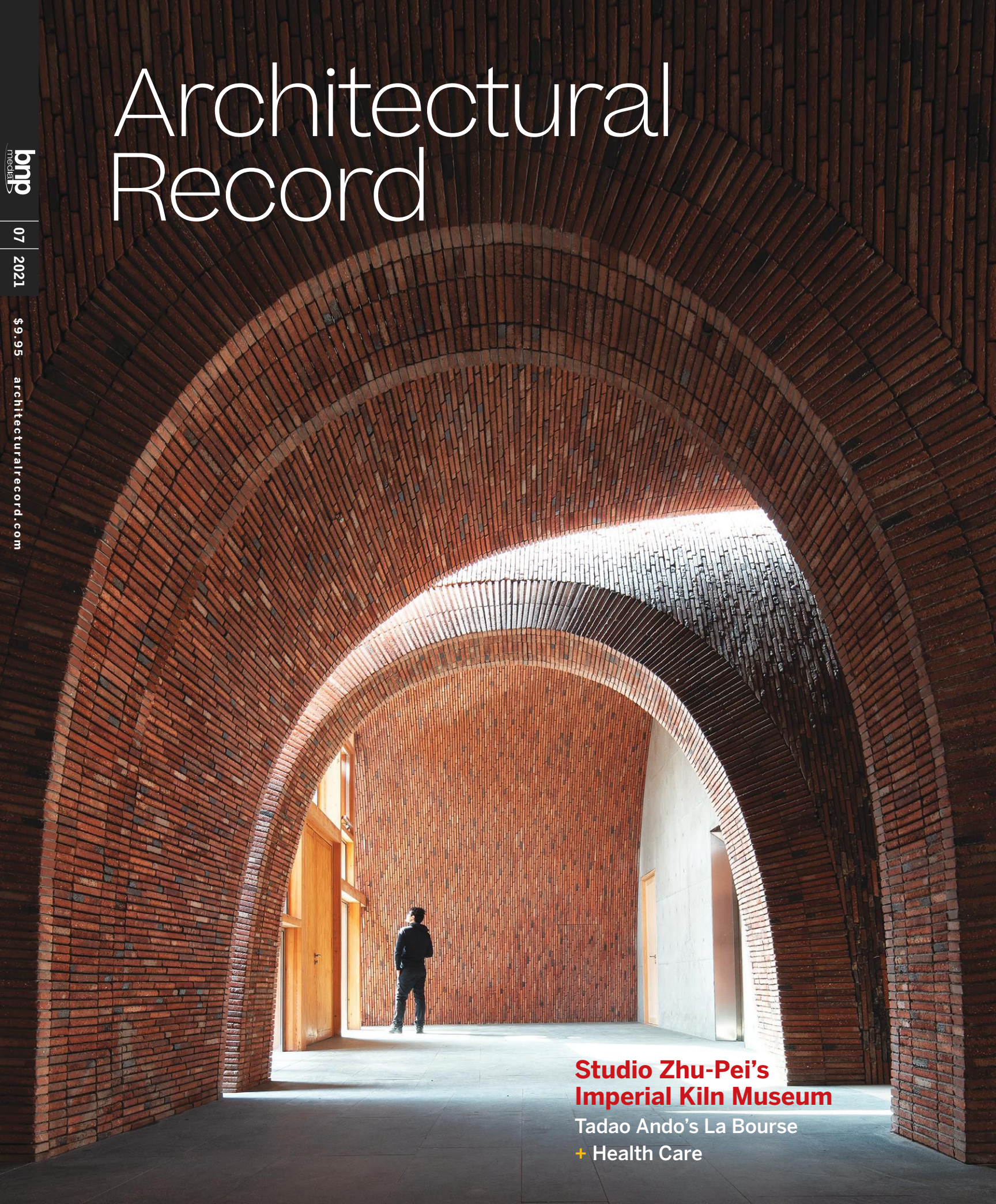
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MANAGING EDITOR	Beth Broome, *broomeb@bnpmedia.com*
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FEATURES EDITOR	Josephine Minutillo, *minutilloj@bnpmedia.com*
SENIOR EDITORS	Joann Gonchar, FAIA, LEED AP, *goncharj@bnpmedia.com* Linda C. Lentz, *lentzl@bnpmedia.com*
SENIOR DIGITAL/NEWS EDITOR	Bridget Cogley, *cogleyb@bnpmedia.com*
ASSOCIATE EDITOR	Kara Mavros, *mavrosk@bnpmedia.com*
CONTRIBUTING PRODUCTS EDITOR	Sheila Kim, *sheilakim.nyc@gmail.com*
ASSISTANT EDITOR	Ilana Herzig, *areditor@bnpmedia.com*
COPY EDITOR	Anna Shapiro
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ASSISTANT ART DIRECTOR	Kaylee Webster, *websterk@bnpmedia.com*
CONTRIBUTING ILLUSTRATOR, PRESENTATION DRAWINGS	Peter Coe
CONTRIBUTING EDITORS	Sarah Amelar, Robert Campbell, FAIA, Blair Kamin, Katharine Logan, Jayne Merkel, Clifford A. Pearson, James S. Russell, AIA, David Sokol, Sarah Williams Goldhagen
SPECIAL INTERNATIONAL CORRESPONDENT	Naomi R. Pollock, FAIA
INTERNATIONAL CORRESPONDENTS	Andrew Ayers, Aric Chen, David Cohn, Chris Foges, Tracy Metz
CONTRIBUTING PHOTOGRAPHERS	Iwan Baan, Roland Halbe

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SOUTHEAST, MID-ATLANTIC: Wesley Loon
(859) 414-3795, Fax: (248) 502-9104, *loonw@bnpmedia.com*
MIDWEST (IA, IL, MN, MO, WI): Bruce Smith
(224) 216-7836, Fax: (248) 786-1390, *Smithb@bnpmedia.com*
MIDWEST (IN, MI, OH), TX, OK, EASTERN CANADA: Lisa Zurick
(513) 345-8210, Fax: (513) 345-8250, *zurickl@bnpmedia.com*
WEST, WESTERN CANADA: Bill Madden
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FL, KS, NE, ND, NY, SD, INTERNATIONAL: Risa Serin
(646) 849-7130, Fax: (248) 786-1393, *serinr@bnpmedia.com*

WORKFORCE/RECRUITMENT: Diane Soister
(646) 849-7137, Fax: (248) 502-2046, *soisterd@bnpmedia.com*

PRODUCTION MANAGER: Kristen Carpenter
(248) 786-1222, Fax: (248) 502-2051, *carpenterk@bnpmedia.com*

CONTINUING EDUCATION
CONTINUING EDUCATION GROUP MANAGER
Brittnie Wilson
wilsonb@bnpmedia.com
CONTINUING EDUCATION PROJECT COORDINATOR
Lisa Stradinger
stradingerl@bnpmedia.com
CUSTOM CONTENT EDITOR
Samantha Staniszewski
staniszewskis@bnpmedia.com

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JULY 2021

NEWS

15 **This Year's Serpentine Pavilion Honors London's Migrant Communities** *By Chris Foges*

18 **Katerra Is Shutting Down** *By Bridget Cogley*

20 **Top 300 Firms: Gensler Remains First** *By Bridget Cogley*

22 **NEWSMAKER: Mark Chambers** *By Joann Gonchar, FAIA*

DEPARTMENTS

12 **EDITOR'S LETTER: History Lessons**

25 **HOUSE OF THE MONTH: Remote Cabin** STONOROV WORKSHOP ARCHITECTS *By Sarah Amelar*

27 **LANDSCAPE: Little Island, New York** HEATHERWICK STUDIO, MATHEWS NIELSEN, AND ARUP *By James S. Russell, FAIA*

29 **GUESS THE ARCHITECT**

33 **EXHIBITION: Venice Biennale** *By Tim Abrahams*

36 **FIRST LOOK: Bob and Renee Parsons Leadership Center for Girls and Women, Phoenix** MARLENE IMIRZIAN & ASSOCIATES ARCHITECTS *By Jennifer Krichels*

40 **FIRST LOOK: Enchantment Resort, Trail House, Sedona, Arizona** GLUCKMAN TANG ARCHITECTS *By David Sokol*

BUILDING TYPE STUDY 1,031 HEALTH CARE

71 **Introduction**

72 **Waldkliniken Eisenberg Hospital Expansion, Germany** MATTEO THUN *By Mairi Beautyman*

78 **Beacon Clinic, Calgary, Alberta** 5468796 *By Clifford A. Pearson*

84 **Penn Medicine Radnor, Pennsylvania** BALLINGER *By Suzanne Stephens*

90 **Mantel Ortho, Cedarsburg, Wisconsin** JOHNSEN SCHMALING *By Laura Raskin*

44 **IN FOCUS: Anstalten, Nuuk, Greenland** SCHMIDT HAMMER LASSEN AND FRISS & MOLTKE *By Clifford A. Pearson*

49 **PRODUCTS: Health Care** *By Sheila Kim*

50 **PRODUCTS: HVAC** *By Sheila Kim*

BOOKS

31 ***Konrad Wachsmann's Television,* by Mark Wigley** *Reviewed by Jean-Louis Cohen*

PROJECTS

52 **Imperial Kiln Museum, Jingdezhen, China** STUDIO ZHU-PEI *By Aric Chen*

60 **La Bourse, Paris** TADAO ANDO, WITH NEM *By Andrew Ayers*

THE POST-COVID WORKPLACE CEU

96 **Rethinking the Office** RESEARCH CAN GUIDE ARCHITECTS IN DESIGNING FOR FLEXIBILITY AND CREATIVITY. *By James S. Russell, FAIA*

123 **Dates & Events**

128 **SNAPSHOT: Musée Carnavalet Renovation, Paris** SNØHETTA AND CHATILLON ARCHITECTES *By Ilana Herzig*

THIS PAGE: THE ROTUNDA INSIDE TADAO ANDO'S TRANSFORMED BOURSE DE COMMERCE MUSEUM IN PARIS. PHOTO © YUJI ONO.

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COVER: IMPERIAL KILN MUSEUM, JINGDEZHEN, CHINA, BY STUDIO ZHU-PEI. PHOTO BY SCHRANIMAGE.

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History Lessons

The past, in all its ugly truths, needs to inform how we plan the future of our cities.

UNTIL RECENTLY, few Americans knew about the Tulsa race massacre 100 years ago, when a white mob burned down a prosperous 35-block Black neighborhood called Greenwood, using not only torches but firebombs dropped from airplanes. Three hundred people were killed, and 1,256 houses and 191 businesses destroyed. Thousands were left homeless among the smoldering ruins.

I first learned about this act of racist terrorism a number of years ago, when I was teaching a journalism course; a student from Tulsa wrote her final paper on the horrific events of the late spring, 1921, that leveled a successful community whose main thoroughfare was known as "Black Wall Street." I was shocked—not only by the details of hatred, slaughter, and destruction but also about the silence that had kept one of the worst episodes of racial violence in the 20th century out of our history books. Now, with the centenary of the massacre, we are finally beginning to learn a truth that should never have been hidden.

Yet even less well-known is the denouement of Greenwood's story. Despite rejected insurance claims and zoning changes thrown up as obstacles by the city of Tulsa, African American residents managed to rebuild their community, and, by the 1940s, there were more than 200 businesses and many hundreds of houses in Greenwood once more. But in the 1960s, a second wave of destruction arrived, this time with the legal cudgel of eminent domain, as a new highway cut the heart out of the neighborhood for good.

That was the fate, of course, of urban neighborhoods throughout America, as billions of federal dollars poured into an enormous highway-construction program, propelling the car culture and the race to the suburbs. Along with urban renewal—planned and carried out almost entirely by white officials—these vast schemes disproportionately targeted Black areas. While redlining and general disinvestment had led many such neighborhoods to be categorized as "blight," they were real communities whose social networks, as well as their homes and livelihoods, were destroyed.

That destruction became the canvas for the modern project: not only the high-speed arteries for automobiles but high-rise housing and the construction of some of America's most celebrated architecture. In Detroit, for example, historic African American neighborhoods were demolished in the name of urban renewal and to build freeways, beginning in the 1950s. Black Bottom (so named by early French settlers for its rich soil) and Paradise Valley, in particular, had been thriving communities, with Black professionals, businesses, and entertainment. With the Chrysler Freeway soon to rip through it, Black Bottom was razed, leaving a tabula rasa for modernist planning. And so one 46-acre parcel was transformed into Lafayette Park (1956–65), a beautiful complex designed by Mies van der Rohe of glass apartment towers, town houses, and a school, set in a verdant landscape.

Another Mies masterpiece—Crown Hall at I.I.T. in Chicago (1956)—is similarly situated, where a legendary apartment building called the Mecca once stood, in the Black neighborhood of Bronzeville. As Thomas Dyja wrote in his award-winning book *The Third Coast*, and in an essay for RECORD (October 2015), the ghost of the Mecca inspired a former denizen, the poet Gwendolyn Brooks. "To touch every note in the life of this block-long, block-wide building would be to capsulize the gist of Black humanity in general," she wrote. She called Crown Hall "an erasure."

Today, a number of cities are trying to heal the wounds made by highways, with plans to tear them down and replace them with boulevards, parks, and, of course, the potential for new real-estate development. In Oakland, California, where the destruction of a Black community by a highway prompted, in part, Walter Hood's installation in the *Reconstructions* exhibition at New York's Museum of Modern Art this past spring, officials have studied the positive impact of the highway's removal (the negative impact could be gentrification). And in Detroit, there is an official commitment to take down the Chrysler Freeway.

While such plans can help repair neighborhoods, there is no reclaiming communities that have been erased, or eliminating the scar tissue. But we must, at least, acknowledge and understand history if we are to design and construct a better future.

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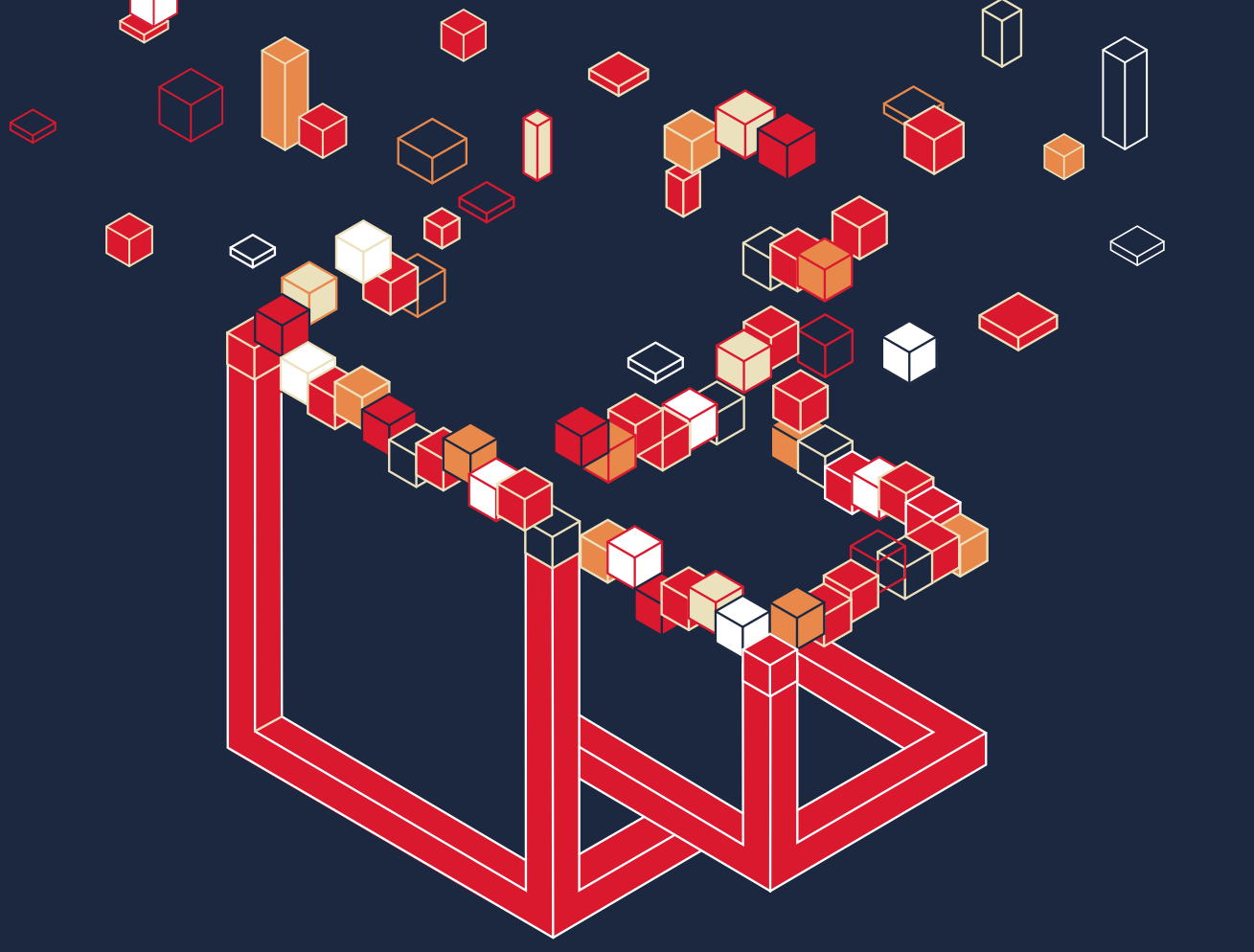
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In many ways, David and I are kindred spirits. We both [had] childhoods moving all over the place. It does give you an appreciation for different traditions. David has used that perspective to create spaces unlike any the world has ever seen.

—*Barack Obama, speaking at the virtual ceremony honoring David Adjaye receiving the 2021 RIBA Royal Gold Medal.*

This Year's Serpentine Pavilion Honors London's Migrant Communities

BY CHRIS FOGES

NARROW your eyes, and the 20th annual Serpentine Pavilion looks like the kind of ruined neoclassical folly you might find in the 18th-century parkland of London's Kensington Gardens. Look more closely, and its thick walls and fluted columns tell a more contemporary story about the city and its inhabitants. Designed by 31-year-old Sumayya Vally of the South African practice Counterspace, the monumental structure is based on a study of gathering places where London's migrant communities have found a sense of belonging. They range from institutions such as churches and cultural centers to spaces of everyday life in multicultural areas such as Hackney and Peckham. The architect has also reached out to some of those neighborhoods by placing small satellite structures—conceived as fragments of the pavilion—in four local cultural spaces.

"We have a focus on working with all of London's communities," says Hans Ulrich Obrist, the artistic director of the Serpentine Galleries, which hosts the pavilion each year. "We didn't want the pavilion to be something that only happens on the gallery's lawn. It also works with the urban tissue of the city."

Over four months spent in archives and walking the streets, Vally compiled more than 50 reference cases, ranging from nightclubs to mosques and barbershops to publishers' offices. Architectural fragments drawn from these spaces have been "abstracted, spliced, and superimposed" to generate the form of the 3,540-square-foot temporary events space with a café.

A roughly circular roof, 23-feet high, rests on 15 chunky columns, some of which resemble coursed stone, while others have a texture reminiscent of 1960s ribbed concrete. One column's capital appears to be a cornice detail from a 19th-century house, enlarged to surreal proportions. Some elements are direct quotations: the base of one column recalls the slanted shelves of a bookstore. Others are more allusive: ruts in the ceiling seem to record traces of a vanished structure like a cast taken from a mold.

This architectural amalgam is a collective tribute to the places that Vally studied, but her design doesn't give a distinct impression of them individually. "I didn't want to make a literal representation of those spaces," she says. "My aim was to honor them by looking closely, understanding how their architectural gestures have fostered gathering, and translating that into new forms." Looking at Iftar tables, on which Ramadan fasts are broken, gave rise to ideas about shared surfaces, for example. Likewise, Vally's thinking about how people sit together was influenced by the porch steps where the Afro-Caribbean community in the Brixton neighborhood once met to organize politically.





A flat roof is supported by variously designed columns (top), some of which frame London's Serpentine South Gallery in Kensington Gardens (right).

Applying those lessons has produced a pavilion that is notably hospitable. "Its arrangement is meant to engender gathering in different ways, at different scales of intimacy, and to create a feeling of generosity," says the architect.

Visitors enter by three paths that slice

PHOTOGRAPHY: © IWAN BAAN



Dark-stained cork and micro-cement in pale shades cover the pavilion's plywood sufaces.

through a grassy berm surrounding the pavilion's low perimeter wall. Large architectural fragments scattered around the interior provide seating and loosely define a square area for events within the circular plan. Around its edge, smaller places to sit are set at different heights, and might accommodate a group of friends or a one-on-one conversation. People may drift among the columns before finding a ledge or bench on which to perch with a drink, or a shady niche with a view of the park.

A slightly dreamlike ambience also owes something to the materials. While the outer faces of the columns are clad in dark-stained cork, the plywood surfaces of the interior have been given a unifying coating of micro-cement in shades of pink and pale gray. "I wanted it to look as if the form has been carved out," says Vally, "and to create an interior which is airy and soft, and responds to changing light through the day."

Plywood was not Vally's first choice; an early plan to clad the building's steel frame in custom-made eco-bricks proved too complex. Tactile, heavyweight masonry might have added something to the experience, but the innovative use of structure and materials isn't central to Vally's agenda, as it has been for some of the previous years' pavilion designers. Her emphasis is on creating an evocative reflection on the importance of gathering spaces.

That theme was adopted before the Covid crisis, which delayed the project by a year. Months of lockdowns and social distancing have given it increased resonance. As London emerges from what is hoped will be the last of its restrictions on coming together, Sumayya Vally's pavilion arrives just in time. ■



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Katerra is Shutting Down

BY BRIDGET COGLEY



Katerra's Catalyst building, designed with MGA, is Washington's first CLT office building.

PHOTOGRAPHY: © BENJAMIN BENSCHNEIDER

MASS TIMBER construction company Katerra has filed for bankruptcy and is closing its U.S. operations—despite the investment of around $2 billion by SoftBank, in the company's effort to radically change the construction industry by using innovative software to create efficiencies in designing and building with cross-laminated timber (CLT). Katerra announced the news in a release on June 6, noting that it will continue to proceed with "certain active projects in a number of states."

