Parts of a large parota tree form a bridge across the pool; remaining pieces reappear as tables and chairs. Earth and clay cover the floors on the first level. For a house that depends on mosquito netting instead of glass, this is hardly *el grande* mansion by the sea. "It's not that kind of statement," says Quiñones, who named the house Naila after a romantic folk song. *Suzanne Stephens*

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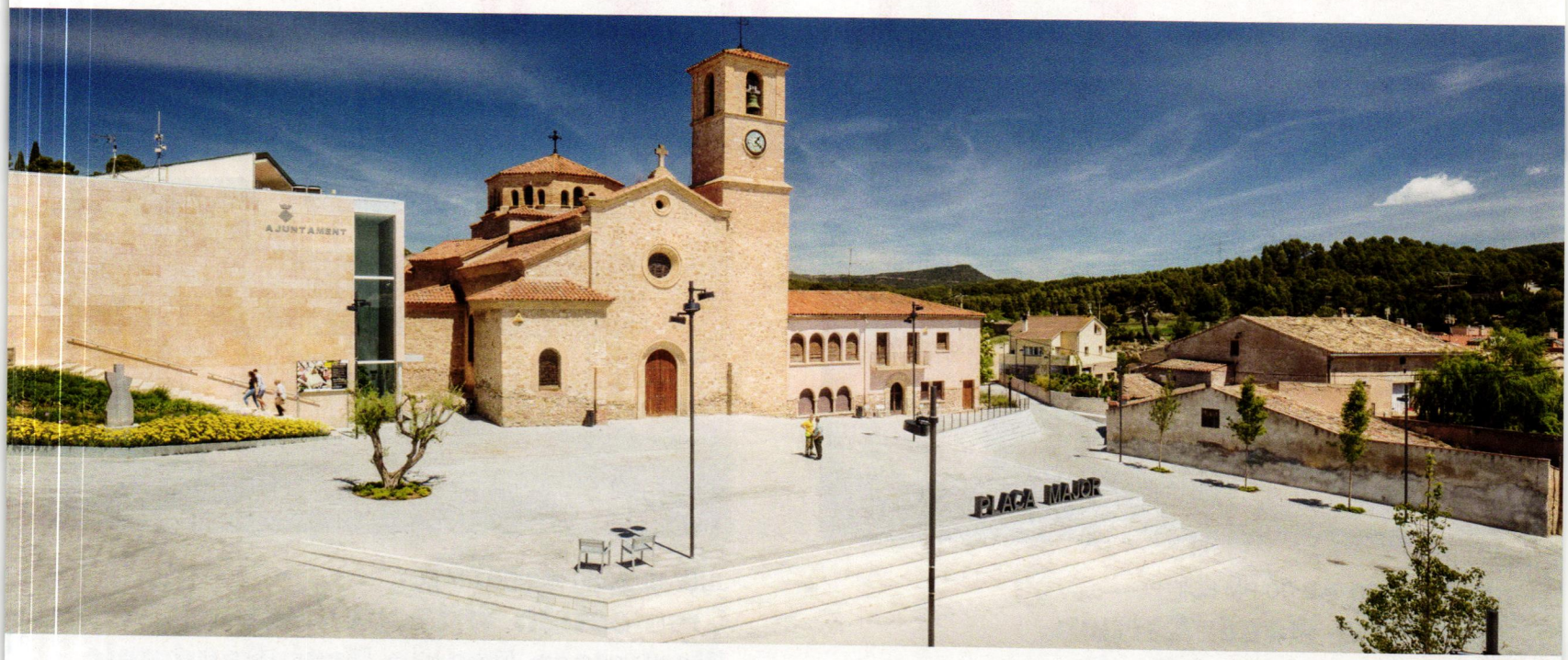
LANDSCAPE

OUTSIDE BARCELONA, SCOB REDEFINED A BUSY INTERSECTION AS THE NEW PLACA MAJOR, AN ELEGANT TOWN CENTER.



WHEN Sergi Carulla and Oscar Blasco won the competition to redesign the historic town center of Ódena, an hour outside of Barcelona, in 2010, the world was a very different place. But their vision of the future is well suited to 2020, with an emphasis on public spaces that foster the social equality this new decade seeks.

Now, nearly a decade later, the duo's Barcelona-based architecture and landscape-design firm, SCOB, has completed the new Placa Major for its clients, the town hall of Ódena and the government of Catalonia. The site, located on the hillside of a Medieval castle, comprises 1.3 acres of land that was previously a heavily trafficked six-way intersection in the center of the mountainous Catalan village. In their proposal, Blasco and his team changed the program from one that favors vehicles to a "pedestrian-priority space" adjacent to the existing structures—including the town hall, a church, and neighboring single-family homes—that he hopes can serve as a 21st-century gathering point for the community of 3,500 people.

"The plaza has a very complex topography, with steep slopes and level changes," Blasco explains. "The challenge was to gain more horizontal space for residents' use and to accommodate all of the events and fiestas that are regularly held in the municipality." To transform the area, the firm razed the former maze of streets and driveways to create several flat expanses of granite paving, accessed by a series of beveled marble steps that provide seating. The stone was all sourced from nearby quarries.

The architect also mentions the regional *vinyala* (a local snail delicacy) and *espelt* (craft-beer) festivals, in addition to the traditional Spanish wine harvest, all regularly held in the town, as incentives to redesign the streets as one unified, open plaza, albeit with multiple levels. While a few of the streets have been closed to through traffic, a sloped ramp remains to connect the distinct neighborhoods on either side of town. Some existing trees in the intersection were preserved within the middle level of the plaza to provide shade during gatherings.

In addition to hosting the slew of local festivities, Blasco hopes the new plaza will bring "social inclusion, intergenerational change, contact with the outside world—which we have missed so much these days—and democratic freedom that does not avoid conflict, but guarantees rights and equality," objectives he believes should be at the heart of all public spaces, including Ódena's. *Kara Mavros*

PHOTOGRAPHY: © ADRIA GOULA

The redesign created more outdoor seating (right) and a pedestrian-friendly plaza for gatherings outside the town hall building and church (top).

ARCHITECTURAL RECORD

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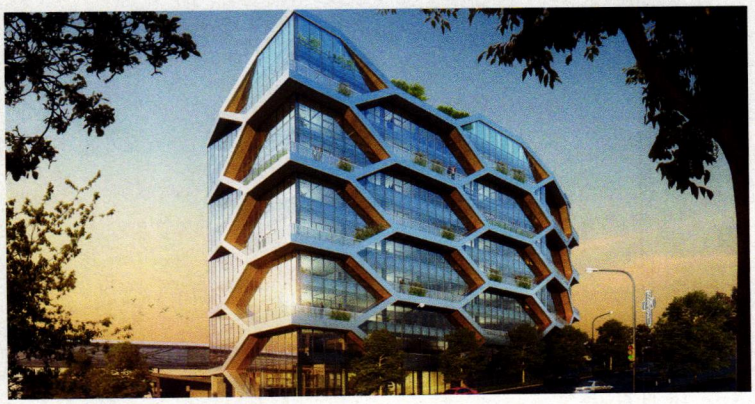

JULY 8, 2020 @ 2:00 PM EDT

The New Wood: Carbon, Technology, and Craft

CREDITS: 1 AIA LU/HSW; 1 AIBD P-CE; 0.1 IACET CEU

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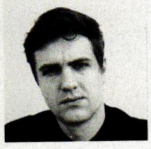

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JULY 15, 2020 @ 2:00 PM EDT

Connection Without Contact: Workplace Design Post-Pandemic

CREDITS: 1 AIA LU/HSW; 0.1 IACET CEU; 1 AIBD P-CE

The way we work is rapidly evolving in response to the COVID-19 pandemic. What are the immediate concerns and the lasting effects on the office environment? This course will examine different aspects of interior workplace design, from space planning strategies to hands free details. Studies will demonstrate ways in which business owners and design professionals can adjust design standards for improved well being. The COVID-19 crisis has given us a unique opportunity to shape the future workplace through innovative design thinking and wellness forward initiatives.

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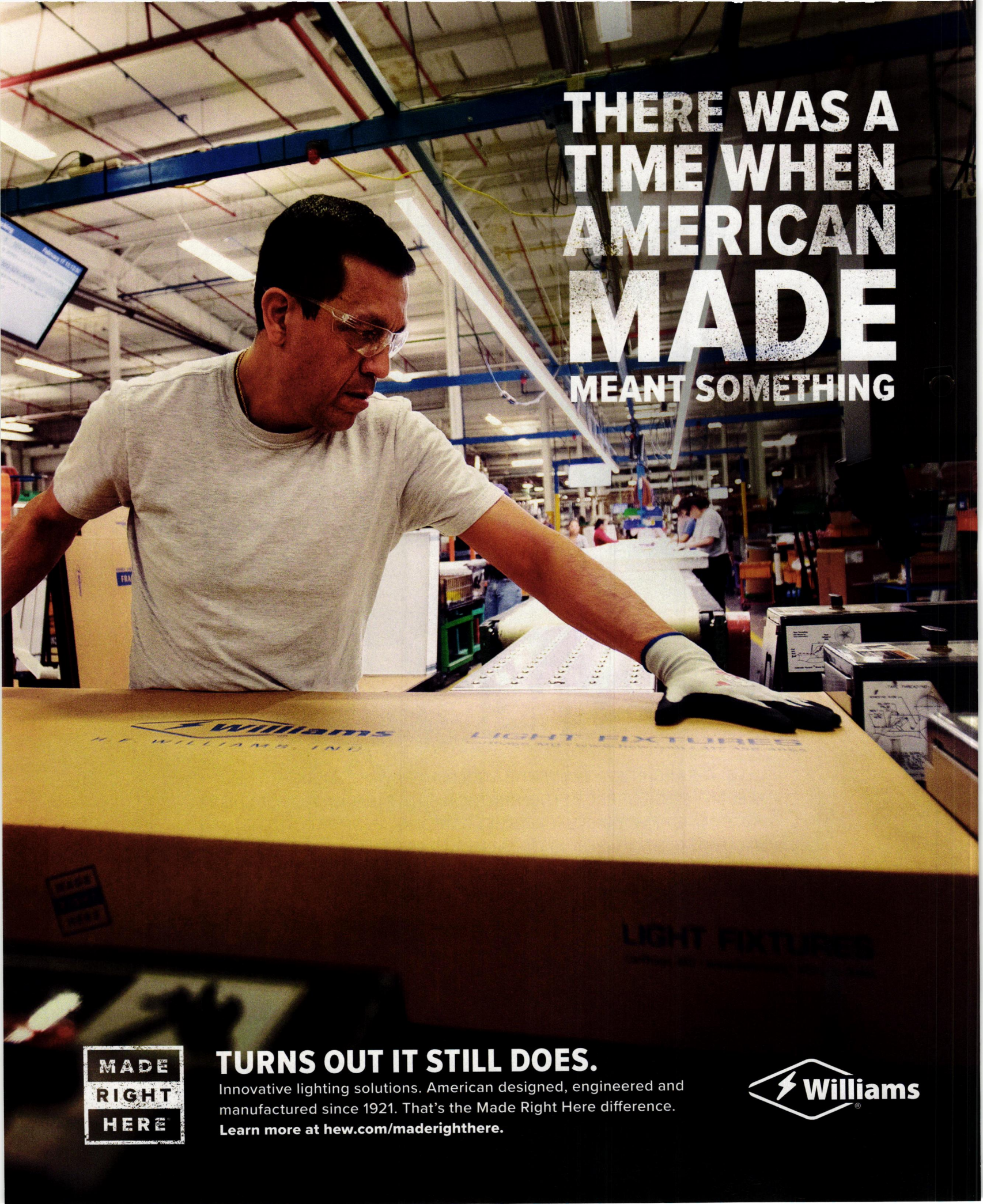
The architect for the Hill House in Helensburgh, Scotland, is **Charles Rennie Mackintosh**, who completed it in 1904. The entrance hall, with its richness of oak furniture and paneling, stenciled wallpaper, and geometric metal-and-glass light fixtures comes as a surprise in its contrast to the austere exterior.

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

PHOTOGRAPHY: M. RAMIREZ/ALAMY STOCK PHOTO (TOP); COURTESY THE NATIONAL TRUST FOR SCOTLAND (BOTTOM).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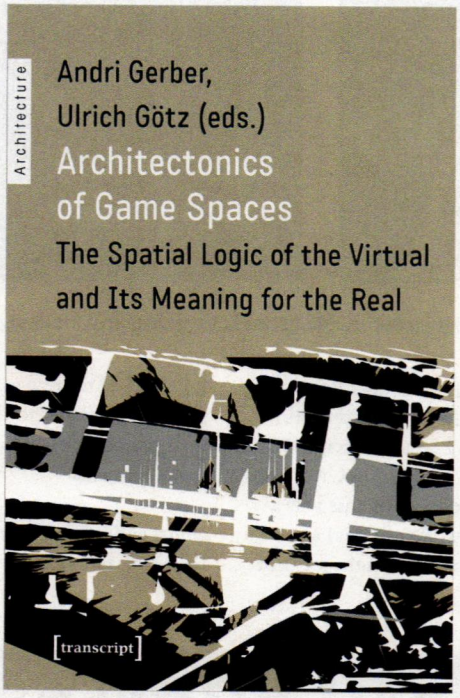
Virtual Reality Check

BY ANDREW BLUM

AMONG THE MANY shocking and disorienting experiences of 2020 was the arrival, during quarantine, of Zoom as the default social experience. More quickly than I could have imagined, its flat boxes became the venueless venue for everything—church, classroom, and banquet hall rolled into one. The mise-en-scène of the flat background was not merely a strange new public architecture but, for a moment, our only public architecture. Looking through peepholes, we saw each others' stairways and ceilings, bookshelves, mantels, headboards, and dirty dishes. The domestic environments and the ease of connection offered a strange intimacy, even as the grid of faces made it painfully clear how much was left out—nothing less than our entire physical experience of the world.

But in my household, with a 7- and 10-year-old home from school, another virtual environment rushed in to fill that void: the candy-colored islands of Animal Crossing: New Horizons, an elaborate new video game released by Nintendo in March, which has since sold more than 10 million copies. Like Sim City or Minecraft, Animal Crossing involves inhabiting and building a virtual world, the details of which are surreal, or maybe preposterous. Your tropical island is populated by cute talking animals; there is an elaborate currency scheme based on turnips, a complete absence of violence, and an abiding ethos of neighborliness and cooperation. The main activity on Animal Crossing is design. You can buy and arrange furniture, tchotchkes, flooring, and wallpaper. Eventually, you can "terraform" the island itself, paving its pathways with different materials, and erecting bridges and hills. Along the way, friends—both real and artificially intelligent—stop by to visit and admire what you've done with the place. As in real life, jealousy abounds.

In *Architectonics of Game Spaces: The Spatial Logic of the Virtual and Its Meaning for the Real* (Transcript Verlag), the Swiss architects Andri Gerber and Ulrich Götz assemble a range of essays and interviews that argue for the importance of these simulated worlds to design. The digital world of video games opens up a way of seeing architecture as distinct from the "built, solid, concrete, and understandable," Gerber writes. Amid that instability—in the "weightlessness of architecture in video games"—lies possibility. Especially now that so much more is virtual, at least temporarily, their notion that video games might clarify how we understand real places has new urgency.



The digital world of video games opens up a way of seeing architecture as distinct from the 'built, solid, concrete, and understandable.'

On our Animal Crossing island, the changes happening each day were shockingly vivid—especially in the absence of any changes to the real world. My kids delighted when the little department store, Nook's Cranny, was expanded and refreshed, remodeled as a hotel lobby. On another day, they worked on collecting and arranging the components of a little Tivoli Gardens, with a teacup ride and a popcorn stand. Back in the real world, there was a debate raging about the usefulness—in a time of pandemic—of offices, universities, theaters, and even cities themselves. But in the game, it was obvious what its places were for. A meteor shower one evening inspired the construction of a star-gazing platform, a wooden deck at the crest of a bluff.

Animal Crossing wasn't just for kids. I began seeing friends—grownups—posting images of their islands on Instagram, and one afternoon I responded to one, an acquaintance from a design conference. She immediately connected me with Brent Kawahara, a former creative director at Banana Republic, who had spent the entirety of his quarantine in San Francisco constructing an elaborate fantasia in Animal Crossing. The next afternoon—because what else was there to do?—my kids and I arrived at Brentonia, as he'd named it. We set up a Zoom link so he could narrate a tour, through a surf camp lit by tiki torches, and a bedroom like a Japanese bathhouse. Brent had dressed for the occasion, wearing a red ascot that matched his avatar. He was grateful for Animal Crossing, he said, "for a place to channel some of this anxious energy, to exert some control, and to share and collaborate."

I realized how strange it is that the pandemic had us asking, "What are places for?" when this virtual place had an easy answer: to be outside, to bump into friends, to build and buy things that help us project a unique version of ourselves. In another essay in *Architectonics of Game Spaces*, Stefano Gualeni, a philosopher and game designer at the University of Malta, points out that "virtual worlds disclose artificial and often extra-ordinary horizons of possibilities for both doing and experiencing." In pandemic-era Animal Crossing, the extra-ordinary was quite ordinary: we all just wanted to hang out together. The lesson for architecture wasn't about form or material (or its lack), but merely that places become more real, and more fun, when other people visit. The interaction is the point. Quarantine had taken that away, or at least boxed it up on the screen, but the game world had brought it back.

In early June, this took on new urgency.

Scenes from Animal Crossing, where players create their surroundings, and the main activity is design.

IMAGES: COURTESY NINTENDO

When the latest Animal Crossing first came out, I'd read about how in-game protests by Hong Kong democracy activists had led to its being removed from sale in China. When Black Lives Matter protests overwhelmed the U.S., they inevitably appeared in Animal Crossing as well, with screen captures leaping to social media. But this was a moment when the limitations again were obvious. As the real streets filled with people, we no longer had to ask what streets were for (not for cars). If there was a brief moment when it seemed as if we were never going back to the world (or at least the office), the presence of millions marching together erased the thought. The game again was just a game. ■

Andrew Blum is the author of The Weather Machine: A Journey Inside the Forecast, *now out in paperback.*

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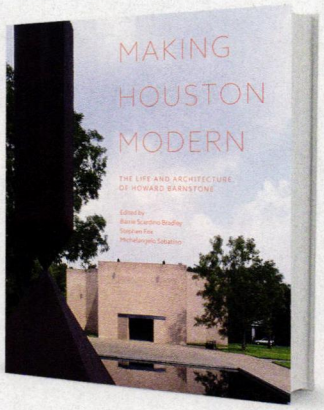
Twentieth-Century Man

Making Houston Modern: The Life and Architecture of Howard Barnstone, *edited by Barrie Scardino Bradley, Stephen Fox, and Michelangelo Sabatino. University of Texas Press, 388 pages, $50.*

REVIEWED BY JOSEPHINE MINUTILLO



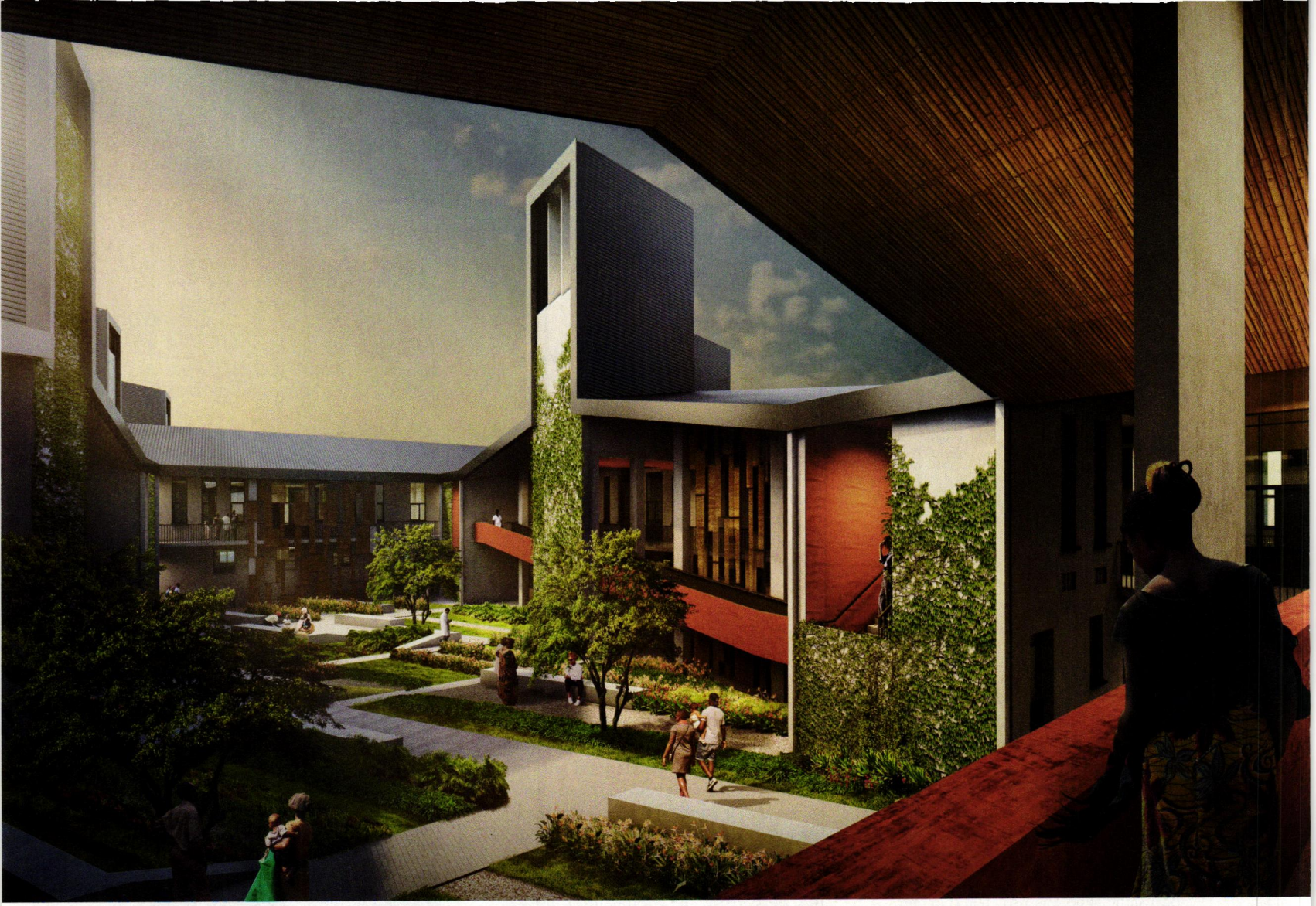
IN THIS BOOK of essays, Michelangelo Sabatino writes, "With the exception of the Rothko Chapel, a design by Philip Johnson that Barnstone & Aubry modified to satisfy Mark Rothko, [Howard] Barnstone's work never entered the canon of iconic Houston modern buildings." Yet the story of this man, and his work, little known outside of Texas, fills this Texas-sized tome with a rich history of 20th-century architecture and its patronage, the complex personal struggles of an "outsider" architect and individual, and stunning archival photography of the inventive buildings and interiors he designed. Those designs, so rooted in their time and place but with universal appeal, deserve, at long last, a larger audience.

Barnstone, who was also an author and educator, did, nonetheless, enjoy renown during his career, which spanned 40 years, from the late 1940s to his death in 1987. He was considered Houston's foremost modern architect in the 1950s; RECORD's editors published his work several times up to the 1970s, putting the Gordon House, by Bolton & Barnstone, on the cover of its annual Record Houses issue in 1956. He also hobnobbed with Houston society, essentially becoming John and Dominique de Menil's in-house architect, providing design services for the family's Schlumberger corporation and their extended family and friends. Notably, in 1961, Barnstone added a barrel-vaulted canopy over the courtyard of John and Dominique's house, another building by Philip Johnson (1951) that he worked on.

Johnson was indeed a central figure in Barnstone's career. Like the New York–based architect, Barnstone adopted early on the rigorous architectural practices of Mies van der Rohe. About Barnstone's buildings, mainly houses, Stephen Fox writes, "they demonstrate amazing consistency in their spatiality, proportions, scale, indoor-outdoor relationships, use of transparency, and details." Sadly, some of these have been demolished by now, including the razing just last year of one of his larger projects, the sculpturally dramatic six-building Harris County Center for the Retarded (1966), as it was originally known. Barnstone resisted Postmodernism until Johnson posed with his model of the AT&T building on the cover of *Time* magazine in 1979. But Barnstone's later work received less attention, and the recession of the 1980s hit Houston, and Barnstone, hard.

While the book's three editors admit most surveys of architects' careers make only minimal reference to their personal lives, they point out that Barnstone was haunted by inner demons. He was a Jewish man living in the South, and bisexual—though he denied it—married for many years to Gertrude Levy, an actress, artist, and vocal political activist who sometimes overshadowed him. Like his father, Barnstone suffered from bipolar disorder. His divorce in 1968 triggered a severe bipolar episode; the treatment included electroconvulsive therapy. A similar episode, beginning in 1985, ultimately led to his suicide by overdose of sleeping pills in 1987. His funeral was held at the Rothko Chapel.

Barnstone readily admitted he had little to do with the design of the chapel, despite frequent meetings with Mark Rothko that involved lots of drinking and commiserating. The artist never saw it installed with his suite of 14 brooding paintings. Like Barnstone, he committed suicide in his mid-60s—a year before the building was completed in 1971. It reopens in September after a comprehensive restoration by New York–based Architecture Research Office (ARO). Says ARO principal Adam Yarinsky, "The chapel's matter-of-fact construction and unfenestrated brick exterior belie the unexpected experiential intensity within." That a simple exterior could mask such revelations inside is something that applies to much of Barnstone's work, and to the man himself. ■



PORTFOLIO

Lessons from the Field

Four upcoming health-care projects in Africa by MASS Design Group offer widely applicable best practices.

BY BETH BROOME

FOR MOST OF US, rampant disease outbreak is uncharted territory that we are just learning to navigate in the face of COVID-19. But the Boston- and Kigali, Rwanda–based nonprofit MASS Design Group has been working on the front lines of infection transmission since the firm was established by Michael Murphy and Alan Ricks in 2008.

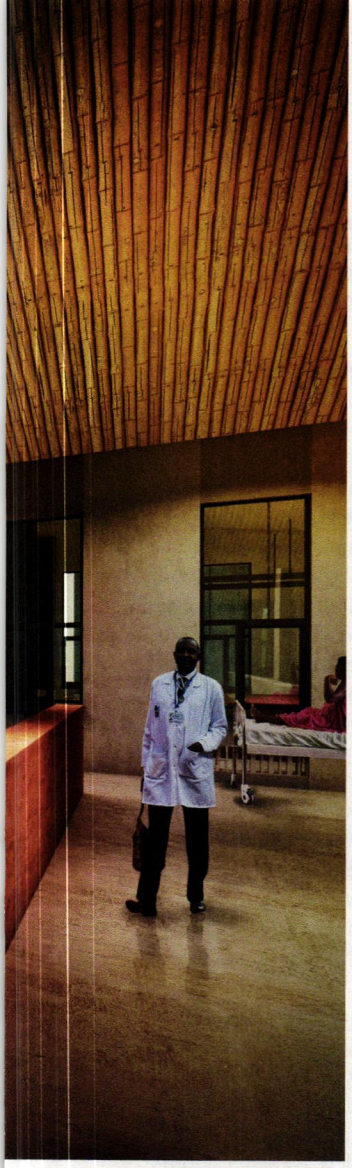
Founded on the belief that the built environment is never neutral and has the power to harm or keep us safe, MASS has worked extensively in developing nations, constructing and retrofitting buildings to promote infection control as well as creating design standards and guidelines for government infrastructure. That expertise enabled MASS to form a COVID-19 Design Response team here in the U.S., to share strategies (mostly open-source guidelines) aimed at mitigating the risk of infection in health-care spaces and beyond.