The potential construction giant, which launched in Silicon Valley in 2015, acquired two architecture firms in 2018: Michael Green Architecture (MGA) in Vancouver, a leader in designing with mass timber, and the much larger Lord Aeck Sargent, with six offices in the U.S. Lord Aeck Sargent is becoming an independent design firm again, and Green told RECORD in an interview that he and partner Natalie Telewiak are in the final stages of executing an agreement to separate from Katerra. "We are busy as ever, with a great team, and will continue to grow," said Green, explaining that MGA always "operated independently" of Katerra, "with full management control."

Based in Menlo Park, California, Katerra used digital tools to manage the entire arc of construction, from the fabrication of CLT to making the fixtures for its projects. At its peak last year, it employed more than 8,000 people. The company planned to lead in creating multi-unit residential buildings as well as commercial structures. ■



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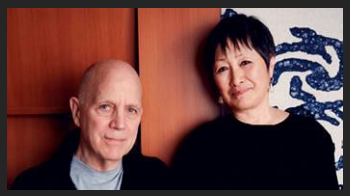
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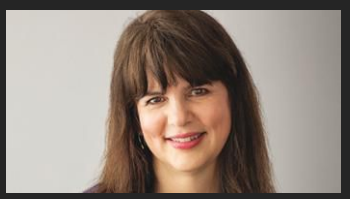
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Top 300 Firms: Gensler Remains First

BY BRIDGET COGLEY

FOR A DECADE, Gensler has topped ARCHITECTURAL RECORD's annual list of the Top 300 Architecture Firms in the U.S. The company, with headquarters in San Francisco, operates 100 offices around the world and earned $1.3 billion in revenue in 2020 (a slight decrease from $1.5 billion the year before) in the face of the pandemic.

Chicago's Perkins&Will and Omaha-based HDR have also held onto their ranks among the Top 5. A handful of firms have made notable climbs in the list compared to the previous year. New York studio CannonDesign moved to ninth from 13th, and Portland's ZGF Architects is 12th instead of 20th. "Much has changed in the world in the last year, but CannonDesign has continued on its trajectory," says David Polzin, CannonDesign's executive director of design, noting that the firm has expanded into work on software, computational tools, and modular-construction solutions.

With these firms' advances, however, comes a lowering of ranks for other firms, including Populous and IBI Group, both of which descended a few notches. Yet, despite the turbulence of this past year's challenges, there was not a significant change among the firms in the Top 25. ■

TOP 25 U.S. ARCHITECTURE FIRMS OF 2021



Renovation of Ford Foundation Center for Social Justice
New York | Gensler



Moynihan Train Hall at Penn Station
New York | SOM



The Heights Building
Arlington, Virginia | LEO A DALY with BIG

Companies are ranked by revenue (in **millions of dollars**) for architectural services performed in 2020. These data also appear in *ENR*'s Top 500 Design Firms list, which, unlike our ranking, also includes firms that do engineering exclusively. Find the full Top 300 Firms list on architecturalrecord.com.

RANK 2021	RANK 2020	FIRM, U.S. HEADQUARTERS	TYPE OF FIRM	TOTAL ARCHITECTURAL REVENUE
1	1	**Gensler** Los Angeles	A	1,320.19
2	2	**Perkins&Will** Chicago	A	595.07
3	3	**HDR** Omaha	EA	456.11
4	6	**HKS** Dallas	A	420.23
5	7	**HOK** St. Louis	AE	411.00
6	4	**Jacobs** Dallas	EAC	384.16
7	8	**Stantec** Irvine, California	EA	337.33
8	5	**AECOM** Los Angeles	EA	337.00
9	13	**CannonDesign** New York	AE	269.00
10	9	**Skidmore Owings & Merrill** New York	AE	268.30
11	10	**Perkins Eastman** New York	A	264.00
12	20	**ZGF Architects** Portland, Oregon	A	245.54
13	11	**DLR Group** Minneapolis	AE	212.40
14	16	**NBBJ** Seattle	A	202.20
15	18	**Corgan** Dallas	A	200.83
16	22	**LEO A DALY** Omaha	AE	194.80
17	**	**CallisonRTKL** Seattle	A	191.20
18	14	**Populous** Kansas City, Missouri	A	184.04
19	12	**IBI Group** Columbus, Ohio	AE	182.36
20	24	**PBK** Houston	AE	174.80
21	19	**PGAL** Houston	AE	166.90
22	23	**SmithGroup** Detroit	AE	150.47
23	28	**Ware Malcomb** Irvine, California	AE	147.10
24	26	**Page** Washington, D.C.	AE	134.65
25	25	**Gresham Smith** Nashville	AE	106.16

Key to firm types

A Architect | AE Architect Engineer | EA Engineer Architect | EAC Engineer-Architect-Contractor



University of Virginia Hospital Expansion
Charlottesville | Perkins&Will



New York University Special Collections Library
New York | CannonDesign



Rainier Square
Seattle | NBBJ

PHOTOGRAPHY (CLOCKWISE FROM TOP LEFT): © RICHARD BARNES; TODD MASON; SCOTT FRANCES; MORIS MORENO; LAURIAN GHINITOIU; LUCAS BLAIR SIMPSON

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Emory University Hospital Pedestrian Bridge, GA
Designed by **SmithGroupJJR**
Structural Engineer **Walter P. Moore**
Photography by Robbins Photography, Inc

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Mark Chambers

BY JOANN GONCHAR, FAIA



ARCHITECT Mark Chambers has focused on advancing environmental policy at the city-government level for more than a decade, working in the District of Columbia and in New York. For the latter, he was director of the Mayor's Office of Sustainability, where he led development and passage of Local Law 97—2019 legislation that set stringent limits on a buildings' carbon emissions. Earlier this year, he started working on climate issues at the federal level as senior director of building emissions at the White House Council on Environmental Quality. Chambers spoke with RECORD about his new role in President Biden's administration.

What are the responsibilities of the Council on Environmental Quality?

The Council is a convener and serves as a critical checkpoint for the government's environmental and climate policy. We tie the many moving pieces together and engage with federal agencies and the public at large.

The Council was created in 1969, but you are its first senior director of building emissions. Is that true?

Correct. The position hadn't existed before. Buildings are where we sleep, go to school, and work. But the energy used to heat and cool and operate them represents nearly a third of our greenhouse-gas emissions. Creation of this new position acknowledges buildings as critical to our climate response. My role is coordinated with the larger environmental effort of the federal government, but also has a sector-specific approach.

New York's Local Law 97 sets statutory caps on CO_2 emissions. Is it a blueprint for federal policy?

The work that we did in New York was the spear tip of the work necessary to decarbonize the built environment. It also lowered the risk for other cities to be able to do the same thing: if the largest city in the country can do it, they can too.

That thinking also applies at the national level. Setting performance targets is a critical part of galvanizing the industry around a common cause with clear and measurable outcomes. You need to know what you're tracking toward and be able to look at building operations based on a greenhouse gas assessment to understand if you will achieve the desired outcomes. That is why we are pursuing performance standards for federal buildings. That's the type of leadership that's necessary in order to move the industry to decarbonize as quickly as possible.

Can you talk about aspects of President Biden's American Jobs Plan that tackle both global warming and social injustice?

Forty percent of the climate and clean-infrastructure investments would be directed toward disadvantaged communities. One key aspect of that initiative is aimed at the shortage of affordable housing. Energy costs are a large part of that problem. The plan includes a significant investment to make housing more efficient, improve thermal envelopes, and reduce reliance on fossil fuels, improving the quality of life for many Americans.

If the infrastructure plan ultimately supported by Congress excludes buildings, how will the president achieve his climate goals?

We're moving full steam ahead right now. There is no waiting for anything. We are moving forward on myriad different efforts with our existing powers and budgets because there's no time to waste. We've released a national road map for making buildings more efficient and grid-interactive and have launched a low-carbon buildings pilot. We are accelerating the development and adoption of heat-pump technologies. And we are investing $30 million in workforce development, particularly related to constructing, retrofitting, and electrifying America's buildings. There's no sitting on the sidelines. We are going to keep being aggressive in pushing for the change that is needed—change that the industry is actually asking for. ■

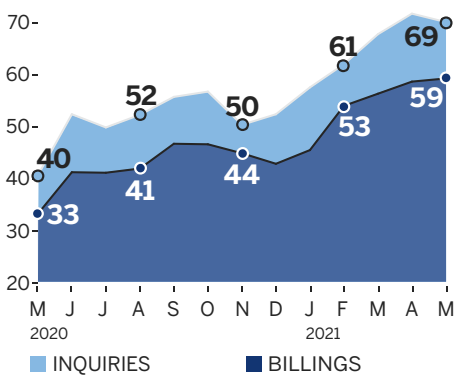
Two Pritzker Prize Winners Have Died

German architect Gottfried Böhm, who was awarded the Pritzker Prize in 1986, died at 101 on June 9. He lived in Cologne, where he designed the Central Mosque (2017) and Madonna of the Ruins chapel (1950), which is now part of Peter Zumthor's Kolumba Art Museum. Known for his highly sculptural forms, Böhm also designed Mary, Queen of Peace pilgrimage church in Neviges in northern Germany (1968) and Potsdam's Hans Otto Theater (2006).

Paulo Mendes da Rocha died at the age of 92 on May 23 in São Paulo, where he completed dozens of Brutalist-style public and private buildings in concrete, including the Brazilian Museum of Sculpture (1988). In 2006, the Brazilian architect was awarded the Pritzker Prize by a jury that cited his "deep understanding of the poetics of space."

New CFA Appointments

President Biden has announced four new appointments to the U.S. Commission of Fine Arts (CFA)—Billie Tsien, Peter D. Cook, Hazel Ruth Edwards, and Justin Garrett Moore—in a move to reshape the seven-member body to be more diverse. Members serve four-year terms and are appointed by the president to oversee new architecture and historic renovations, mainly in the District of Columbia, in an advisory capacity.



ABI Score Keeps Climbing

The Architecture Billings Index (ABI) score has continued to increase every month since January and is at 58.5 for May, as reported by the American Institute of Architects. The last time the score was this high was in November 2007. Design contracts are also at an all-time high, while inquiries are slightly down.

PHOTOGRAPHY: © BLAIR REID

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HOUSE of the Month

A DESIGN/BUILD DWELLING BY STONOROV WORKSHOP ARCHITECTS FITS WELL INTO ITS ADIRONDACK SETTING. **BY SARAH AMELAR**

STONOROV Workshop Architects' (SWA) cabin in the Adirondacks stands alone on a 22-acre site so remote, it's only reachable by boat. On neighboring land, along the wooded shores of this five-mile-long lake, five generations of the client's family have whiled away summers in rustic quarters. For both the owner and her architects, preserving and connecting with this wild landscape was the beauty—but also the great challenge—of building here.

The construction process needed to be extremely light-footed and sustainable, producing a house that would perch gently on the sloped terrain, with minimal impact on its surroundings throughout its lifetime. But before any building materials or components could be ferried across the lake on a small boat or barge and carried 100 feet up a steep hill, everything had to reach the launch spot via a narrow dirt road that's usually impassable from October through May, limiting construction time. Committed to saving as many trees as possible, SWA eschewed heavy construction equipment. Instead, partner Otto Stonorov (with an intern or two) hand-built the 783-square-foot, two-bedroom cabin, using a human-powered chain hoist, in place of a crane, to raise long timbers and wooden trusses onto the structural hemlock frame. (Only the foundations involved a mini-excavator, operated by contractors.) The lumber, including white pine siding and floors, was all locally sourced. A solar array, elsewhere on-site, powers this off-the-grid property, and sustainable filtration provides lake water for home use. Set on stilts, the house hovers above the ground.

For the interior, says SWA partner Tolya Stonorov, "we made almost everything ourselves," including the dining table with benches, the precise finger-jointed kitchen drawers, with cutouts instead of pulls, and anything upholstered. They collaborated with artist Julia Busenitz of Luca Jackson to custom-dye fabrics with natural indigo.

Since the cabin's completion, last summer, its owner has basked in the ever-changing views out, "amidst trees, nature, and whatever the weather brings," she muses, adding, "Lying in bed here, watching stormy nights, morning sun on the calm water, or swaying trees, is pure magic." ■

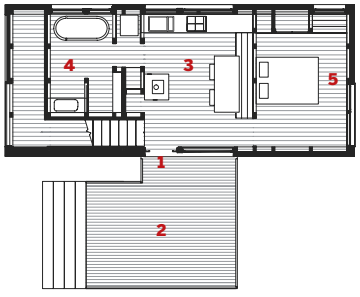




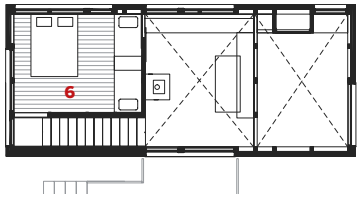




The white pine cabin has a standing-seam metal roof (top). The upper level's built-in bunks (right, above) highlight SWA's carpentry, as does the main room (above and right).



FIRST-FLOOR PLAN



SECOND-FLOOR PLAN

0 10 FT. 3 M.

1 ENTRANCE
2 DECK
3 LIVING/DINING
4 BATHROOM
5 MAIN BEDROOM
6 LOFT BEDROOM

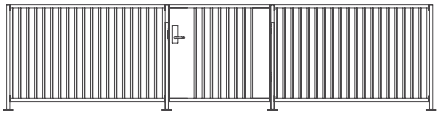
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LANDSCAPE

THE NEW YORK PARK, BY HEATHERWICK STUDIO, MATHEWS NIELSEN, AND ARUP, OPENED MAY 21. **BY JAMES S. RUSSELL, FAIA**

TREES AND SHRUBS undulate like a tousled green crown on a forest of precast-concrete pilings rising out of the Hudson River, which themselves unfurl into interlocking tulip-shaped containers for the landscape within. This eye-catching spectacle is Little Island, an addition to the Hudson River Park in lower Manhattan.

This tiny, 2.4-acre tour de force of design is the brainchild of Heatherwick Studio, known for the artichoke-shaped 150-foot-high *Vessel* at Hudson Yards to the island's north. Thomas Heatherwick worked with Signe Nielsen, of the landscape architecture firm Mathews Nielsen, and with Arup as engineers.

First asked to design a pavilion on a nearby pier in need of renovation, Heatherwick says he asked his clients, the Hudson River Park Trust, and the philanthropist Barry Diller, "Wouldn't you rather be over the river, to imagine that pier with topography?" This shoot-the-moon upselling strategy worked: Diller and his wife, the fashion designer Diane von Furstenberg, agreed to underwrite most of the cost of the park (which ballooned from $130 million in 2015 to $260 million). The couple's family foundation added $120 million to support operations for a period of years.

The crumbling pier was demolished and the Lilliputian park, pulled away from the shoreline, rose. When crossing one of the pair of ramps that connect the island to the riverbank, Heatherwick explains, "Emotionally, you leave Manhattan behind for a micro-portion of the day."

The visitor passes through a portal framed by the concrete piles and arrives in a protected bowl-shaped gathering space, surrounded by a dramatically rumpled topography featuring diminutive bluffs, meadows, and sloping lawns. Serpentine paths (friendly to wheelchairs) invite visitors to amble as they discover hidden nooks and expansive river and city views, all framed by trees.

The folded and shaped landscape hides two performance venues—concerts had been the primary, if poorly suited, purpose of the derelict (now demolished) pier. A thrust-stage amphitheater seating 687 fronts on the river and tucks back-of-house functions beneath surrounding slopes.

Another informal venue, for up to 2,000 people, where a series of summer concerts is planned, feels like a glade hemmed in by hillocks that frame views of Lower Manhattan.

The design team sweated the details of the 132 tulip-shaped pilings, creating the apparent irregularity with just 39 separate formwork elements. Reinforcing steel bars project vertically from each of the pier caps, while horizontal rebar beams are placed and concrete cast over them to form a slab that ties the piling together. Foam-plastic blocks atop the slab were carved to shape the intricate topographic conditions.

In contentious New York, the completed project will provoke skeptics. It's a stunningly expensive bauble—privately commissioned and paid for—that ornaments a wealthy neighborhood already rich with amenities, including the High Line. The project was nearly halted by a snit between Diller and a fellow developer and philanthropist, Douglas Durst.

Desperate to escape their Covid cocoons, locals are already swarming the park, embracing its idiosyncrasy. Much delayed, Little Island could not have arrived at a better time. ■

James S. Russell, FAIA, is a journalist who often focuses on sustainability and resilience.





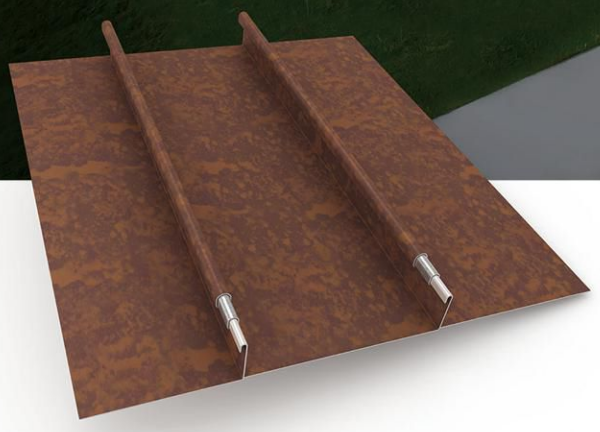
According to Signe Nielsen, the design was inspired by Maine's Acadia National Park, "a coastal landscape of tremendous beauty." She grouped densely planted trees at the east and northern edges of the park to fend off fierce winds.

PHOTOGRAPHY: © TIMOTHY SCHENCK

Rustic Design

With a metal roof in a weathered steel finish





A metal roof in a Weathered Steel finish gives this wildlife refuge visitor center a classic farm-style look reminiscent of agricultural buildings seen at the time of President Roosevelt's visit to this area.

Theodore Roosevelt Visitor Center, Onward, MS Installing Contractor: Central Roofing
Architect: John S. Odom Photo: hortonphotoinc.com

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CLUE: WHEN THE ARCHITECT DESIGNED THIS SHELTER WITH REHABILITATIVE SERVICES FOR THE HOMELESS, HE WAS BEST KNOWN FOR AVANT-GARDE HOUSES. HIS USE OF DOUBLE GLAZING AND AIR COOLING WERE INNOVATIVE, BUT THERE WERE KINKS THAT NEEDED TO BE ADDRESSED. NEVERTHELESS, THE BUILDING STILL STANDS AS A TESTAMENT TO HIS EXPLORATORY IDEAS AND VOCABULARY.



The architect for the Fragrant Hill Hotel outside Beijing was I.M. Pei, who completed the building in 1982. Although known for a strong geometrical formalism, Pei looked for more historically referential motifs in the design of this low-rise structure, whose white walls and gray trim could be found in vernacular architecture.

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The Dematerialization of Architecture

Konrad Wachsmann's Television: Post-architectural Transmissions, *by Mark Wigley. Sternberg Press, distributed by MIT Press, 400 pages, $24.95.*

REVIEWED BY JEAN-LOUIS COHEN



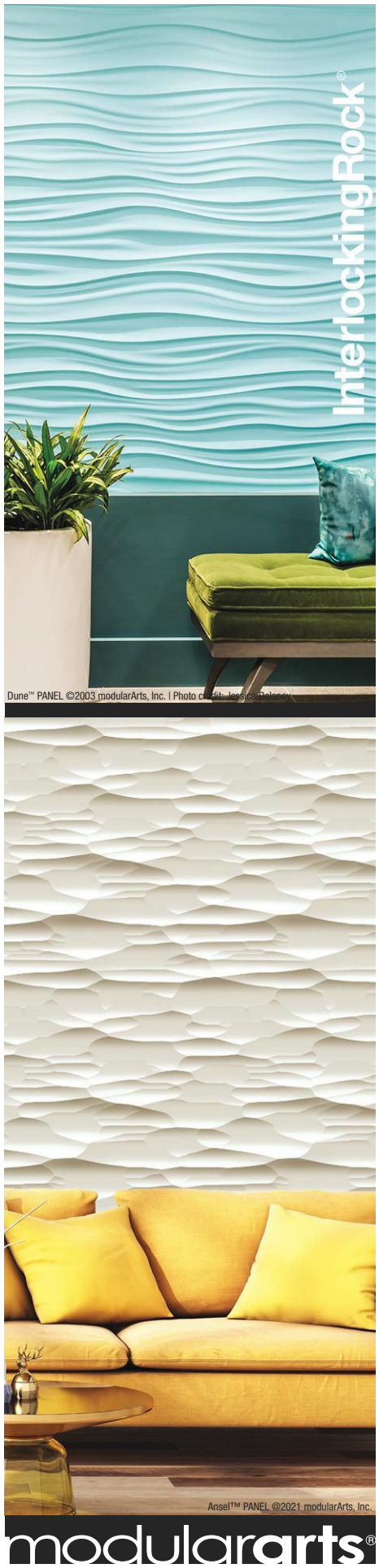
VERY LITTLE survives from the built work of Konrad Wachsmann, who was born in 1901 in Frankfurt an der Oder and died in Los Angeles in 1980. His German beginnings in architecture were in wood construction, as he worked for Christoph & Unmack, a firm engaged in prefabrication, and built Albert Einstein's weekend house in Caputh, Germany, in 1929. During the Second World War, after he emigrated to the U.S., he designed the Packaged House System, consisting of assembled factory-made panels, held together by his extremely ingenious "wedge connector," though the system turned out to be a commercial failure. But several of the modest, boxy houses still dot the Los Angeles landscape.