But in the meantime, the firm has continued to design and build in the developing world, during what has been a particularly prolific period. "We have 10 times as much under construction today as we have done in last 10 years combined," says Ricks. Nearing completion are several health-care projects in Africa. Though each is unique in responding to its context, each showcases the firm's approach and offers widely applicable best practices.

MASS's philosophy of health-care design goes back to its first hospital, in Butaro, Rwanda, in 2011 (RECORD, December 2019), working with Paul Farmer's Partners in Health. It used simple passive-ventilation systems to reduce airborne infection. This focus on natural airflow—as well as leveraging outdoor areas and using local, sustainable materials for creating spaces with dignity—have guided the design process and become hallmarks of MASS's work.

New Redemption Hospital Caldwell

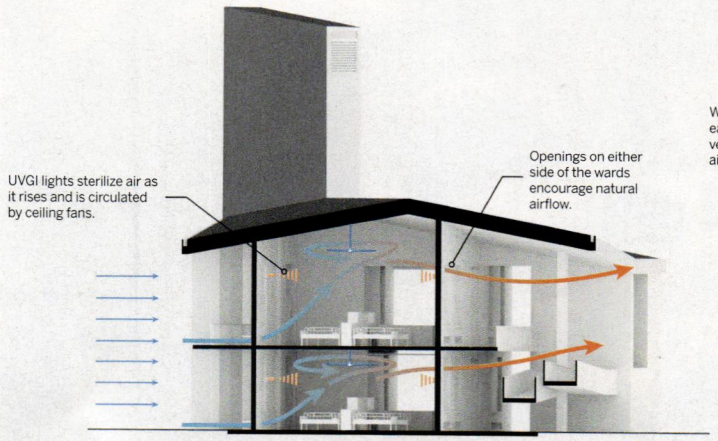
Such tenets are elevated in the design of New Redemption Hospital in Caldwell, Liberia, whose first phase is scheduled for completion

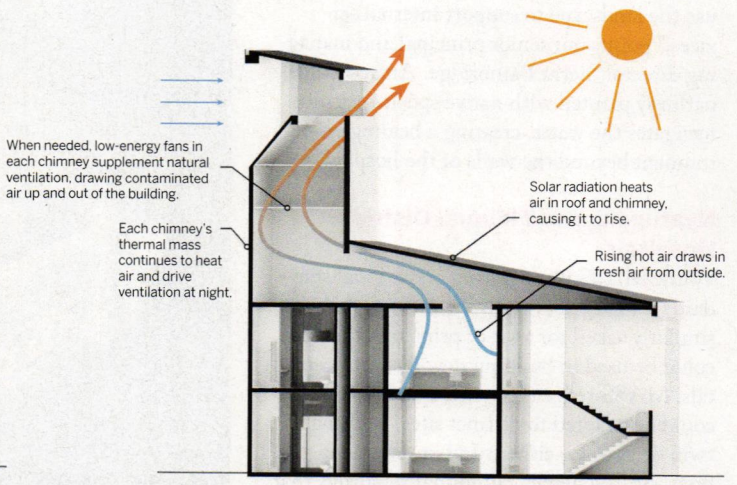


The figure-eight form of the New Redemption Hospital (top, right) embraces expansive courtyards (above).

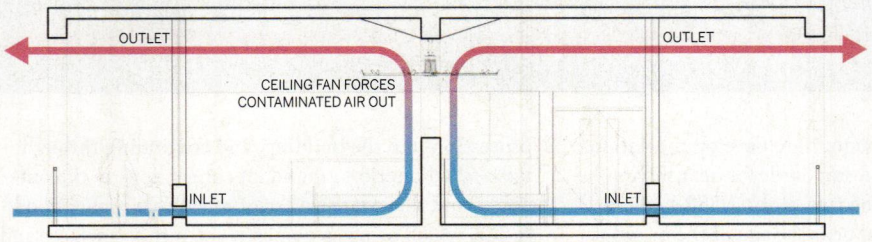
in June 2021. Originally brought in to develop the national infrastructure guidelines and standards for health-care facilities, MASS designed the two-story, 1,550-bed maternity and pediatric hospital near the site of the original one in a rapidly urbanizing district of greater Monrovia. Composed of two square volumes, in a figure-eight form, the building has large courtyards at its two centers and an undulating, unifying roofline. To provide shading and mitigate solar gain, the team is wrapping the exterior in vertical masonry fins and employing local reeds within a steel frame to shade the corridors on the courtyard side. Working in a country that had recently been ravaged by an Ebola epidemic, the team was committed to rebuilding public trust in the system among a population that had come to see hospitals as a place to die. A welcoming tone prevails, beginning with a gracious public forecourt and procession into the building, and continuing through light-filled interiors, abundant connections to the outdoors, and the extensive use of renewable rubberwood inside, which brings a domestic warmth to surfaces and furniture.

The building is oriented to enable airflow, with non-conditioned spaces facing southwest to capture breezes and those requiring mechanical ventilation, like operating theaters, located within the building's wind shadow or toward the southeast. The large courtyards, planted to offer privacy, serve as waiting areas, limiting time spent indoors. Giving formal expression to the significance of airflow are 12 solar chimneys (developed with Transsolar) that tower over the building. Because of the high heat and extreme humidity here, the chimneys incorporate fans that, along with heat flow, draw contaminated air past





NEW REDEMPTION HOSPITAL NATURAL VENTILATION FOR INFECTION CONTROL



CALCULATIONS FOR AREA OF INLET AND OUTLET

$$\frac{\text{ROOM VOLUME x AIR CHANGES PER HOUR}}{60} = \text{VENTILATION REQUIRED PER MINUTE}$$

$$\frac{\text{VENTILATION REQUIRED PER MINUTE}}{\text{AIR SPEED (45 METERS PER MINUTE)}} = \text{SIZE OF OPENING}$$

ultraviolet gerimicidal irradiation (UVGI) lights and out of the building, cycling 12 times an hour and producing a cooling effect. Working with civil engineers, the team is planning to keep the surrounding wetland intact but increasing the depth of channels to control the mosquito population. "We try to use the landscape to support internal services," points out senior principal and managing director Sierra Bainbridge. An accessible pathway planted with native species circumnavigates the water, creating a healing environment beyond the walls of the hospital.

Nyarugenge and Munini District Hospitals

While MASS was working on national standards for Liberia, the government of Rwanda similarly asked for a set of principles that could be used in building new district hospitals. MASS responded with a tool kit that could be adapted to distinct sites, devising twin designs for either rural or urban contexts. Both schemes call for bar buildings that can step down on a sloped site, and both employ Butaro's core strategies: exterior hallways, cross ventilation and UVGI lights, as well as single-loaded wards that are connected to balconies, with generous fenestration for views and airflow.

MASS developed a tool kit of principles for designing district hospitals in Rwanda. The first prototypes are for an urban facility, Nyarugenge (left), and a rural one, Munini (bottom).

Two MASS-designed hospitals are the first prototypes. For the 80,000-square-foot 300-bed Nyarugenge District Hospital in Kigali, Rwanda's capital (slated for completion this month), the plan is for two bar volumes that are more or less parallel, while at the rural 155,000-square-foot 300-bed Munini District hospital (due for completion in the fall), three bar volumes bend along the site's contours in deference to a memorial to the 1994 genocide at the top of the hill. Both strategies use exterior space for airborne-disease control through spacious, shaded courtyards between the volumes that can be patient waiting areas, as well as early labor walking gardens for expectant mothers and play areas for children. While Munini has the benefits of a large, landscaped campus, Nyarugenge, due to its urban context and compressed site, will employ vertical gardens on facades, offering both shading and psychological benefits.

Though MASS aims to use locally sourced materials, here the team opted for reinforced-concrete structural systems. This facilitates replication across Rwanda, says senior principal and managing director Christian Benimana, since it is widely available, appropriate for seismic zones, and familiar for most workforces. Yet local materials are also used: fired clay brick and compressed stabilized earth (CSE) blocks at Nyarugenge; for Munini, fired clay brick and local stone, lending texture to the largely stucco exteriors.

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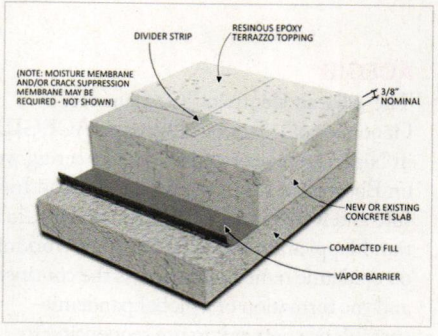

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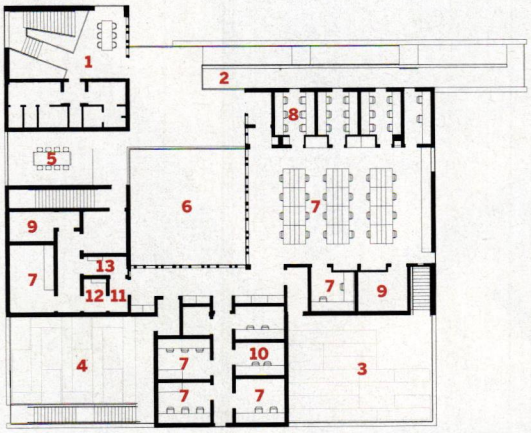

SECOND-FLOOR PLAN

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The African Centre of Excellence for Genomics of Infectious Diseases (ACEGID), in Nigeria, is celebrated for its pioneering work on Ebola. Collaborating with the Broad Institute and MASS, ACEGID, led by Dr. Christian Happi and Dr. Pardis Sabeti, is working on epidemic remediation across the continent and the formation of a global pandemic-surveillance network to use sequencing to prevent the next pandemic. In this effort, the team is building a 14,000-square-foot genomics laboratory in the southwestern town of Ede, the first research institute of its kind in Africa, scheduled for completion in the fall. ACEGID wanted the institute's architecture "to be as bold as their scientific research," says Ricks. A low-slung rectilinear massing of solids and voids, its labs and offices alternate with exterior decks for respite and revitalization. Broad steel-and-wood canopies wrapping the structure mitigate solar gain while providing inviting areas for the broader population of Redeemer's University to gather (the labs inside are only open to authorized staff and students). A solar array on the roof helps with demanding energy loads. Aspiring to demonstrate the "high-tech potential of locally available materials," the center is probably the only biosafety level-3 lab (for handling toxic pathogens) in the world to employ walls of rammed earth, providing high thermal mass with low embodied carbon. Getting approval for the use of low-cost and sustainable rammed earth for a health-care facility (and for the CSE blocks at Nyarugenge) after 10 years of effort is a major triumph for MASS, and an approach the firm hopes can be incorporated into future projects.

In the wake of COVID-19, a growing awareness has emerged about the role of design in keeping people safe. But, cautions Ricks, "we want to design for people—not pathogens—by creating spaces that are dignified and healing, and not just about mitigating risk." While taking lessons from these projects, his team stays focused on the larger picture: how to leverage local resources, keep as much money as possible in the local economy, and build for a climate-positive future. "We can't lose sight of those bigger agendas and just think about emergency response," says Ricks. "This is about building long-term resilience and building for public health—global health." ■

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BY SHEILA KIM

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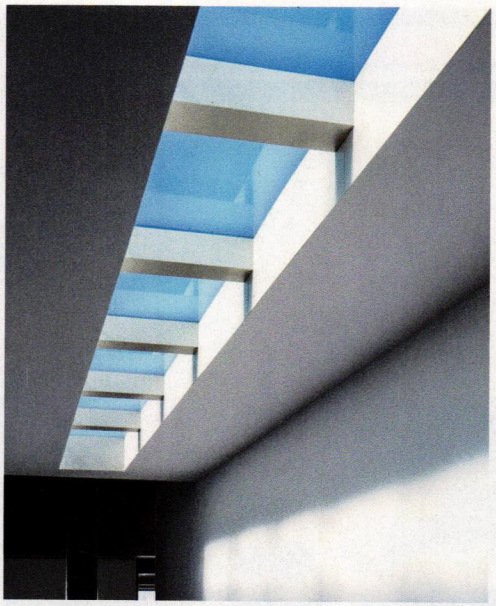

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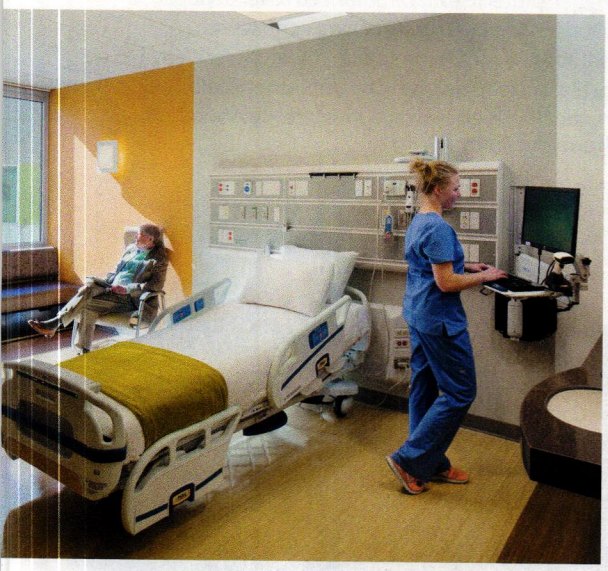
coelux.com



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Commend Nurses Station

The Commend system has the look and feel of high-end custom millwork but is actually a prefabricated kit of parts offering convenience, fast installation, and visual cohesion across facilities. These high-performance team hubs come in four configurations, with customizable options such as a linear unit with a Corian transaction top, a corner unit with glass screening, and a U-shaped station divided by a central work-surface peninsula.
hermanmiller.com

COVID-19 Protection Kit

Practical for pandemic-related retrofits, this AS Hanging Display Systems kit suspends a barrier between people in front of and behind a transaction desk. Adapted from existing hardware, the system includes cables, fasteners, hanging rail or fixed piers, and ½"-thick plexiglass or other acrylic sheeting. (The existing ceiling and choice of sheet material affect which hardware is applicable.)
ashanging.com

Exchange Recovery Pod

Allseating designed this partially screened chaise longue with the current crisis as well as the needs of triage and health-care facilities in mind. The upholstery is health-care- and contract-rated faux leather that is available in a wide range of colors. The multipurpose pods can be used for emergency recovery or reconfigured as seating for waiting areas and staff lounges.
allseating.com

IntelliFlex I/O

Recently expanded to include automation by a sensor or building-management system, Draper's IntelliFlex I/O motorized roller shades eliminate the need for touching controls or switches. They are made with Phifer SheerWeave textiles, said to be free of harmful chemicals, and treated to inhibit stains, odors, and deterioration.
draperinc.com

Designtex Celliant

This seating upholstery backing is composed of thermo-reactive materials that absorb heat emitted by the human body and convert it to infrared energy, which is clinically proven to speed up recovery. A person can potentially experience this cell oxygenation and improved circulation within minutes of sitting.
designtexcelliant.com

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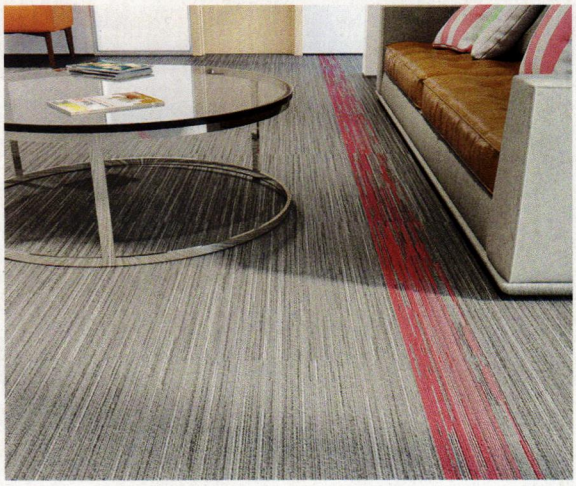
BY SHEILA KIM



Sonata Elements

American Biltrite's new luxury vinyl tile fools the eye by simulating striated and layered design trends of modular carpet planks. Five neutral bases range from a light gray to brown, while five corresponding tiles introduce striated patterning. Accent tiles build on these with streaks of vibrant color. The tiles come in an 18" x 36" format.
american-biltrite.com

Smart City

Transit maps of major cities such as New York and Berlin inspired the linear graphics of this Gensler- and Mohawk Group–designed carpet-plank system. Made with solution-dyed nylon and EcoFlex NXT backing, the 12" x 36" planks meet the stringent standards of Living Product Challenge Petal Certification.
mohawkgroup.com

Bespoke Parquet

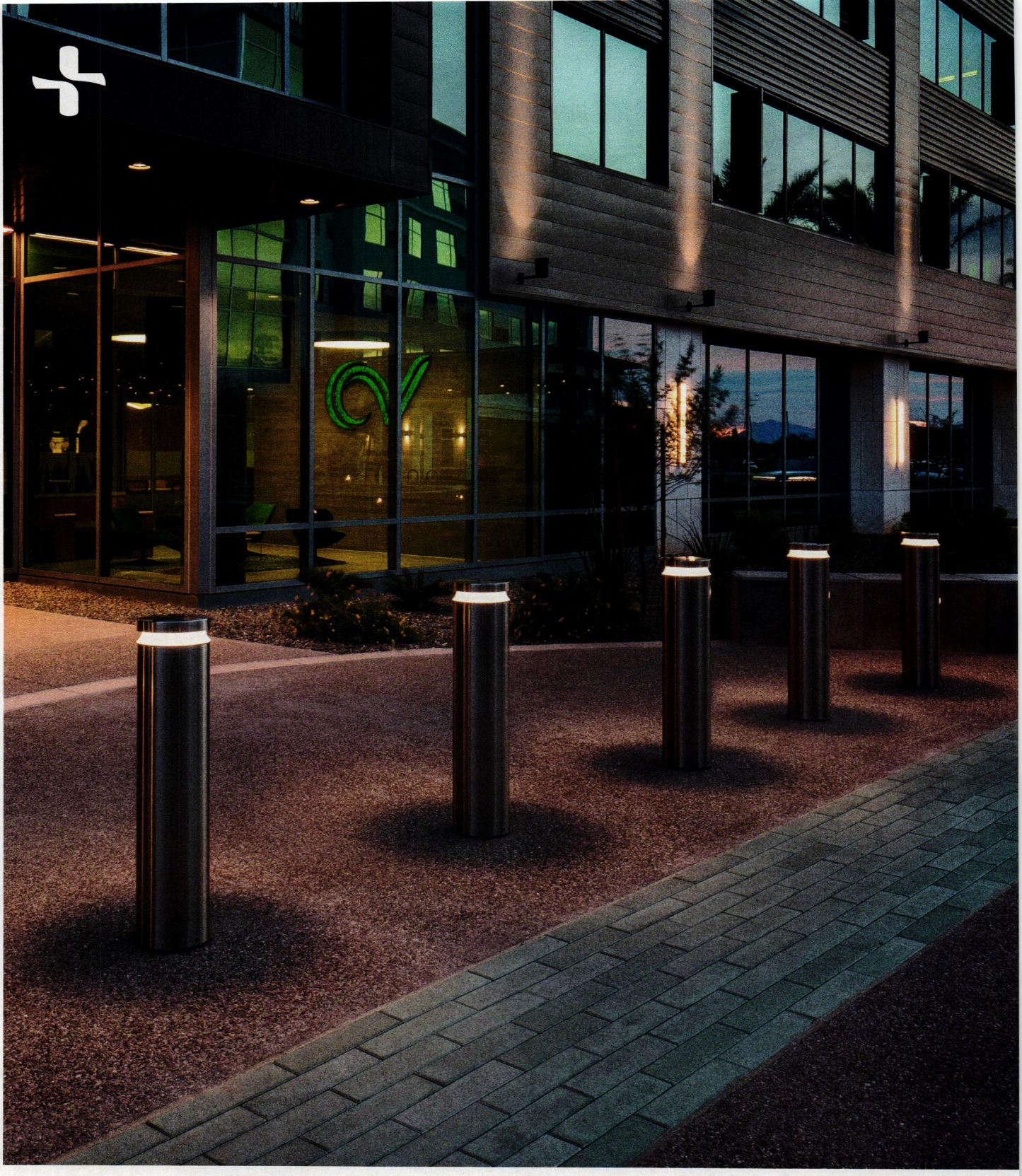
In addition to wood planks, Havwoods offers engineered and solid wood parquet panels in patterns ranging from a recreation of flooring inside the Palace of Versailles to custom styles such as this prismatic-diamond motif created for British luxury department store Harvey Nichols. The products are composed of European or reclaimed American oak.
havwoods.com

Rubber Stair Treads with DuPont Kevlar

The only resilient treads to incorporate the DuPont Kevlar fiber known for its use in ballistic body armor, Roppe's new treads resist common wear-and-tear issues. The treads are available in eight profiles and 134 colors, and are 100% recyclable.
roppe.com

Terrace LVT

Shaw Contract references the meditative quality of Zen gardens in this new luxury vinyl tile—designed specifically with the health-care industry in mind—via soft abstract line work, nature-inspired colorways, embossed texture, and subtle metallic accents. The tiles come in a 12" x 24" format, 1/8" thick, with a 20-mil wear layer, and Shaw's ExoGuard Plus finish.
shawcontract.com



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In with the New

The Zhang Yan Cultural Museum by Horizontal Design emerges from the ruins of a historic village outside Shanghai.

BY ARIC CHEN
PHOTOGRAPHY BY SU SHENGLIANG

IN 2015, the Chinese government designated the village of Zhang Yan, on the western outskirts of Shanghai, as a pilot site for revitalizing the country's rural areas. Last year saw the completion of a centerpiece of that initiative: the Zhang Yan Cultural Museum, a complex that was a pilot project for its Shenzhen-based designer, Ju Bin, as well.

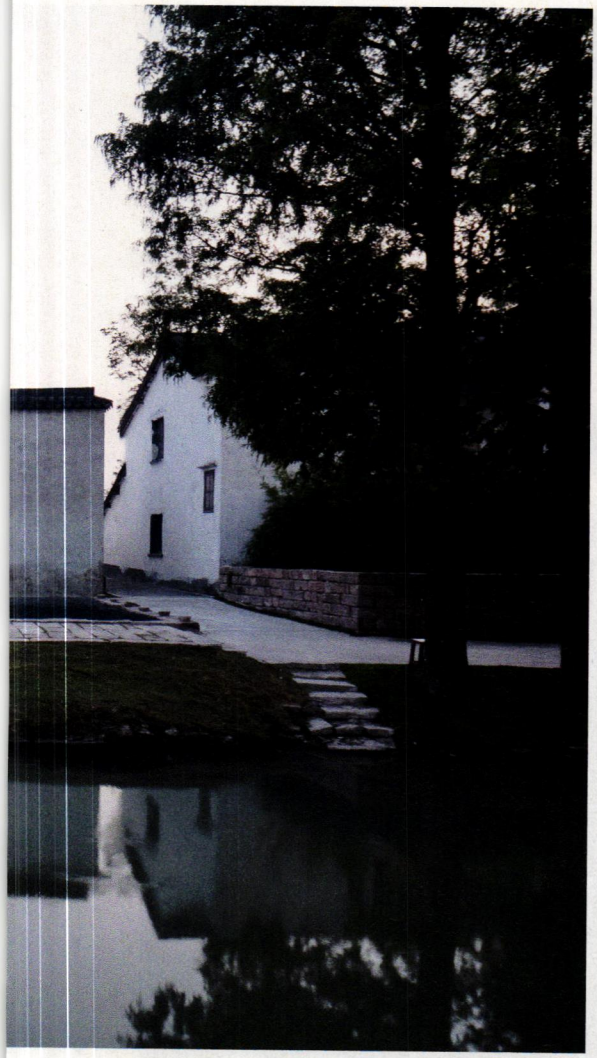
Dating to the Tang dynasty (618–907 C.E.), Zhang Yan was once a prosperous trading hub, sitting on a bend in the Zhangyan Jin River. Having long ago lost its commercial importance, the village's location on what's now the edge of Shanghai made it a convenient testing ground for rethinking China's yawning rural-urban divide.

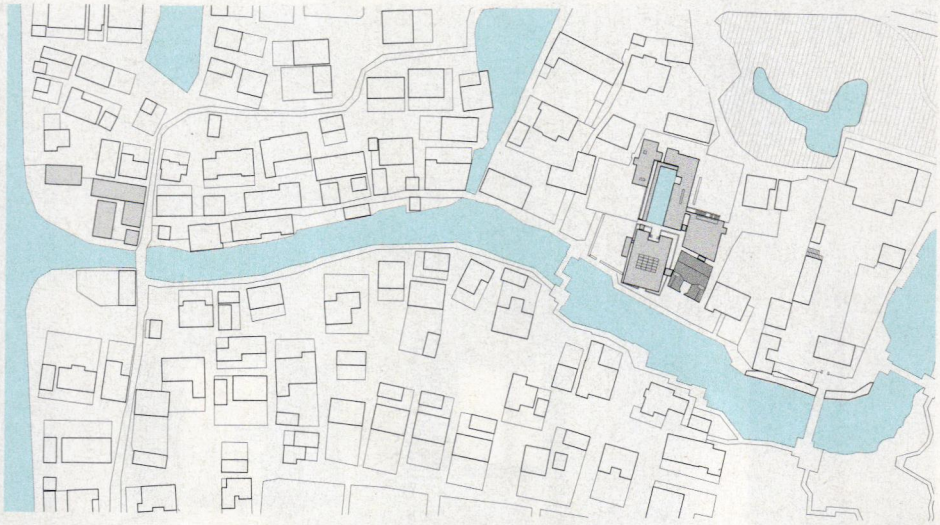
For Ju Bin, the museum is his first ground-up architectural project. Through his firm, Horizontal Design, Ju has become one of China's most prominent interior designers, known mostly for high-end hospitality projects that give modern syntax to a design vocabulary drawing from traditional Chinese culture, crafts, and typologies. "Until now, as an interior designer, I mostly concentrated on details," he says. "But this project was a chance to use the same logic between interior and exterior, and work more intensely with the site and its history."

About an hour's drive from central Shanghai, the city's high-rises yield to tree nurseries, fields, and stands of bamboo. In an otherwise bucolic setting, now punctuated by small-scale construction sites, one arrives at the Zhang Yan Cultural Museum by crossing a stone footbridge. (Plans for the village call for an agriculture park, a commercial zone, wellness center, villas, and new housing for current village residents.) Adjacent to a Qing-dynasty (1644–1912) temple, Ju's complex emerges on the riverside as a kind of three-dimensional stratigraphy: part ruin, partly preserved, partly pristine.