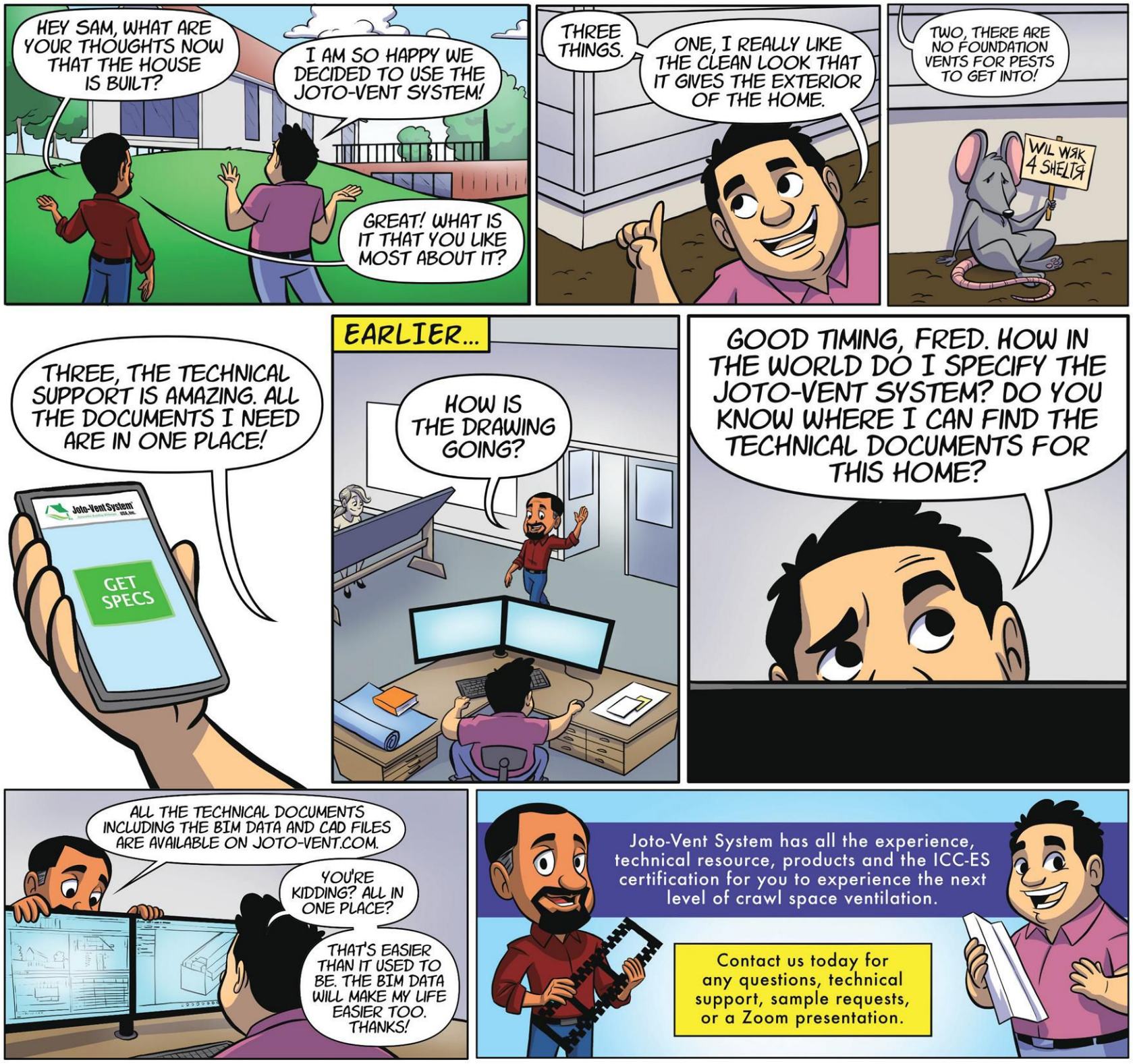
Dropping wood for metal, Wachsmann hit the headlines in 1954 with a giant cantilevered hangar for the U.S. Air Force's strategic bombers. Designed at IIT in dialogue with Mies van der Rohe, it was a forest of tubular trusses joined by other imaginative nodes. Floating high above the ground, this expansive structure became the main attraction of his carefully laid-out book *The Turning Point of Building*, published in 1959 in Germany, a bible for European radical architects beginning with Yona Friedman, and which mesmerized me during my student years in the late 1960s. It assembled a seductive collection of images ranging from the Crystal Palace to Wachsmann's own Mobilar building system. In parallel with the making of this book, he taught seminars from Germany to Austria, Israel, and Japan, where his influence on the young Metabolists was significant.

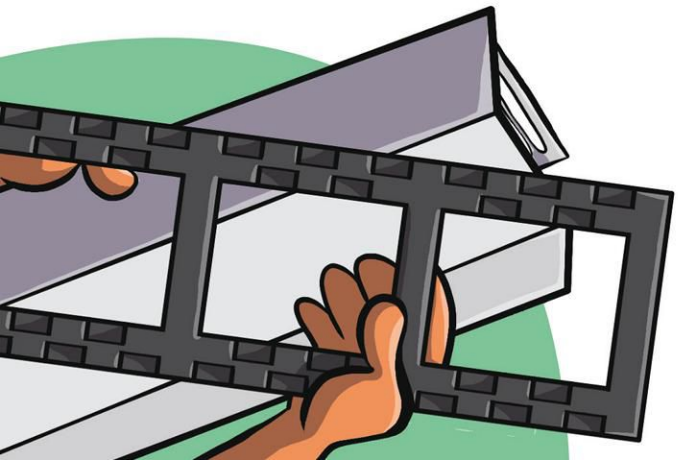
Now Mark Wigley, in his minimalist volume based on discoveries he made in Wachsmann's archive at Berlin's Academy of Fine Arts, discusses the most elusive of the architect's designs—the "Twisting-net." In it, the differentiation between the nodes and the struts of the structure is dissolved, as shown in the Piranesian drawings he produced with his Chicago IIT students and exhibited for decades in a wide range of venues. Attention is also devoted to a vast horizontal cable structure conceived in the 1960s for the Civic Center of California City, a settlement begun in the Mojave Desert by developer Nathan Mendelsohn, which would have largely operated through television.

Wigley's pocket-size book unveils this hitherto repressed face of Wachsmann, who shunned both wood and steel in order to operate in an immaterial world of visual and numeric data. In the early 1970s, television was invested by him with multiple potential virtues, as the vector for an interconnected society. Attracted by screens and computers, Wachsmann imagined new ways of transmitting energy and creating ever more ambitious spatial structures, for instance in his 1974 "Manifest for the Evolution of Assembling the Artificial Human Environment between Time and Space," unearthed by Wigley. Wachsmann explored these ideas at the Division of Building Research he had created at the University of Southern California in 1966 with the blessing of Mies, while conceiving a television series about the environment that would allow citizen participation—and dissent. Wigley's elegant and witty work considers the German-American's research strategy and its reception, precisely inserted in the networks of Cold War modernism—from émigrés to emerging designers and theorists—subtly sculpting the portrait of a man he sees as a "wireless architect, or, more precisely, a post-architect." ■

Jean-Louis Cohen is professor in the history of architecture at the Institute of Fine Arts, NYU, and author of the recent Building a new New World: Amerikanizm in Russian Architecture.







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The Venice Architecture Biennale's Optimistic Vision of the Future

BY TIM ABRAHAMS

VENICE seemed becalmed this year. Like so much of the world, the city was quiet, waiting for life to begin again. In May, during the much-delayed opening of the Architecture Biennale, there were only a handful of tourists, mostly Italians. The 50,000 Venetians who live on the island had their city to themselves, yet an air of melancholy hung on the empty piazzas. Few visitors came to the Biennale: the Dutch curators popped open some bottles of prosecco to celebrate the debut of their pavilion, but that was the limit of the partying. Exhibitors were relieved that at least some people would see their work, although the concern that the audience might remain small for this global architecture event was never far away.

And that would be a huge shame. For while Venice felt adrift in the present, the Biennale itself had a strong sense of either recent history or the need to plan for our future. The best national pavilions displayed a nuanced reflection on recent populist movements, either the socioeconomic version, in which the working class has been pitted against elites, or a more cultural form, which has focused on issues of national identity. The generally liberal, cosmopolitan profession of architecture has often felt at odds with a wider public, and several exhibitions addressed this head-on.

The particularly strong U.S. pavilion represented a genuine attempt at reconciling this polarization. Curated by the architects and professors Paul Andersen and Paul Preissner, it was a triumph on several scales. A four-story hymn to timber construction—an almost Gothic structure built across the front of the 1930 Neoclassical pavilion—provided glorious views across the Giardini, the Biennale's primary site. Inside, Chris Strong's superb photographs captured the construction of timber housing across America.

The pictures convey an often ad hoc building industry, with the potential to be a more developed system (the sad demise of CLT-timber construction firm Katerra notwithstanding). Models made by the curators' University of Illinois at Chicago students, of primary wooden housing types, show a profession eager to learn from the vernacular that has sheltered great swaths of American society in rural and suburban areas, when more modern building systems have not.



The U.S. pavilion is particularly strong, a four-story-high hymn to timber construction.

The Finnish pavilion looked at a similar typology—timber-framed building—but from a different historical perspective, with a rigorous piece of research about the Puutalo Oy, a 20th-century industrial venture for building timber houses. The company was established to deal with the displacement of 420,000 internal refugees who flooded the country from the East, following the Russian annexation of a part of Finland in 1940. Juuso Westerlund's photography of the housing today is full of character, showing that uniform housing doesn't mean uniform living. The Giardini was full of such excellent documentary photography, the key means for exploring forgotten quarters of society, from the immigrant populations of Romania to those who inhabit the Modernist superstructures of the past in Brazil.

The real stars of the show, though, were not the national pavilions but the main exhibition in the Arsenale (the Venetian munitions factory originally built in the 12th century) and the Central Pavilion of the Giardini. Curated by Hashim Sarkis, dean of the School of Architecture and Planning at MIT, these installations, around the theme "How Will We Live Together?"—finely tuned in the extra year the curatorial team were granted due to the Covid delay—consider the future of architecture in a complex yet more hopeful approach than the jaundiced views of the field that we've seen in recent Biennales.

When Vittorio Gregotti became director of the Venice Biennale, in 1976, he instituted for the first time a system whereby the art biennale alternated with the more socially purposeful medium of architecture. His first Architecture Biennale, in 1980, expressed the theme "La presenza del passato" (the Presence of the Past)—and was perhaps the only time the Biennale has transcended the temporary event and entered the narrative of architectural history.

In the just-refurbished Arsenale, he installed a historicist, Postmodern "street," with a string of facades down its length, by Frank Gehry, Rem Koolhaas, Hans Hollein, and Ricardo Bofill, among many others— a stunning work that is impossible to avoid

PHOTOGRAPHY: © IWAN BAAN





In the Arsenale, Modem installed spacesuit gloves (left), while Aires Mateus made incisions into an elongated grid on the floor (below, left).

PHOTOGRAPHY: © MODEM (TOP); AIRES MATEUS (BOTTOM)

when discussing the theatrical quality of Postmodern architecture. In a profound irony, "La presenza del passato" has dogged the curation of subsequent Architecture Biennales, encouraging curators to formulate new movements when none exist. Historical context has been used to create a comforting idea of a shared professional language, rather than addressing the real issue: where exactly should architecture sit within our society now and in a better future?

Sarkis has bravely focused on architecture's real place in our shared culture. The show opens with a series of delicately lit spacesuit gloves, presented by the California-based practice Modem, which speak of an intimate architecture and convey both human ingenuity and our fragility in a hostile environment. Then, a bust of Nefertiti made of honeycomb by the Slovakian designer Thomas Libertiny, in collaboration with several thousand bees, shows how our sense of our humanity is shifting as our ideas about nature change. Our identities are in a state of flux, which Sarkis suggests is caused by technological innovations rather than by the rise of a new kind of politics. While this may be debatable, he ingeniously foregrounds the potential of a communal architecture to come. If our sense of self is malleable, are we not more open to others and hence to new ways of living?

In 1966, the British architect Cedric Price asked, "Technology is the answer, but what was the question?" The question could have been a provocation for Sarkis as he concentrates on technology as a means for problem-solving and offers architecture as both a haven from and a platform for it. It is perhaps not surprising that the MIT architecture dean is unafraid of exploring the emerging aesthetic of these new environments. Some of the results in the Biennale are unsuccessful: EcoloLogicStudio's air-purifying and diet-supplementing algae-farming system looks like a series of shower curtains embedded with snot. Yet, nearby in the exhibition, films by Gramazio Kohler show how two buildings at the Swiss Federal Laboratories for Materials Science and Technology was built both for and by robots. The films, informed by the hypnotic, unceasing rhythm of robotic construction, possess a strange mundane lyricism and give the unsettling impression that the future is already upon us.

Even the more conventional architecture that Sarkis exhibits—of which there is actually plenty—operates as simple social technology. One modest piece is a film about Farshid Moussavi's mixed-use project in Nanterre, near Paris, which includes private apartments, student lodging, and commercial and public spaces. Apartments are arranged in pairs, so they are accessed vertically with elevators and stairs. Inhabitants can choose privacy or meet with neighbors, share space or not. The communal component in Aires Mateus's work is the very ground into which its work is often dug and the design of a building begins. The piece that the Portuguese office created here is gouged into the floor of the Arsenale—a series of varied incisions, beautifully lit, into an elongated grid. These sophisticated symbols also look like the geoglyphs of the Atacama Desert, suggesting a developed cosmology and possibly an extraterrestrial audience.

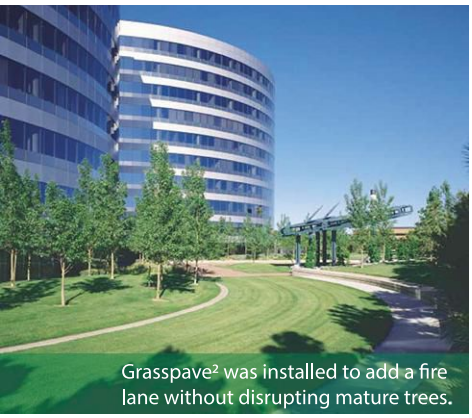
While the tenor of the show is hopeful, Sarkis has not entirely avoided the alarming prognosis of many environmentalists, but he has sensibly grouped such projects in the Central Pavilion in the Giardini, apart from the more optimistic projects in the Arsenale. These stand alongside proposals that consider humanity from a global perspective but don't have imminent demise as the end point. If imagining an environmental apocalypse in the near future is a feature of contemporary culture, the logic of Sarkis's exhibition suggests it is just one aspect of a developing global consciousness. DESIGN EARTH's *The Planet After Geoengineering*, which takes total disaster as a given, sits next to more upbeat visions, such as Richard Weller's proposal for a global park from the perspective of Apollo 11.

Trapped as we are, like Venice, in an endless present, Sarkis's beguiling message of hope is prescient in a way he could never have intended when he was named this edition's curator in late 2018. We need a vibrant future now more than ever. Yet there is a profound irony that a wide international audience may be deprived of seeing it. ■

Tim Abrahams is a U.K.-based critic.

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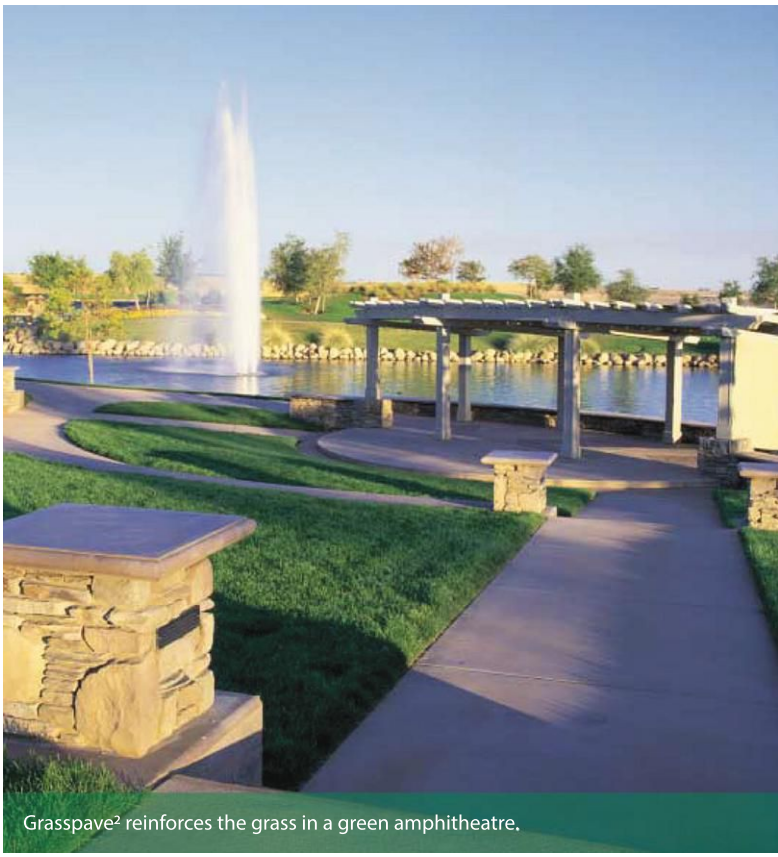
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Built for Girl Power

Marlene Imirzian's campus for the Girl Scouts at the edge of Phoenix preserves a fragile desert ecosystem.

BY JENNIFER KRICHELS

MARLENE IMIRZIAN unknowingly started down the path to designing the Bob and Renee Parsons Leadership Center for Girls and Women decades ago, when she was just a young Girl Scout. True to that organization's motto, when Imirzian was being considered to design a new scout camp south of downtown Phoenix, she was prepared. "I wore my sash to my interview," she says of the part of the uniform on which Girl Scouts display their badges and awards. She also brought her knowledge of sustainable building and, in 2010, her firm was hired to create a master plan for the 14.5-acre campus at the edge of South Mountain Park. The Girl Scouts had owned the property since the 1920s, using it as a camp, but, with outdated structures and paved areas dotting the land, it was time to look toward the future.

"The vision was for an urban program center with camp appeal," says Imirzian, whose firm has offices in Phoenix and Escondido, California. The master plan would help connect the center's buildings with its Sonoran Desert landscape while capturing views of South Mountain and the city's skyline. Parts of the property had been disturbed by off-road vehicles, and water-flow studies indicated a large arroyo snaking down from the mountain to the site's northwest corner. What might seem like challenges became for Imirzian—collaborating with landscape architect Chris Winters and civil engineer Leslie Kland—the guiding principles to determine where to place new structures and how to restore the desert vegetation throughout the camp.





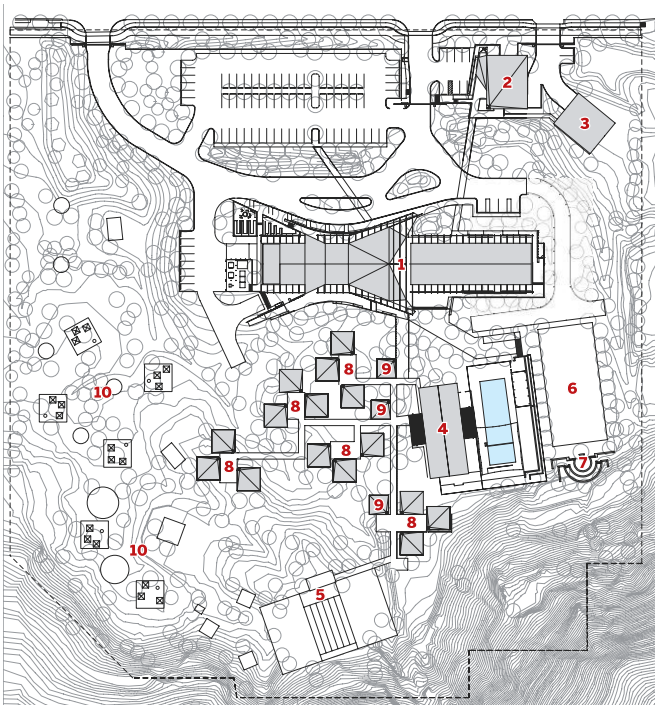
THE COMPLEX includes a main Leadership Center building (opposite) and cabins, among other facilities, on a Sonoran Desert site with views of downtown (above, right).

PHOTOGRAPHY: © TIMMERMAN PHOTOGRAPHY

"The Girl Scout mission is to work toward community improvement, so the opportunity of the site was a demonstration of sustainable building in the desert," says Imirzian. Now the camp's 15 cabins, each with 10 beds, are clustered in groups of three and float above the land, allowing water, plants, and animals to occupy the desert beneath. Circulation decks are raised, too, so scouts don't tread on the delicate desert floor as they walk from their cabins to the communal leadership center. Outside each three-cabin cluster, the walkway widens as space for impromptu gatherings. The elevated platform was also crucial to the Scouts' mission of universal access. "Everything is on one path, even if you are in a wheelchair," says Imirzian.

To reduce project costs, each structure is identical, but Imirzian used the site's north-to-south upward incline and slightly rotated each cluster to give the cabins a varied appearance. Their sloped roofs each have a diagonal fold, angled to direct water to the lowest corner. From there, a rain leader clad in a perforated screen of galvanized steel directs its flow to a basin in the ground that distributes water to nearby plants—a feature key to managing the heavy rains that can fall in the desert, especially from June through September.

The Leadership Center's main building also reflects a scouting ethos, by being open to a nearby neighborhood. Its multipurpose



SITE PLAN

1 LEADERSHIP CENTER
2 VOLUNTEER CENTER
3 EXISTING MAINTENANCE BUILDING
4 EXISITING POOL HOUSE
5 ARCHERY RANGE
6 PLAY FIELD
7 AMPHITHEATER
8 RESIDENTIAL CABINS
9 ACTIVITY CABINS
10 CAMPGROUNDS



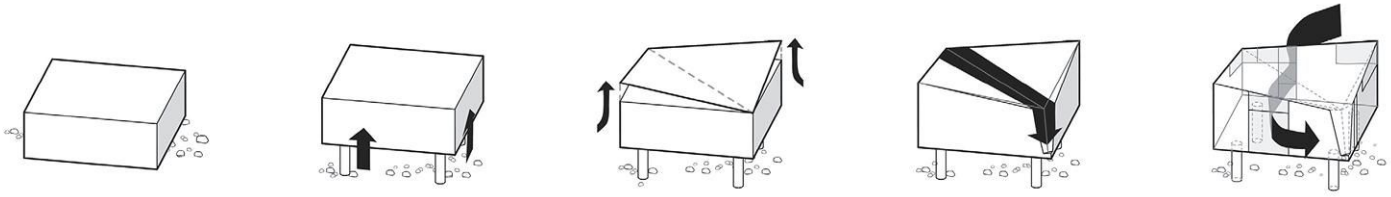




THE CABINS, for activities (above, left) and sleeping, are elevated above the desert floor (above), as is a walkway connecting them (left).

hall, seating up to 400 people, can host Council functions as well as larger community events. In this spot, the desert prevails, with native plantings continuing on either side of the building's glass walls. Imirzian was inspired by the idea of a tent structure when designing the roof, with a steel spine and ribs that maintain views from nearby mountain trails while concealing mechanical equipment. Its shape ensures that direct sunlight never enters the interior, and it extends over the surrounding exterior walkways. The entrance is wrapped in a translucent green "sash" of architectural resin, representing the Girl Scouts uniform and the green campus that sustains both the desert and the community around it. ■

Jennifer Krichels writes about architecture and design and is managing editor of AIA New York's Oculus *magazine.*



CABIN CONCEPT DIAGRAM

PHOTOGRAPHY: © TIMMERMAN PHOTOGRAPHY (TOP, LEFT); MARLENE IMIRZIAN & ASSOCIATES

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Outward Bound

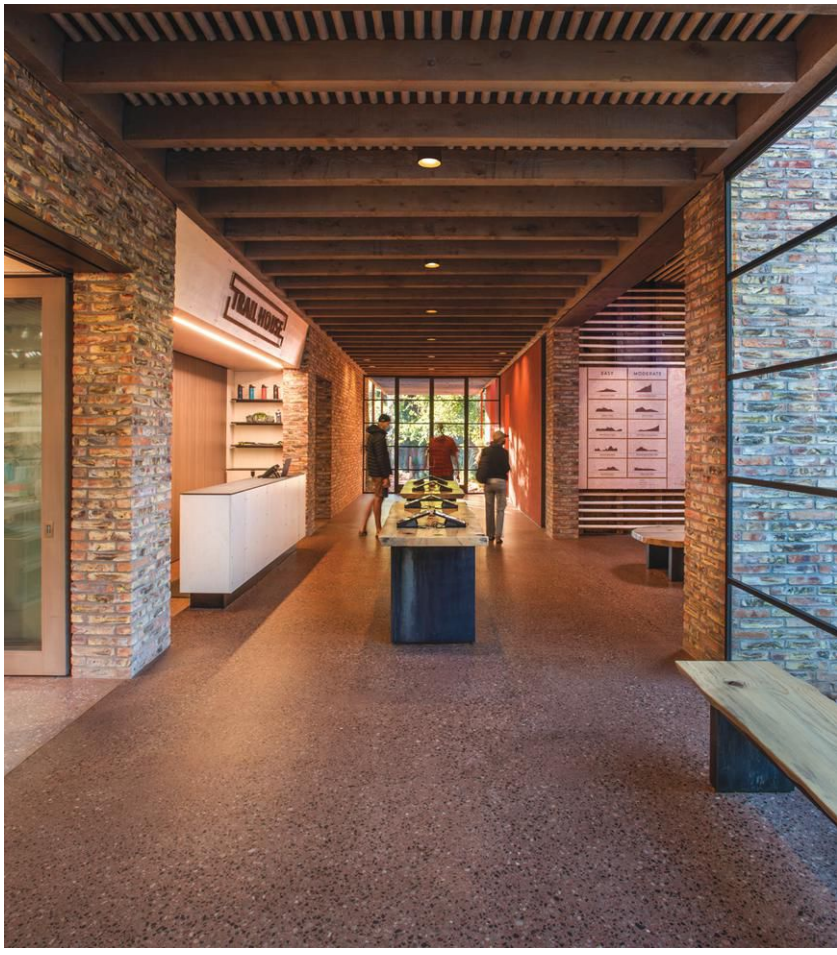
Gluckman Tang Architects returns to Enchantment Resort with a project called Trail House, which transforms the recreation spot into a campus that embraces the Arizona landscape.

BY DAVID SOKOL
PHOTOGRAPHY BY MATT WINQUIST

MAYBE BECAUSE it originated as a tennis ranch when it opened in 1987, or maybe because it already ranks among the best travel destinations in the United States, the owners of Enchantment Resort were not sure that their Sedona, Arizona, campus needed to cater to nature seekers too when they tapped Gluckman Tang Architects in 2018 to design a trailhead building. Though the resort's longtime trail guides were beloved by guests, "There was a perception that hikers and mountain bikers preferred camping over hotels," recalls firm partner Dana Tang. But after completing the programming and design of the new 4,000-square-foot Trail House, there was unexpected demand for adventure tourism.

Gluckman Tang had added on to the Enchantment campus once before, building a spa facility (RECORD, May 2001), which the firm is now modernizing. With both expansions, Tang says, "we embraced



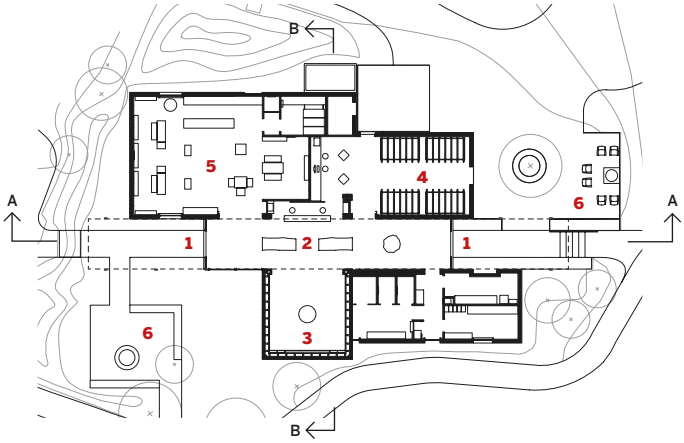




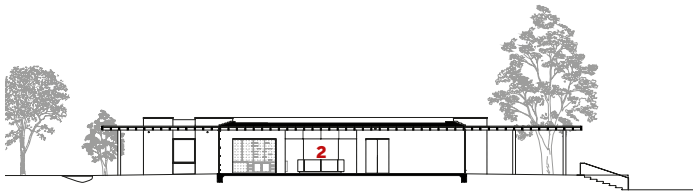
A SEATING AREA (above) mimics the building's plan. The main corridor (top, right) reflects the materiality of the exterior. In the Map Room (bottom, right), *latillas* soften sunshine through a skylight.

materials that were already there and then used them in a more modern way." For the Trail House, an asymmetrical pair of L-shaped volumes that slide along a wide north–south corridor, the New York–based architects avoided the red sandstone that is synonymous with Sedona, instead employing red stucco and adobe brick for the exterior of the wood-frame structure, which rises above foundation walls, footings, and on-grade slabs all formed in concrete. The vertical surfaces meet at a weathering-steel slot, which functions as a scupper during the summertime monsoon season.

The building's interior corridor merges with outdoor paths that connect to the surrounding trail system; bicyclists and hikers could ostensibly journey through Trail House without giving the enclosure much thought, and the design team leaned into that possibility.



FLOOR PLAN



SECTION A - A



SECTION B - B

1 ENTRANCE
2 HALL/CONCIERGE
3 MAP ROOM
4 BIKE SHOP
5 RETAIL
6 FIREPIT



A TRELLIS comprising weathering-steel columns, western red cedar, and *latillas* extends from the southern entrance of Trail House. Resort guests interact with bike-room attendants through a Dutch door.

Gluckman Tang covered the north and south entrances of Trail House with trellises in which *latillas* (peeled pine logs) sit within cedar frameworks on weathering-steel columns. Inside the building, the circulation spine is topped in cedar beams cradling *latillas* once again. Pigmented concrete floors, adobe brick, and red stucco further blur interior and exterior.

To complement Enchantment's heightened focus on activity, Gluckman Tang designed a full-service bike shop, in Trail House's southeast quadrant, to the specifications of the resort's "bike chief," George Miraval. The architects left staple trusses exposed to underscore the room's utilitarian character and clad most of the remaining surfaces in pegboard and plywood, which are both functional and hard-wearing. (The plywood reappears in an adjacent retail shop.) For added efficiency, the southernmost perimeter wall includes a Dutch door, so that bikers can interact with Miraval and his colleagues without rolling through the building.

Considering how some users may never enter Trail House, Tang reflects, "You're just meeting here and traveling through, yet we wanted the building to have some significance as a place." The design team came up with the Map Room, a skylit gallery catty-corner from the bike and retail spaces, which showcases the region's natural and indigenous histories as well as cork maps that pop in and out of the wall. This sophisticated exhibition space not only celebrates the very reason for Trail House's being but also hedges Enchantment's investment in adventure. Not that guests are averse to seeing Sedona's famous red rocks up close: Tang reports that Trail House has been immensely popular since its inception, among passionate outdoorspeople and city slickers alike. ■

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Cold Comfort

A correctional facility in Greenland takes a gentle approach to incarceration while engaging the rugged landscape.

BY CLIFFORD A. PEARSON
PHOTOGRAPHY BY ADAM MØRK



WHILE the American criminal-justice system focuses on detention and punishment—with the largest prison population in the world—Scandinavian countries take a vastly different approach. Denmark's prison system, for example, emphasizes the "good release." From the start of a sentence, the state is preparing a convicted person to return to society, equipped with new job and life skills, and perhaps a school degree. To that end, the Danish Prison and Probation Service (DPPS) operates its facilities on a set of principles that includes "normalization, openness, responsibility, and . . . the least possible intervention." Prison routine is designed to be as close to "normal" life as possible, with inmates doing their own laundry, shopping for food at a prison grocery store, and preparing their own meals. They are encouraged to take responsibility for their actions and manage their lives.

Anstalten, a new prison in Greenland, designed by Schmidt Hammer Lassen (SHL)—which was acquired by Perkins&Will in 2018—and Friis & Moltke, embodies the Danish method of incarceration, while engaging the rugged landscape of its site three miles outside Nuuk, the capital of Greenland. The project is part of a larger program by the Danish government to upgrade health and human services in Greenland, an autonomous dependent territory of Denmark with a largely Inuit population among its 56,000 inhabitants, who have their own social practices. "We designed Anstalten as a village of buildings to mimic local communities," says Jette Birkestov Mogensen, an associate partner at SHL. The buildings climb a rocky slope overlooking Nuup Kangerlua, a fjord 165 miles south of the Arctic Circle.

"Greenland has its own culture, and we tried to respect that with Anstalten," explains Tina Engelbrecht Ising, head of the resocialization division at the DPPS. Since nature is an important part of that culture, the architects engaged the prison as much as possible with the outdoors, orienting windows to views and even designing one building to bridge a small stream and allow water to run underneath it.

The 86,000-square-foot prison, comprising poured-concrete structures clad in many places with weathering-steel panels, accommodates 76 prisoners (both men and women) in five residential blocks, and provides workshops for learning employment skills, a library, a health center, and facilities for education and recreation. Most of Anstalten (which means "establishment" or "institution" in Danish) sits behind a perimeter wall and houses maximum-, medium-, and minimum-security prisoners. A few buildings outside the wall are for staff and for prisoners close to release, many of whom work or go to school in town and return in the evening.

Most inmates live in 130-square-foot rooms with their own bathroom, bed, and desk, like a nice college dorm "single" in the U.S. The units are in clusters of four to eight, with shared living/dining/cooking space. In addition to video surveillance in all communal areas, an observation room adjacent to each cluster provides views into the cluster's common rooms. But the staff spend most of their time in those communal spaces with the prisoners and act more as counselors than guards, says Engelbrecht. Instead of bars on the windows, high-strength laminated glass provides security. Prisoners can close curtains on their own windows and even lock their



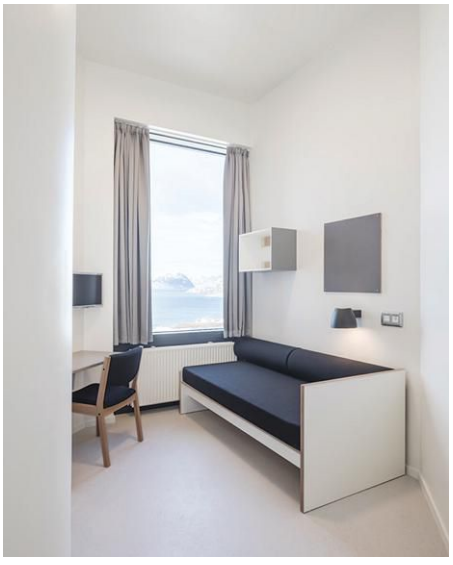
THE BUILDINGS offer prisoners a connection to the strikingly beautiful setting (this photo and below). The housing units each have access to an outdoor space, here an enclosed terrace (right).











THREE local artists, Julie Edel Hardenberg, Miki Jakobsen, and Aka Høegh, created site-specific works, some in the daylit chapel (top) and gym (above). Individual rooms have views (above, right).

doors from the inside, though staff can open any space, if needed. Windows in residential rooms are angled to catch views outdoors, but also to provide privacy from other rooms. "By respecting inmates' privacy, you encourage them to act responsibly and as part of a community," says Mogensen.

The prison encourages families to visit—providing a playground and accommodations for overnight stays. Before Anstalten, most Greenlanders served their time in Denmark, which made visits difficult and expensive.

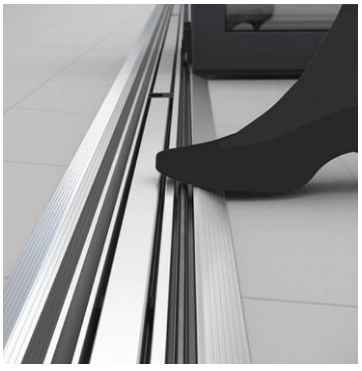
SHL has a long history of building in Greenland, starting with the Katuaq Cultural Centre in Nuuk, which opened in 1997. But Anstalten is the firm's first correctional facility. Perkins&Will has a policy of not designing prisons, says Rachel Rose, associate principal and director of communication, because they don't reflect the firm's values and "commitment to upholding "the broader goals of society." When Perkins&Will acquired SHL, the Danish firm was already working on Anstalten. "When we reviewed SHL's portfolio prior to the acquisition, we were impressed with the client's vision for humane rehabilitation rather than punishment, which is markedly different from the standard U.S. approach to incarceration," explains Rose.

In recent years, though, some politicians in Denmark have pushed for tougher policies, says Engelbrecht, as gangs have become more aggressive and public perceptions of crime have shifted. In the U.S., the pendulum may be moving in the opposite direction, with the passage in 2018 of the First Step Act, which shortens mandatory minimum sentences in the federal system for nonviolent drug offenses and requires federal prisons to offer programs to reduce recidivism. But American prisons would have a long way to go before their conditions could begin to compare favorably with those in Scandinavia. ■

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2021 Record Products of the Year

The editors of *Architectural Record* are currently inviting submissions for the 2021 Products of the Year Awards, which salute the best building materials and furnishings introduced to the U.S. market within the last year (no earlier than August 15, 2020).

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 2021 issue of RECORD.

DEADLINE TO ENTER:
WEDNESDAY, AUGUST 18

Enter online:
architecturalrecord.com/call4entries

Pictured: A selection of 2020 Record Products of the Year (RECORD, December 2020)

CE CENTER PODCASTS

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In Treatment

Besides hygiene and cleanability, holistic concepts of wellness dominate new health-care products.

BY SHEILA KIM



PD97PT

This advanced version of INOX's PD97 sliding-door hardware was designed with health care and other high-security facilities in mind. The electric mortise lock—which auto-latches and locks as soon as the door closes—is powered directly through the door strike, making it easier to install and retrofit.
unisonhardware.com



Wellness Collection

Drawing on biophilic design, this Wilsonart laminate collection features eight motifs and palettes reminiscent of nature that can have calming effects. Coastal Dots (shown), for one, positions dots of ocean-evoking dusty-blue shades against a white background. Other visuals include wood patterns and misty mountain landscapes.
wilsonart.com



CSelect Cubicle Curtain Fabric

While Construction Specialties has already been producing health-care curtain tracks, it's only now that the brand has launched its own curtain-textile line. Available in four stitch-detail patterns, the fabrics come in six calming, nature-inspired palettes. Optional Nanotex treatment further protects against microorganisms.
c-sgroup.com

Legato Collection

Mannington Commercial's Legato liquid linoleum is poured in place for a truly seamless floor, eliminating cracks where bacteria can form and thus aiding in infection control. VOC-, PVC-, and Declare Red List–free, it's offered in a choice of 54 colors that range from neutral to vibrant tones.
manningtoncommercial.com





Evermoin

This new Staron ultrahygienic solid-surfacing material is well suited to a range of interior applications—from countertops to casework—in high-traffic areas. Evermoin has passed industry tests, such as the ISO 846 antifungal test, to prove effectiveness in inhibiting bacterial growth. It is available in two finishes.
staron.com

Up in the Air

These latest ventilation products are providing more than just occupant comfort.

BY SHEILA KIM

Haiku Uplight

Big Ass Fans has added uplighting to its popular Haiku smart fan—preserving its sleek silhouette by integrating the dimmable-LED source into the hardware above the blades. Like the original Haiku, the new fan is offered in three diameters and with bamboo or aluminum airfoils.
bigassfans.com





HZ700MD Louver

Developed to meet Miami-Dade qualifications for extreme weather, this Ruskin building louver features a horizontal front cover that conceals a vertical rear louver, providing an aesthetically pleasing horizontal-blade appearance with the performance of the vertical-blade system critical for coastal areas. It has a total depth of 7".
ruskin.com



Thermaround Metal Clad Ductwork

Thermaduct has expanded its pre-insulated duct system with a metal-clad version that features an R12 insulation value, is usable indoors and out, and reduces air-leakage rates. Meant to become a part of the architectural design, it's offered in 36 Kynar color finishes.
thermaduct.com



MESP Air Sterilizing Purifiers

AirQuality Technology (AQT) has launched a line of commercial air purifiers featuring non-ozone-generating washable filters and the manufacturer's MESP technology, which is third-party verified to eliminate 99% of pollutants ranging from bacteria to pollen and other allergens.
en.airquality.com



TE Series

This ceiling-mounted humidifier from Condair is a self-contained system that directly humidifies spaces without water recirculation. Well suited to smaller commercial projects such as offices and classrooms, it utilizes evaporative polyester media to reduce energy use by up to 95%.
condair.com



AMERICAN FRAMING

Pavilion of the United States at the 17th International Architecture Exhibition – la Biennale di Venezia, May 22–November 21, 2021

Paul Andersen, Ania Jaworska, Thomas Kelley, Carrie Norman, Paul Preissner, Daniel Shea, and Chris Strong, with UIC School of Architecture students Emory Alba, Kassandra Alvarez, Alondra Ayala, Hannah Bernas, Kenda Blanks, Sama Jafarnejad Chaghoshi, M. Lorenze Cordova, Luna Vital Gallego, Nathan Gawlinski, Ronald Hall, Esau Hernandez, Summer Hofford, Andrew Hunt, Andrew Huss, Jeffri Jacobe, Colin Jecha, Nash Kennedy, Tina Kracke, Riley Kyrouac, Sohui Lee, Rizna Rafi Maalouf, Shamsedin Mokhber, Courtney Moushi, Martin Murungi, Kayla Oliver, Yamileth Ovalle, Jacob Patnode, Sam Piombino, Meghan Quigley, Mallory Rabeneck, Ricardo Sandoval, Jocelyn Schneider, Cody Schueller, Martina Smith, Lia Thompson, Julia Turner, Giselle Valle Figueroa, Andreina Yepez, and Roya Zanjani

Made possible by the Bureau of Educational and Cultural Affairs (ECA) of the U.S. Department of State, the National Endowment for the Arts, and the University of Illinois at Chicago

www.americanframing.org

Image: Al Palmer, photographer. *War housing in Erie, Pennsylvania*, 1941. Courtesy Library of Congress



Treasure Chest

The Jingdezhen Imperial Kiln Museum by Studio Zhu-Pei celebrates a Chinese craft and tradition.

BY ARIC CHEN
PHOTOGRAPHY BY SCHRANIMAGE

STRADDLING the Chang River in an area once replete with kaolin, the long-secret critical ingredient of porcelain, Jingdezhen—in the land-locked Chinese province of Jiangxi—has been China's center for creating the exquisite translucent ceramic for well over a millennium.

Completed last year, but only recently installed with excavated artifacts and fully opened to the public, architect Zhu Pei's Imperial Kiln Museum marks this legacy on the site of the city's former kilns from the Ming dynasty (1368–1644). Here the finest enamel-glazed and, especially, blue-and-white vessels were produced for the imperial household and for

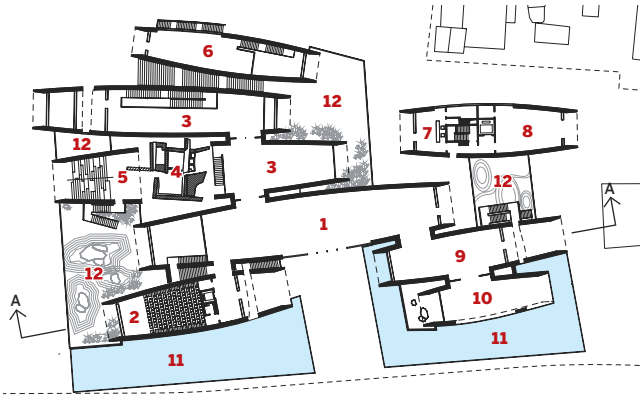
A VIEW through the brick vaults of the Imperial Kiln Museum looks toward a reflecting pool.



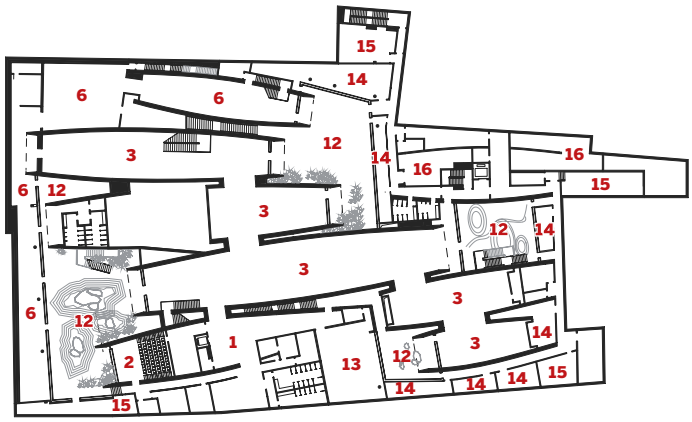
export during one of the heights of the art in China. "It's a place of historic significance," the Beijing-based architect says.