Indeed, the complex's two front buildings, both late Qing-dynasty residences that formed the genesis of the project, were dilapidated, verging on collapse. In front of the eastern house—whose timber framing had to be restored—an existing structure was beyond salvaging, so Ju cleared it while retaining its granite column bases "to preserve the memory of the place," he says. The move opened up views to the western building, where only the exterior brick walls, mottled with eroded plaster, remained retrievably intact. Within those walls, Ju inserted a white-finished concrete volume—the museum's main gallery—

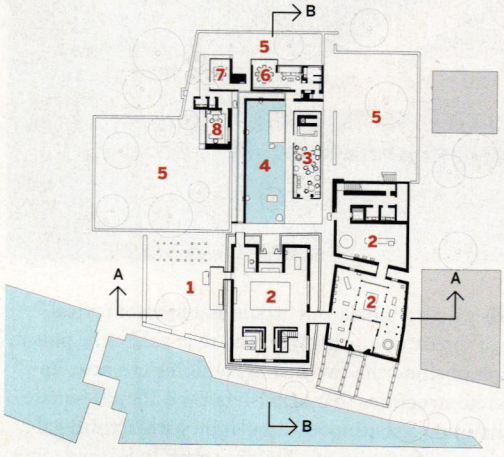
SITTING on a bend in the Zhangyan Jin River, the museum complex comprises restored Qing Dynasty residences and new construction (above and top, left).





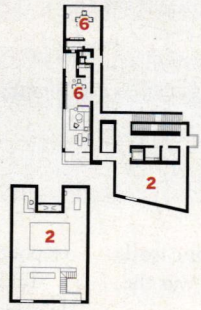
SITE PLAN

0 100 FT. 30 M.



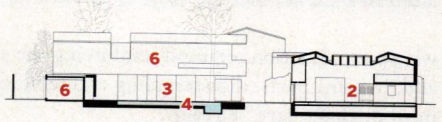
GROUND-FLOOR PLAN

0 30 FT. 10 M.



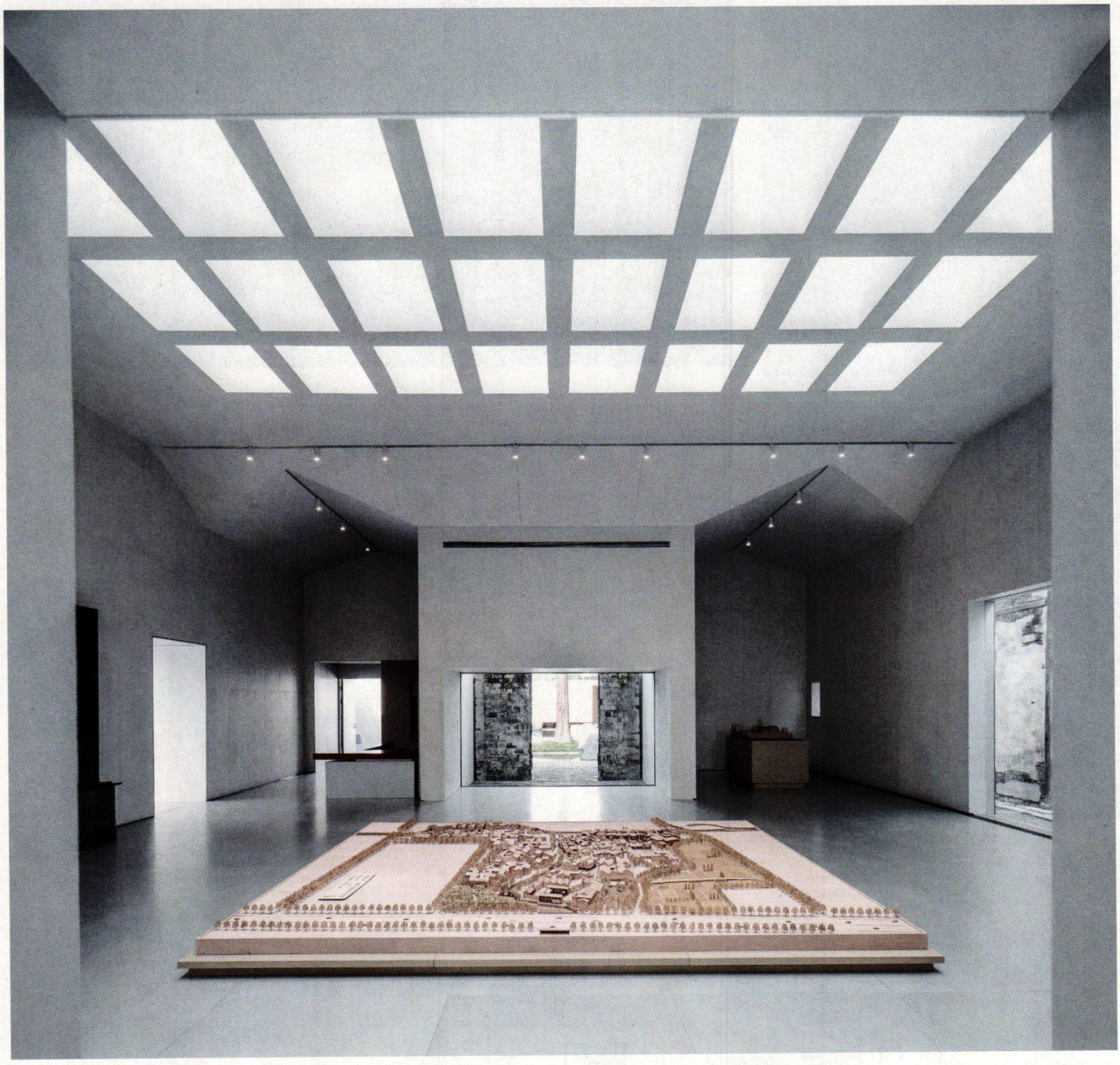
SECOND-FLOOR PLAN

SECTION A - A



SECTION B - B

1 ENTRANCE PLAZA
2 GALLERY
3 CAFÉ
4 WATER COURT
5 COURTYARD
6 REST AREA
7 TEAHOUSE
8 STUDY ROOM

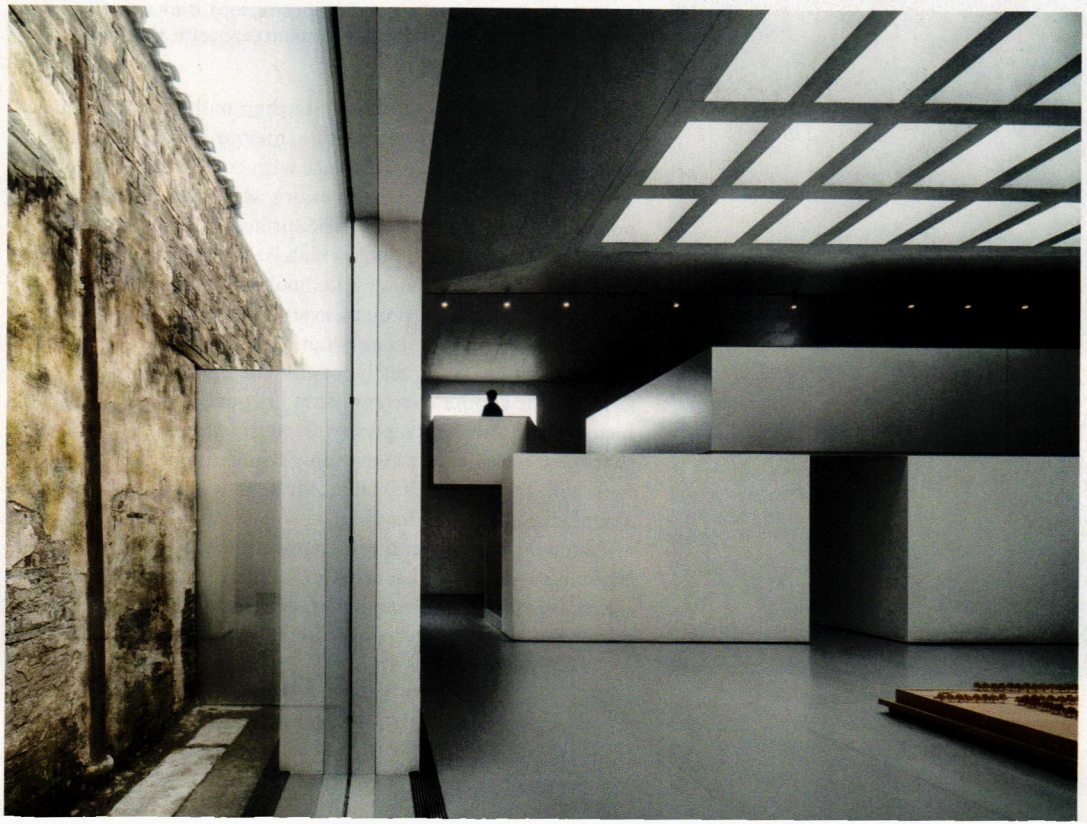


whose construction required reinforcing the surrounding historic walls and, in some parts, disassembling and rebuilding them. "That was the most difficult part," he says.

To create a more generous arrival, Ju reoriented the complex's main entrance to the side of the western house, creating a plaza paved in reclaimed granite, with a preserved locust tree at its center. From there, one enters the double-height main gallery, where daylight filters through a grid of skylights reflecting off floors of anodized aluminum. Extending into a local-history gallery that now occupies the eastern, timber-frame house, the metallic floors are more ethereal than jarring; they put everything in a pleasing soft focus. "A space is not just a space, but a gathering point for the five senses," says Ju, who's known as something of a designer-poet. "I wanted this place to inhale and exhale as a form of revival."

Taking a strategy of "preservation, growth, and renewal," as he puts it, Ju extended the complex behind the two historic buildings to new, immaculate, white concrete structures that help fill out the 16,000-square-foot site. While maintaining a continuous circulation path, a third gallery—roughly following the footprint of a building that, Ju learned, once occupied the site—was added behind the local-history gallery, connecting to a two-story L-shaped structure (housing tearooms, VIP rooms, and other facilities) that acts as the complex's spine. On the latter's ground level, a glass-enclosed café-lounge creates only a transparent barrier between a garden on one side and a reflecting pool on the other.

It wouldn't be a cliché to say that Ju's design evokes the spatial



DAYLIGHT filters through a grid of skylights in the double-height main gallery, reflecting off floors of anodized aluminum (opposite). Exterior brick walls, mottled with eroded plaster, juxtapose with the crisp new structure (this page).

A LOCAL-HISTORY gallery occupies the timber-frame house (above), while a lounge is completely new-build (left). The glazed café looks over the water court (opposite, top). Dark wood frames a view into the reading room and tearoom (opposite, bottom).

strategies of Chinese gardens, with their multiplicities of meticulously constructed views. Here, mezzanines, stairs, and walkways seem timed in sequence with cutouts, overhangs, and sight lines. Openings in the interior's white concrete walls perfectly frame contrasting rustic surfaces behind. A viewing platform "floats" in the pool, which is edged by an 80-foot-long wall that, propped up on granite boulders, appears to float itself. Throughout the project, every joint, reveal, gap, and detail was impeccably thought out and executed, while carved-out volumes and voids deftly manipulate light and shadow. Overall, the complex accomplishes Ju's goal of juxtaposing the historic with the contemporary through fragmental gestures that come together as a compelling whole. If one had to find fault with the project, it would only be that it exhibits an overabundance of pent-up ideas.

Naturally, Ju designed the interiors—which included selecting the books and teacups that help furnish the VIP rooms—down to the tea that's served. "It was important to me that everything be integrated," he says. "My main concern is creating an atmosphere." ■

Credits

ARCHITECT/INTERIOR DESIGN: Horizontal Design — Ju Bin, design director; Zhou Zhimin, He Bin, project architects; Zhang Jia, Deng Shuyu, Song Wenyu, Hu yao, Huang Ping, Xu Weiwei, design team

ENGINEERS: Jiang Architects & Engineers

GENERAL CONTRACTOR: China Construction Eighth Engineering Division

CONSULTANTS: Shanghai Sunvast Construction Decoration Eng. Company (facade)

CLIENT: CSCEC (Shanghai) New Urbanization Investment Development Company

SIZE: 11,450 square feet

COST: withheld

COMPLETION DATE: May 2019

Sources

METAL ROOFING: Rheinzink

HARDWARE: Helaform

EXTERIOR LIGHTING: Viabizzuno

Factory Fresh

The Momentary, by Wheeler Kearns Architects, regenerates a former cheese plant in Bentonville, Arkansas.

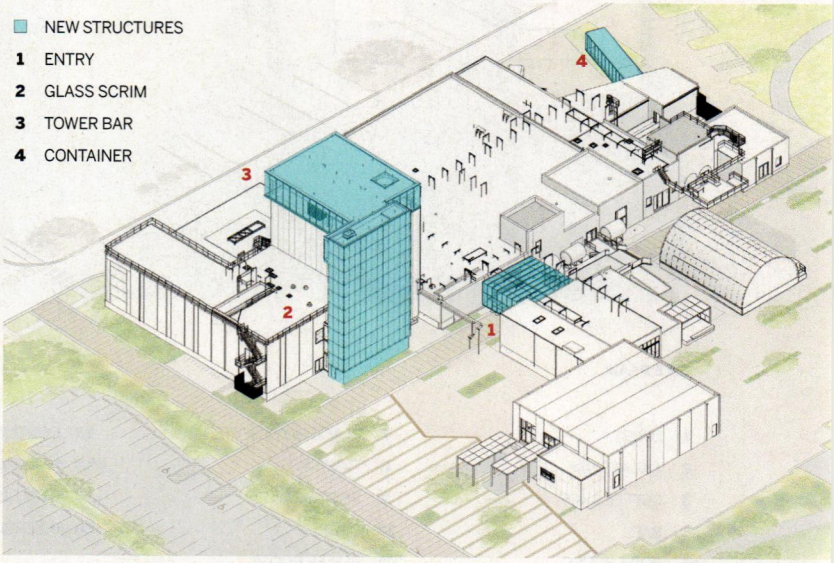
BY LINDA C. LENTZ
PHOTOGRAPHY BY TOM HARRIS

AS THE Walton family continues to develop its Walmart corporate base in Bentonville, Arkansas, it has been investing in community and cultural resources to boost commerce and attract a talented workforce. This became most apparent in 2011, when Alice Walton, daughter of Walmart founder Sam Walton, opened the Crystal Bridges Museum of American Art on 120 acres of woodland and creeks (RECORD, January 2012). Designed by Moshe Safdie to display a vast collection, this popular destination has since hosted nearly 5 million visitors.

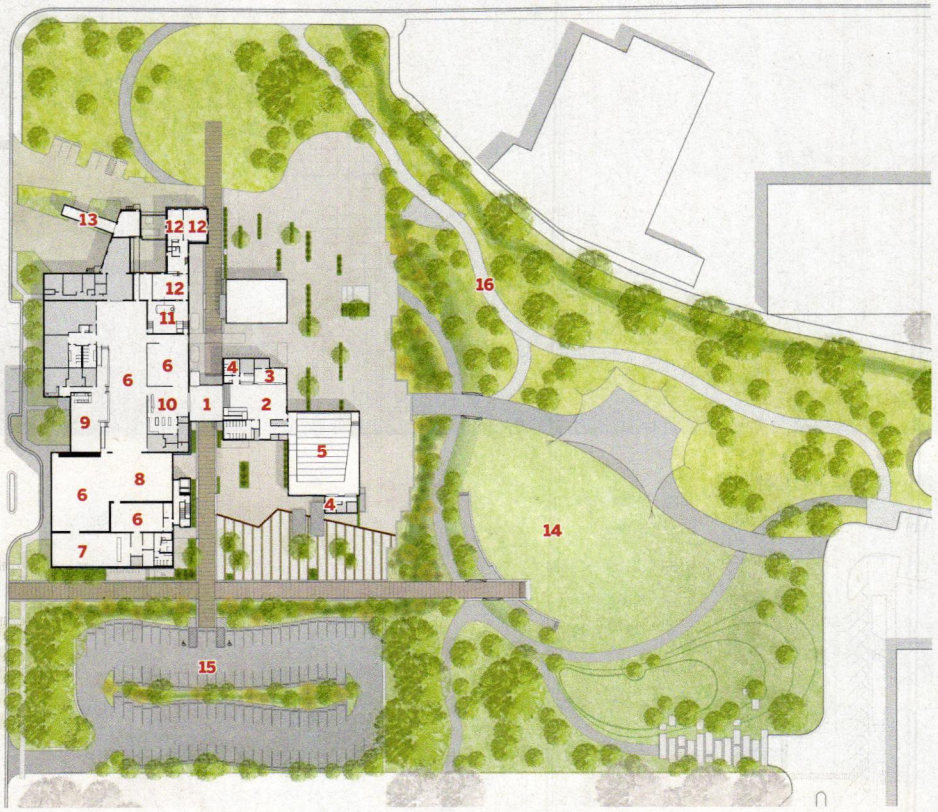
In a similar spirit, a trio of younger Waltons—her nephews Steuart and Tom, and Tom's wife Olivia—spearheaded the conversion of a Kraft cheese plant in Bentonville's downtown to create a dynamic satellite for Crystal Bridges that offers a mix of visual, performance, and culinary experiences for a growing millennial audience. The Momentary, as it is called, is located only about a mile and a half downstream from its parent museum and will co-curate some exhibitions. But the urban offspring definitely has a flavor of its own.

Designed by the Chicago-based Wheeler Kearns Architects, the

A GREENHOUSE-LIKE entry is in a central location (right). The backlit "Glass Scrim" circulation hub (top) can also be used for projections.



AXONOMETRIC DIAGRAM



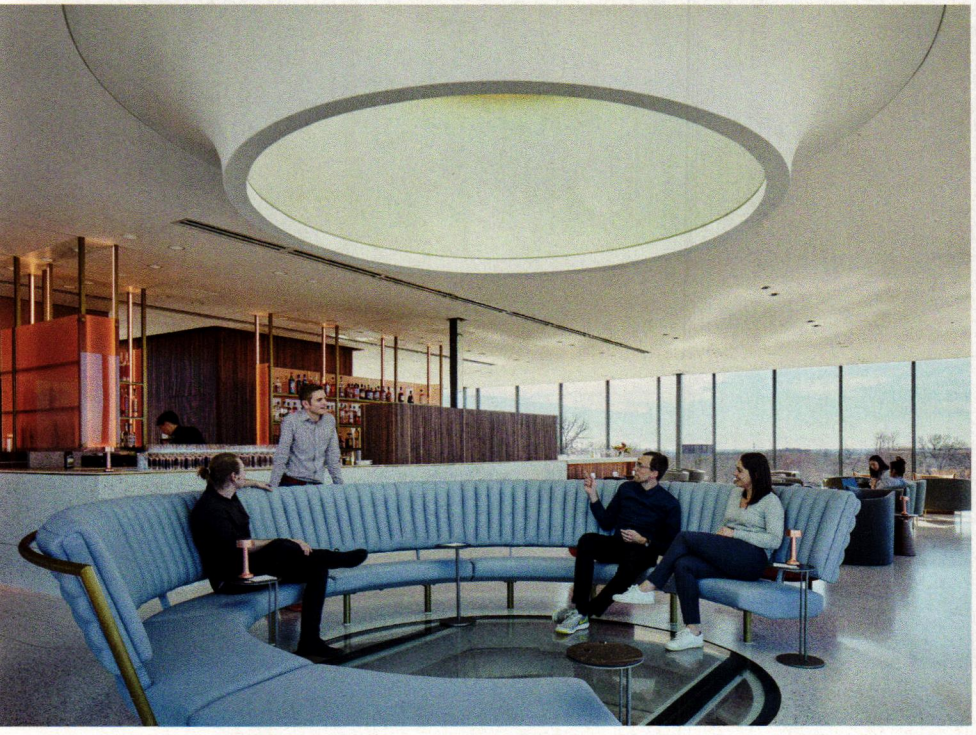
SITE PLAN

1 LOBBY
2 THE ATRIUM
3 COFFEE SHOP
4 BAR
5 RØDE HOUSE
6 GALLERY
7 BLACK-BOX THEATER
8 THE TOWER
9 RESTAURANT
10 SHOP
11 BOILER ROOM
12 ARTIST STUDIO
13 CONTAINER
14 MOMENTARY GREEN
15 PARKING
16 BIKE TRAIL

61,000-square-foot project is the most recent development in a former industrial area being transformed into office space, shops, and food-focused businesses such as CO-OP by local architect Marlon Blackwell (RECORD, June 2020). The 10½-acre site, bordered by residential streets to the west and a creek and 36-mile bike path to the north, anchors these commercial developments, which edge its parklike grounds called the Momentary Green, landscaped by the Tulsa-based Howell & Vancuren. A weathering-steel bridge built over bioswale, introduced to manage storm-water, leads visitors toward the collection of connected structures dating from 1947 that make up the Momentary.

According to project architect Calli Verkamp, the clients wanted to preserve as much of the existing facility as possible. The challenge, she says, was figuring out how to incorporate the ambitious program into the patchwork of buildings: the original brick-masonry structure, along with steel and pre-cast concrete additions erected over the last four decades. The spaces had been cleared of large equipment and machinery, but infrastructure such as pipes, catwalks, and platforms remained. "We had to decide what to remove and what to keep as a relic," she explains. With surgical precision, the team preserved an immense cylindrical boiler in one gallery and the skeletal remains of a stair in a 70-foot-high mixed-use space called the Tower, once employed for production. At the same time, they repaired damaged surfaces, replaced the roof, and installed advanced HVAC, lighting, and

A FORMER loading dock east of the lobby is now the Atrium (opposite, top), where visitors can grab a drink or coffee before entering the RØDE House (top, left), a performance hall with an adjustable platform floor that accommodates numerous stagings. The Container (top, right) evokes a docked truck and serves as a collaboration space for staff and artists-in-residence. Its glass shell is printed with a gradated Native American motif designed by Osage artist Addie Roanhorse. A gallery in a 1980s steel addition (above) features the existing quarry tile floor and comfortable new seating.



A CASUAL restaurant overlooks the main gallery (top) in the 1947 brick building. Clad in walnut and terrazzo, the Glass Scrim (above, right) provides access to the new Tower Bar (above, left), where a round skylight and glass floor enable views and daylight into the mixed-use Tower below (opposite).

acoustical systems.

The architects aimed to touch the building lightly, Verkamp says, but several insertions were necessary for circulation and programmatic needs. The first was to reorient the entrance from the street to a more welcoming central location near the campus core and Momentary Green. To do this they replaced ancillary rooms added to the rear of the brick structure with a greenhouse-like lobby that opens to the north and south. One of four glass-and-steel interventions, the entrance also serves as a conduit between the building's west wing—with mixed-media galleries, artist-in-residence studios, a black-box theater, a restaurant, and kitchens—and its east wing, where the design team converted a loading dock and garage into a casual bar/café and state-of-the-art performance venue.

Each of the new structural elements is distinct from the Kraft factory. What looks like a glass trailer emerging from a loading dock is a collaboration space for visiting artists called the Container. A slender circulation hub, dubbed Glass Scrim, rising alongside the Tower supplants the old stairs and contains an elevator that carries guests up to a crystalline bar built above the Tower that offers 360-degree views of the city—as well as a peek into the volume beneath it through a circular glass insert in the terrazzo floor.

Printed with gradations of a Native American motif, designed by Osage artist Addie Roanhorse, the glazed entrance, the Container, and Glass Scrim are part of a select group of highly visible and functional commissioned works that manifest the Momentary's mission of "championing contemporary art's role in everyday life," according to director Lieven Bertels. Gently backlit in the evening, the tall circulation hub is a neighborhood beacon, as well as an appropriate backdrop for a bold neon installation by Nassau-born artist Tavares Strachan that announces, "You belong here." ■

Credits

ARCHITECT: Wheeler Kearns Architects — Larry Kearns, principal; Calli Verkamp, lead project architect; Brandon Hall, project architect

INTERIOR & GRAPHIC DESIGNER: FODA

ENGINEERS: Thornton Tomasetti (structural); McGuire Engineers (m/e/p/fp/it); McClelland Engineers (civil)

GENERAL CONTRACTOR: Flintco

CONSULTANTS: Howell & Vancuren (landscape architect); Lux Populi (lighting); Schuler Shook (theater designer); Threshold Acoustics (acoustic and a/v); Edge (kitchen design)

CLIENT: Crystal Bridges Museum of American Art

SIZE: 61,000 square feet

COST: withheld

COMPLETION DATE: February 2020

Sources

METAL PANELS: Kingspan

CURTAIN WALL: YKK

GLASS: Bendheim; Tristar; Viracon; Greenlite Glass Systems

SKYLIGHTS: Wasco; Bristolite

DOORS: Entice; Krieger; Renlita; NanaWall

LIGHTING: KIM; Color Kinetics; Kichler; iGuzzini

CONVEYANCE: Otis; Garaventa Lift

FLOORS: Serapid; American Terrazzo; Teckton

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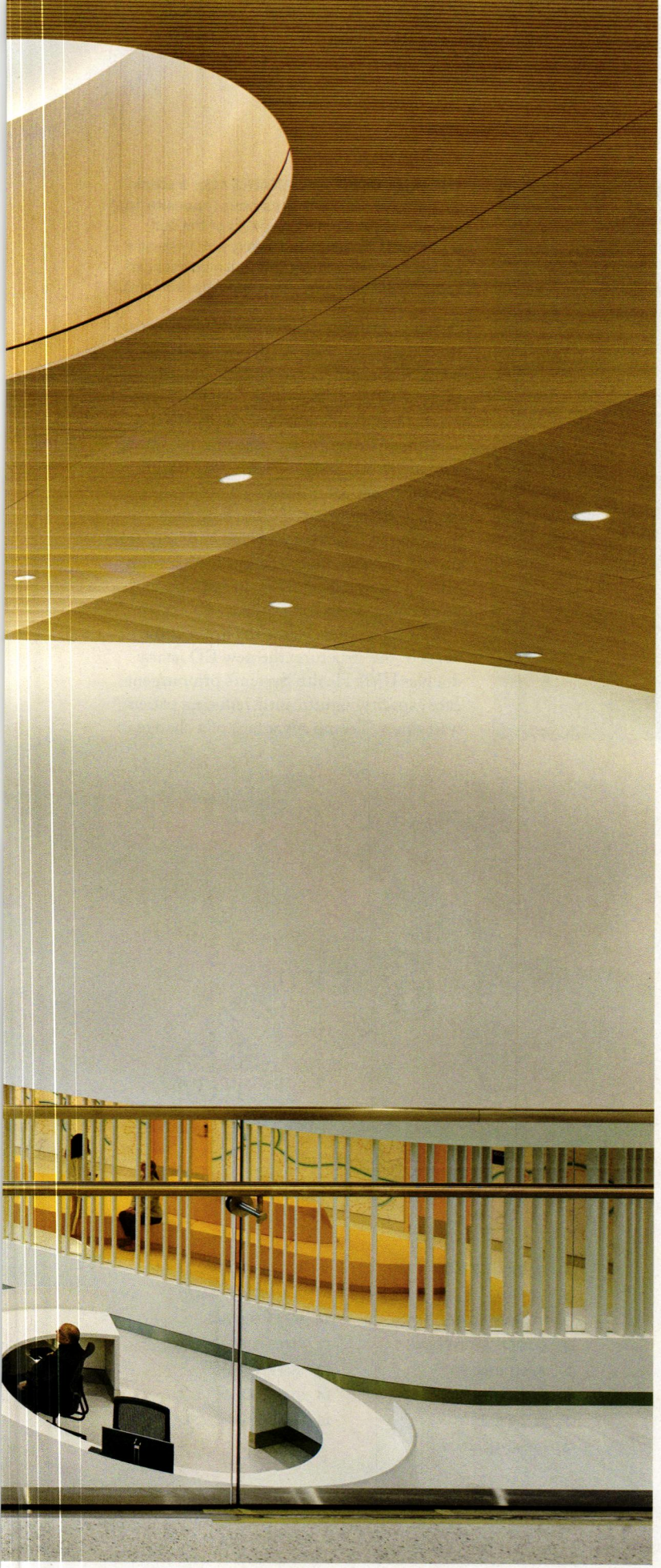
PERKINS AND WILL

PHOTOGRAPHY: © TODD MASON



Turn for the Better

Perkins and Will's flexible design for a hospital expansion at the University of Virginia swiftly adapted to the COVID crisis before its opening.