The museum—among the most photographed new buildings in China at the moment—is significant in its own right. Anchoring a historic park, adjacent to pleasantly restored alleyways and buildings from the Qing dynasty (1644–1911) through the Republican era (1912–49), as well as the Mao years (1949–76) and after, it is a striking composition of eight attenuated brick vaults, of varying lengths, curvatures, and heights up to 26 feet, all set slightly askew.

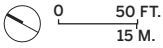
The low-slung complex is half-sunken below grade and seems to float on a reflecting pool that spans its entrance. Connected by parabolic passageways, hollowed court-

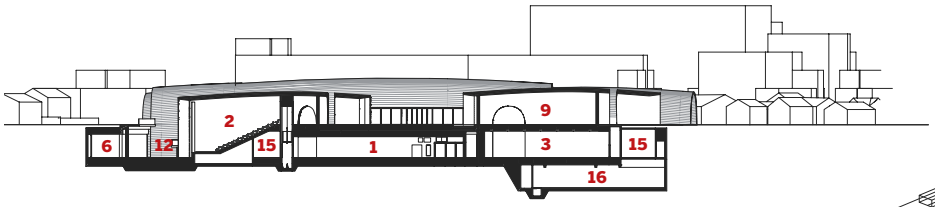


GROUND-FLOOR PLAN

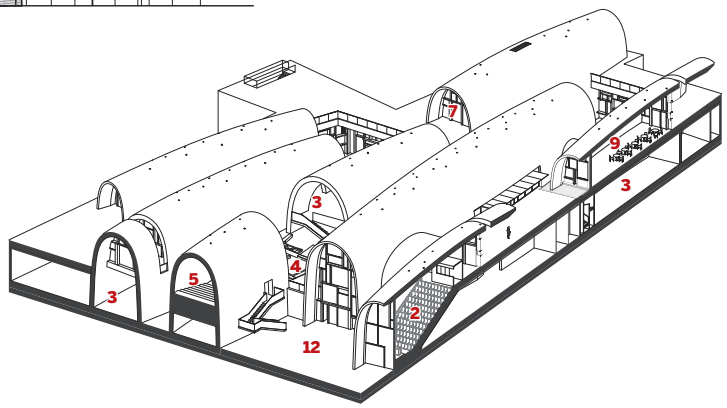


LOWER-LEVEL PLAN





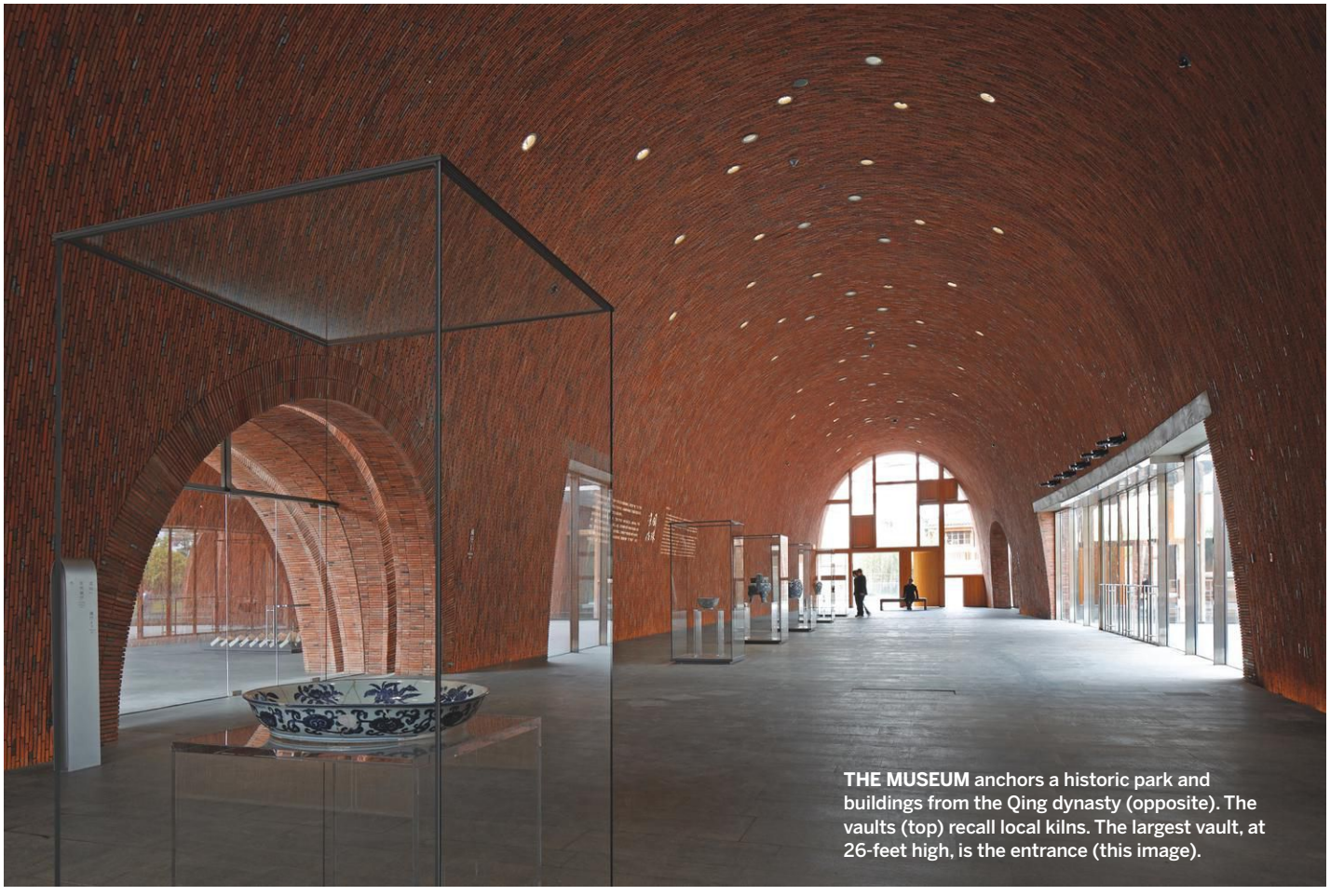
SECTION A - A



AXONOMETRIC DIAGRAM

1 FOYER
2 AUDITORIUM
3 PERMANENT EXHIBITIONS
4 RUINS
5 AMPHITHEATER
6 CHANGING EXHIBITIONS
7 OFFICE
8 LOADING DOCK
9 BOOKSTORE/CAFÉ
10 TEAROOM
11 REFLECTING POOL
12 SUNKEN COURTYARD
13 MULTIFUNCTION HALL
14 RESTORATION ROOM
15 MECHANICALS
16 STORAGE





THE MUSEUM anchors a historic park and buildings from the Qing dynasty (opposite). The vaults (top) recall local kilns. The largest vault, at 26-feet high, is the entrance (this image).



DAYLIGHT washes through glazing and small cylindrical skylights (left). Vitrines (opposite, top) display artifacts from the Ming-dynasty kiln site. Double-height spaces connect areas above and below grade (opposite, bottom).

yards and impeccably composed views, its gracefully bulging structures house galleries, indoor and outdoor auditoria, a semi-enclosed café designed to capture breezes off the reflecting pool, and other facilities where one winds through, in, out, up, and down the quietly soaring spaces. With their glazed or open ends, cylindrical skylights and gaps and reveals, the vaults are washed in natural daylight: "This is an open building—open to the city, to people, nature, and the elements," says Zhu.

The vaults themselves recall the cavernous forms of Jingdezhen's masonry kilns. Though structurally supported by reinforced concrete, due to seismic regulations, they are clad in both new and salvaged bricks—the latter appropriated from actual kilns, whose changes in thermal properties over time require them to be rebuilt every few years, in cycles that have been repeated over centuries. Zhu points out that Jingdezhen can claim a historical continuity unlike other Chinese cities—which rose and fell with dynastic fortunes—and, for him, this project "had to be rooted in that," he says.

Zhu skillfully incorporated one of the two major archaeological remains discovered during construction by bisecting one vault to create an open-air gap for revealing the excavation, while turning the ends into a viewing platform and small amphitheater. (The other ruins were at the site's border and required relatively minor design adjustments.)

But more fundamental is how the architect's integration of the site extends beyond the site itself. In addition to recalling Jingdezhen's traditional kilns, the museum's vaults were designed to act as wind tunnels. Oriented roughly north–south to capture the predominant breezes during the city's hot summers, they also provide shading, while five sunken courtyards were designed to create a heat-dissipating chimney effect.

Meanwhile, during his research, Zhu noticed how Jingdezhen's active kilns, scattered today throughout the city, have become sites for social and other facets of worker life. This prompted him to make the museum as porous as possible, its spatial negotiation of indoors and outdoors creating areas for gathering that are interspersed within, rather than separate from, the whole. "For me, the root of the project was not just in its physical materi-

als or architectural metaphor," Zhu says. "I really wanted to go deeper and integrate the project into the local climate and culture."

Indeed, the museum marks a turning point for Zhu. One of China's most prominent architects, he was among the country's earliest post-Mao private practitioners—a role only possible since the 1990s—first gaining widespread attention with his microchip-inspired digital command center for the 2008 Beijing Summer Olympics (RECORD, July 2008).

In the ensuing years, Zhu's work—from his UFO-like OCT Design Museum in Shenzhen to the faceted interventions of his industrially repurposed Minsheng Contemporary Art Museum in Beijing (RECORD, February 2016)—seemed to track the panoply of slick architectural styles unleashed by China's building boom. But by the early 2010s, Zhu entered a period of architectural soul-searching (to which I was witness), when he ac-









SUNKEN courtyards (left) create a heat-dissipating chimney effect. One vault was split to accommodate an excavation (bottom). Gaps between vaults admit daylight (opposite).

cepted fewer projects, took on more teaching, and began to rethink his architectural approach.

Commissioned in 2016, the Jingdezhen museum represents a new phase in his work, which he has further developed with projects like his Yang Liping Performing Arts Center (being built in Yunnan province, with an undulating timber canopy) and the abstracted courtyards of his Shou County Culture and Art Center in Anhui province.

"Before, we thought innovation meant meeting 'international standards,'" Zhu says. "But I tried to rediscover deeper roots, like climate and culture, that draw on a lot of the intelligence in Chinese philosophy that we had forgotten."

In this sense, Zhu is hardly alone. Across China, architects are building projects that aim to recover this lost intelligence, marking a new chapter, not just for Zhu but perhaps for Chinese architecture in general. ■

Aric Chen is the general and artistic director of Het Nieuwe Instituut in Rotterdam. For the past 13 years, he was a writer and curator based in China.

Credits

ARCHITECT: Studio Zhu-Pei — Zhu Pei, principal

ENGINEER: Architectural Design and Research Institute of Tsinghua University (structural, green building, m/e/p)

GENERAL CONTRACTOR: China Construction First Group Corporation; Huajiang Construction

CONSULTANTS: Zhou Rong, Wang Mingxian, Li Xiangning (art); ClickNetherfield (showcases); Shenzhen Dadi Facade Technology (facade); Ning Field Lighting Design (lighting); Building Science & Technology Institute, Zhejiang University (acoustic)

CLIENT: Jingdezhen Municipal Bureau of Culture Radio Television Press Publication and Tourism; Jingdezhen Ceramic Culture Tourism Group

SIZE: 34,000 square feet

COST: $3 million

COMPLETION DATE: March 2020

Sources

MASONRY: KOTAO

FURNISHINGS: Beijing Juncheung Trade; Figueras International Seating; Kvadrat

ELEVATORS: TK Elevator

LIGHTING: WAC



In the Round

Tadao Ando and a team of French architects turn the cylindrical La Bourse, the onetime commodities exchange of Paris, into a whorling new museum.

BY ANDREW AYERS

THIS IS NOT the first time that French billionaire François Pinault has called on the services of Tadao Ando. Twenty years ago, when the luxury-goods mogul was initially seeking to display his fabled collection of contemporary art in Paris, he had the Pritzker Prize winner design him a brand new museum on Boulogne-Billancourt's Île Seguin, erstwhile site of the original Renault car factory. But after that project foundered on the rocks of bureaucratic sluggishness, Pinault turned his attention to Venice, where he commissioned Ando to convert the Palazzo Grassi and the Punta della Dogana into galleries. Now the tycoon has finally come home to roost with a new conversion project, bang in the French capital's heart: the former Bourse de Commerce (commodities exchange), strategically located between the Louvre and the Centre Pompidou.

Pinault has a reputation for loyalty to trusted collaborators, and so it was that he commissioned Ando to design his new museum. But, since the Japanese architect is not qualified to practice in France, Pinault asked him to partner with young local firm NeM—Lucie Niney and Thibault Marca—who had previously worked for Pinault in Lens, France, where they realized a small artists-in-residence structure. Two more practices were hired for the job: the group setec bâtiment, a master in complex projects of this sort (its back catalogue includes the Fondation Louis Vuitton), who acted as team coordinator and architect of record, and heritage specialist Pierre-Antoine Gatier, since La Bourse is an important historic monument.

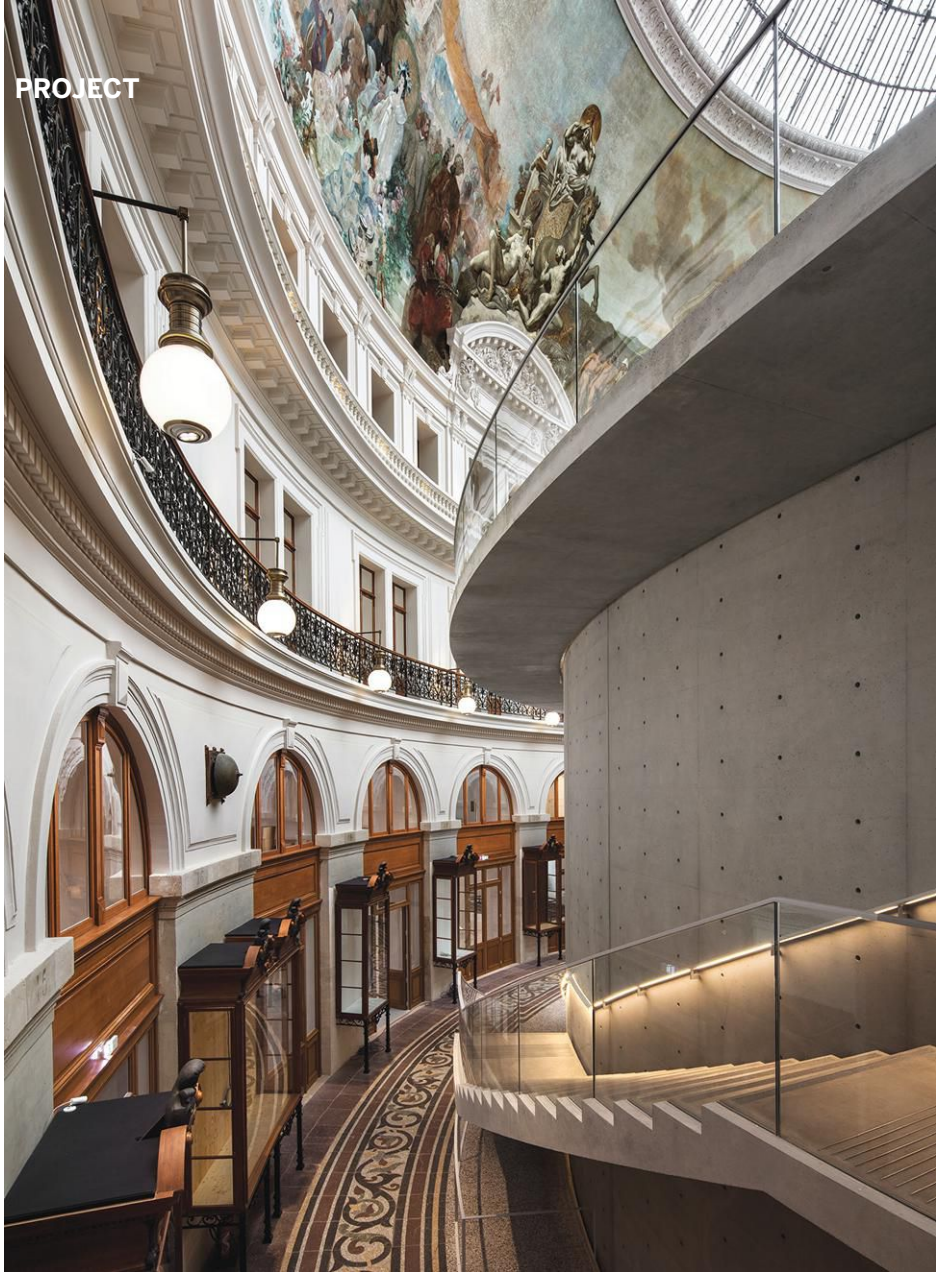
The building stands on the site of a 16th-century royal palace, of which only a vestige now survives—the Colonne Médicis, a 102-foot-high Doric column that may have been used for astronomical observations. After the palace's demolition in the mid-18th century, the site became home to the Halle au Blé, Paris's corn exchange, designed by Nicolas Le Camus de Mézières and built in 1763–67. A circular stone edifice, it enclosed a large open-air court at its heart, which was later covered with a wooden dome. The dome burned in 1802, after which



PHOTOGRAPHY: © STUDIO BOUROULLEC; YUJI ONO (OPPOSITE)



THE STONE building was erected in the 18th century and later modified (opposite). Ando and NeM collaborated on the design of the concrete insertion in the rotunda (this page).





François-Joseph Bélanger erected a pioneering iron-framed replacement in 1806–11. Over the course of the 19th century, the Halle au Blé became too small for its original function, and, in 1885, work began to convert it into a commodities exchange. To do this, the architect Henri Blondel conserved both the courtyard wall of Le Camus de Mézières's building and Bélanger's dome, but demolished all the rest (apart from a double-revolution staircase), replacing it with a ring of office accommodation. He also modified the courtyard elevation and Bélanger's dome, glazing the latter at its summit and facing its lower parts with slate, the inner surface thus obtained being decorated with a giant canvas depicting trade between the five continents. The transformation was completed in 1889, just in time for the Exposition Universelle of that year, which marked the centenary of the French Revolution.

This was the building that Ando was taken to see in 2015, after the City of Paris had begun negotiations to purchase it from the Chamber of Commerce and was brokering a 50-year lease with Pinault. As at the Gare d'Orsay 40 years before, the challenge was to fill a 19th-century glass-roofed void with something that would allow artworks to be displayed on and in it, but without that something altering the nature of the void too fundamentally. "I have consistently experimented with architecture inside architecture," Ando told RECORD. "From Venice to Paris, I have inserted modern interventions into historic buildings. The new structure must be formidable enough to compete with a historical building's overwhelming and powerful presence. I find this strength in the purity of primordial and Platonic geometries." The geometry he used at the Bourse is, naturally enough, a cylinder, an old Ando trope (Paris already had one by him, the 1995 UNESCO meditation space), which he placed inside the rotunda under the dome. Realized in his trademark in situ–cast concrete, and pierced with three giant portals, it "allows us to create a calmer exhibition space [than provided by Blondel's busy elevations]," explains Lucie Niney, "offering optimal conditions for the contemplation of artworks." For Ando, it also evokes a building that strongly marked him as a young man: "I thought that the ethereal projections of sunlight, as at the Roman Pantheon, would reflect the changes in time and season in space, revealing the geometry and the expression of the concrete wall."

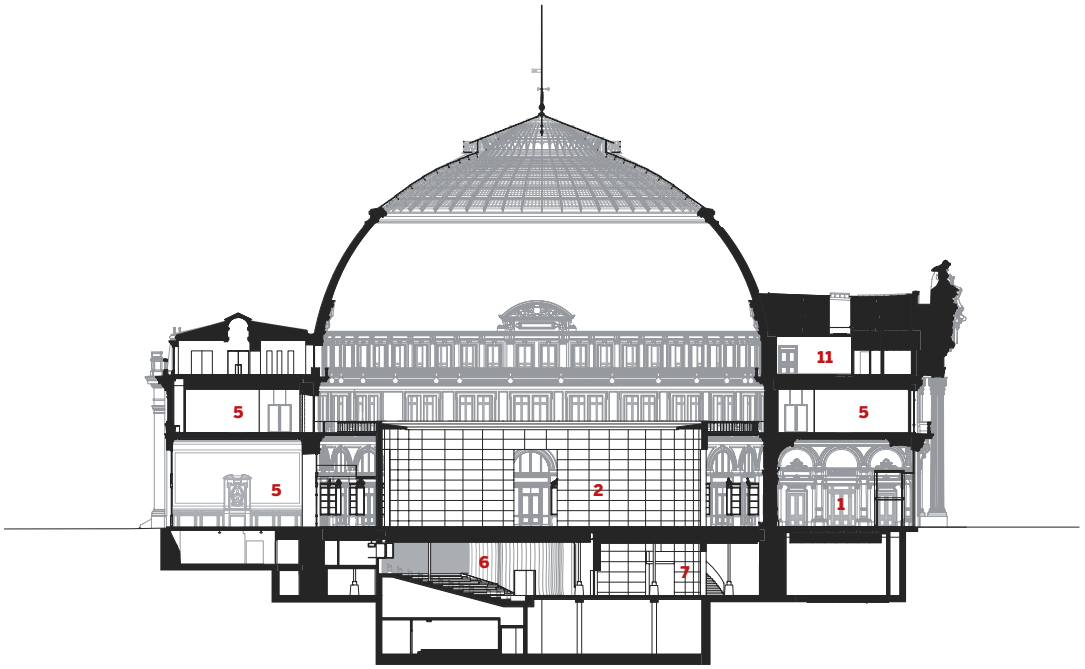
While the idea may sound compellingly simple, its realization was anything but. Firstly, Pinault was in a hurry: announced in April

PHOTOGRAPHY: © PATRICK TOURNEBOEUF (2); AURÉLIEN MOLE (OPPOSITE, 2)

THE CYLINDER'S concrete wall can be seen from the glass entrance doors (opposite, both). Galleries have access to daylight (this page, both).

2016, the museum was initially set to open in early 2019. Since purchase of the Bourse was not completed until 2017, preliminary design studies had to be undertaken before a building survey could be carried out. Ando had initially proposed a very tall, wide cylinder with a walkway two-thirds up projecting from its outer surface, at the level of the Bourse's second story. Once the design team finally gained access to the site, they were able to build mockups, resulting in a radical modification of the initial intuition. "We insisted that, at the second level, you needed to keep the view open across the entire width of the Bourse," says Niney. "Otherwise, the original perception of the space was entirely lost." Ando was thus persuaded to lower his cylinder to the second-story level, as well as to leave a wider ring of space around it, again for better perception of the original building, but also so the ring could accommodate artworks (in the Bourse's 19th-century vitrines, which he had initially planned to remove). Then there was the question of how to construct the cylinder. "Since the building is landmarked, we couldn't demolish the rotunda's floor to build a concrete wall,"

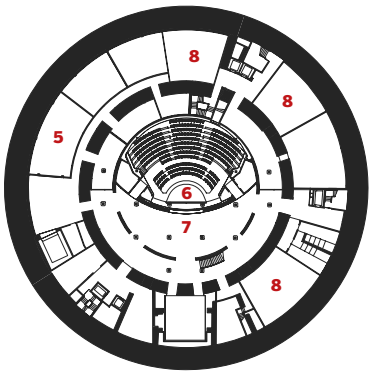




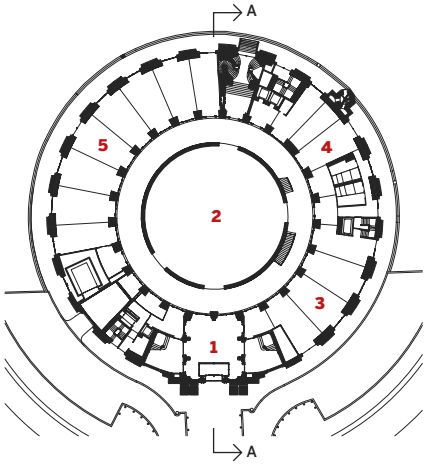
SECTION A - A

0 30 FT. 10 M.

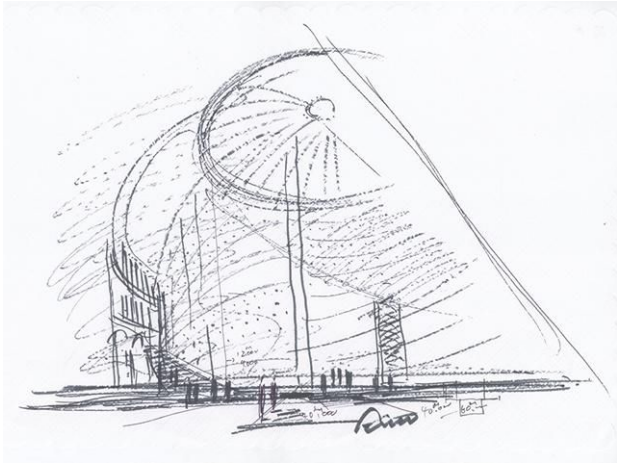
1 ENTRANCE
2 ROTUNDA
3 LOBBY
4 BOOKSHOP
5 GALLERY
6 AUDITORIUM
7 FOYER
8 MECHANICAL
9 VOID
10 OFFICE
11 LOUNGE
12 RESTAURANT

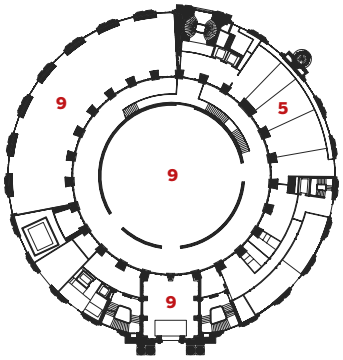


LOWER-LEVEL PLAN

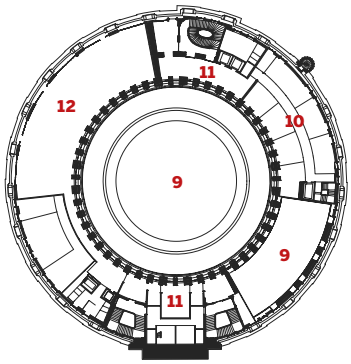


GROUND-FLOOR PLAN





SECOND-FLOOR PLAN



THIRD-FLOOR PLAN

0 50 FT. 15 M.



THE HOLLOW concrete wall panels were hung from a metal frame to avoid damaging the floor.





THE TOP FLOOR contains a restaurant (right) and the basement a theater that occupies half the cylinder (below).

explains Niney. "So we decided to pierce it at certain points with steel supports and to hang the concrete from a metal frame." This rather unorthodox solution had two big advantages: reversibility—the cylinder can be more easily dismantled—and the fact that, because it is hollow, all the rotunda's heating and ventilation and much of its lighting could be integrated into it, thereby relieving Blondel's elevations of those functions. "Besides shortening the cylinder," continues Niney, "the biggest change we proposed to Ando was redefining the nature of a concrete wall, which traditionally is solid. But we probably also had a false idea about his conception of concrete, since it turns out he has no fixed formulae. 'Concrete is inexpensive and found everywhere,' he told us; 'that's why I use it. As such, it's a sort of non-material, a form of abstraction.'"

But to get concrete to that level of abstraction, it needs to be well made—if not, brute material reality may ruin the effect. "Mr. Pinault . . . was always strict and uncompromising in his approach, sometimes more so than me!" says Ando. "For example, he insisted on an almost perfect execution of the concrete walls." Daniel Sancho, Pinault's project leader, agrees: "Ando has never had concrete as beautiful as this—he says so himself!" Indeed all the detailing is highly soigné: the narrow gap left between the cylinder and its stair, for example, as well as that between Blondel's facades and the footbridges leading off the cylinder's walkway ("we insert but never touch," says Niney); the stair and walkway handrails, for which NeM was inspired "by those Ando designed in his early houses," more graceful than the guardrails in his more recent projects, they say; the shadow joint between the cylinder and the rotunda floor; or the transition as you descend the cylinder's stair into the basement, where the illusion of continuity is maintained and upward sightlines skillfully handled. NeM sought a more matte concrete finish than Ando usually uses, "so that it would catch the light," says Niney; artificial light rains down from the cylinder's summit, thanks to a projecting "cornice," which also serves to hide the sight of visitors on the walkway from those contemplating art within the cylinder. Left fully hollow for hanging works, Ando's trademark tie-rod holes cadence the endless concrete expanse like a mammoth masonry pegboard.

Converting Blondel's rings of offices into exhibition and other public spaces (including a top-floor restaurant) proved relatively straightforward, his use of a mezzanine meaning that double-height galleries could be obtained at grade level by removing the intermediary floor. Indeed, La Bourse enjoys the full range of display spaces, from the low-ceilinged and intimate (part of the mezzanine that was not removed) to the handsomely proportioned main galleries on the first and second levels (the latter achieved by removing part of the third level's floor) and the monumental space inside the cylinder, suitable for very large-scale and special-commission works. All the above-grade galleries are naturally lit, the architects having prioritized views through the building from the rotunda out to the cityscape (there are blackout blinds if needed). The one windowless gallery is located in the basement, a black-box modular space for performances or video art. The basement also contains a 284-seat auditorium, occupying one half of the cylinder, that looks out through a wall of glazing "in the same spirit of transverse views," says Niney, into its generous foyer, which is also intended to host artworks.

Where the original fabric was concerned, "the building's structure was a bit tired," says Sancho, "so we had to repair and reinforce it to take museum-standard loads." The base-

PHOTOGRAPHY: © PATRICK TOURNEBOEUF (BOTTOM AND OPPOSITE); MAXIME TÉTARD (TOP)



THE GLASS of the dome was replaced and its painting restored.

ment's floor was lowered about 3 feet, and a large technical area excavated below it. "Since time was tight, we had to do pretty much everything at once," he continues. "As we were digging the lower basement, scaffolding was in place for work on the dome (the glass was changed and the canvas restored), the metal structure of the cylinder was going up, followed by the formwork, while, outside, the facades and roof were being restored." In addition to the administrative headache posed by this simultaneity, there was the risk that a problem in just one sector would bring everything grinding to a halt. The complexity of the task saw to it that the empty building was delivered over a year and a half late—then Covid-19 delayed inauguration by another 12 months.

Four years in the making (still extremely fast), the finished museum—complete with bespoke lighting and furnishings by French star designers Erwan and Ronan Bouroullec—does not disappoint: Ando and company have succeeded in pulling off the paradox, radically altering the building while ensuring that it still appears the same (hats off to Gatier's restoration team). Were one inclined to gripe, it would merely be to regret the lack of surprise, for the Bourse delivers exactly what was promised on the can, no less, no more. Inevitably one is tempted to compare it to Paris's other billionaire-built art museum, the Fondation Louis Vuitton (RECORD, October 2014) dreamt up by Frank Gehry for French luxury-sector magnate Bernard Arnault. Though purpose-designed, Gehry's overwrought building seems poorly adapted to the task of displaying art, with vast, overwhelming, ill-proportioned galleries and a museum circuit that defies all logic, sending visitors off on a wild goose chase in search of the next room in the sequence. Pinault's museum, on the other hand, converted from an entirely unrelated and, a priori, incompatible function, provides an ideal range of spaces organized in an easily navigable manner, with a flexibility of layout that will allow it to remain open all year, segments being closeable for rehangs without disrupting visitor flow. Obviously, it helps to have a billionaire client ready to reach deep into his pockets (the official figure is $120 million, all told), though any extra spending at the Bourse had to be justified, and luxury was sought in the quality of execution rather than in ostentation of forms or materials. But then, they could afford understated good taste at the Bourse de Commerce, since Blondel's railroad-age baroque offers all the required spectacle in spades, Ando's cylinder adding a further dimension to the spatial thrill. ■

Credits

ARCHITECT: Tadao Ando Architect & Associates
ASSOCIATE ARCHITECT: NeM / Niney et Marca Architectes
ENGINEER: setec bâtiment
CONSULTANTS: Agence Pierre-Antoine Gatier (preservation); T/E/S/S (glass dome)
GENERAL CONTRACTOR: Bouygues Rénovation Privée
CLIENT: Collection Pinault Paris
SIZE: 107,500 square feet
COST: $120 million
COMPLETION DATE: May 2021

Academy of Digital Learning



The CE Center's Academy of Digital Learning allows architects to fulfill some or all of their annual CE requirements and gain advanced specialized knowledge on specific areas of design interest.

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JULY 13, 2021 | 2:00 PM EDT

High Design/Low Carbon™ Residential Design

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

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JULY 14, 2021 | 2:00 PM EDT

Prioritizing Sustainability and Embodied Carbon Goals

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Design Considerations for Behavioral Health

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inpro®



JULY 21, 2021 | 2:00 PM EDT

Achieving Better Acoustics and Fire Resistance for Multifamily Buildings with Magnesium Oxide (MgO) Floor and Wall Panels

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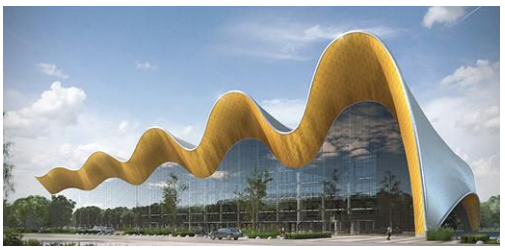
JULY 22, 2021 | 2:00 PM EDT

Three Approaches to Non-Residential Interior Design

Credits: 1 AIA LU/Elective;
1 AIBD P-CE; 0.1 IACET CEU

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JULY 27, 2021 | 2:00 PM EDT

How BIM Helps Firms Achieve Sustainability and Long-Term Success

Credits: 1 AIA LU/Elective;
1 AIBD P-CE; 0.1 IACET CEU

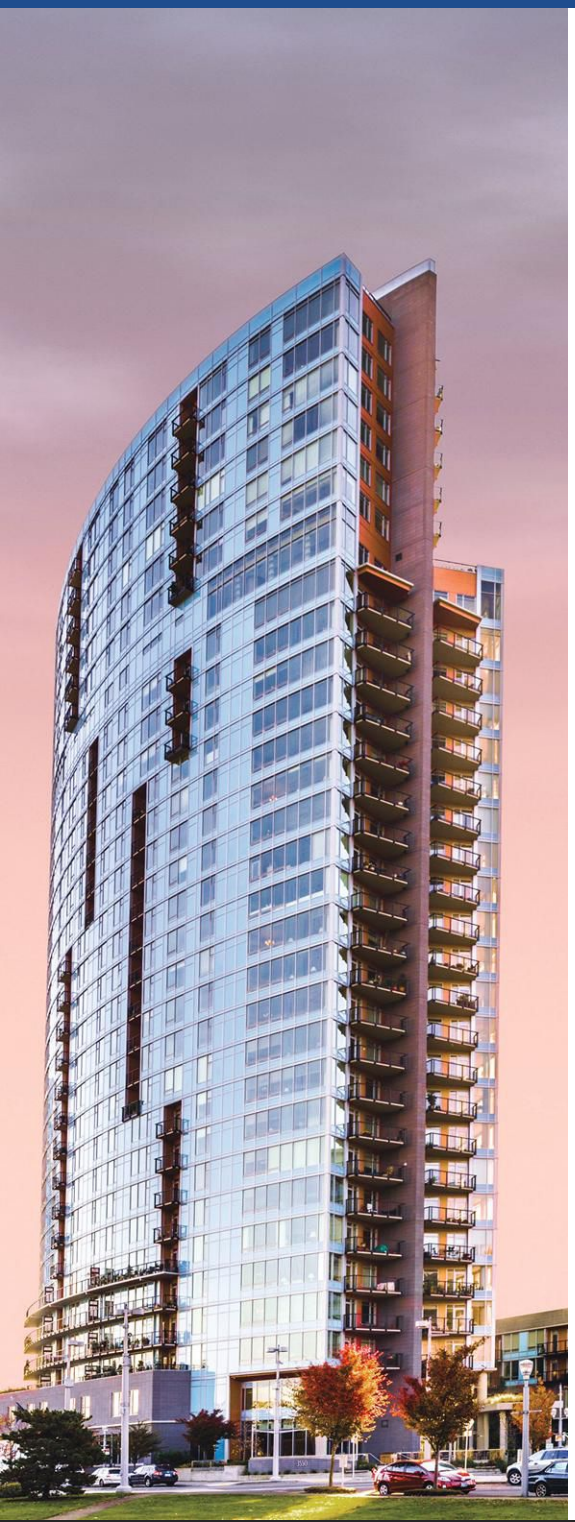
This webinar is part of the Business & Technology Academy

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Architectural Record

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WEDNESDAY JULY 28, 2021

11:00AM
Understanding Low-E Coatings

Vitro Architectural Glass

1:00PM
Structural Silicone Glazing: 50 Years of Performance

DOW

2:30PM
High-Performance Rainscreen Design with Insulated Metal Panels

Kingspan

THURSDAY JULY 29, 2021

11:00AM
Silicone Coatings: An Alternative to Ceramic Frit for Spandrel Glass

ICD HIGH PERFORMANCE COATINGS + CHEMISTRIES

1:00PM
Using Building Performance Analysis to Enhance Data Driven Design

cove.tool

2:30PM
Fire-Retardant-Treated Wood in Tall Buildings

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AIA New York

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Save the Date

July 20, 2021
11:30am–2:00pm

Please save the date for the 2021 Honors and Awards Luncheon. Join us to celebrate the winners of the AIA New York's prestigious Design Awards, along with our 2021 Honorees: Kimberly Yao, AIA, Medal of Honor; Justin Garrett Moore, AICP, NOMA, Champion of Architecture Medal; Cathleen McGuigan, Architecture in Media Award.

Event details are listed at aiany.org/luncheon.

BUILDING TYPE STUDY 1,031

HEALTH CARE

72 Waldkliniken Eisenberg Orthopedic Center, Germany

78 Beacon Dermatology Clinic, Calgary, Alberta

84 Penn Medicine Radnor, Pennsylvania

90 Mantel Ortho Clinic, Wisconsin



PHOTOGRAPHY: © ALBERT VECERKA/ESTO

PENN MEDICINE RADNOR
BY BALLINGER

Well Healed

Matteo Thun employs hospitality strategies for the new patient wing of an orthopedic center in Germany.

BY MAIRI BEAUTYMAN
PHOTOGRAPHY BY GIONATA XERRA



IT'S SAFE TO SAY architect Matteo Thun isn't a fan of hospitals. "The food is horrible, the rooms are ugly, and your pajamas are terrible—you are just surrounded by things you don't like," he says. Seeing an industry ripe for revolution—and motivated to change its institutionalized unpleasantness—Thun, on a whim, submitted a proposal to an international competition calling for a new hospital wing at Germany's largest orthopedic center to accommodate pre- and post-operative patients, as well as those requiring therapeutic treatments.

Forty-five miles southwest of Leipzig, on the outskirts of the town of Eisenberg, the Waldkliniken Eisenberg sits within the Thuringian Forest, one of the most densely wooded landscapes in Germany. Idyllic site aside, the facility was in need of a revamp. Of the clinic's three buildings, two, now slated to be demolished, dated back to the days of the former German Democratic Republic (East Germany). To meet the rigid criteria of the reunited country's public health-care system, the competition's brief challenged applicants to comfortably fit 246 beds in 128 patient rooms, most for two occupants; 13 rooms would be set aside for single patients with private health insurance. The budget of $83 million was nonnegotiable.

"We won because we've never had a health-care project," laughs



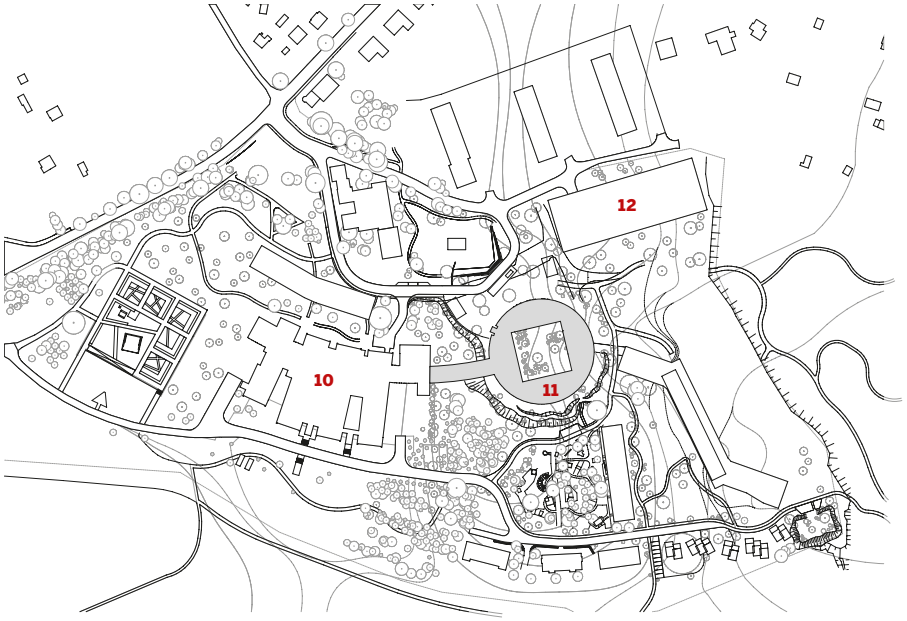
LOCALLY SOURCED larch wood clads the circular facade of the new hospital wing, which connects to the orthopedic center's existing surgery building via a glass passageway.



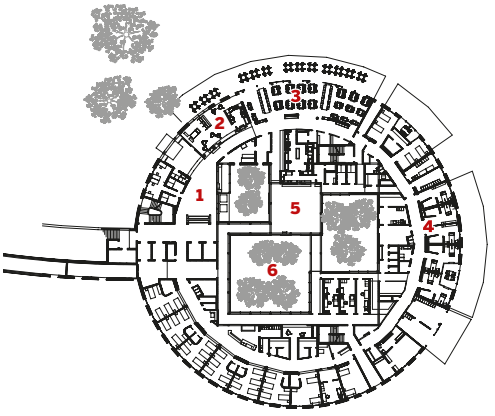
Thun, who heads up the Milan-based Matteo Thun & Partners with Antonio Rodriguez. "We expected they'd kick us out because of zero know-how, yet the opposite happened."

What did appeal to the client was the firm's experience with a very different typology. Since its founding in 1984, Matteo Thun & Partners has completed some 80 hospitality projects around the globe, including the JW Marriott Venice Resort and Spa (RECORD, June 2016). In collaboration with health-care specialist HDR Germany in Leipzig—a subsidiary of the U.S. firm, and the architect of record—Thun's team landed the project with a scheme that successfully merges the creature comforts of a hotel with the requirements of a hospital. They call this strategy "hospitecture," now a new division within the firm.

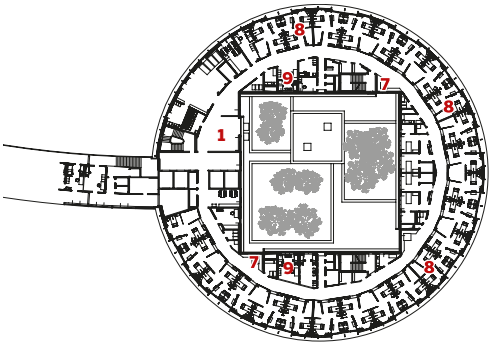
Treating patients more like hotel guests made sense to the client, who, Thun notes, agreed that tomorrow's hospital should not be



SITE PLAN



GROUND-FLOOR PLAN



UPPER-FLOOR PLAN

1 RECEPTION
2 LOBBY/BAR
3 STAFF RESTAURANT
4 CHILDREN'S WARD
5 PATIENT BISTRO
6 COURTYARD
7 HELP DESK
8 PATIENT ROOM
9 EXAMINATION ROOM
10 SURGERY UNIT
11 NEW WING
12 PARKING







PATIENT-ROOM PLAN

A GREEN ROOF (opposite) houses mechanicals in two gray aluminum volumes. Oaklike vinyl flooring and washable green upholstery are among easily disinfected surfaces in shared (top) and private (left) patient rooms. The layout diagram (above) illustrates a pair of double rooms connected by a winter garden.