BY JOSEPHINE MINUTILLO
PHOTOGRAPHY BY TODD MASON

DISASTER PREPAREDNESS was on the minds of everyone involved in the design of the new emergency department (ED) and hospital expansion at the University of Virginia (UVA) in Charlottesville. But, at the time, they were thinking more along the lines of a 9/11-type attack or an Ebola or flu outbreak. No one could have predicted a pandemic of a virus never before seen in humans. COVID-19 forced a last-minute change of course.

Though the ED, located in the base of the building, had been operational for some months, the six-story, curving, glass patient bed tower had yet to open. "We planned on inaugurating the tower by June, but opened part of it for treatment of coronavirus patients in early April," recalls Kevin Fox, director of facilities planning and capital development at UVA. The new hospital was never overwhelmed—it treated a steady volume of 25 to 30 infected individuals at a time before cases in central Virginia plateaued in late spring. To do so, it underwent some speedy but significant modifications. Says Fox, "We already had three airborne-infection-isolation (AII) rooms on the third floor, but we were able to utilize a smoke-evacuation system and cobbled together some ductwork fairly quickly to create 12 additional rooms that have the static pressure equivalent of AII." As a second phase of the response, the hospital procured three high-velocity fans that were installed in the mechanical space on the roof to create negative-pressure rooms for the rest of the third floor and all of the fourth floor. In these rooms, lower air pressure allows outside air into the segregated environment. Any contaminated air that flows out of the room is rerouted away from other patients and hospital staff or passes through a filter.

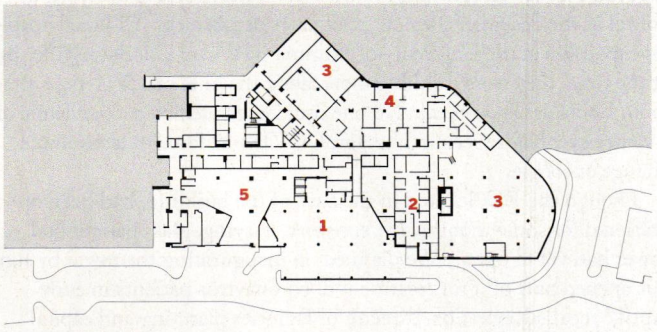
With almost half of its firmwide portfolio devoted to health care, Perkins and Will, the building's designer, knew to allow for plenty of contingencies. Because the patient rooms were designed as universal rooms—a more expensive but flexible approach that can accommodate

VISITORS to the expanded hospital are welcomed into a 28-foot-tall atrium, where extensive glazing and 10-foot-diameter circular skylights flood the dramatic space with daylight.

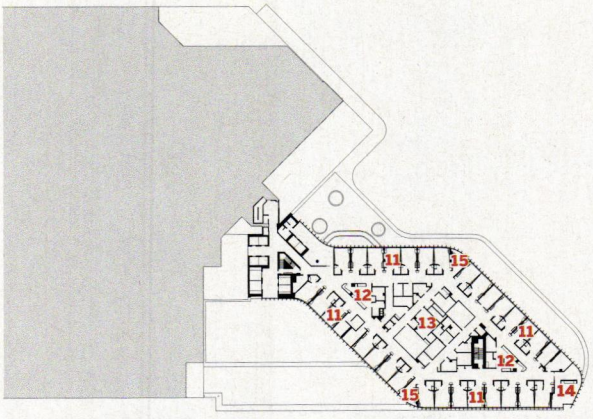
THE BLUE RIDGE MOUNTAINS offer a scenic backdrop to the medical campus (opposite, top) and are visible from many areas of the bed tower (left). Patients and family enter the new emergency department through a landscaped, semicircular welcome area (opposite, bottom).

the most stringent requirements of use—they were easily adaptable in this scenario. The bed tower itself was overbuilt: it comprises three completed floors with 84 private patient rooms, and three additional empty levels to accommodate twice that many in the future. The tower was designed with curved walls to maximize patient privacy by blocking direct views into the rooms of other hospital occupants in the existing connected building. Staff privacy was also addressed by creating team stations behind glass walls, in addition to the more public desks in the open.

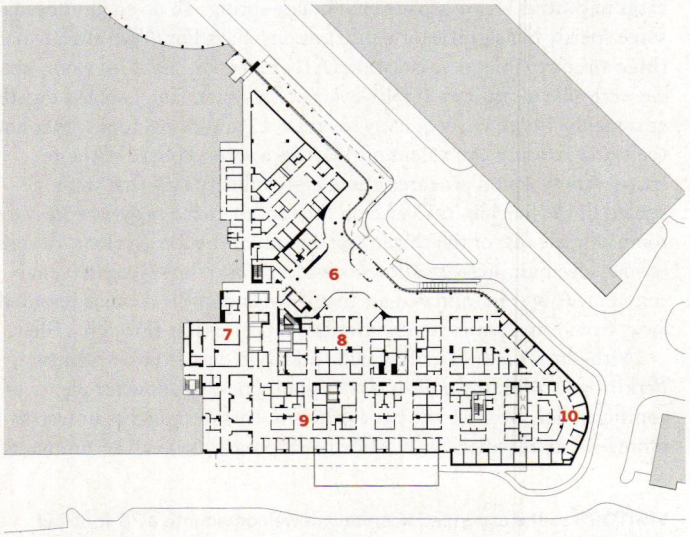
Within a plinth below the tower is the heart of the structure: the new ED nearly doubles UVA Health System's prior urgent-care capacity, significantly reducing patient wait times. Taking advantage of a change in



LOWER-LEVEL PLAN



LEVEL-THREE PLAN



LEVEL-ONE PLAN

0 50 FT.
15 M.

1 AMBULANCE DOCK
2 OFFICES
3 MECHANICAL/ELECTRICAL
4 CLINICAL ENGINEERING
5 WASTE STAGING
6 MAIN LOBBY
7 IMAGING
8 PEDIATRIC INTAKE
9 TRAUMA/RESUSCITATION
10 BEHAVIORAL HEALTH
11 PATIENT ROOMS
12 STAFF WORK AREA
13 STAFF LOCKERS
14 STAFF LOUNGE
15 FAMILY WAITING AREA

grade, the architects designed for ambulances to arrive at a lower level, allowing for a possible pandemic and decontamination area there, and a separate entrance for walk-in patients above. Perkins and Will global-design director Ralph Johnson calls that 28-foot-high, daylight-filled atrium on the ground level "a great public space." In a simple but highly effective move, much of the new building, despite its deep floor plates, maximizes daylighting and views to the surrounding mountains and its own occupiable green roofs through the use of extensive glazing.

The ED also incorporates progressive strategies. It is separated into seven modules, including distinct areas for pediatrics and behavioral health, for instance, that provide safe, calming environments for children or patients in acute mental-health distress. While anterooms are "out of fashion," according to Marvina Williams, a senior medical planner at Perkins and Will who was an ED nurse, the ED has two negative-pressure anterooms. "We were looking at an 'ideal state,' and that includes a certain number of infection-control rooms," she says. The plinth contains an additional surgery floor above the ED. This floor features a CT scanner on rails—increasing access to real-time CT scans, which is an unprecedented feature in the U.S., according to UVA. For surgical teams who spend hours in an enclosed operating room, an adjoining glass corridor with views to the outdoors affords respite between procedures. "Recruitment and retention of staff was important to us," says Johnson.

The design takes a serious approach to sustainability. Metal fins on the building's exterior reduce glare and heat gain, lowering energy

CORRIDORS end in large expanses of glass (left), and treatment rooms feature clerestory windows (below). An interactive wall in the children's area depicts a topographical map of the Shenandoah Valley (opposite).

consumption. The new wing employs what is called net zero water-design strategies—highly unusual in a hospital. A 50,000-gallon cistern under the ambulance bay captures graywater for use in heating and cooling. "Essentially, we are back-feeding the existing chiller plant to offset the amount of water used by the low-flow fixtures," says senior project architect Jim Woody. The green roofs mitigate water runoff.

UVA's exemplary response to the pandemic was critical in the short term, thanks in large part to design decisions—not always easy or inexpensive—that were made for the long term. At press time, with the crisis still affecting operations, the hospital has had to furlough some staff. Still, that the new building weathered the impact of COVID-19 so well before it fully opened points to continued success as the hospital enters a post-pandemic world. ■

Credits

ARCHITECT: Perkins and Will — Ralph Johnson, design principal; Daniel Moore, managing principal; Marvina Williams, senior medical planner

ENGINEERS: BR+A Consulting Engineers, Valley Engineering (m/e/p); VHB (civil); Walter P. Moore (structural); GHD (fire protection and life safety)

GENERAL CONTRACTOR: Skanska USA

CONSULTANTS: Rhodeside & Harwell (landscape); Roof Meadows (green roof); Convergent Technologies Design Group (audio-visual, IT); Genesis Planning (medical equipment)

CLIENT: University of Virginia

SIZE: 440,000 square feet

COST: $394 million

COMPLETION DATE: May 2020

Sources

ROOFING: Sika Sarnafil, Georgia-Pacific DensDeck, OMG Edge Systems, Metal Roofing Systems, PPG Metal Coatings

MASONRY: Oldcastle APG

METAL/GLASS CURTAIN WALL: Keymark Corporation, Pioneer, PPG Metal Coatings

ALUMINUM-FRAMED INTERIOR WINDOWS: C. R. Laurence

FIRE-RESISTANT GLAZING: VT Industries, Technical Glass Products, McGrory Glass

EXTERIOR LIGHTING: Bega, Spring City, Elliptipar, i2Systems, B-K Lighting

INTERIOR AMBIENT LIGHTING: Tivoli, Finelite, Corelite, Fail-Safe, Amerlux, H.E. Williams, Oxygen, Winona

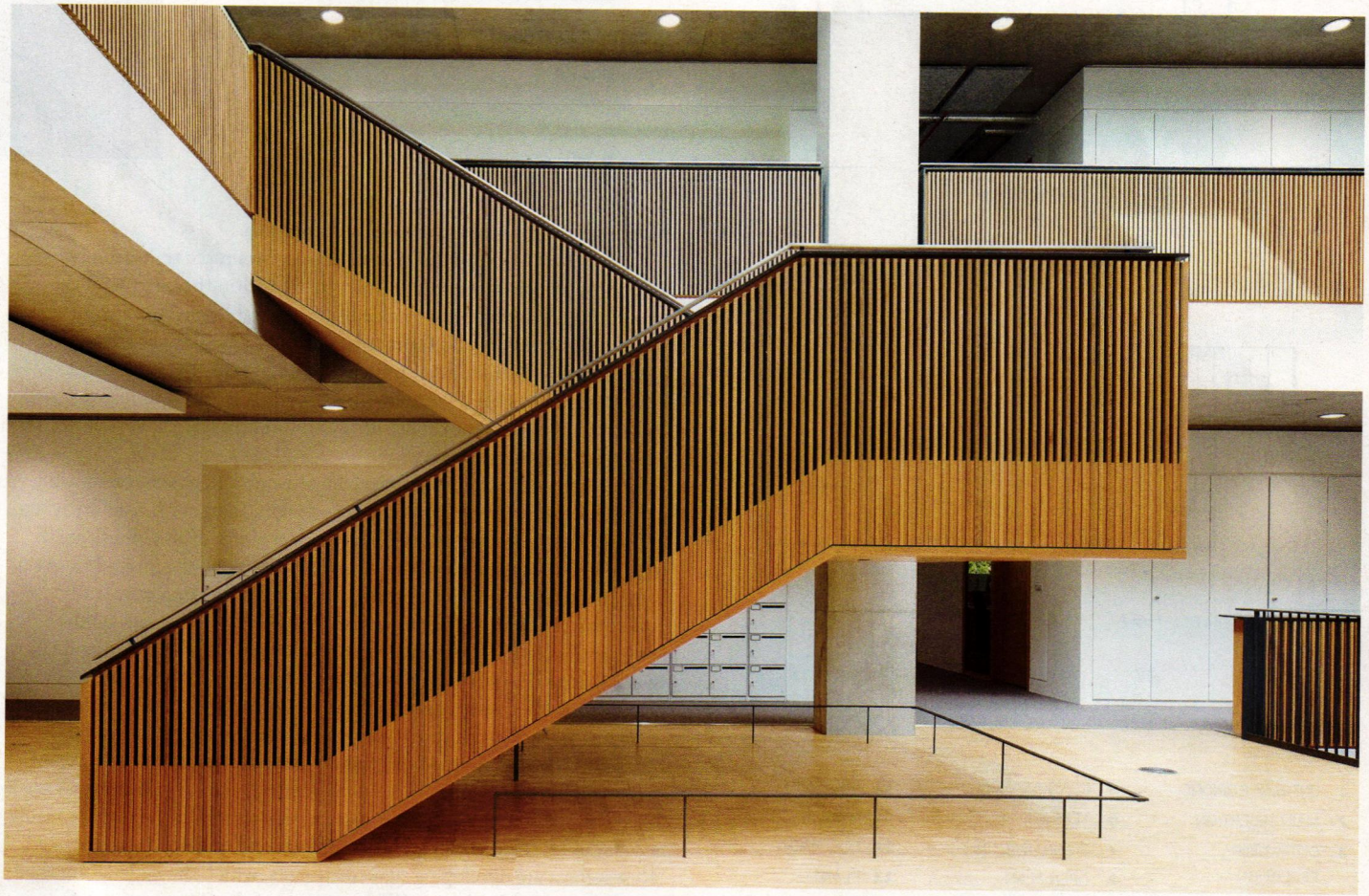
Strength in Unity

The Zayed Centre, a new building in London by Stanton Williams, is an unusual pairing of both research and clinical care for children's rare diseases.

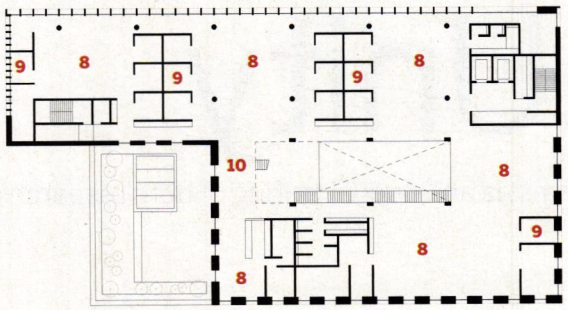
BY TIM ABRAHAMS
PHOTOGRAPHY BY HUFTON + CROW

A NEW RESEARCH facility for the study of rare diseases in children is now part of London's Great Ormond Street Hospital (GOSH). One of the world's leading pediatric facilities, it opened in 1852 in a townhouse and expanded rapidly, thanks to philanthropy—J.M. Barrie gave his copyright for *Peter Pan* to the institution in 1929. Now the hospital depends on the National Health Service for the bulk of its operational budget, but thrives because of private and charitable donations. Today, GOSH is an intensely urban low-rise complex, packed into Bloomsbury's Georgian district, which provides 339 beds in 14 different buildings. In the late 1990s, the hospital managers considered moving from central London but rejected this idea for an ambitious new development that improves and expands the existing facilities. By doing so, the hospital retained the famous address, remained part of an ecosystem of other institutions, and attracted top staff who want to work in central London.

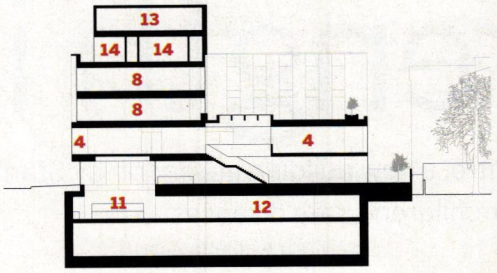
Now architect Stanton Williams has inserted a generous, dignified new research and outpatient facility of 141,000 square feet in a domestic-scale neighborhood by taking over the site of a demolished computer facility at University College London. Constructed in partnership with the university and GOSH, the Zayed Centre was made possible by a $75.5 million donation from Her Highness Sheikha Fatima Bint Mubarak, the wife of the late Sheikh Zayed bin Sultan Al



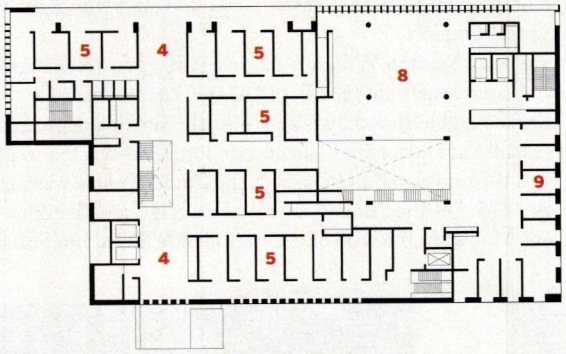
SHIMMERING GLAZING forms a vitrine at the street-level entrance of the Zayed Centre (opposite). An oak stair connects upper levels (above).



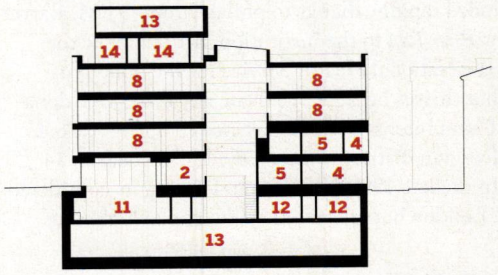
THIRD-FLOOR PLAN



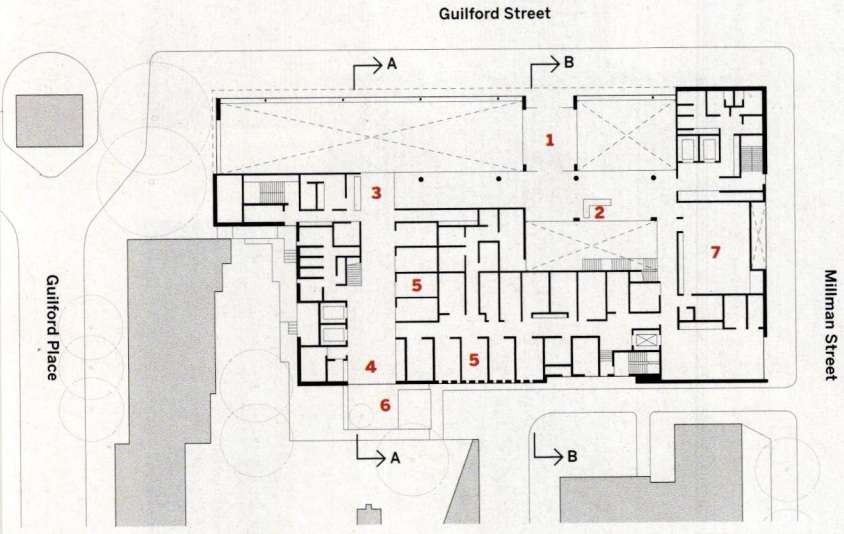
SECTION A - A



SECOND-FLOOR PLAN



SECTION B - B



MAIN-FLOOR PLAN

0 30 FT. 10 M.

1 ENTRANCE BRIDGE
2 MAIN RECEPTION
3 OUTPATIENT RECEPTION
4 OUTPATIENT WAITING
5 CONSULTATION
6 TERRACE
7 SEMINAR ROOM
8 OPEN-PLAN WORKSPACE
9 OFFICE
10 BREAKOUT
11 LAB
12 EQUIPMENT
13 PLANT
14 CLEAN ROOM

Nahyan, founder of the United Arab Emirates.

One of the building's great strengths is the simple transition between a six-story mostly glass-and-terra-cotta facade on the north and the more traditional three-story scale of the brick Bloomsbury neighborhood to the south. It also represents a new typology for a radically modern type of medicine: the first time anywhere that outpatient pediatric care has been paired with laboratory research in rare diseases. Research previously took place at GOSH in separate pockets across the wider hospital assemblage.

Encouraging proximity between lab research and patient care meant managing the moments of necessary seclusion, along with visibility when desired. This strategy is immediately evident along the building's north side, where what appears to be a long open vitrine on the ground floor sits beneath an impressive finned terra-cotta screen shielding glass walls. Pedestrians walking by the center can look down into the labs on the lower level or to the street-level reception area. Both outpatients and lab workers enter the building by walking on a bridge extending over the below-grade labs, which get abundant daylight from the street level above.

The eight-story structure (two stories of which are below grade) is concrete—a post-tensioned slab with wide spans—that is "deliberately quite straightforward," says Gavin Henderson, a principal director. Yet the subtlety of the scheme is manifested in the way the interior reconciles families, often with very sick children, and research personnel. "Researchers are developing new treatments, which the patients are then receiving," adds Henderson. "The outcome of those treatments is fed back into the research. So there's a sort of a virtuous circle."

THE RECEPTION area is pulled back from the street, separated from it by a sunken lab space (above). Visitors walking along the front enter and cross over the lab on a bridge to get to the interior lobby (left).

A CENTRAL atrium brings daylight to interior levels and provides a space for incidental encounters (opposite). Clean labs are located on the upper levels (left). The outpatients' waiting area on the second floor overlooks the street (left, bottom).

The architects placed the labs in the basement and also on top of the building, leaving the central floors for outpatient activities and administrative workspace. The fritted glass "attic" heightens the legibility of the clean-room laboratories —the biggest facility of its kind in Europe. A large skylit atrium, with a commanding oak staircase, becomes the heart of the complex and permits views between research and outpatient areas.

Notably, circulation space becomes incidental-meeting area. The architects pulled back the consulting rooms from the main facade, creating an interstitial space where families wait to see consultants, and where medical professionals might confer with each other. Too often, academic and research buildings encourage scientists to engage spontaneously with each other only in cafés. The Zayed Centre enables this goal to happen less deliberately and closer to workspaces. The interior, extensively finished in European oak, provides a warm gesture to what must be for many families the first step on a terrifying journey.

This steadfastly sympathetic approach is familiar to those who know Stanton Williams's work. This quietly successful practice, founded by Alan Stanton and Paul Williams, was celebrated in 2012 when the firm won the RIBA Stirling Prize for the Sainsbury Laboratory for the University of Cambridge. Like that building, which was commended for its "calm beauty," the Zayed Centre expresses the architect's role in creating a space for social interchange.

Professionals are not always entirely comfortable with working in a somewhat public setting. Yet, even though the Zayed Centre was completed before the COVID-19 crisis, the building, with its glass loggia on the street, foregrounds quite uncannily how the expertise of medical professionals now assumes a very public role. The Zayed Centre gives that new recognition an architectural form while reasserting a strong urban role for the research facility. ■

Tim Abrahams, a former editor at the Canadian Centre for Architecture in Montreal, is a critic and editor based in the UK.

Credits

ARCHITECT: Stanton Williams — Artemis Antonopoulou, Chris Ainoo, Stuart Bourne, Jessica Chidester, Kristian Garrecht, Sanjay Ghodke, Matthew Grandfield, Ben Hale, Jade Huang, Gavin Henderson, Kalpesh Intwala, Dennis van Kampen, Eleni Makri, Luke O'Bray, Patrick Richard, Tom Routh, Nick Sinden, Alan Stanton, Helen Summers, Joshua Waterstone, Henry Williams, Paul Williams

ENGINEERS: Pell Frischmann (structural); Hoare Lea (m/e/public health, fire)

CONTRACTOR: Skanska UK

CONSULTANTS: Gardiner & Theobald (project management and cost); Bradley-Hole Schoenaich Landscape Architects (landscape); Eckersley O'Callaghan (facade); Hoare Lea (sustainability, acoustics, lighting)

CLIENT: Great Ormond Street Hospital and UCL Great Ormond Street Institute of Child Health

SIZE: 141,000 square feet

PROJECT COST: $117 million

COMPLETION DATE: October 2019

Sources

MASONRY: Feldhaus

METAL/GLASS CURTAIN WALL: FAG, Hueck

METAL PANELS AND STRUCTURAL GLAZING: Structura, Kingspan

PRECAST CONCRETE: Evans Precast

TERRA-COTTA: James and Taylor

SKYLIGHTS: Schüco

SANITARYWARE: Ideal Standard, Duravit

LIGHTING: Whitecroft Lighting, Bega, Zumtobel


PATISSIER

Mirror, Mirror

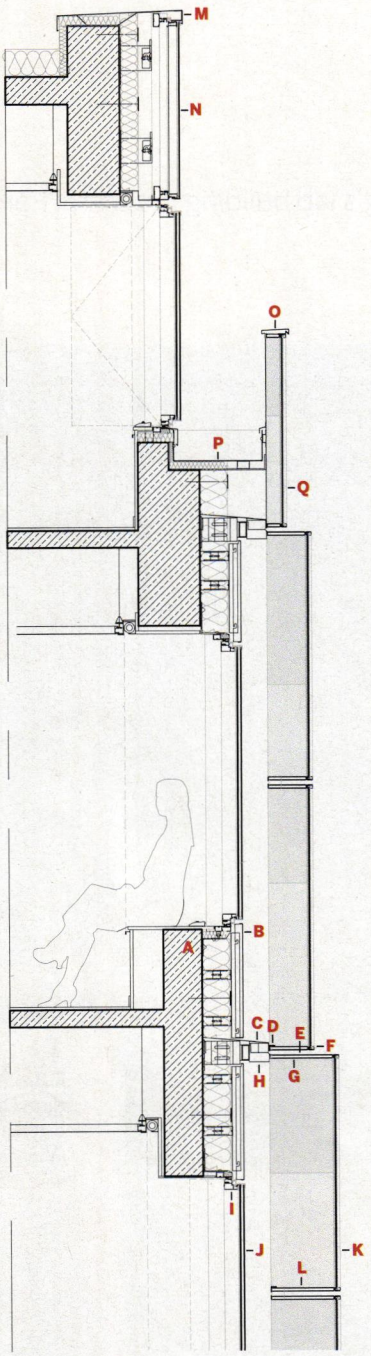
VIB Architects creates a striking public face for the Institute of Hearing's lab building in central Paris.

BY ANDREW AYERS
PHOTOGRAPHY BY CYRILLE LALLEMENT

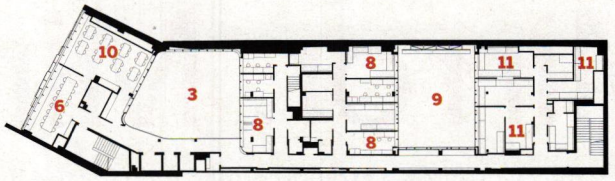
"RESEARCH INSTITUTES today employ a strategy of seduction," says Franck Vialet, joint principal, with Bettina Ballus, of Paris-based architects VIB. "'Come to us,' they say to scientists from all over the world: 'you'll find fantastic working conditions in an amazing building!' Architecture is expected to contribute to the institute's international prestige." Such was the challenge facing VIB when designing the $18 million central-Paris home of the Institut de l'audition (Institute of Hearing, or IdA), a new cross-disciplinary research center for fundamental hearing research in neuroscience, genetics, biophysics, etc., as well as a forum where both professionals and patient groups can meet. That the IdA is located near the Bastille, a stone's throw from the Institut de la vision (Institute of Sight), was no accident but rather the result of City Hall's policy of encouraging and supporting medical research in Paris. Indeed, it is the City that owns the IdA's premises and that, through its majority-owned property company RIVP, piloted conversion of the existing building to its new use.