RECEPTION is warmly lit by dimmable LEDs (left). The patient dining room (bottom, left) overlooks a courtyard. A wood-slat ceiling reduces noise in the lobby lounge area (below). The winter gardens have forest views (opposite).

a "sterile, boring box." Following a decade of development, planning, and construction, the inauguration of the new 178,000-square-foot hospital building took place during a masked ribbon-cutting event last September.

Clad in horizontal battens of local larch wood and an abundance of glass, the six-story, round, hybrid wood-and-concrete structure, 220 feet in diameter, is striking. From the interior, "the circular facade, wherever you are, gives the same relaxing view of the forest outside," says the architect. From the outside, the large windows reflect the trees. As it ages to a silvery patina, the larch wood facade will seem to disappear into the forest. "In 50 years, this building will look even better," Thun notes.

Thun and his partners planned the building around what they refer to as a "three-zeros" concept—zero distance, zero CO_2, and zero waste—employing local materials and labor when possible, optimizing energy loads and emissions, and using, or reusing, renewable materials. To that end, the structure's reinforced-con-





PHOTOGRAPHY: © HGESCH (BOTTOM, LEFT)



crete skeleton, necessary for fire protection and for the large spans required in hospital construction, is reduced to a minimum. Infills, such as the exterior walls in the upper floors, are wood-frame. A series of green roofs and central courtyards help maintain comfortable temperatures and the aura of nature throughout.

Inside, the first sign of a new kind of medical experience emerges in a lobby that is like a hotel's. Visitors are greeted by a 4-foot-long reception desk, clad in green-veined granite, and a cozy cocooning nook, upholstered in a sunny, acoustically absorbent fabric that helps maintain the quiet atmosphere of a hospital. It is here that incoming presurgery patients receive a lockable wheeled cabinet, "so there's no complexity or worry about your wallet or your watch," Thun says.

To reinvent the stale industry standard of a typical patient room, the architects erected a life-size mock-up in a hospital garden during the design process and asked for feedback from staff. The result achieves a level of comfort rarely found in a health-care setting. Without violating the requirement of two patients per room, the architects carved out coveted privacy with a floor plan that zigzags spaces for beds around shared bathrooms, dividing the rooms with residential-style curtains to create distinct yet flexible, homey environments. Oaklike vinyl flooring heeds the performance demands of beds on wheels, and moss-green blankets and upholstery recall the adjacent forest. In addition, the design team inserted a 135-square-foot winter garden at the nexus of every two rooms, to be shared by four patients. Stacked at intervals around the building, these intimate spaces channel light and air throughout the rooms and provide a peaceful place overlooking the grounds to recuperate and socialize with guests.

Holistic nutrition is also essential to recovery—as this writer, who had to turn down a pork chop after throat surgery in a German hospital, can attest. Thun's team provided choice and a reason to get on your feet again, with four restaurants, all furnished with custom upholstery and wallcoverings as well as dimmable lighting systems. A restaurant for patients spills out to an inner courtyard, while one devoted to staff opens to the surrounding grounds. For visitors, there is a public bar adjacent to reception, serving snacks, coffee, and juice below an acoustically absorbent ceiling of slatted spruce, and even a fine-dining restaurant accessible to all patients and guests. A dedicated chef achieves high-quality menus within budget using locally sourced ingredients.

Less visible yet also essential to the design of this unique hospital is its digital program. Upon arrival, patients receive an iPad, which is used for direct communication with their doctor. When discharged, a patient is lent an Apple Watch, for easy monitoring of activity progress. "The whole system allows patients to recover as fast as possible," says Thun. "And that makes even the health-insurance companies happy." ■

Berlin-based Mairi Beautyman has been writing about design since 2001.

Credits

ARCHITECT: Matteo Thun & Partners

ARCHITECT OF RECORD: HDR Germany

ENGINEERS: R & P Ruffert (structural); Potthoff (hvac/plumbing); Gnuse Ingenieurbüro (electrical/lighting); IB FMM (facade); iproplan Planungsgesellschaft (acoustics); Sachverständigenbüro Arnhold (fp)

CONSULTANT: Werner Sobek (energy)

CLIENT: Waldkliniken Eisenberg

SIZE: 178,000 square feet

COST: $83 million

COMPLETION DATE: September 2020

SOURCES

WINDOWS: Raico Bautechnik

SUNSHADES: Warema Renkhoff

SMOKE & HEAT EXHAUST: Lamilux

LIGHTING: Mawa Design; EWO

DOORS: Wicona; Schüco

PARQUET FLOOR: Bohemian Works

FURNITURE: Vitra; Cassina; Meda

TEXTILES: Delius

FITTINGS: Keuco



Skin in the Game

5468796 Architecture gives a veil of mystery to a dermatology clinic in Calgary, Alberta.

BY CLIFFORD A. PEARSON
PHOTOGRAPHY BY JAMES BRITTAIN PHOTOGRAPHY

SUBURBAN SPRAWL promotes a cookie-cutter approach to commercial as well as residential development, creating successions of similar buildings—whether they happen to be stores, banks, restaurants, places of worship, doggy-daycare centers, or offices. Everything fits into a strip mall. Commissioned to design a two-story mixed-use structure, with retail on the ground and a dermatology clinic above, the Winnipeg firm 5468796 Architecture aimed to transcend the humble building type. Instead of a flimsy curtain wall or tilt-up construction, the architects specified poured-in-place concrete, and added depth to the building's facade with recessed storefronts and large balconies at the corners of the upper story. A band of concrete panels precast with a strongly textured corduroy pattern obscures the lower portion of the second floor, creating a sense of mystery about what happens behind it. You may not recognize this as a medical facility, but you immediately know it's not like anything else around it.

Facing 17th Avenue, a busy thoroughfare that runs south of downtown Calgary, Alberta, the 25,000-square-foot building needed to establish a presence on the street and create a handsome buffer between inside and outside. The stately rhythm of thin, rectangular concrete columns and large panes of glass on the ground floor has helped attract a mix of street-level retail that includes a quirky pharmacy/café and, if lease negotiations are successful, a dental office. Some people park in a small surface lot adjacent to the building, but most enter from an underground garage. Knowing this, the architects carved a lightwell out of the center of the structure's large footprint, bringing daylight and greenery down to the two parking levels. On each floor, the elevator lobby looks onto this lightwell, injecting a touch of nature into the arrival experience.

Creating a calming transition from busy street to medical clinic was

FROM 17TH AVENUE the building has a strong presence, with recessed storefronts on the ground and deep balconies above (top). The curving roofline slides inside the clinic, injecting a graceful sense of motion (opposite, bottom).

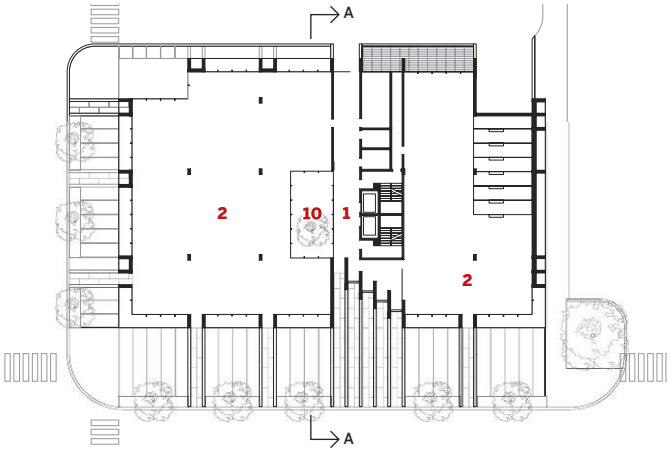



ACNE PRONE & OILY SKIN

a critical goal of the architects, says Johanna Hurme, the 5468796 partner in charge of the project. “We focused on the patient experience and wanted to make the interiors as ethereal as possible,” she says. To do that, they choreographed layers of light that guide visitors through the large second-floor clinic and help them feel relaxed. Clerestory glazing brings in diffuse light from above, while the band of cast-concrete panels, which the architects refer to as the “veil,” blocks views to the undistinguished environment outside and maintains privacy for the patients inside. Soft illumination from the lightwell, skylights, and corner balconies, which are protected by deep eaves, adds to an ambience of tranquil medical care. The team of three doctors who work here hope to see about 90 patients a day (their prepandemic level) in treatment areas devoted to medical dermatology, aesthetic dermatology, and rheumatology. “The architecture needs to move people efficiently through the space without making them feel like they’re being processed,” says Hurme.

From the outside, what appears at first as a flat roof turns out to be gently curved on its underside, its profile revealed most clearly above the building’s corner balconies. This gracefully bowing plane, clad in light-colored



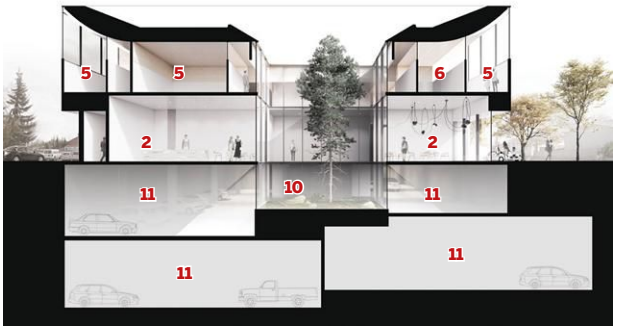


GROUND-FLOOR PLAN



SECOND-FLOOR PLAN

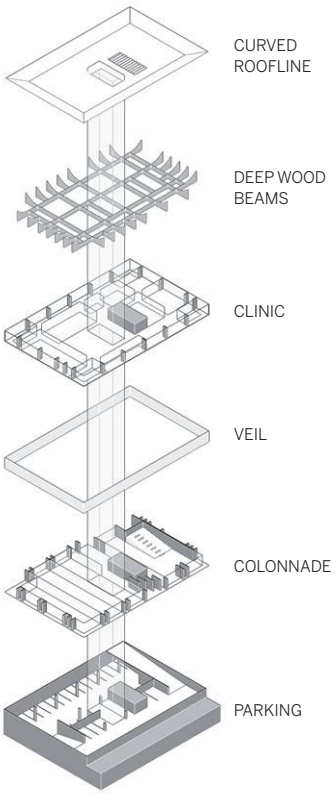
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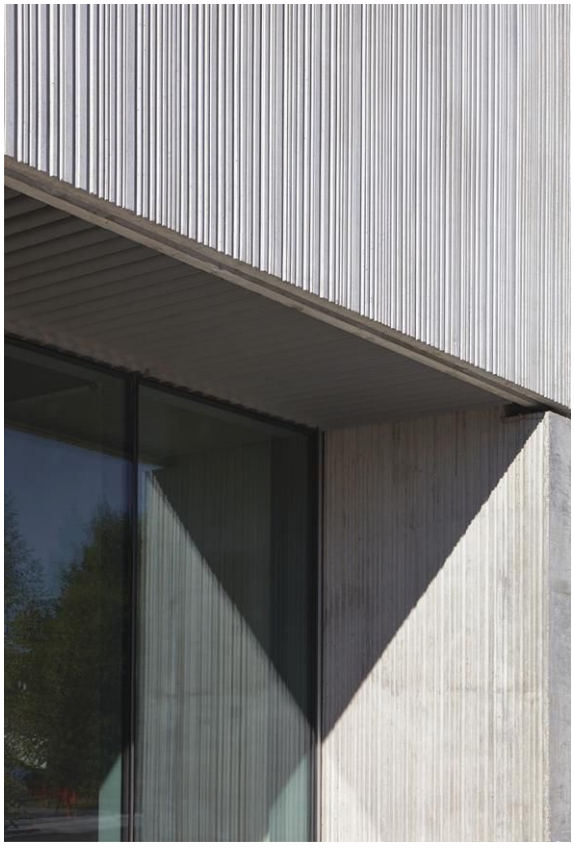
SECTION A-A

1 LOBBY
2 RETAIL
3 WAITING
4 BALCONY
5 EXAM/OFFICE/ MEETING
6 RECEPTION
7 NURSING STATION
8 STORAGE
9 KITCHEN/DINING
10 LIGHTWELL
11 PARKING





DESIGN LAYERS

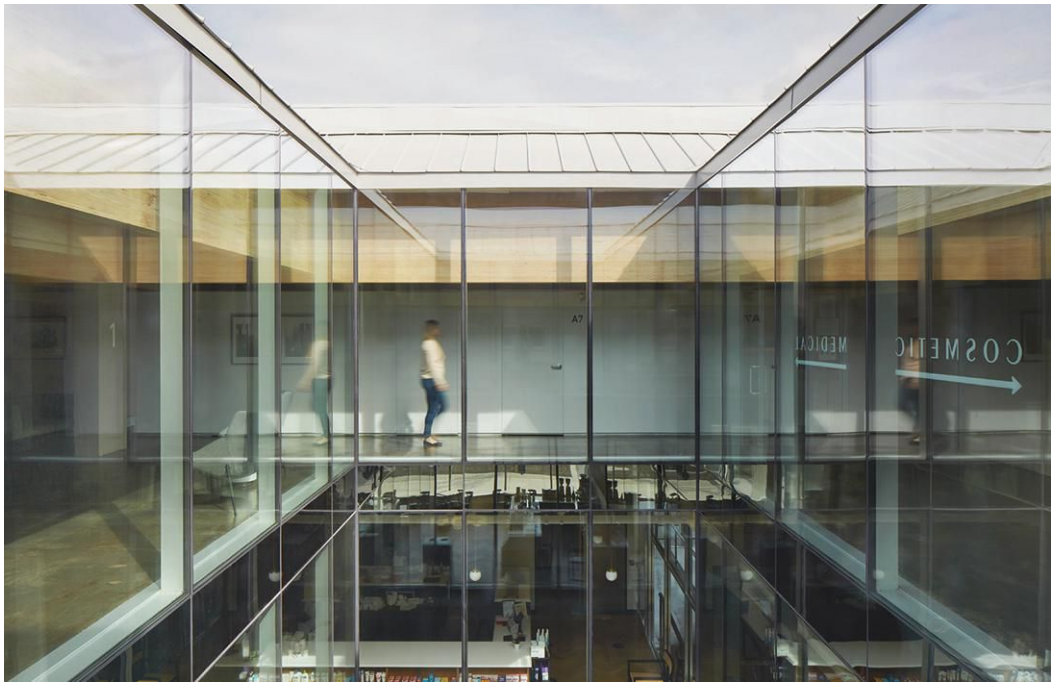


A CONCRETE colonnade wrapping around the building establishes a visual rhythm for the ground floor (above), while a "veil" of precast panels ensures privacy in treatment areas on the second floor (left).

pine, slides inside to become the ceiling—reflecting a soft glow throughout the facility and compressing space to create the sense of a protected haven. Inside, walls rise to a 7-foot-high datum to reinforce that sense of enclosure, while clerestory windows above offer patients—often lying on their backs—views up to the sky. Supporting the roof is an exposed grid of engineered-lumber beams that start at the 7-foot datum and rise another 6 feet. Pulled away from the building's perimeter, the beams don't interrupt the clerestories or block the daylight sliding deep into the facility. But they add depth and shadow to the various spaces and rooms—no flat hung ceiling here.

While not conceived as a "green" project, the building uses passive-design strategies such as broad eaves and deep recessing on the storefronts to reduce solar loads. Triple-pane windows and generous insulation also minimize energy consumption.

Founded in 2007 and named after its



DAYLIGHT comes deep into the building from a central lightwell (above and left) and clerestory windows (opposite, bottom). Pine cladding on the curving ceiling adds warmth to the light in a waiting area (opposite, top).

registration number, 5468796 Architecture has been expanding in recent years beyond its base in Winnipeg to do projects in Calgary, Toronto, Nova Scotia, and British Columbia. Included in Record's Design Vanguard in December 2011, the firm has developed a reputation for innovative housing projects such as the Avenue Building (RECORD, February 2013) and OZ Condominiums (RECORD, October 2015), both in Winnipeg. After giving a talk in Calgary in 2016, Hurme was contacted by Alkarim Devani, a local developer, who, along with his brother Afshin, runs a company, RNDSQR (pronounced "Round Square") that prides itself on "thoughtful placemaking" and using design to bring people together. 5468796 (which has no easy-to-pronounce phrase for its name) has done a number of projects for RNDSQR, including housing and master planning, in addition to Beacon Dermatology.

Most commercial buildings on busy suburban thoroughfares seem temporary—cheap containers for an ever-changing mix of tenants. With its sculpted form and material palette of timber beams and deeply grooved concrete, Beacon Dermatology conveys a different message—that developer-built structures can have heft and substance, grace and subtlety. ■





Credits

ARCHITECT: 5468796 Architecture — Emeil Alvarez, Pablo Batista, Brandon Bergem, Ken Borton, Jordy Craddock, Donna Evans, Ben Greenwood, Johanna Hurme, Jeff Kachkan, Stas Klaz, Lindsey Koepke, Kelsey McMahon, Colin Neufeld, Sasa Radulovic, Amanda Reis, Erin Riediger, Helia Saadat, Matthew Trendota, Shannon Wiebe, Jenn Yablonowski, design team

ENGINEERS: Wolsey Structural Engineering (structural); CGM Engineering (mechanical/electrical); Watt Consulting Group (civil); E2K (geotechnical)

GENERAL CONTRACTOR: RNDSQR

CONSULTANTS: Navagrah Landscape Architecture (landscape); Civic Works (planning); Optimize Envelope Engineering (envelope); Footprint Consulting (energy)

CLIENT: RNDSQR

SIZE: 25,000 square feet (above ground)

COST: withheld by client

COMPLETION DATE: July 2020

Sources

PRECAST CONCRETE: Lafarge Canada

CURTAIN WALL: Desa Glass

WOOD BEAMS: Brisco Manufacturing

CABINETWORK: Impeccable Interiors

SOLID SURFACING AND RECEPTION FURNITURE: Executive Millwork



Medical Pedigree

Ballinger's new ambulatory care center, Penn Medicine Radnor, is rooted in history.

BY SUZANNE STEPHENS
PHOTOGRAPHY BY ALBERT VECERKA/ESTO

ALTHOUGH Penn Medicine Radnor, which opened in 2020 in suburban Philadelphia, is strictly an ambulatory care center, it belongs to an august medical family tree. It is descended from Pennsylvania Hospital, the first such institution in this country, founded by Benjamin Franklin and Dr. Thomas Bond in Philadelphia, in 1751. Through a merger between the original hospital and the University of Pennsylvania Health System (UPHS) in 1997, it now is connected to more than a dozen health-care facilities of varying specialties in the Philadelphia area.

UPHS's decision to build a large, 250,000-square-foot structure—to serve 1,500 outpatients a day—in Radnor township was simple. "We wanted to provide as much care as possible close to home," says Tracey Commack, the hospital's associate executive director. The array of services ranges from endoscopy, radiation and oncology, audiology, ophthalmology, neurosciences, and dermatology to a heart and vascular center. Designed by Ballinger, architects and engineers based in Philadelphia, the center is unlike most centralized hospitals because it is part of a mixed-use development, next to a high-speed intercity railway, that will eventually include an office building (also designed by Ballinger) and a hotel (architect to be determined). UPHS purchased the 22.6-acre site in 2015, but, since the parcel was larger than needed for its medical program, UPHS, with Ballinger as the master planners, sought a mixed-use zoning to amend the pharmaceutical lab-and-office one that previously existed when Wyeth Ayerst Pharmaceuticals company, by then defunct, occupied the site. Brandywine Realty Trust is the



FROM THE DROP-OFF facing north, visitors enter the first level (left). A landscaped courtyard is enclosed by two hospital wings, which are linked by a two-level pedestrian bridge (below).

developer of the two nonmedical components.

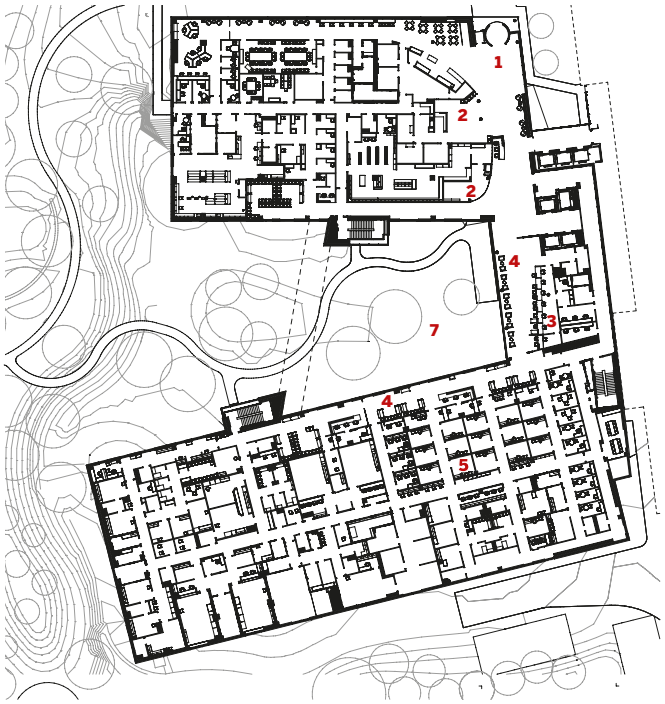
Wyeth Laboratories—as it was initially called—had been designed by Skidmore Owings & Merrill (RECORD, April 1957), with low-slung, blue-green glass and porcelain volumes. While its Midcentury Modern look was distinctive, the renovation needed for the UPHS program was deemed too extensive to keep the architecture, and so the buildings were razed. "Not only were the existing ones inefficient for health operations," says Ballinger principal Eric Swanson, "the former complex depended on surface parking instead of garages—which didn't help stormwater management."

Only the concrete from the foundations was salvaged; it was recycled, cut, and used for fill to regrade the land, as well as for the base of the ground-level hospital slab.