Initially constructed as a furniture workshop in 1906, the building is now enjoying its third life, after becoming a law school in the 1950s. When VIB first visited it, during the competition phase, in late 2013, they found a nondescript six-story edifice with labyrinthine circulation routes and dreary 1950s curtain walls; room for maneuver was limited, since the building is hemmed in on three sides on a long, narrow plot with little street frontage. "The IdA hadn't quite crystalized at that point," recalls Vialet, "and the competition brief asked us to evaluate the building's potential. How could you give it an identity on the street and make it suitable for research labs?" Fine-tuning the particulars came later, hand in hand with the client once the IdA had been properly constituted, but the initial ideas have made it all the way through to the end: a strong facade concept, inspired by the form of human cell tissue, that gives the institute street presence and the desired identity (and behind which are offices, administrative spaces, and staff rooms);

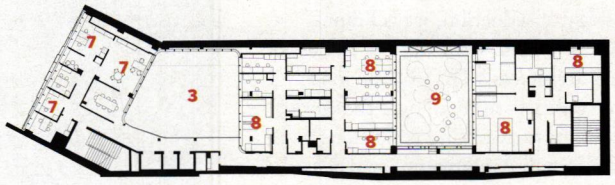
A CRYSTALLINE stainless-steel and glass street-facing facade riffs on the pattern of sensory hearing cells and reflects its more straitlaced neighbors (above and opposite).



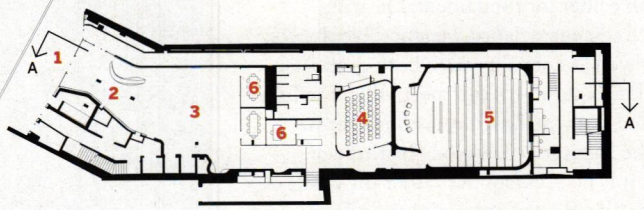
FACADE SECTION



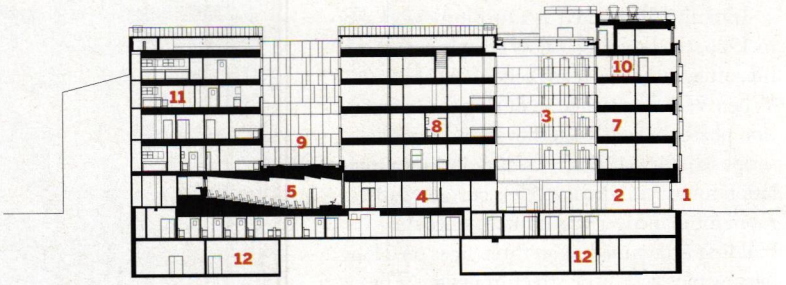
FIFTH-FLOOR PLAN



SECOND-FLOOR PLAN



GROUND-FLOOR PLAN

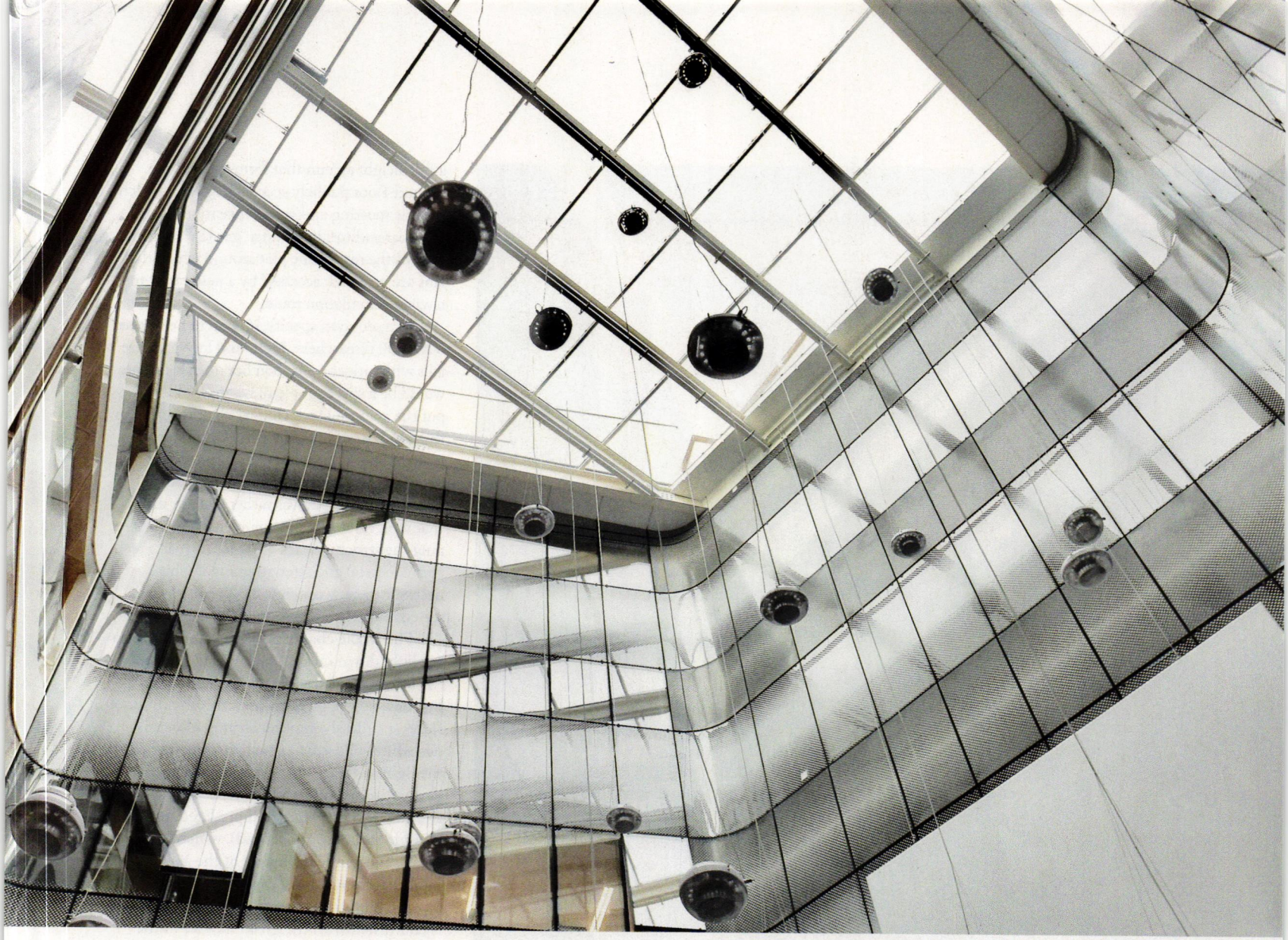


SECTION A - A

0 30 FT.
10 M.

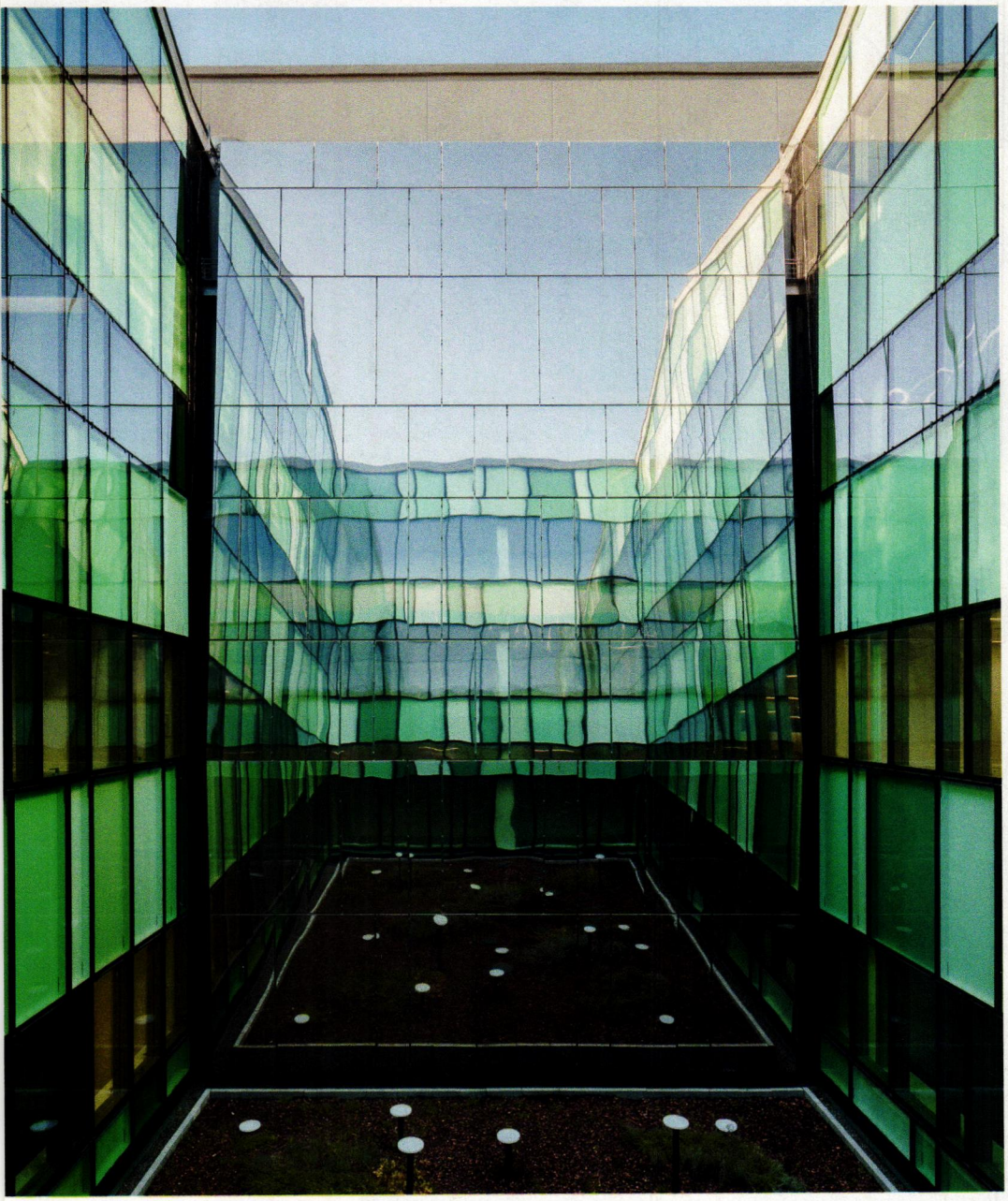
A REINFORCED-CONCRETE BEAM
B POWDER-COATED ALUMINUM PANEL
C STAINLESS-STEEL FIRE SEPARATION BETWEEN FLOORS
D LED STRIP
E VENTILATION AND DRAINAGE GAP
F STAINLESS-STEEL GLAZING BEAD
G FRAMES COMPOSED OF FOLDED STAINLESS-STEEL SHEET
H STAINLESS-STEEL BRACKET
I ALUMINUM HALF PROFILE
J LAMINATED DOUBLE GLAZING
K LAMINATED SINGLE GLAZING
L STAINLESS-STEEL BRACKET
M ALUMINUM COPING
N SHADOW BOX WITH TEMPERED GLASS
O STAINLESS-STEEL COPING
P STAINLESS-STEEL RAINWATER GUTTER WITH WATERPROOF MEMBRANE
Q TEMPERED OPAQUE GLASS

1 ENTRANCE
2 LOBBY
3 ATRIUM
4 EVENT ROOM
5 AUDITORIUM
6 MEETING
7 OFFICE
8 LABORATORY
9 PATIO
10 CAFETERIA
11 BIOSAFE LABORATORY
12 TECHNICAL



A FULL-HEIGHT atrium (top) is part of the ground-floor publicly accessible areas and carries light deep into the long and narrow inward-looking building, its labs (left), and other spaces.

PHOTOGRAPHY © FRANCK CASTEL (TOP)



Credits

ARCHITECT: VIB Architecture — Franck Vialet, Bettina Ballus, principals; Pierrick Cornière (design); Daphné Engel (construction)

ENGINEERS: IGREC Ingenierie (general engineering & economics); ARCORA (facade)

CONSULTANTS: Batiss (fire prevention); PEUTZ (acoustic design)

GENERAL CONTRACTOR: Léon Grosse

CLIENT: RIVP (City of Paris) with Audition Foundation, researchers, and the Pasteur Institute

SIZE: 69,000 square feet

COST: $51 million (project); $18 million (construction)

COMPLETION DATE: December 2019

Sources

CURTAIN WALL: Léon Grosse, Schüco

GLAZING/SKYLIGHTS: AGC, Raico, Guardian

DOORS: Jansen, Forster, Malerba, Blocfer, Dagard, Promat

FINISHES: Corian, Stamisol, Ferrari, Perfomousse, Boulenger, Dickson, Forbo, Texaa, INWALL, Haro, Gerflor

LIGHTING: iGuzzini, Zumtobel, Bega, Buzzi & Buzzi

HARDWARE: Normbau, Dorma, Kaufel

CONVEYANCE: Kone

a full-height atrium that forms part of the ground-floor publicly accessible spaces (which include meeting and conference rooms and a 163-seat auditorium); and a "garden" lightwell toward the rear of the plot around which the labs are grouped, accessed by a new easier-to-navigate circulation route.

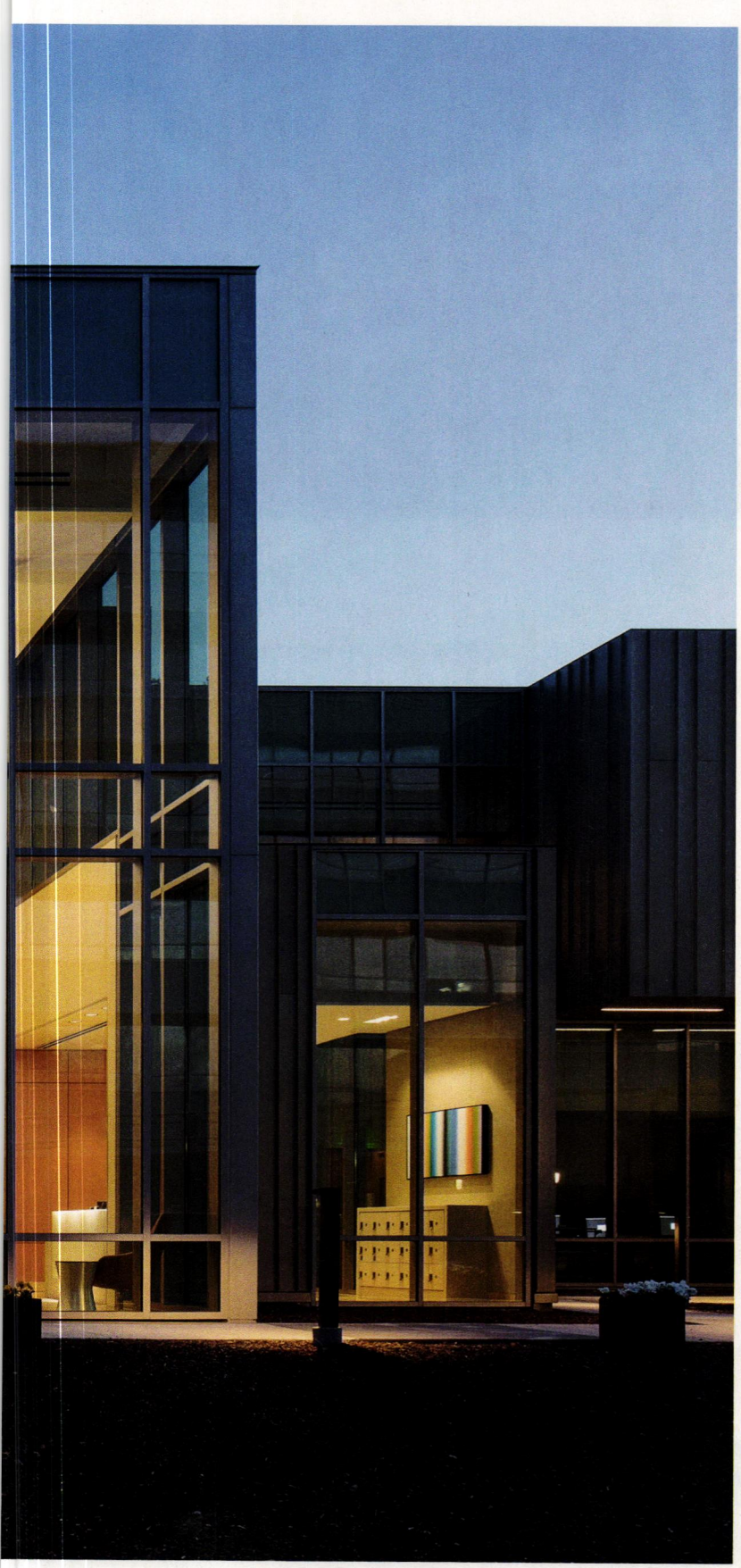
Once program specifics began to be worked out—130 researchers, high- and low-pressure labs with airlocks—it soon became clear there would be a space problem: where could they put the voluminous technical plant required by this kind of facility? Since the City refused to let it go onto the roof, the only option was to excavate and create a new basement. As a result, construction was rather a heroic affair that took three years to complete: after stripping the structure back to its frame (part steel, part concrete) and strengthening it where necessary, a new concrete basement was inserted; only then could retrofitting begin.

"The whole challenge of the project was to get light down inside," says Vialet. "It's essential for such a dense, introverted building." Just beyond the glass-fronted threshold, space flows seamlessly into the atrium, along sinuous white solid-surface wall facings that catch the light in their curves and cellular acoustic perforations. The atrium itself is all glass, alternately transparent and pixilated in white (to hide the masonry behind), which contributes to the gentle milkiness of the generous light that floods down even on a dark winter's day. The interior leitmotif of laboratory white is contrasted with the green facades of the rear lightwell, whose floor (part of the auditorium roof) was originally planned to be luxuriantly planted (in the end, it only got grass) to provide a cloistered oasis of calm. "The cheaper the glass, the greener it is," explains Vialet, which is how VIB inexpensively achieved the lightwell coloring, while a giant mirror, tilted to reflect the sky, hides the neighboring party wall and ensures yet greater luminosity. But the pièce de résistance is incontestably the splendid street frontage, where new walls and windows are hidden behind a second facade in glass and stainless steel to thrilling effect. A riff on the pattern of sensory hearing cells, this protective, reflective layer, which helps mitigate the proximity of neighbors just opposite, has been fractured into crystalline facets in three dimensions, multiplying the city and the sky all around and exclaiming to passersby, "I am a place of interest!" ■

Andrew Ayers is a Paris-based writer, translator, and educator.

INTERIORS FLOW seamlessly alongside sinuous white solid-surface walls with acoustic perforations, as in circulation areas (above) and a 163-seat auditorium (left). The back lightwell (opposite) is clad in reflective deep green glass, and has a planted floor.

A TALL, TRANSPARENT lobby welcomes patients and visitors as they approach the Taube Pavilion. The building's glass and board-formed-concrete skin (opposite) adds to its warmth.



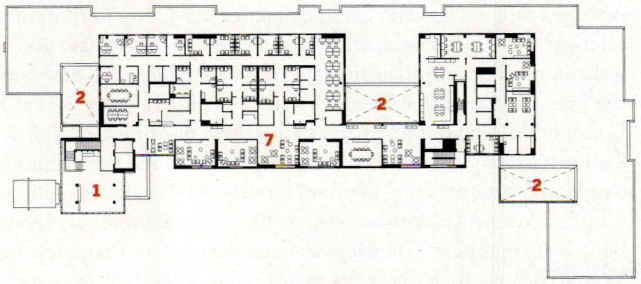
A Quiet Place

WRNS Studio infuses the calming effects of nature into a new mental-health pavilion for Silicon Valley's El Camino Hospital.

BY LYDIA LEE
PHOTOGRAPHY BY JEREMY BITTERMANN

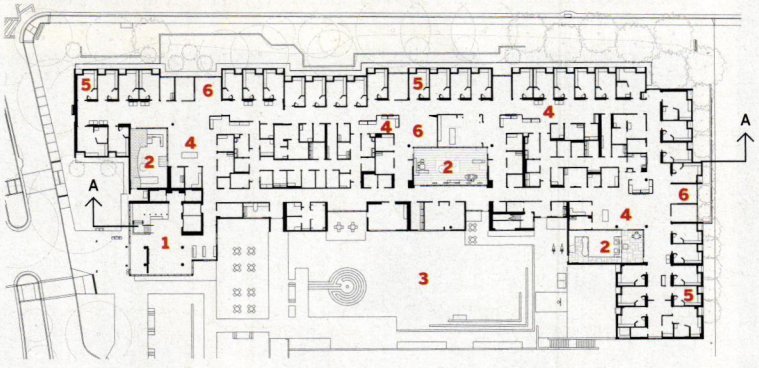
THE TERM "psych ward" may be obsolete, but mental-health institutions are notorious for being grim environments. These buildings, designed for patients who are in danger of self-harm, need to focus on safety. But it is possible to create a secure environment that also feels welcoming. The recently completed Taube Pavilion, the new home of the Scrivner Center for Mental Health & Addiction Services at El Camino Hospital in the Silicon Valley town of Mountain View, California, couples architectural ambitions with the latest thinking in psychiatric patient care. "We didn't want it to feel like an archetypical hospital experience, with a corridor that runs on forever and no natural light," says architect Tim Morshead, partner at San Francisco–based WRNS Studio. The firm's design for the two-level, 55,000-square foot building emphasizes flexible use and outdoor access.

In replacing its outdated 1961 psychiatric building, the hospital wanted to increase its capacity from 25 beds in private and shared accommodations to 36 private rooms, and have the space to provide specialized care to perinatal women and other small groups of patients.



SECOND-FLOOR PLAN

SITE PLAN



FIRST-FLOOR PLAN

0 50 FT.
15 M.

1 LOBBY
2 COURTYARD
3 SECURE PATIENT YARD
4 CARE SUITE
5 TYPICAL PATIENT ROOM
6 GROUP THERAPY
7 OFFICE/SUPPORT
8 TAUBE PAVILION

SECTION A - A

0 30 FT.
10 M.

In addition, it wished to expand and centralize its outpatient services. To accommodate these programs and their security needs, the building is designed as two separate facilities, co-located so that patients can transition easily from inpatient to outpatient care. The inpatient unit is located on the ground floor for easy access to outdoor spaces, while outpatient services are on the second floor.

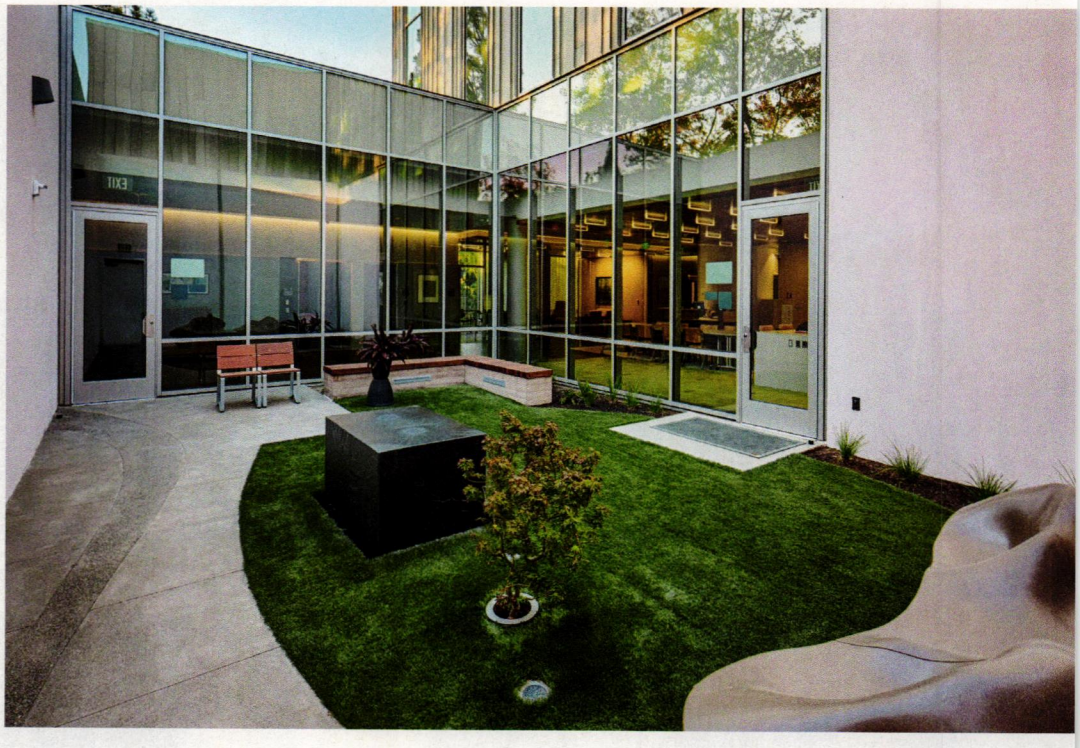
Because the hospital had to provide continuous service during construction, the architects designed an L-shaped building around the old facility (soon to be demolished and replaced by a secure ⅓-acre recreation yard). They conceived of the new structure as a collection of volumes in a parklike setting, which aligned well with the hospital's approach of caring for small groups of patients. "It's an interesting hybrid of a mat-building and a long bar," says Morshead. "It's a low-spreading, cellular structure that fills the space, but the organization is also incredibly clear." And this strategy obviated the long, straight stretches of rooms found in a traditional hospital.

The first-level inpatient unit is the more complicated part of the building: it is organized around three internal courtyards and divided into four "neighborhoods" that can expand or contract depending on the type of patients at any time, giving the hospital more flexibility. For example, the 12-room unit for those with the most intensive care needs can expand to 16 or 24 rooms. Adhering to the "onstage/offstage" model of hospital care, in which there are separate circulation routes for patients and employees, the floor is designed to allow staff to supply and maintain each neighborhood without disrupting the patients in place.

Instead of putting the facility's 36 private rooms along double-loaded corridors, the architects organized them around the south and west perimeters, next to an exceptionally wide hallway that ranges from 12 to 14 feet wide, rather than the minimum standard width of 8 feet. "We wanted to make it part of the living space, for a more open plan," says Morshead. Seating areas along the corridor allow patients to spend time on their own or meet with visitors, who are not allowed into their private rooms. Three glass-walled courtyards outfitted with seating, communal tables, and water features allow patients to go outside unaccompanied but remain in view of staff. A palette of muted, dark finishes, including wood on ceilings and faux-wood vinyl tile on the floor, as well as cove lighting throughout, also helps to dispel a clinical atmosphere on the inpatient floor. For safety reasons, the interiors had to be designed to make ligatures impossible; in lieu of pendant lighting, the architects placed glowing acrylic bars (which they dubbed "sticks of butter") in low relief on the lounge ceilings. The door to each patient room is cleverly highlighted with a band of recessed linear lighting.

To help destigmatize mental-health care, the lobby is a prominent glass-walled double-height volume. It welcomes people to its outpatient programs, including support for youth, seniors, and addiction treatment, as well as visitors to the inpatient unit. (Those in need of urgent psychiatric care are typically admitted through the emergency department, and come in through private side entrances.)

The architects also tried to counter the impression of a locked-down facility on the exterior. Originally, they wanted the building



THE FACADE'S organic striping (opposite) is echoed by the linear formats of the flooring and lights in a patient lounge (above). These social spaces are supplemented by tranquil courtyards (top).

ONE OF THREE courtyards, this glass-walled space allows patients to benefit from fresh air whenever they like, while staff can still monitor them visually from within.

to blend in with the trees by cladding it with greenish zinc panels, which they'd used to good effect at Boeddeker Park in San Francisco (RECORD, April 2017). But since zinc was not on the state health-care regulator's approved list of materials, the architects went with anodized aluminum standing-seam panels, selecting them in a light champagne hue for their intrinsic color variation. "This is not a cheap wall. Not that many health-care folks are going to make this kind of investment," says Bryan Shiles, founding partner at WRNS Studio. "I think the money that was allocated to this project speaks to how the hospital management are great stewards of place." Their new building, with its pixilated facade, has a quiet shimmer that corresponds to the calming interiors within. ■

Lydia Lee is a freelance writer in the San Francisco Bay Area who focuses on architecture and design.

Credits

ARCHITECT: WRNS Studio — John Ruffo, partner in charge; Bryan Shiles, design partner; Tim Morshead, Pauline Souza, partners; Andy Adams, Lynn Soleski, project managers; Dale Diener, David Wilson, project architects; Beth Radovanovich, medical planner

ENGINEERS: Thornton Tomasetti (structural); Interface Engineering (m/e/p); Sandis (civil)

GENERAL CONTRACTOR: XL Construction

CONSULTANTS: BFS (landscape architect); RGD (acoustics)

CLIENT: El Camino Health

SIZE: 55,000 square feet

COST: $96.4 million

COMPLETION DATE: November 2019

SOURCES

METAL PANELS: Morin

RAINSCREEN: Swisspearl

CURTAIN WALL: Kawneer

GLAZING: Vitro Architectural Glass

ROOF: Johns Manville

DOORS: Horton Automatics; Curries; VT Industries; Adams Rite; Nanawall; Cookson

HARDWARE: Sargent; Assa Abloy

CEILINGS: Armstrong

DEMOUNTABLE PARTITIONS: National; Georgia-Pacific; USG

CASEWORK: Wilsonart

PAINTS & STAINS: Benjamin Moore

FLOORING: Milliken; Mohawk

TILE: LAMINAM; Daltile; Florim

LIGHTING: Litecontrol; Dado; Delray; Kenall; USAI; Eaton; Erco

Submit your products for recognition!

2020 Record Products of the Year

The editors of *Architectural Record* are currently inviting submissions for the 2020 Products of the Year Awards, which salute the best building materials introduced to the U.S. market within the last year (no earlier than August 15, 2019).

A panel of architects and designers will judge the entries on the basis of innovation, function, sustainability, and aesthetics. Winners will be published in the December 2020 issue of RECORD.

Pictured: The 2019-winning Ventilated Glass Facade System for Parking Structures by Bendheim

DEADLINE TO ENTER: FRIDAY, AUGUST 14

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architecturalrecord.com/call4entries

ARCHITECTURAL RECORD

COCKTAIL NAPKIN

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2 GRAND PRIZE WINNERS WILL RECEIVE A **$300 GIFT CARD!**

CALL FOR ENTRIES

If you are a licensed architect or related professional who practices in the United States, you can enter this remarkable contest.

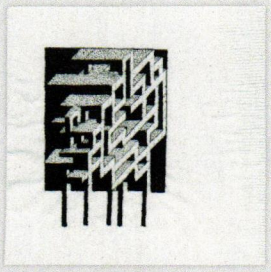
All you need is a white cocktail napkin and pen to demonstrate that the art of the sketch is still alive. Two grand prize winners will be chosen (1 licensed architect, 1 related professional). Grand prize winners will receive a $300 gift card and a set of cocktail napkins with their winning sketch printed on it!

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

HOW TO ENTER:

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

Winning Sketch 2019 by Jeongin Kim, Registered Architect



Winning Sketch 2019 by Jordan Lutren, Non-Registered Architect

DEADLINE: September 4, 2020. ENTER NOW!

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- ❒ SPECIFICATION WRITER
- ❒ ENGINEER
- ❒ STUDENT
- ❒ DESIGNER
- ❒ FACILITIES MANAGER
- ❒ CONTRACTOR
- ❒ OTHER _____

ARE YOU REGISTERED?

- ❒ YES
- ❒ NO

ARE YOU AN AIA MEMBER?

- ❒ YES
- ❒ NO

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

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For more information and official rules visit:
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A Cure for What Ails Us?

A look at microbe-attacking additives in building materials and finishes in the COVID-19 era.

BY JOANN GONCHAR, FAIA

AFTER MONTHS of being confined, Americans are slowly resuming pre-pandemic activities. In preparation for the new normal, and in hopes of preventing the spread of COVID-19, architects are working with employers to reconfigure offices and reception areas, helping restaurant-owners rethink their dining rooms, and assisting cultural institutions to create new operations plans. Clients are probably looking at staggered work schedules, tinkering with mechanical systems, and updating cleaning protocols. As one additional precaution, designers might be considering replacing finishes with those that include antimicrobial treatments. But materials experts and green-building advocates question the effectiveness of many such substances and advise caution, because of possible negative consequences for humans and the environment.

What is an antimicrobial? The term can apply to antibacterials, biocides, and pesticides. These substances are used in thousands of consumer items, including cleaning products, household goods, and clothing. They are also incorporated into many building materials, often as preservatives, to protect the product from decay and degradation. For instance, antimicrobial agents are sometimes included in ductwork insulation to inhibit mold and mildew as a result of condensation; in paint to prevent it from spoiling in the can; and in certain plastics, to maintain flexibility. But, increasingly, antimicrobials are added to products that are then marketed—either explicitly or implicitly—as providing a health benefit to building occupants. These are the ones that specifiers should be skeptical of, say sources, products that take advantage of the public perception that all microbes are bad and that all antimicrobials must therefore be

To reduce the risk of health-care-associated infection, SmithGroup used hands-free technology, among other strategies, for its renovation of an oncology unit at Brigham and Women's Hospital in Boston.

PHOTOGRAPHY: © JESSE SHAUFFER FOR SMITHGROUP

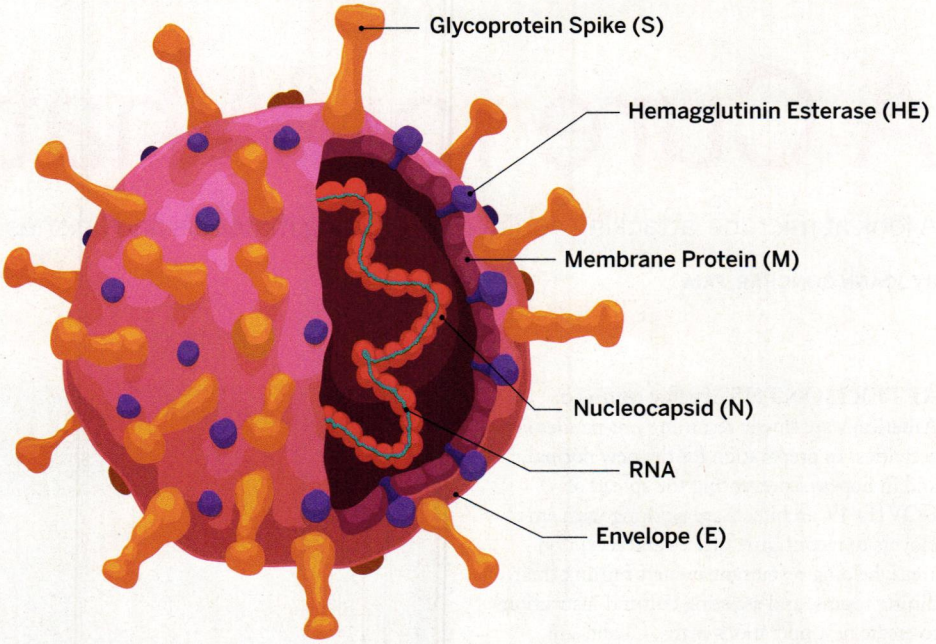
good. "The marketing aims to reinforce existing consumer beliefs," says Bill Walsh, founder of the Healthy Building Network (HBN), a research and policy organization.

Hospitals and clinics would seem the best fit for potential germ-fighting products, especially since preventing health-care-associated infections (HAIs) is a top priority in such settings. However, government agencies, leading medical institutions, and sustainable hospital proponents have called into question the utility of using antimicrobials in interior finishes as a means of infection control. Guidance on controlling infection for hospitals, first published in 2003 by the Centers for Disease Control (CDC) and updated last year, says that there is no evidence available to suggest that use of items impregnated with antimicrobials makes patients healthier or prevents disease. In 2015, the giant managed-care provider Kaiser Permanente banned 15 antimicrobial agents from furnishings and finishes in its facilities, also citing a lack of evidence of their effectiveness. And in 2016, the nonprofit Health Care Without Harm published a study that reviewed existing research on antimicrobial additives and HAIs. It found that textiles and surfaces with such treatments "have rarely been evaluated in well-designed clinical studies for their effectiveness in contributing to HAI reduction," determining that the benefits and risks of antimicrobial substances in hospital furnishings were still largely unknown.

Other researchers have come to similar conclusions. *Healthy Environments: Understanding Antimicrobial Ingredients in Building Materials*, a 2017 white paper, produced by the architecture firm Perkins and Will in collaboration with HBN, states that "no evidence yet exists to demonstrate that products intended for use in interior spaces that incorporate antimicrobial additives actually result in healthier populations." Perkins and Will and HBN revisited the report this past spring, in light of the pandemic, issuing a new document confirming their earlier conclusions. "We found no new evidence," says HBN's Walsh. Mary Dickinson, a codirector of Perkins and Will's materials lab, explains that they were searching for "a demonstration of efficacy, not just in the laboratory, but also in the built environment."

Despite scant indication of health benefits, architects and clients may still be tempted to specify building products with antimicrobial additives as one extra measure in the fight against COVID-19. But sources point out that, not only has research thus far been largely unconvincing in proving the occupant-health benefits of finishes containing antimicrobials, it has primarily focused on bacteria, rather than viruses. "There is a lack of standardized protocols for evaluating the impact of antimicrobial additives on many kinds of viruses and their infectivity," says Ted Schettler, author of the 2016 Health Care Without Harm report and science director of the Science and Environmental Health Network. "This is really the topic of interest with SARS-CoV-2," he says, referring to the virus that causes COVID-19.

What is more concerning: antimicrobial substances come with a long list of potential downsides for both public health and ecosystems. Widespread use of this large group of chemicals may be contributing to the resistance to therapeutic antibiotics. Some are bioaccumulative and are endocrine disruptors or suspected carcinogens. So, if they are released into the wider environment, the substances increase in concentration as they move up the food chain. As a result, they have been flagged as chemicals of concern by such groups as the International Living Future Institute, which includes antimicrobials in its Living Building Challenge Red List, and the Green Science Policy Institute, which has designated the group of substances as one of six families of chemicals whose use it aims to curtail.



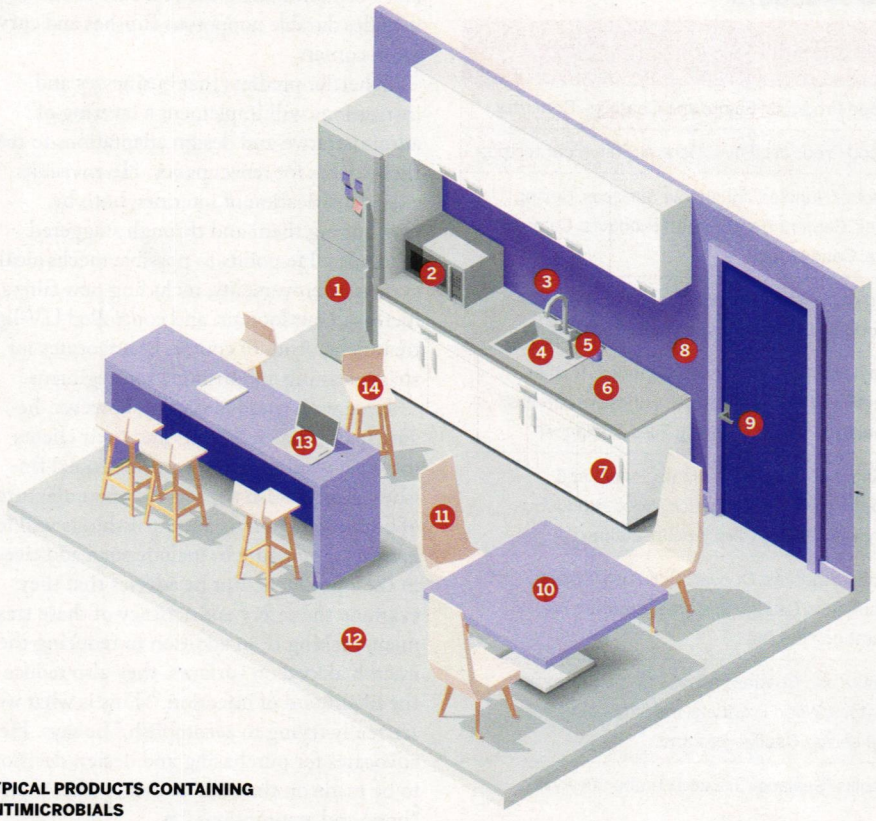
CORONAVIRUS STRUCTURE

SARS-CoV-2 consists of RNA enclosed within an envelope of lipids studded with various kinds of proteins. The fatty membrane is readily destabilized by soap and water.

Among the antimicrobial compounds that are common in finishes and furnishings, often as preservatives, is triclosan. Although it was banned by the U.S. Food and Drug Administration in 2016 for use in soaps and hand-washes due to a lack of data showing it was safe and effective, triclosan can still be found in consumer products as well as building materials, including some countertops, textiles, mortar, and grout. It is considered harmful to aquatic ecosystems, as are quaternary ammonia compounds (QACs), a typical ingredient in industrial disinfectants and personal-care products, and used in some wood products and specialty paints.

The antimicrobial properties of metals, including silver and copper, have been relied upon for centuries. But now there is a focus on copper, after it performed better than a host of other materials in recent studies looking at how long SARS-CoV-2 remained infectious on surfaces. Just four hours after contamination, the virus on the pure copper surface was no longer considered viable, compared with up to seven days for plastic and stainless steel, and up to four days for glass.

Many copper-containing alloys are registered with the U.S. Environmental Protection Agency and have gone through a testing and assessment protocol. This process allows



TYPICAL PRODUCTS CONTAINING ANTIMICROBIALS

1 APPLIANCE SHELLS
2 APPLIANCE HANDLES
3 FAUCETS
4 SINK BOWLS
5 FAUCET HANDLES
6 COUNTERTOPS
7 CABINET HARDWARE
8 PAINT
9 DOOR HANDLES
10 TABLETOPS
11 UPHOLSTERY
12 FLOORING
13 ELECTRONICS
14 WIPE-ABLE SEATING

manufacturers of products using these alloys to make a health-benefit claim, but only for specific strains of bacteria. And while the antimicrobial properties of copper and its alloys have been much examined in the laboratory, showing reductions in microbial populations, there have been fewer studies looking at the association between copper surfaces and infection in the real world. One recent systematic evaluation of the research into the efficacy of copper surfaces in reducing infection in health-care settings was critical of the studies' designs and determined that "no clear effect on healthcare associated infections has been demonstrated yet." The assessment also pointed to a potential for a conflict of interest. Of the 10 studies conducted in health-care settings on the impact of copper surfaces on microbial contamination or on HAIs, "all received financial support from copper industries and/or at least one author was affiliated with the copper industry."

Another antimicrobial-metal application is Silver zeolites, which are sometimes included in carpet fibers, wallpaper, and paints, among other products. The European Chemicals Agency has labeled these zeolites—highly porous crystals that can store silver ions and then slowly release them—as "suspected to be toxic to reproduction." Sources say, however, a newer concern with both silver and copper is the increasing use of antimicrobial coatings and polymers that incorporate metallic nanoparticles (ultrafine elements, about 500 to 100,000 times smaller than the thickness of a human hair). These tiny-scale materials are potentially more effective as antimicrobials than their full-scale counterparts, but also possibly hazardous, since scientists don't yet fully understand how they work. "They are not yet well regulated or studied," says Walsh, "so there is concern about how they interact with humans and the environment."

How big a role do finishes and surfaces play in transmission of SARS-CoV-2? Our understanding of the virus is still evolving, but current evidence indicates that the primary means of transmission is from person to person, through respiratory droplets and smaller aerosols that are expelled when an infected person coughs, sneezes, or talks. Contaminated inanimate objects (known to medical professionals as "fomites") are thought to play a secondary but still important role. A healthy person can become infected by touching a fomite and then touching their own mouth, nose, or eyes, but this route is now considered less likely than airborne infection.

The good news about contaminated surfaces is that the SARs-CoV-2, due to its structure, is responsive to basic soap and water. The virus consists of ribonucleic acid, or RNA, enclosed within an envelope of lipids studded with various kinds of proteins, including a barblike "spike" protein that enables the virus to invade human cells. Soap disrupts the fatty envelope, making the virus essentially fall apart. Hence the admonition, among others from the CDC, to frequently wash our hands. For surfaces, Schettler advises cleaning first, which involves the removal of visible soil, before disinfecting, which entails the elimination of many or all pathogenic microorganisms.

Such cleaning and disinfection procedures do not typically fall under the purview of design teams. However, architects can make spaces that minimize the opportunity for pathogens to collect and spread, and are easier for their clients to maintain, while still avoiding materials that include antimicrobials. Andrew Brumbach, a SmithGroup senior associate, points to his firm's 2018 renovation project for Brigham and Women's Hospital in Boston, part of the Partners Healthcare system. The consortium is a participant in the Healthier Hospitals program, whose mission encompasses the promotion of safer chemicals and the elimination of potentially toxic interior products such as those containing antimicrobials. SmithGroup's 10-bed unit for immunocompromised oncology patients relies on strategies for infection control that could be applicable to other building types. The scheme reduces the number of high-touch surfaces by deploying hands-free technologies such as wave-activated doors and faucets; separates the work zone from the handwashing sink to avoid

SELECTED ANTIMICROBIALS FOUND IN BUILDING PRODUCTS

Chemical	Used In
QACs (quaternary ammonium compounds)*	Wood Products, Paints and Coatings, Concrete
Inorganic Zinc Compounds*	Wood Products, Paint, Ceramic Tile, Countertops
Copper and Copper Compounds*	Knobs/Handles, Touchable Surfaces, Ceiling Tiles, Cement Board, Wood Products, Ceramic Tile, Countertops
Formaldehyde and Formaldehyde Donors*	Formaldehyde is released into wet-applied products by certain preservative additives.
Silver Zeolites and Nanosilver*	Vinyl Flooring, Paints and Coatings, Textiles, Ceramic Tile, Countertops, Adhesives, Caulks/Sealants, Carpets, Ceiling Tiles, Wallpaper
Isothiazolinones* (e.g., CMIT, CIT, MIT, BIT, BBIT, DCOIT, OIT)	Adhesives, Caulks/Sealants, Paints and Coatings, Textiles, Plastics, Wood Products, Drywall, Ceiling Tiles, Pipe Insulation
Borax and Boric Acid 1303-96-4 and 10043-35-3	Wood Products, Drywall, Cellulose/Cotton Insulation, Caulks/Sealants, Ceramic Tile, Bamboo Flooring
IPBC (3-Iodo-2-propynylbutylcarbamate) 55406-53-6	Paints and Coatings, Wire & Cable, Carpets, Textiles, Wood Products, Insulation, Drywall, Adhesives, Caulks/Sealants
Chlorothalonil 1897-45-6	Caulks/Sealants, Treated Lumber, Drywall
OBPA (Phenoxarsine oxide) 58-36-6	Flexible PVC, Adhesives, Coatings, Textiles
Propiconazole 60207-90-1	Wood Products, Paints, Coatings, Caulks, Adhesives
Triazinetriethanol 4719-04-4	Caulks/Sealants
Triclosan 3380-34-5	Textiles, Plastic, Adhesives, Caulk/Sealants, Coatings, Hardware, Ceramic Tile, Carpets, Countertops
Zinc Pyrithione and Pyrithione sodium salt 13463-41-7 and 3811-73-2	Fabrics/Textiles, Wallcoverings, Adhesives, Cork Flooring, Caulks/Sealants, Carpet, Insulation, Ceiling Panels, Paints, Drywall
Carbendazim 10605-21-7	Paints, Sealants/Caulks, Drywall
Sodium o-phenylphenate 132-27-4	Drywall
Thiabendazole 148-79-8	Insulation, Ceiling Panels, Drywall, Rubber Flooring
Ziram 137-30-4	Drywall

*Refers to a group of chemicals. CAS (Chemical Abstract Service) numbers are specific to individual substances.

Most antimicrobials are added to products to protect the material from mildew, mold, or spoilage. The above list includes both this typical use and uses where the substances are added to market the product as "antimicrobial." Not all products in any given type will necessarily contain the biocide indicated or any other antimicrobial additive.

TABLE: COURTESY HEALTHY BUILDING NETWORK

cross-contamination; and, for ease of cleaning, includes durable nonporous finishes and curved room corners.

Schettler predicts that businesses and institutions will implement a layering of administrative and design adaptations to ready their spaces for reoccupancy. He envisions a de-densification of interiors, both by rearranging them and through staggered schedules. He points to possible mechanical-system improvements, including new filters, increased outdoor air, and controlled UV-light treatment. And, of course, he advocates for strict cleaning and disinfection regimens.

Even with these measures, however, he anticipates that architects and their clients may still want to specify antimicrobial finishes. And he also expects that manufacturers of building materials and furnishings will feel increasing pressure to include such additives in their products. But he advises that they examine the safety and efficacy of these treatments, asking if, in addition to reducing the microbial load on surfaces, they also reduce the likelihood of infection. "This is what we are really trying to accomplish," he says. He advocates for purchasing and design decisions to be made on the basis of data, rather than on "hope and assumptions." ■

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Learning Objectives

1. Define the term "antimicrobials" and explain their purpose in building materials, finishes, and furnishings.
2. Identify some of the substances used as antimicrobials, discuss their properties, and name some of the materials they are commonly found in.
3. Discuss the role of finishes and surfaces in spreading COVID-19.
4. Describe spatial strategies, mechanical-system modifications, and operational and mainentance protocols that can mitigate the spread of COVID-19.

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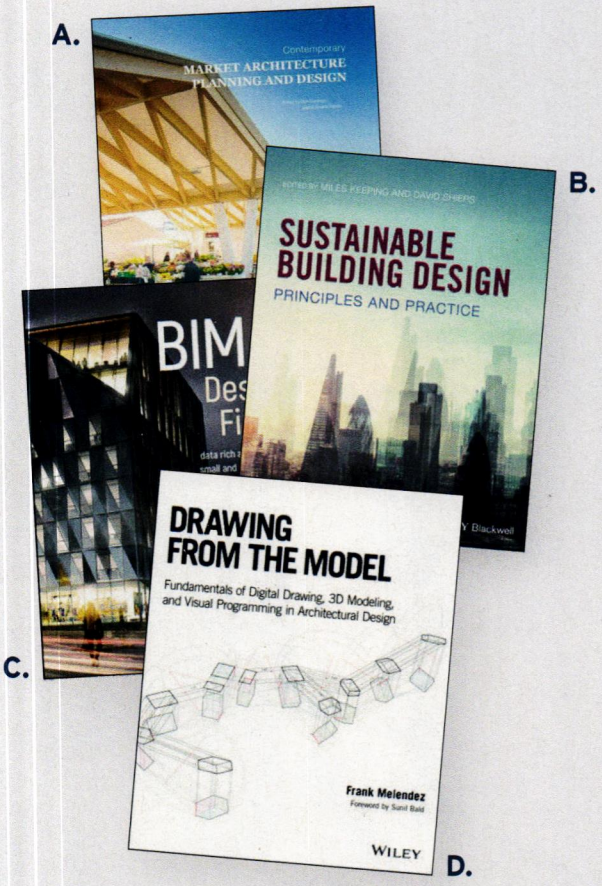

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Photo courtesy of Turf Design


p102

Designing for Better Acoustics

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Photo: © Michael O'Callahan


p111

Ceiling Systems for High-Performing Health-Care Facilities

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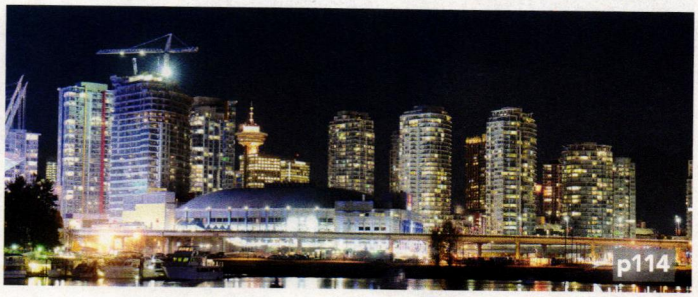
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Expansion Joints and Their Role in Waterproofing

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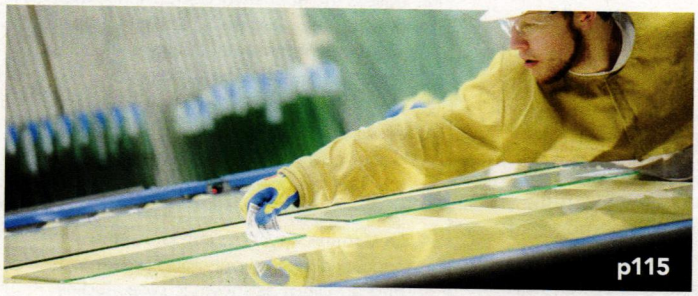
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Glass Fabrication: Getting It Right for Commercial Facades

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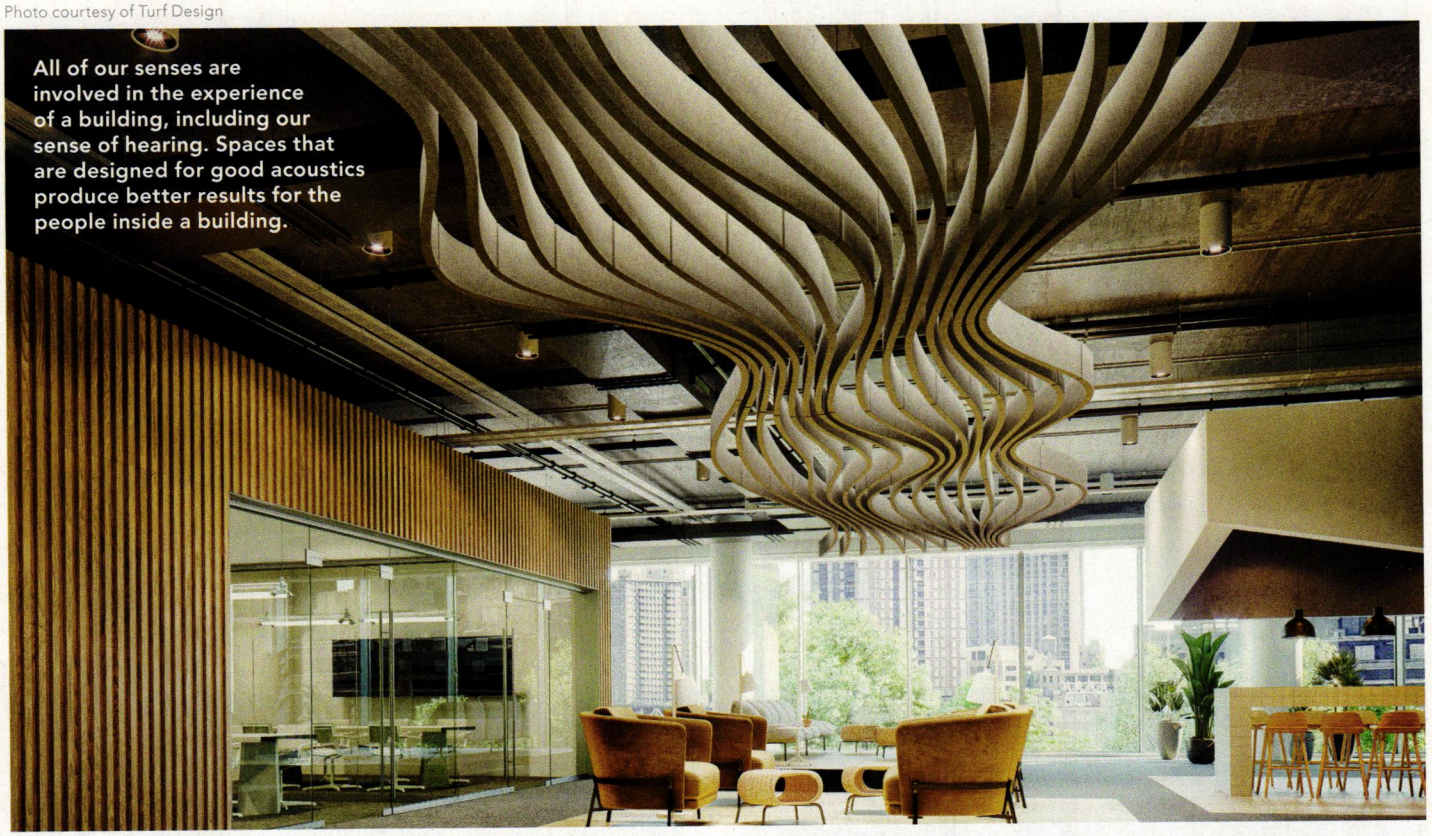
CATEGORIES

- **AC** ACOUSTICS
- **BE** BUILDING ENVELOPE DESIGN
- **IN** INTERIORS
- **LS** LIFE SAFETY AND CODES
- **PM** PRODUCTS AND MATERIALS
- **ST** STRUCTURAL
- **SU** SUSTAINABILITY

Photo courtesy of Turf Design



All of our senses are involved in the experience of a building, including our sense of hearing. Spaces that are designed for good acoustics produce better results for the people inside a building.

Designing for Better Acoustics

New products and systems help create quieter results

Sponsored by AMBICO Limited, NanaWall, PABCO Gypsum, and Turf Design

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

People experience building interiors with all of their senses—sight, touch, smell, sometimes taste, and quite significantly, hearing. When those sensations are pleasant, supportive of health, or otherwise in line with what we expect, then a positive indoor environmental quality is achieved. When we experience negative sensations or subtle background conditions over time, then the indoor environmental quality is less desirable and may even be harmful to our health and welfare. All of these traits are particularly true when it comes to sound in buildings. Pleasant music, soft background sounds, or appropriate levels of quietness help define a space as different from one with distracting background noise or a lack of acoustical control. It has been well-documented by numerous sources that poor acoustics or exposure to unwanted noise in buildings negatively impacts the ability of people to concentrate, be productive, learn, or carry on meaningful conversations. Further, those exposed to these conditions over the long term can see a deterioration in their health related to physical and psychological degradation.

Based on all of the above, this course focuses on how the interior design of buildings can directly and proactively address acoustics and sound control. In particular, it looks at some specific strategies related to common interior surfaces, including walls and ceilings. Additionally, acoustical control

CONTINUING EDUCATION

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Learning Objectives

After reading this article, you should be able to:

1. Identify and recognize the significance of acoustic design as part of the overall interior design of a space to improve human health and welfare.
2. Assess the acoustical performance aspects of operable glass walls to create a positive indoor environmental quality while still controlling sound in a building.
3. Explain the importance of proper acoustical treatments on walls, ceilings, doors, and other interior surfaces to eliminate unwanted noise and reverberation in a building.
4. Determine ways to incorporate the acoustical design principles presented into buildings as shown in case studies reflecting improved welfare for occupants.

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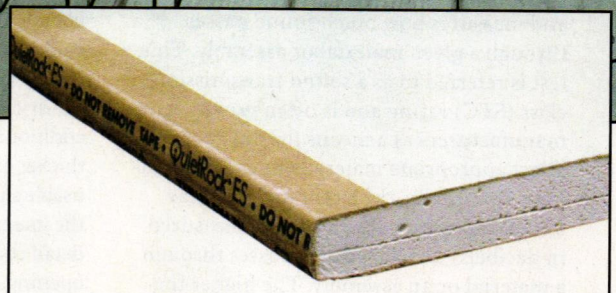
DESIGN FOR ACOUSTICAL EXCELLENCE



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at openings such as doors and operable walls is addressed to maintain acoustical separations. Overall, we explore different strategies and techniques to create positive indoor environments with desirable acoustical results.

ACOUSTICS OVERVIEW

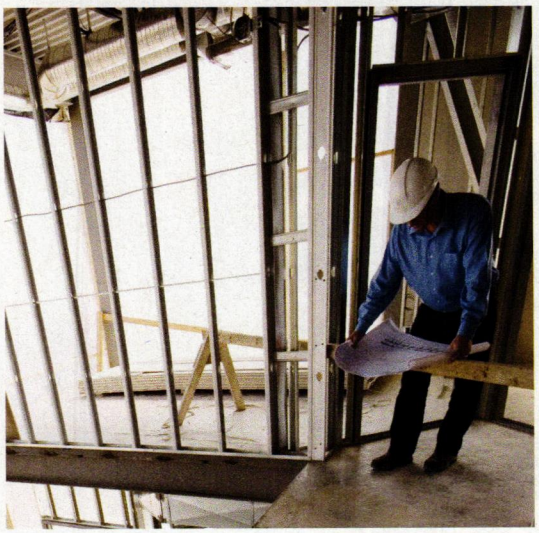
Sound is energy that radiates out from a source, just like heat and light are radiative energy. Understanding how to direct, restrict, or otherwise control sound is similar to how we do the same with other types of energy.

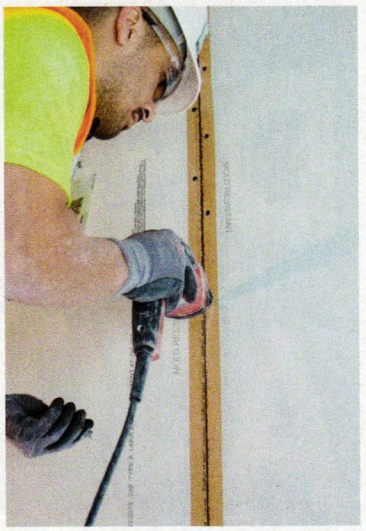
In the case of interior acoustics, design strategies focus on what happens when sound waves travel into or through a space and meet a surface (i.e., ceiling, floor, wall, door, glazing, etc.). The particular effect that surface will have on the emitted sound waves will depend directly on the acoustic characteristics of the material encountered, but all will exhibit differing levels of the same three actions:

- **Reflection:** Some percentage of the sound will bounce off of the surface and be reflected back into the space. If this condition is severe, echoes are heard or sound levels seem to intensify.
- **Absorption:** Some materials (usually softer, porous ones) are very good at absorbing sound waves and dissipating the energy. In some situations, sound-absorptive materials are added to interior spaces to counteract reflection.
- **Transmittance:** Whatever sound is not reflected or absorbed is transmitted through the material or the assembly.

There are a number of different ways that each of these acoustical characteristics is measured. All are based on laboratory testing of materials and have become common and well-documented. One such measured test focuses on sound transmittance and measures how much sound passes through a given material or assembly. This test is referred to as a sound transmission class (STC) rating and is often provided by manufacturers as a means for designers to select appropriate materials to use in buildings. Essentially, the STC rating is a way to determine how much sound (measured in decibels) is reduced as it passes through a material or an assembly. The higher the STC rating, the more sound that does not transmit (i.e., more quiet). For most building conditions, an STC rating on the order of 40–45 is appropriate for most normal conditions, but ranges between 35 and 55 are also common.

Photos courtesy of PABCO Gypsum





Installing sound-reducing drywall can produce excellent acoustical control inside a building while relying only on standard drywall installation methods.

ACOUSTICS IN FRAMED INTERIOR PARTITIONS

Interior partitions are routinely constructed of metal or wood framing with gypsum board (drywall) on both sides. Gypsum panels are manufactured to meet various requirements as detailed by building codes, standards organizations, or other high-performance building guidelines. Most notable of these requirements is fire resistance, acoustic performance, mold-resistance, and abuse and impact resistance. Gypsum panels are tested per standard test methods to verify that they meet or exceed the criteria of given classifications.

With the increased focus on acoustics, human health, and worker productivity, higher STC ratings are more routinely specified in buildings. To meet these higher STC ratings, gypsum board partitions require enhancements beyond what conventional gypsum panels provide. Traditionally, these enhancements include adding sound insulation between the studs, using thicker or multiple layers of gypsum panels, or using resilient channels to decouple the drywall from the studs, all of which require additional time and extra cost. In the case of thicker or multiple layers of gypsum panels, the usable square footage of space is decreased and the increased depth of the partition can impact detail coordination, particularly around door openings and utility boxes.

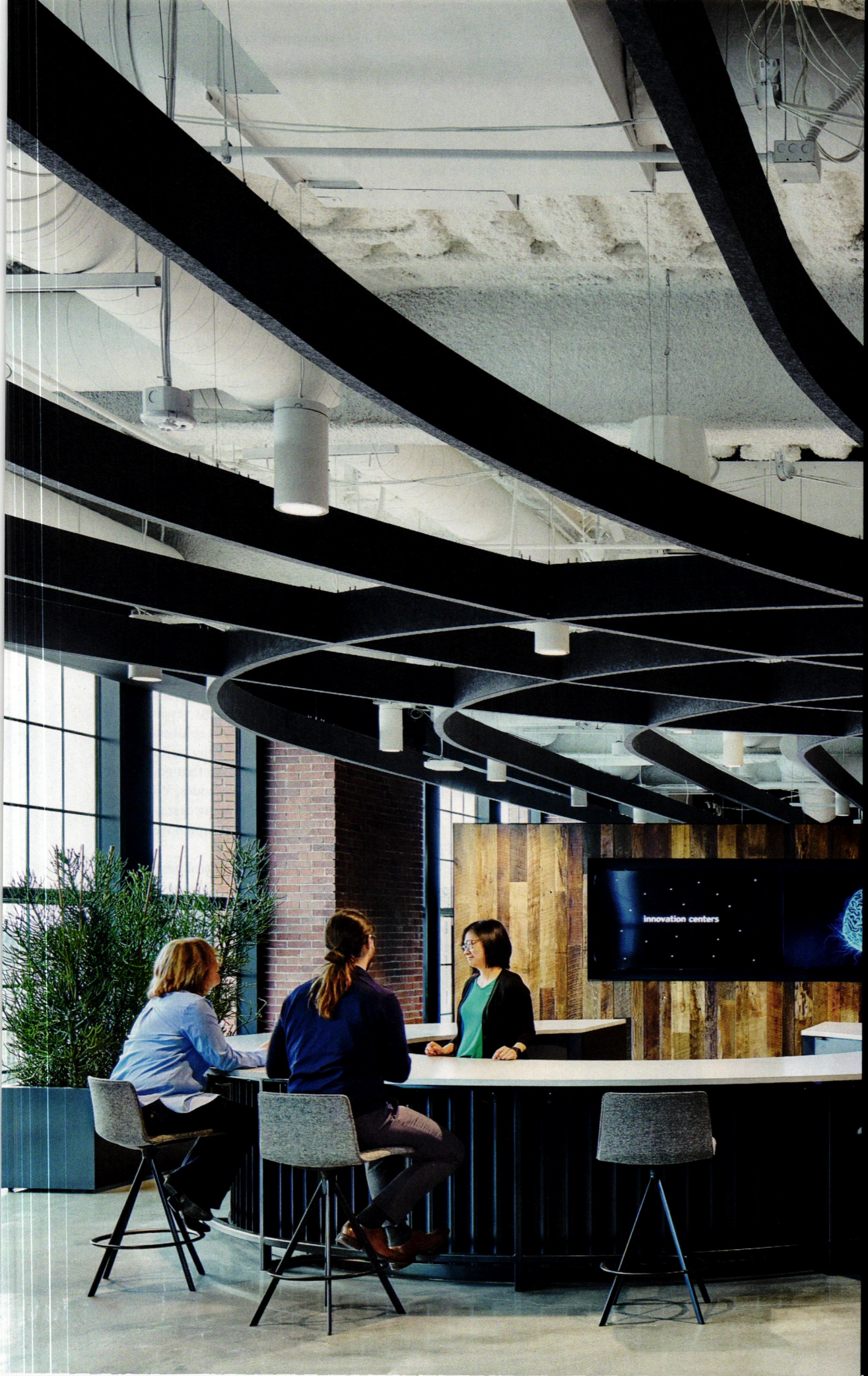
Constrained Layer Damped (CLD) Gypsum Panels

As an alternative to conventional gypsum panels, there are some advanced products simply referred to as constrained layer damped (CLD) gypsum panels that offer excellent acoustic performance while integrating more easily with standard construction. Acoustic testing has been performed on a vast number of interior partitions using CLD panels to document the STC rating of the particular assembly. In many cases, the desired acoustic performance can be achieved with a single CLD layer without the need for multi-layered gypsum panels, resilient channels, or supplemental products. This also decreases the chance for improper installation that will negatively affect acoustic performance.

There are various CLD products available on the market, some more technologically advanced than others. These include a broad portfolio of products that can suit a variety of applications—from entry-level CLD panels for do-it-yourselfers to the highest-performing CLD panels ideal for high-end projects, such as recording studios, home and commercial theaters, and other sound rooms.

Variations of the Product

Just like other gypsum panels, CLD panels can be manufactured to meet or exceed other building code requirements, most importantly, the life-safety requirement of fire resistance. Some CLD panels have been tested in a number of different types of assemblies according to specific requirements to provide different fire-resistant-rated partitions that can be used to satisfy building code requirements.



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Some project applications require mold-resistant drywall panels. CLD panels can be manufactured to meet these requirements using special formulations for both the core and paper facings. Typically, mold-resistant CLD panels are available in thicknesses of ½ inch for use in non-fire-resistant-rated partitions and ⅝-inch Type X for use in fire-rated assemblies. For circumstances that warrant it, there is also sound-reducing drywall that can resist impact and abuse.

Ease of Installation

Field-installed products are often only as good as the quality of the installation. To help in this regard, CLD panels offer some intriguing advantages. First, there may be fewer layers of drywall to install, as STC ratings can be achieved with a single CLD panel instead of multiple layers of drywall. This saves installation time, reduces action steps, and helps control labor costs. Second, at least one manufacturer has developed panels that allow installers to easily score, snap, hang, and finish the drywall just like standard gypsum wallboard. With no paper or metal in the center of the panel, the drywall delivers high acoustic performance with improved workability to speed up installation time.

Related Products

To achieve the best performance in a partition, the joints and penetrations around and in between CLD panels also need to be addressed. Typically this means acoustical sealants and caulk/putty need to be properly applied to the perimeter of the wall and penetrations.

With the wide variety of building types and possible applications, it is recommended to work with a manufacturer and an acoustic consultant early in the design process to determine the best and most cost-effective products for any given project. It is best to work with manufacturers that bring a depth of technical knowledge, independent testing results, and a willingness to share the data with the design professionals who request it. These manufacturers also provide continuing education opportunities directly to firms or through professional associations.

David E. Marsh, FASA, is the president and principal of Marsh/PMK International, a professional consulting firm specializing in acoustics and audiovisual system design. Referencing a recent corporate office project, he says, "The architect's drawing notes called for a particular type of acoustical panel. We recommended a particular sound-reducing drywall manufacturer because of the research and development effort and money invested into the products, and the resulting lab test information available to consultants."

FLEXIBLE SPACE, ACOUSTICALLY CONTROLLED

There are often design conditions with client requirements that can make acoustical performance more difficult if available options are not fully understood. A great example is the common request for building spaces to be more open and more flexible in the ways that they are used. Open, vibrant spaces can be great for large groups, but small meetings or individual workstations often need some acoustical separation. The design question then becomes how to provide both the desired openness and the needed acoustical control.

A popular solution to this seeming paradox is to use opening glass walls. This intriguing product type is comprised of individually framed glass panels that can be moved into either a closed or open position. The panels fold or slide along a track to open fully, permitting a once enclosed space to seamlessly reintegrate with those around it, allowing the space to be truly multifunctional. In the closed position, the glass panels can be specified to provide the appropriate level of acoustical barrier to create a more private, separated space. Floor-supported folding glass walls are able to achieve sound control up to impressive levels. This system combines sleek acoustically separated aluminum framing and specialized gasketing with sound-enhanced glass to achieve optimal performance with an STC range of 35–45.

Other all-glass opening walls are specifically engineered for enhanced acoustical separation and a minimalistic, frameless appearance. Such high-performance systems can provide better sound buffering than many fixed all-glass partitions. These systems have been independently tested and rated to a STC 36.

When selecting and specifying operable glass walls, it is important to consider not only the configuration and usability of the space but also the acoustical performance of the product. The higher-rated framed acoustical systems have been specifically engineered for interior spaces where acoustical privacy and ease of use are of utmost concerns, such as educational or work environments. The frameless versions offer flexible space management solutions for offices, banks, schools, or other building types, providing a design solution that goes beyond what a fixed glass wall provides. With no floor track required in many cases, these systems allow for uninterrupted transitions between interior spaces.

While some sound-control products require tools to crank and seal panels when closed, quality acoustic glass walls offer the user ease of operation. Some products are engineered with roller systems and acoustic seals that do not require additional efforts when closing. It is important to note that when the STC requirements of the system go up, so does the weight of the glass used within the panel. Therefore, it is best not to overload specification requirements when the environment may not require the highest acoustical values.

Other things to keep in mind are that product cost is determined by the level of acoustical privacy and the type of opening glass wall system selected. Hence, it is important to only specify the product and acoustically enhanced glass type that is needed for any given space. Finally, as with most construction, to achieve the desired acoustical control of any room, it is important that the

Photos courtesy of NanaWall

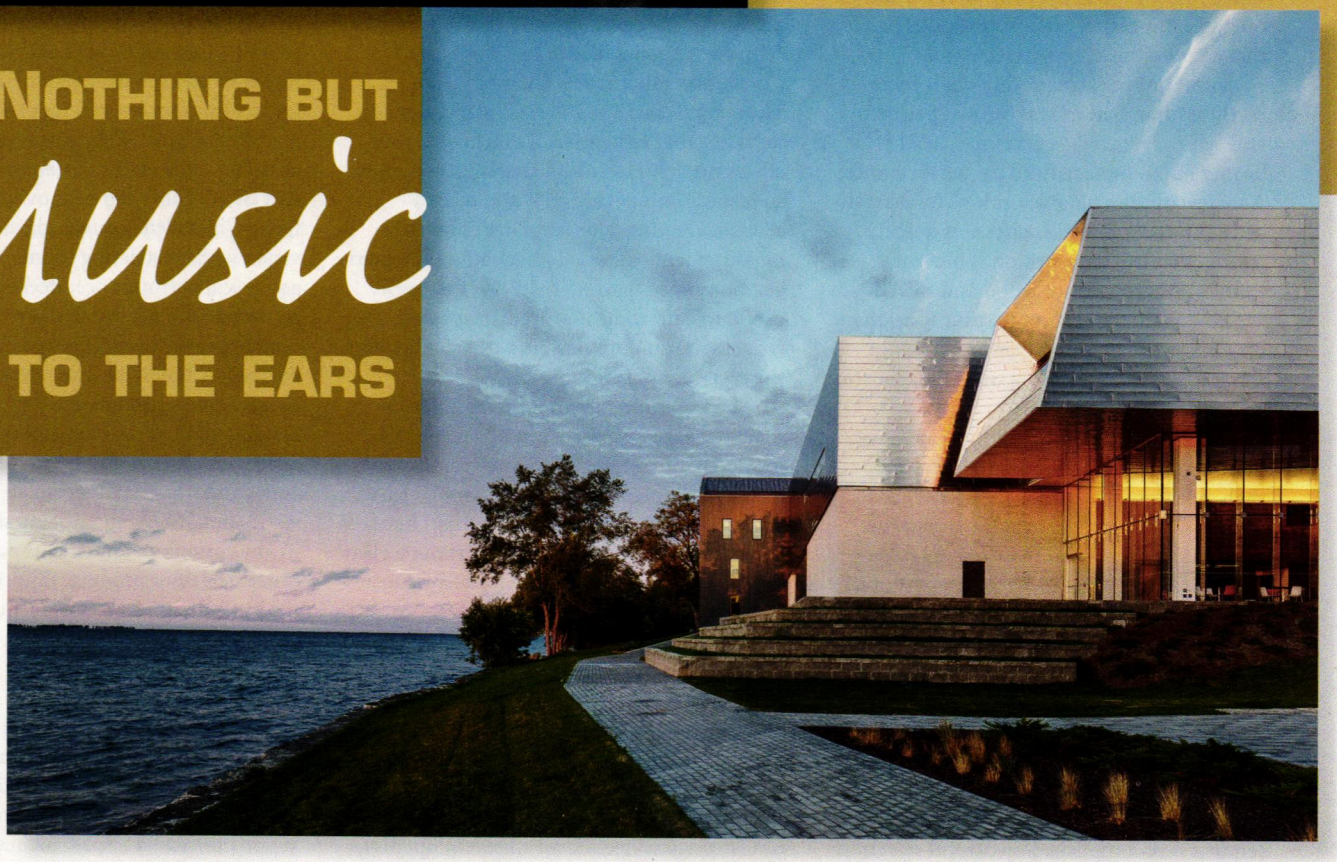
Frameless operable glass walls, like the ones shown here, provide open, flexible integration of spaces when open and private, acoustically controlled spaces when closed.

Acoustic Performance for the Performing Arts

Acoustic Steel Doors & Frames to STC 59

Acoustic Wood Doors & Steel Frames to STC 56

Nothing but *Music* to the ears



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sound-rated opening glass wall is properly installed. It also needs to be integrated into the space so that it is matched and surrounded with acoustically comparable ceiling, walls, and flooring.

ACOUSTICAL DOORS AND FRAMES

While walls and ceilings can be treated as continuous surfaces and addressed acoustically, intentional openings in those walls require particular attention. Doors in particular are needed for access, but if they are not also addressed acoustically, then unwanted sound transfer and noise will be unwelcome intruders. It is important to note that in most commercial building applications, this means addressing not only the operable door itself but also the door frame that couples the door with the wall.

Sometimes design professionals incorrectly assume that to make doors perform and achieve desired STC ratings, aesthetic beauty has to be sacrificed for performance. A review of the available options for acoustically enhanced doors and frames quickly reveals that this assumption is incorrect. Rather, a range of both wood and steel doors are now available that maintain the aesthetic options found on other commodity door types while still providing superior acoustic design and performance.

Interior doors between rooms and spaces often require other design attributes too, such as vision lites, fire ratings, and hardware configurations. Each of these needs to meet the functional requirements that they fulfill in a door and become part of its integrated design. However, each of these attributes will also directly impact acoustical performance in one way or another. Fortunately, there are manufacturers who welcome the challenge to provide wood and steel doors and frames that meet all of the aesthetic design attributes while still providing the needed acoustical performance. Often this is accomplished by careful selection of the materials used and optimizing them for performance and appearance. It also means paying close attention to the details of the interface between the door and the frame and the frame with the wall. In some cases, this includes the use of add-on gaskets and seals that inhibit the flow of sound, just as weather-stripping on exterior doors inhibits the flow of heat and drafts.

It is worth noting that doors and frames are acoustically tested according to the same standards as other building components. There are two common tests used by independent testing laboratories to determine acoustic performance. The first is ASTM E-90: Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements. The scope of this test method is intended to cover the laboratory measurement of airborne sound-transmission loss of building partitions, such as walls of all kinds, operable partitions, floor-ceiling assemblies, doors, windows, roofs, panels, and other space-dividing elements. The second is ASTM E413: Classification for Rating Sound Insulation. This classification covers methods of calculating single-number acoustical ratings (i.e., STC and related acoustical ratings) for laboratory and field measurements of sound attenuation in materials. Combined with ASTM E-90, this test is useful to determine how well an acoustic door reduces the amount of sound transfer between the two sides of the door.

Photos courtesy of AMBCO

Acoustic doors are available in a both wood and steel with a wide variety of appearance and performance options to suit any project.

The way to ensure that the best performance is achieved throughout a project is to specify acoustical doors and frames as a tested assembly from a single manufacturer. Otherwise the compatibility and seal between them may come into question without a clear means of who is responsible for resolving any issues that might arise. Manufacturers of such full door and frame assemblies can work with architects and designers to provide a full and varied range of options to meet the differing needs throughout a project. There is rarely a one-size-fits-all solution for doors and frames, but standardized systems can be used to create optimized assemblies with different STC ratings as needed for different openings. This is true for both wood and steel door assemblies that can be specified or selected based on all of the other design requirements and attributes being sought.

Following are some of the specific features of steel and wood acoustical doors.

Steel Doors

Steel doors and frames are widely used in commercial buildings of all types and can be readily specified to provide a full range of acoustic performance. The preferred products are a complete system with acoustic steel frames, perimeter and bottom seals, threshold, and astragal pairs that all work together to assure reliable, tested, STC ratings. Steel door assemblies that are 1¾ inches thick offer acoustic performance ratings from STC 33–53. In greater thicknesses, ratings of STC 54–59 are readily available. If higher ratings are needed, custom-engineered solutions can be pursued. Any of the doors can be provided with factory-installed acoustic glazing to allow vision while restricting sound. In addition to acoustical performance, steel doors can be provided with needed fire labels in single or double panels for most tested classifications covered by NFPA 80. The relatively lightweight panels combined with level swing seal systems allow for easy operation and compliance with accessibility standards required by codes and ANSI 117.1. From an appearance standpoint, they can be painted or finished in any common manner comparable to any other steel door product, thus providing all of the same design freedoms in addition to the specified performance.

Wood Doors

Acoustic wood doors with steel frame assemblies provide a broad range of STC ratings up to and including STC 56. The specific door and frame assemblies matter though. Wood doors that are 1¾ inches thick are rated up STC 50, while wood frames are available up to STC 45. Wood acoustic door and frame assemblies are also available to meet fire ratings up to 90 minutes. If vision lites are required, they can be factory glazed, including accompanying sidelites and transoms. With all of these performance attributes, remember that the beauty of wood can still be maintained and enhanced. Face veneers are available in virtually every wood species, cut, and grade. Stiles and rails are typically hardwood with vertical door edges to match the face. The factory finish can be

a standard or custom stain or clear coat. If preferred for any reason, laminate face veneers are also available with hardwood edges. Doors can be Forest Stewardship Council certified to contribute to LEED or other green building rating systems.

Overall, steel and wood doors can meet all of the design and appearance requirements sought for a project while being specified to achieve the most appropriate acoustical rating.

IMPROVING SOUND ABSORPTION ON CEILINGS AND WALLS

The interior design of commercial buildings often means that a variety of space types are created with a range of surface treatments on ceilings and walls. The shape of those spaces and the type of surface treatments all impact the acoustical performance of the space. Large spaces with highly reflective surfaces can create echoes, making it difficult to understand speech. Smaller spaces can suffer too from reflective surfaces with the sense of amplified noise as in a restaurant full of people. The solution to these sound issues is to use or add material to the walls and ceilings to reduce the reflected sound and increase the absorbed or dissipated sound.

Finding the most appropriate material to add to a space typically involves criteria based on three things: sustainability, performance, and design. Each of these is discussed further in the following sections.

Sustainable Materials

Any material used for building interiors needs to meet multiple criteria for durability, workability, fire resistance, and aesthetics. It has also become standard practice for many designers to incorporate sustainable materials into their projects. Toward all of these ends, one material has emerged as a popular and proven choice to create acoustical products from. Referred to as PET felt, this material is a form of polyester (like the clothing fabric) with a technical name of polyethylene terephthalate (PET). The most common use for PET felt in general is for it to be extruded or molded into plastic bottles and containers for packaging foods and beverages, personal care products, and many other consumer products. With a focus on sustainability though, PET felt is an alternative product that is routinely made from 60 percent pre-consumer recycled material. The manufacturing process creates felts that are flat but of varying thicknesses, sizes, colors, and textures. Some manufacturers make it a point to collect any felt waste and transform it to an energy source with lower key emissions than coal, thus avoiding the landfill. Additionally, they are actively researching ways to use waste to create new products. The combination of the material and manufacturing process has allowed some PET acoustical products to earn a Declare label as issued by the International Living Futures Institute, which developed the Living Building Challenge.

Acoustical Performance

PET felt products are very good at absorbing sound, making them a very effective solution for spaces that need acoustical improvement. While such products can contribute to the overall STC ratings of a wall or an assembly, they are more often used to help find the right combination of sound absorption versus reflection for a given space. This is essentially a matter of using several well-developed tools to balance the preferred acoustic characteristics within that space. These tools are known as the noise reduction coefficient (NRC) and Sabin measurements, both described as follows.

- **Noise reduction coefficient (NRC):** Individual materials can be formally tested according to ASTM C423: Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method. This standard is used to measure the rate of sound absorption of materials on a scale of zero to one. As such, NRC ratings of a material are commonly viewed as a percentage. For example, an NRC of 0.75 means that 75 percent of the sound energy that strikes a tested material is absorbed instead of being reflected or transmitted. Note, however, that since the test determines sound-absorption rates at four specific sound frequencies (250, 500, 1,000, and 2,000 Hz), the NRC rating number is actually an average of the results across those four frequencies that are generally in the range of human speech. Hence a material with an NRC of 0 can be presumed to reflect back all of the sound striking it within those four frequencies (i.e., not absorb any), while a material with an NRC of 1 is represented to absorb all of the sound that strikes it in this range. Therefore, NRC is useful for determining the sound-absorbing characteristics of materials in many general building applications, but not for special applications where sound at other frequencies needs to be addressed. When PET felt products are tested, they generally achieve very high NRC ratings, including some that demonstrate more than 100 percent (i.e., NRC values greater than 1). These results will vary based on the circumstances of how it is used, the thickness and makeup of the PET felt, and variations between products.

Continues at ce.architecturalrecord.com

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

Photos (from left): courtesy of Turf Design; © Eric Laignel Photography; courtesy of Turf Design

Acoustical treatments made from PET felt can be used as hanging baffles or integrated into ceilings in other ways to provide very good performance while also acting as notable design elements of an interior space.

PRODUCT REVIEW

Designing for Better Acoustics

AMBICO Limited

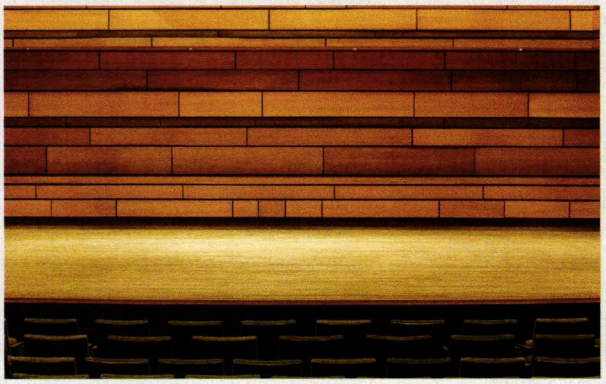

Photo courtesy of doublespace photography

Wood and Steel Acoustic Assemblies

AMBICO products take center stage at the Isabel Bader Centre for the Performing Arts. This $63-million project required the architects to rely on AMBICO's acoustic assemblies to block sound from room to room. AMBICO designed and supplied nearly 100 wood and steel acoustic assemblies ranging from STC 40–59.

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NanaWall Systems

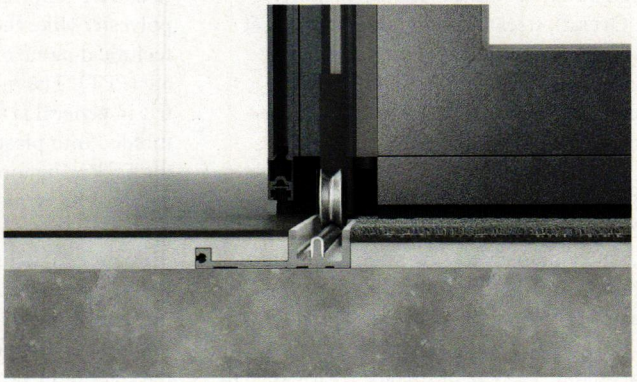

Photo courtesy of NanaWall Systems

Sound-Control Solutions

NanaWall offers an array of interior folding, sliding, and frameless glass walls products depending on a project's specific design constraints, including STC requirements, space planning requirements, structural requirements, ease of operation, aesthetics, and cost.

www.nanawall.com/sound-control-solutions

PABCO® Gypsum

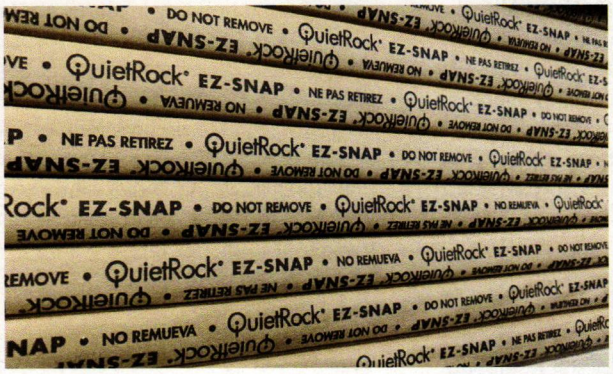

Photo courtesy of PABCO® Gypsum

QuietRock® Sound-Reducing Drywall

QuietRock® is the original sound-damped drywall that architects trust and installers swear by. The product line is broad—from entry-level sound control for DIYers to the highest-performing sound-damping drywall for high-end theaters and recording studios. QuietRock is backed by world-class R&D and acoustics testing, and respected by architects and acousticians nationwide.

www.pabcogypsum.com

Turf Design

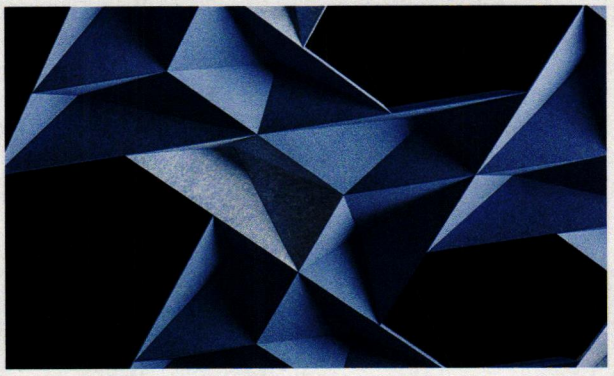

Photo courtesy of Turf Design

Fractal Modular Cloud

Fractal is an elegant cloud system that fills the ceiling with dynamic tessellations. Each triangular module is faceted, building a powerful aesthetic with visual depth. It can be organized in a seamless whole, punctuated with openings, or grouped in clusters, Fractal transforms large volumes of space with a visually stunning and acoustically performative assembly.

www.turf.design

The 220,000-square-foot Kaiser Permanente medical office in Mission Bay, San Francisco, utilized acoustic stone wool and metal ceiling panels to help create a healthy environment for both the patients and medical staff.

Photo: © Michael O'Callahan

Ceiling Systems for High-Performing Health-Care Facilities

Achieve better acoustics, daylighting, infection control, mold resistance, and air quality

Sponsored by Rockfon

Following the global COVID-19 pandemic of 2020, the world became a far different place. While the threat of infectious diseases was already concerning, it gradually became all-consuming. As the coronavirus outbreak intensified, the struggles of hospital staff became painfully vivid. We cheered our medical workers for their heroics.

What we have all lived through brings us into a new consciousness about the importance of health-care facilities, the people who save lives in these facilities, and those whose lives are saved. Few built environments are as critical to get right as the health-care facilities designed, constructed, and renovated today.

Continues at ce.architecturalrecord.com

CONTINUING EDUCATION

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Learning Objectives

After completing this course, you should be able to:

1. Describe the importance of acoustic design in a health-care environment.
2. Identify how high-performing ceilings can impact infection control.
3. Explain how ceiling specification can increase natural daylighting.
4. Discuss how high-performing ceilings can affect operations and maintenance in a health-care setting.
5. Define the connection between high-performing ceilings and a project's sustainability goals.

To receive AIA credit, you are required to complete the entire course and pass the quiz. Visit **ce.architecturalrecord.com** for the full course and to take the quiz for free.

AIA COURSE #K2007E

Windows are pivotal in today's commercial spaces. The higher percentage of glass also raises the stakes for shading strategies.

All images courtesy of Draper Inc.

Supporting Performance While Saving Energy

Designing solar shades to cultivate occupant well-being and promote whole building function

Sponsored by Draper Inc. | *By Amanda Voss, MPP*

Windows play an integral role in buildings by providing daylighting and ventilation. This role is clearly demonstrated by data, with numerous studies finding that the health, comfort, and productivity of building occupants are improved due to well-ventilated indoor environments and access to natural light. The very sustainability of a building itself—how much energy it consumes and the health of its interior and exterior structures—can be further enhanced by careful fenestration design.

However, these benefits carry a price: Gregg D. Ander, FAIA, Whole Building Design Guide, cautions that windows also represent a major source of building issues, including unwanted heat loss and/or heat gain, discomfort, and condensation.[1] In turn, these problems directly impact occupant comfort and productivity as well as the overall building performance.

A successful shading product and plan mitigate the negative issues arising from increased glazing surfaces, while still allowing the building and occupants to enjoy the benefits. Motorized shade systems create ideal environments to promote occupant well-being and increase energy savings. Unlike other shading strategies, natural light can be maximized, energy conserved, and thermal comfort maintained simply through the proper specification of motorized shades and controls. A motorized and automated shade system provides the greatest advantage to the design for a relatively small cost impact on the overall project budget—an expense that can ultimately be offset by improved occupant productivity and energy cost savings.

CONTINUING EDUCATION

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Learning Objectives

After reading this article, you should be able to:

1. Discuss both the positive and negative impacts of natural light in commercial buildings, and compare various types of shading strategies.
2. Explain how a building's energy can be conserved through specification of solar shades and how motorized shades can contribute to sustainability goals.
3. Describe how interior shading strategies can improve occupant welfare, productivity, and comfort.
4. Plan and coordinate exterior and interior design details to maximize budget and increase occupant and building benefits.
5. Defend how motorized shades provide a superior return on investment and amplify both occupant comfort and energy efficiency while preserving aesthetic dynamics.

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.

AIA COURSE #K2007H
IDCEC COURSE #CC-111868-1000

COMPARING TODAY'S SHADING STRATEGIES

Modern windows have undergone a high-tech transformation. With technology advancing in huge strides, even from the fenestration of just 10 years ago, today's glazed units are high-performance, energy-efficient systems that dramatically cut energy consumption and pollution sources. According to the National Institute of Building Sciences' Whole Building Design Guide (WBDG), glazing advances in modern windows stack up to lower heat loss, cut air leakage, and create warmer window surfaces that improve comfort and minimize condensation.

While technology has resolved some of the outstanding energy concerns with fenestration, glare, solar heat gain, and direct sunlight on occupants' eyes or workspaces still can diminish the comfort of interior spaces, making it more difficult to perform basic work functions and endangering occupant comfort.

Solar control, a shading strategy, is therefore of paramount importance in the modern commercial building. Because every building type, design, and location is different, there is no one-size-fits-all solar-control solution.

Architects and designers find that many approaches to solar control are available to them. Chief among these options are fixed exterior shading, mini blinds, dynamic glass, and interior solar shades. Whichever type of solution is selected, having a system that can react according to the prevailing conditions, while retaining local control so that individual comfort is taken into account, is important.

Fixed exterior shading creates an often striking but non-flexible solar shading option for buildings.

Fixed Exterior Shading

Fixed exterior shading structures allow for dramatic aesthetic expressions that highlight building architecture. Typically, fixed exterior structures are used to create overhangs that shade windows beneath, which in turn reduce solar heat gain.

However, fixed exterior shade strategies cannot react to changing sky or sun conditions and, practically speaking, can only be effective for southern elevations in the Northern Hemisphere. Eastern and western elevations with low-angle sun exposure are impractical for most exterior shading devices. Generally, these windows will still require interior shading to reduce glare and provide occupancy comfort. To be effective, fixed exterior shades can also be extremely expensive, depending on the material selected.

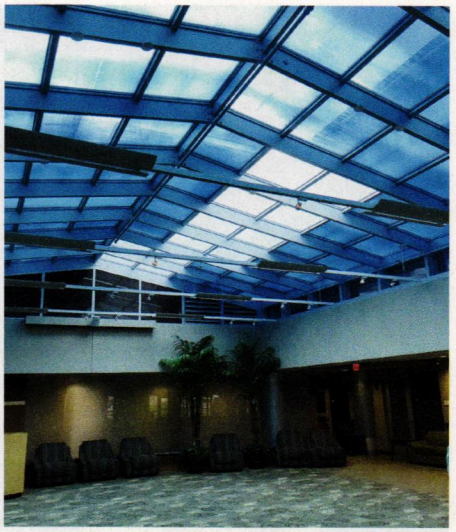
Dynamic Glass

One of the newest mainstream technologies for shading is dynamic glass. Dynamic glass uses electricity to alter the chemical composition of the glass or coating to shift window tints in response to the sun's angle or via a switch control. While dynamic glass preserves views, it is expensive and, in certain cases, can be slow to respond to changing exterior conditions. Windows can present an inconsistent color, particularly across a large facade. Dynamic glass can be difficult to retrofit and is often unsuitable for existing multi-tenant buildings. In addition, if true privacy is desired, other treatments may need to be incorporated.

Mini Blinds

One-inch horizontal blinds, or mini blinds, are a conventional solution that are available off the shelf for a minimum cost. Mini blinds can be adjusted for glare control and to allow for personal interaction, but closing the blinds to prevent glare sacrifices both view and natural daylight.

Mini blinds are high maintenance, requiring frequent cleanings to eliminate the buildup of airborne dust and potential pathogens. Frequent adjustment increases damage to slats, wands, and lift cords and requires extensive attic stock, forcing building management to maintain replacement materials in a wide range of sizes. Mini blinds have an operational life of six to eight years.



Dynamic glazing offers a new option for shading in buildings, but it is expensive and difficult for retrofit applications.

Solar Shades

Solar shades are designed to preserve views of the outside and allow natural light to enter a room while controlling unwanted glare. When not in use, solar shades simply roll up and out of the way—whether into a recess in the ceiling or a set point on the window or wall. Besides glare control, shades offer heat control and ultraviolet (UV) light protection. There are many types of shade systems, from manual to fully automated, and many fabrics options, depending on the project requirements.

Solar shades are flexible and allow for unique responses to changing conditions, optimize orientation and occupancy, and are durable. Manually operated solar shades can be operated by a bead chain clutch, crank operation, or spring rollers.

Motorized or automated shades are a relatively inexpensive upgrade within shade technology and allow for better control and maximal benefit realization for occupant welfare and energy efficiency. Average expected operational life for shades is 25-plus years. Shade fabric weave, color selection, and openness affect building temperature, glare, and visual comfort.

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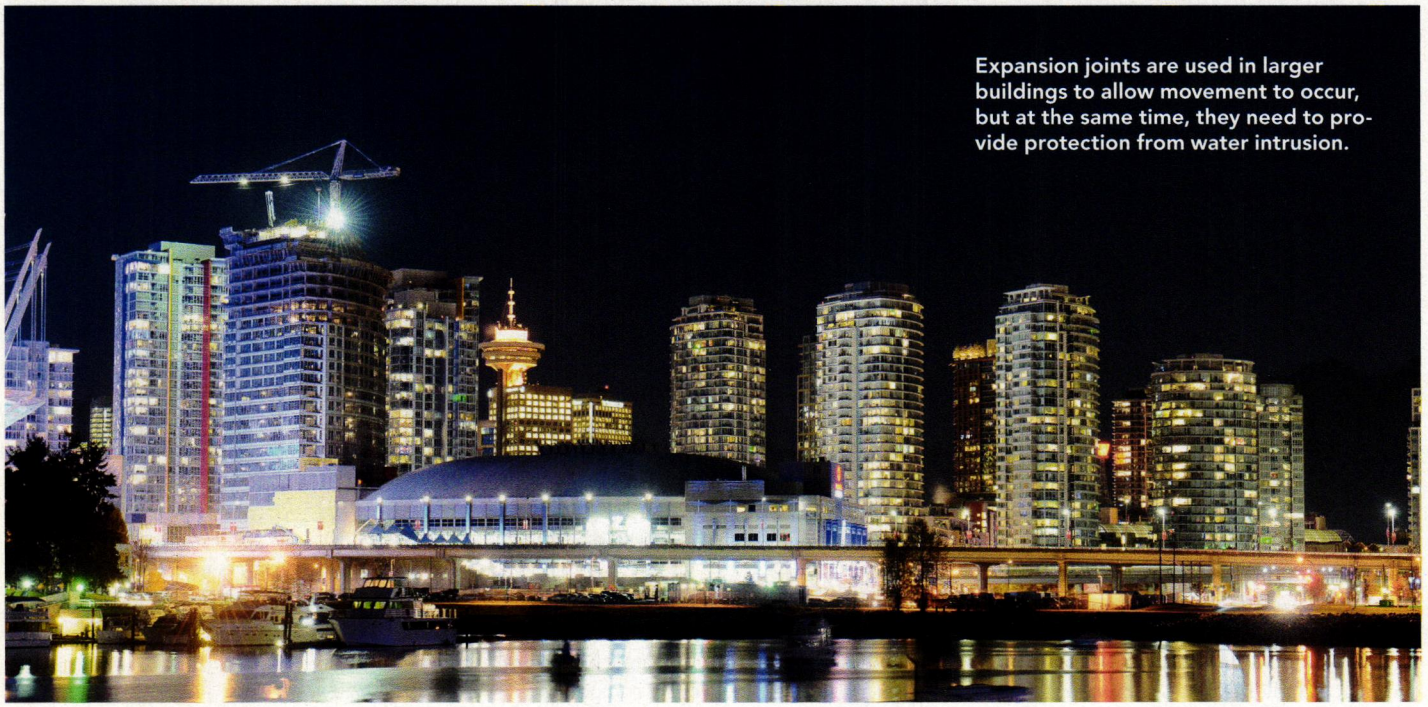

Expansion joints are used in larger buildings to allow movement to occur, but at the same time, they need to provide protection from water intrusion.

Photo courtesy of Inpro

Expansion Joints and Their Role in Waterproofing

Keeping water where it belongs

Sponsored by Inpro | *By Peter J. Arsenault, FAIA, NCARB, LEED AP*

Architectural expansion joints are necessary, predetermined gaps in large structures that are designed to absorb environmental movement in buildings. When done correctly, they tend to be integrated with their construction such that they blend in with a design and almost disappear. Hence, it is easy to overlook the fact that they can be a potential source of water and moisture infiltration and damage. This infiltration could be problematic for the expansion joint itself, or it could cause problems for other building materials or occupants too. Either way, when using expansion joints that need to cut across exterior surfaces, their ability to resist water needs to be factored in along with the other requirements for the joints.

This course will look at the ways that expansion joint filler systems can be designed and specified to provide the needed performance characteristics and still remain water resistive. In the process, it will examine the types of moisture and bulk water concerns that need to be addressed, the other performance needs of expansion joints, and the various types of solutions available.

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***

CONTINUING EDUCATION

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Learning Objectives

After reading this article, you should be able to:

1. Identify the significance of water and moisture penetration in a building based on its affects on materials and people.
2. Recognize the role that building construction joints play in a well-designed building, and the code and life-safety issues that are associated with making these joints water resistive.
3. Differentiate among the common types of expansion joint filler systems that are available as solutions to meet water resistance and safety requirements.
4. Review the practical aspects of designing and constructing water-resistive expansion joints in different building situations and conditions.

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.

AIA COURSE #K2007F

Glass Fabrication: Getting It Right for Commercial Facades

Sponsored by Guardian Glass

Photo courtesy of Guardian Glass

Today's buildings rarely serve a single purpose. From creating environments where people feel safe and can live their best lives, to surpassing the toughest energy-efficiency standards, to inspiring with bold design, architects must balance many priorities. An in-depth understanding of the role that fabrication plays in commercial glass facades can inform your choices and help ensure you meet every project objective.

We are seeing more buildings with uniquely shaped surfaces that twist, turn, and bend—and meet at unconventional angles. Innovative fabrication technology helps to make these organic forms achievable. New fabrication ovens can bend glass into convex and concave shapes, expanding the realm of possibilities for designs. More and more, developers are looking skyward with ultra-tall buildings. Fabricated glass is an integral part of these skyscraping structures. Fabrication makes the beautiful, monolithic look of these towers possible, as well as the expansive views from the inside that people love.

Sustainable construction is also on the rise. Ever-changing building codes and standards are pushing new performance requirements for structures to be more energy efficient and harder working. Sustainable design requires cutting-edge fabrication technology as part of the overall design process to achieve these new building standards.

Continues at ce.architecturalrecord.com

CONTINUING EDUCATION

AIA Continuing Education Provider

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Learning Objectives

After completing this course, you should be able to:

1. Define the vital role of fabrication in glass to increase energy efficiency for commercial facades.
2. Understand how fabrication factors into preservation and adaptive reuse of existing buildings.
3. Identify ways that fabrication can help achieve project goals for safety and security, acoustics, aesthetics, and energy efficiency.
4. Recognize how glass fabrication can increase occupant safety in large public buildings.

To receive AIA credit, you are required to complete the entire course and pass the quiz. Visit **ce.architecturalrecord.com** for the full course and to take the quiz for free.

AIA COURSE #K2007G

GUARDIAN GLASS

See what's possible™

Guardian Glass, a major business unit of Guardian Industries, is one of the world's largest manufacturers of float, coated, and fabricated glass products, offering a range of low-emissivity and interior glass options to meet performance and design requirements. **www.guardianglass.com**

Online Programming

Art, Design & Architecture Museum at UCSB
Santa Barbara, California
The school put many of its collections and archives online, including the exhibitions *J.R. Davidson: A European Contribution to California Modernism*, *Irving J. Gill: Simplicity and Reform*, and *UCSB Campus Architecture: Design and Social Change*. Other collections available on its site include work from architects Myron Hunt and Harold Chambers, Robert Stacy-Judd, R. M. Schindler, Lutah Maria Riggs, Thornton Abell, Gregory Ain, Julius R. Davidson, Palmer Sabin, Kem Weber, Whitney Smith and Wayne Williams, Edward Killingsworth, Rex Lotery, Maynard Lyndon, A. E. Morris, and Barton Myers, among others. See museum.ucsb.edu.

Chicago Architecture Center
Chicago
The institution has launched CAC@Home, a mini-magazine that includes quizzes and other online interactive content, and CAC Live, where online events are accessible remotely, many of which are free to members. See architecture.org.

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

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

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

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

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

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

Museum of Islamic Art, Qatar
Doha, Qatar
Online visitors can tour the I.M. Pei–designed museum and much of the collection on Google Arts & Culture. Family activities including coloring exercises, puzzles, word searches, and art-tutorial videos are also available on the website. Visit mia.org.qa/en.

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

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

Ongoing Exhibitions

USC Architecture's Virtual Expo
Through July 31, 2020
The USC School of Architecture's annual end-of-year exhibition of student work is online this year. Browse the virtual gallery to explore work from design studios and thesis courses in the school's architecture, landscape architecture, and building-science programs. See more at expo.uscarch.com.

Soul of a Nation: Art in the Age of Black Power
Houston
Through August 30, 2020
The Museum of Fine Arts Houston is the final venue to present this exhibition, organized by the Tate Modern, that features work of over 60 black artists from the 1960s to 1980s in America including Betye Saar, Romare Bearden, Elizabeth Catlett, Roy DeCarava, David Hammons, Lorraine O'Grady, and Faith Ringgold. Learn more at mfah.org.

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

Competitions

Airport of the Future Design Competition
Deadline: July 31, 2020
Students and recent graduates from around the world are invited to submit to Fentress Global Challenge's competition as they create a new airport-terminal concept. Entrants are encouraged to utilize forecasts for population, environmental conditions, modes of travel, and potential destinations in the creation of their concept. Submissions will be judged on innovation and creativity, responsiveness to the site, sustainability and resiliency, and functionality. First place will receive $15,000 in cash and prizes, and four additional entries will also receive awards. Registration deadline is July 1, 2020. See fentressglobalchallenge.com.

WARMING
Deadline: August 3, 2020
This competition calls on architecture, planning, and design students and professionals to submit projects that respond to our changing climate. Participants may propose architecture that prevents greater global warming, reacts to the world we will inhabit, or take a combined approach. Cash prizes, book features, and inclusion in an exhibition will be awarded. Learn more at thewarmingcompetition.com.

DATES & Events

HEALING: Alternative Designs for Quarantine Cities

Deadline: August 22, 2020

This competition asks participants to come up with concepts for alternative urban life in relation to the COVID-19 emergency in only three drawings, with absolute freedom of scale, site, or program, answering the questions: "What kind of role can we play as designers in reimagining urban life?" and "How can we produce new, inspiring visions to trigger a discussion around alternative models of urban living?" Two winners and six honorable mentions will be chosen by a jury. Anyone can enter, in groups of up to five or individually. More information available at nonarchitecture.eu/healing.

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 further and faster together toward a net zero or zero-carbon future. Proposals that address climate justice and green futures are welcome. The competition is free to enter and open to anyone over the age of 18. For more information, go to museumsforclimateaction.org.

The Forge Prize

Deadline: November 1, 2020

This competition 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. For more information, see forgeprize.com.

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

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SNAPSHOT

Earlier this summer, while COVID-19–induced social-distancing measures were still in full effect for New York, Brooklyn's Domino Park, designed by James Corner Field Operations, developed an out-of-the-box—yet within the circle—plan that allows locals to enjoy the landscaped public waterfront from the safety of designated individual spaces. Park staff drew dozens of 8-foot-diameter circles on the artificial turf with white chalk to encourage those who aren't sheltering together to keep their distance from others (6 feet apart, as recommended by the CDC) to help slow the virus's spread while combating cabin fever. *Kara Mavros*

PHOTOGRAPH: MARCELLA VINOGRAD