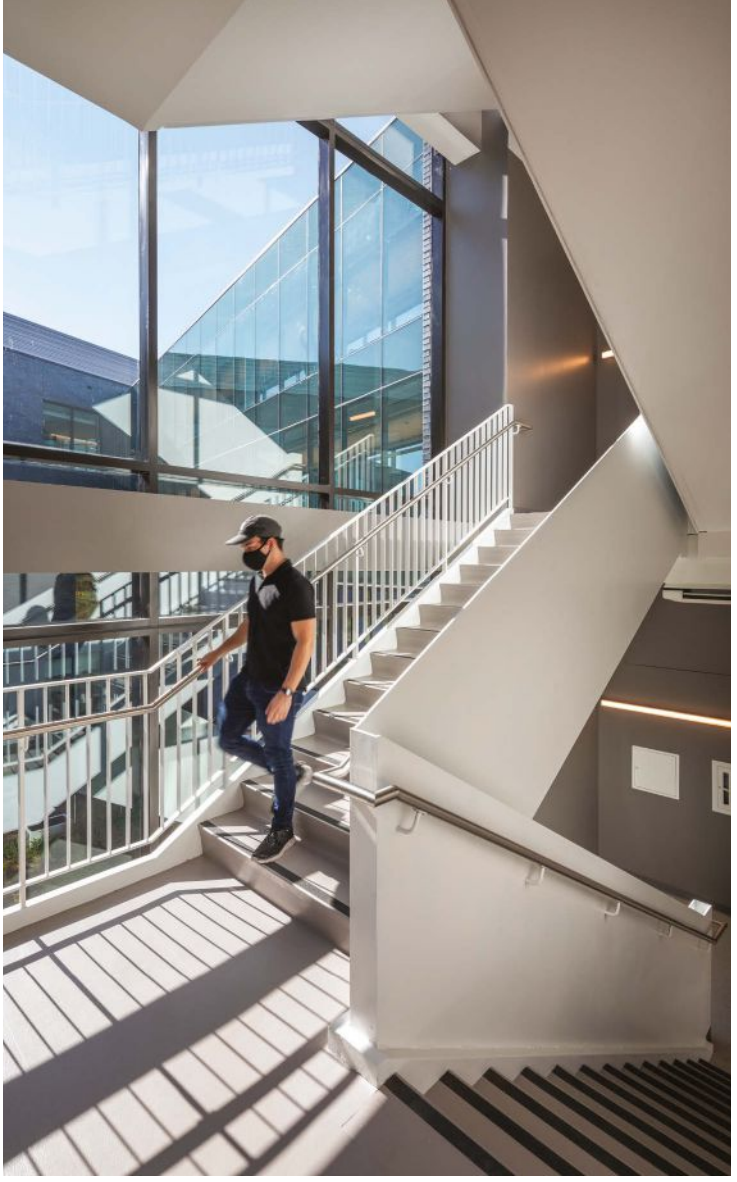
To adhere to the height-limit and size requirements of the new zoning, Ballinger designed a U-shaped structure, four stories high, with a steel frame and a sleekly tailored iron-spot-brick rainscreen. A 1,000-car precast-concrete garage, six stories high, hovers above its east end near the railroad tracks. From the garage, patients can enter the hospital on the ground level, obviously a boon in bad weather. Stepping into the lobby, they behold, through floor-to-ceiling glass expanses, a lushly planted garden with outdoor seating, enclosed by the facility's two wings. Beyond, a meadow rises gently to the west, concealing any glimpse of a main road on its other side.

The architects emphasized the knoll-like configuration of the land to place the main entrance on a higher level than the one on the ground floor accessed by the garage. Here, on the north, a porte-cochère for drop-off brings visitors into the first floor, where they find a café and retail shop, and can survey the green courtyard one level below. On the second and third levels, the two wings of the U, one angled away to avoid a parallel alignment with the other, are linked by pedestrian





FIRST-FLOOR PLAN





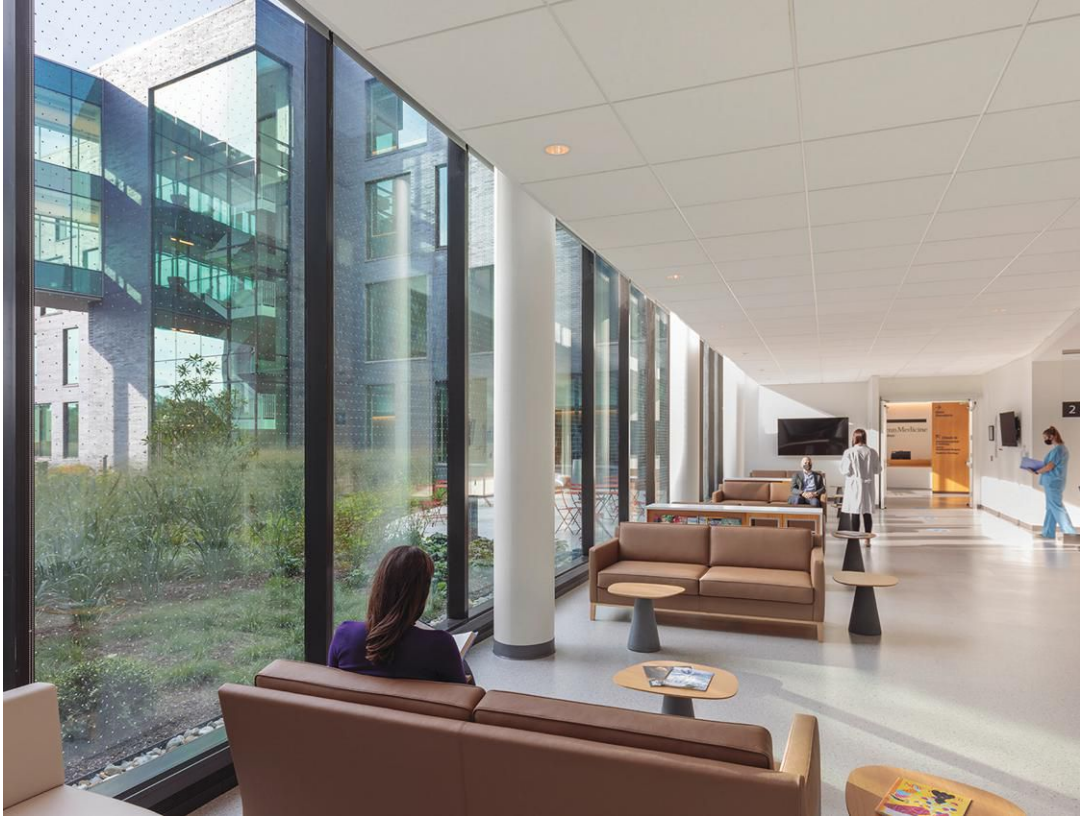
SECOND-FLOOR PLAN

0 50 FT.
15 M.



SITE PLAN

1 ENTRANCE
2 CAFÉ AND SHOP
3 CHECK -IN
4 PUBLIC HALLWAYS/WAITING
5 CLINICAL AREA
6 PEDESTRIAN BRIDGE
7 COURTYARD
8 GARAGE
9 AMBULATORY CARE CENTER
10 OFFICE BUILDING (FUTURE)
11 HOTEL (FUTURE)
12 GARAGE (FUTURE)





GLAZED STAIRWELLS jut into the courtyard (opposite). Plantings can be viewed from the waiting areas and hallways (right). The clinical pods (below, right) have views out as well.

bridges. As you walk across these narrow—14 feet wide—glazed passages, you may want to linger: counters for laptops line one side and lounge chairs are arrayed on the other. Two glassed-in stair towers jut into the courtyard to bring visitors down to the garden, and encourage physical exercise.

According to Commack, evidence-based design was behind the attention to light and the views of plants and trees, seen not only at the point of arrival, or from the pedestrian bridges, but through the floor-to-ceiling glass expanses of the hallways and lounges, which overlook the grassy courtyard from much of the facility. Even some corridors of the clinical pods that branch off the main hallways terminate in windows showing glimpses of the verdant property. Since the greenery attracts a variety of birds, the design team placed fritted glass in the most vulnerable areas; elsewhere, glazing is etched or tinted.

On a weekday in the spring, the waiting areas were not crowded; visitors and patients were socially distanced and wore masks, following Covid restrictions. The architects designed the waiting areas and exam pods so that they convey a modern Scandinavian simplicity through wood louvers and doors, and used assorted earth tones that echo the brick exteriors. Terrazzo floors provide a sheen to the well-trafficked areas on the first level (elsewhere, vinyl surfaces with a terrazzo pattern are substituted). Many walls have a lustrous plaster finish; others display plaster "paintings" abstractly relating to the landscape. Uplighting adds a soft ambient glow supplemented by the infusions of daylight.

Jonathan Alderson Landscape Architects, based in nearby Wayne, created the sustainable natural setting that adheres to Penn Med's biophilic orientation. The firm centered the courtyard around a basin-shaped rain garden that captures stormwater and allows it to percolate into the ground instead of producing runoff. "A storm-management system is the backbone of our plan," says Alderson, who also specified native plants such as penstemon, baptisia, and phlox to help in this endeavor. Paths threading through the garden and meadows are composed of porous chips of recycled tire and stone, which also help water absorption. Alderson favored meadows over lawns since they don't need to be irrigated. Some large trees were saved, and over 100 new trees have been planted on the hospital site; 150 more trees will be added to the entire complex.

The 1751 progenitor, Pennsylvania Hospital, had a "physic garden" to grow plant ingredients for medicines, so perhaps Penn Medicine Radnor is showing its ancestral DNA. But there is evolution: now the extensive vegetation has psychological benefits, and the stormwater measures and other strategies place Penn Med Radnor on track to qualify for a LEED Gold certification.

As another evolutionary step, the mixed-use development concept offers an intriguing business model for future health-care facilities of a decentralized yet specialized type. True, the pandemic and its economic fallout have delayed the construction of the hotel and the





office building. Brandywine is still seeking an anchor tenant for the work space, known as 155 Radnor, and is marketing the future building with an emphasis on health (touchless features, antimicrobial environments, 100 percent outside-air circulation) and the connection to nature. The developer's plans for the hotel are further off, although the clientele would seem to be in the area—not only patients who want to stay close to the hospital, but visitors to nearby colleges.

While the ambulatory facility appears more clinical than a hotel, the design imparts a serene ambience. It is too early for studies at the hospital to determine how the entire environment, the luxuriant landscaping included, fosters the cure and treatment of its patients. But this seems to be a good start and is certainly attuned to the progress being made in hospital design today, with its attention to evidence-based design, biophilia, and sustainability. ■

Credits

ARCHITECT: Ballinger — Eric Swanson, principal; Christina Grimes, health-care planner; Thomas J.Parr, project manager; Jason Cole, lead designer; Charlotte DiGiorgio, Mike Euker, Cyrus Dezfuli-Arjomandi, project architects; Angela M. Fante, chief structural engineer; Brent Ellman, project structural engineer

ENGINEERS: Ballinger (structural); Stantec (m/e/p); Pennoni (civil)

CONSULTANTS: Jonathan Alderson Landscape Architects (landscape); LEED (Atelier Ten)

CLIENT: Penn Medicine

SIZE: 250,000 square feet

COST: $230 million

COMPLETION DATE: June 2020

Sources

MASONRY: Endicott

METAL PANELS: Kingspan

CURTAIN WALL: YKK AP

BUILT-UP ROOFING: Sarnafil

GLASS: Vitro

ENTRANCES: CR Laurence

ACOUSTICAL CEILINGS: Armstrong

ELEVATORS: Kone

MOISTURE BARRIERS: GCP



IN THE COURTYARD, Jonathan Alderson Landscape Architects planted a rain garden (this page). The pedestrian bridge overlooks it on both sides (opposite, top); a meadow extends to the west (opposite,bottom),

Play it Straight

Johnsen Schmaling reenvisions a mundane clinic type with a light-filled orthodontics office in Wisconsin.

BY LAURA RASKIN
PHOTOGRAPHY BY JOHN J. MACAULAY



ANYONE who has endured the pain and annoyance of a mouthful of metal to achieve a perfect smile has also probably experienced the typical orthodontist's office, with its insular, maze-like hallways and windowless treatment rooms. It certainly doesn't make the experience any more fun.

Architects Brian Johnsen and Sebastian Schmaling set out to change that paradigm for an orthodontist with a growing practice on the outskirts of Cedarburg, Wisconsin, a rural town 30 miles north of Milwaukee.

For Mantel Ortho, the architects conceived a one-story linear volume set on an empty lot that bridges the divide between the sprawling town and adjacent agricultural land. While the building's west elevation, which fronts a busy county road, needed to be windowless to conceal lab and sterilization rooms, the east-facing facade is entirely glazed, flooding open treatment bays with daylight and offering views out to a tranquil meadow. "This changed the entire experience for the patients, because they're not in a little cubicle with fluorescent light," says Schmaling. "It's now a spa experience, where they're overlooking



THE BUILDING'S largely opaque street-facing side is animated by an artificial green wall (top). A trellised entry procession (opposite) leads patients to the open-bay treatment area (right).

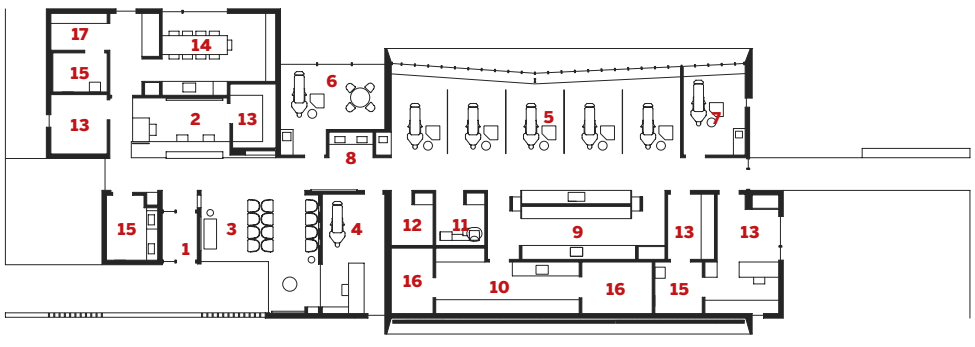




nature rather than sterile equipment."

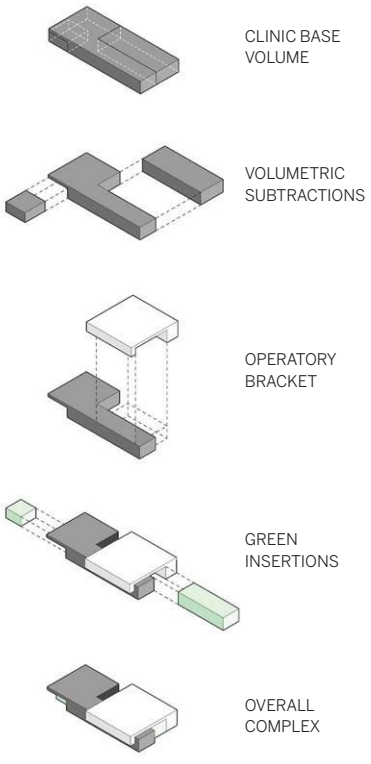
Johnsen and Schmaling, who founded their eponymous Milwaukee-based firm in 2003, have accrued national accolades for high-end residential design and boutique commercial projects. A medical office isn't entirely outside their wheelhouse—the nine-person studio completed a daylit dentist's office in Milwaukee in 2017, and it's what brought Dr. Alison Mantel to their door. "One thing that surprised us was how easy it was to integrate the technical requirements into the architectural framework we had envisioned," says Schmaling. "We thought they'd prevent us from doing things visually and aesthetically, but they were easy to resolve and didn't have an impact on what we wanted to achieve."

For Mantel, the architects organized the clinic's programmatic requirements on either side of a central circulation spine that runs north-south through the bar building. (A window at each end helps orient occupants and connects them to the outdoors.) After guests enter the building under a trellised forecourt and covered entry walk, they are guided by a wood-slatted ceiling to a reception desk and light-filled waiting area. The design team turned to clever and economical



FLOOR PLAN

1 ENTRANCE
2 RECEPTION
3 WAITING ROOM
4 CONSULTATION
5 OPEN-BAY OPERATIONS
6 FAMILY OPERATORY
7 COMFORT ROOM
8 BRUSHING STATION
9 STERILIZATION
10 LAB
11 PAN/CEPH X-RAY
12 PHOTOGRAPHY
13 OFFICE
14 BREAK ROOM
15 RESTROOM
16 MECHANICAL/STORAGE
17 STAFF LOCKERS



MORPHOLOGY DIAGRAM

touches where possible, such as using simple drawer pulls—painted the office's signature green—as wall hooks for coats and bags. Polished concrete floors round out the mostly neutral palette, while a bright green wall in the treatment bay adds a lively touch.

The circulation spine continues to the six open treatment bays, where the exposed wood-beam ceiling extends to 14-feet high. Each patient chair is angled for optimal views through the aluminum-framed glass curtain wall. The wall, which is angled slightly to embrace the prairie beyond, rests atop a built-in bench that offers parents and caregivers a place to sit during treatments.

Opposite the treatment bay, a sleek service island appears to float within the wall separating the lab from the public areas. An open shelving system on either side of the island allows staff to pass tools between the lab and the treatment bay, keeping the patient areas free of clutter.

Johnsen and Schmaling also gave Mantel a family treatment room, which can accommodate a group of patients, as well as a consultation room with a one-way mirror to allow parents to keep an eye on kids in the waiting room. But packing all of this program into one story yielded a street-facing facade that was quite long and uniform.



EXTENSIVE GLAZING on the back elevation brings light and views into the treatment areas (top). A wood-slatted ceiling guides patients to reception (opposite) and the waiting room (above).



THE CLINIC embraces the adjacent pastoral view.

To articulate the bar volume on the exterior, the architects "pulled" and "subtracted" certain areas from the mass. For example, the base bar is clad in low-maintenance, durable poly-ash board in dark gray, while the lab and treatment areas are contained in a light gray stucco box that appears to "clip on" over the base volume.

The box, in turn, frames a green wall composed of artificial plants that serves as both a striking billboard and a palimpsest: The willfully manmade material alludes to a bird's-eye view of farmland. "The path of so-called progress is changing the landscape here rapidly. The wall is like a vestige of memory, a reminder of the area that we are occupying," says Schmaling.

Mantel says that her practice is on track to grow about 30 percent more this year than in the previous two years, which she credits, in part, to the new building. "What was notable was a much higher percentage of patients' scheduling to start treatment after their initial consultation, rather than shopping around or starting someplace else," she says. "The building function has been ideal. We have patients frequently remark about the beauty of the space. Many feel relaxed with the outdoor views. When we were able to open the clinic back up [after Covid], it filled my heart to watch parents reconnect with their friends on the treatment-bay bench."

For Schmaling, the clinic's success is a testament to the power of a small architectural practice's stepping into territory typically reserved for a handful of specialized firms. "You don't have to be a health-care-design specialist to do something that has architectural merit," he says. ■

Credits

ARCHITECT: Johnsen Schmaling Architects — Brian Johnsen, Sebastian Schmaling, principals in charge; Matt Wendorf, project manager; P.J. Murrill, Ben Penlesky, Angelina Torbica, project team

ENGINEERS: Core 4 Engineering (structural); M Squared Engineering (civil)

GENERAL CONTRACTOR: Peridot Construction Management

CLIENT: Dr. Alison Mantel

SIZE: 3,800 square feet

COST: $1.3 million

COMPLETION DATE: July 2020

Sources

RAINSCREEN: TruExterior

STUCCO SYSTEM: Dryvit

MEMBRANE ROOFING: Johns Manville

FLUID-APPLIED ROOFING: Coelan

WINDOWS/ENTRANCES: Tubelite

INTERIOR DOORS: Jeld-Wen

HARDWARE: Corbin Russwin

INTERIOR FINISHES: Acoustical Surfaces, Armstrong, Sherwin-Williams, LG Hausys, Mohawk

FURNISHINGS: Herman Miller

LIGHTING: Halo, WAC Lighting

LIGHTING CONTROLS: Lutron

PLUMBING: Blanco, American Standard, Kohler

GREEN WALL: Vertical Greenwalls

Architectural Record

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Record Houses Live

EARN: 1.5 AIA LU/ELECTIVE; 1.5 AIBD P-CE; 0.2 IACET CEU

Architectural Record's annual Houses issue has been the premier showcase for residential architecture for decades, each year reflecting the best in inventive contemporary design. Come see and hear from the architects of 2021's award-winning houses, featured in the April issue of the magazine and online.

Learning Objectives:

- Discuss how the projects presented have used local, natural materials as a means of connecting to their sites and providing the houses with a strong sense of craft.
- For each project, describe the designer's approach to detailing the intersections of various materials and connections between structural and architectural elements.
- Explain how each house has been sited and configured to optimize daylighting and ventilation and to capture views.
- Discuss how the projects presented have reinterpreted vernacular typologies, including gabled roof structures and courtyard houses.

Speakers:



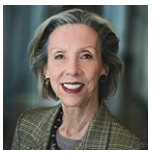
Jim Cutler, FAIA
Architect
Cutler Anderson Architects



Paul Masi
Architect
Bates Masi + Architects



Nicola and Lance Herbst
Architects
Herbst Architects



Moderator: Suzanne Stephens
Deputy Editor,
Architectural Record
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Rethinking the Office

Research can guide architects in designing for flexibility and creativity.

BY JAMES S. RUSSELL, FAIA

THERE'S A LOT of prognostication about the future workplace as the Covid pandemic has begun to retreat and more people are vaccinated. Organizations are examining whether their business needs demand a full return to office work, or whether they should become a fully virtual organization—given the success of remote work over the last 15 months—or whether they should deploy a hybrid strategy.

The tech giant Microsoft—heavily invested in effective computer-based work since the 1980s—has some answers, at least from the employee perspective. The company commissioned extensive workplace surveys during the pandemic, analyzing the experiences of its 160,000 global employees, and integrated the findings with research derived from a wide range of other industries. *The New Future of Work* project informs the company's approach to Teams, its virtual-meet-



FOR SOFTWARE company Atlassian, in Sydney, SHoP has designed a tower (opposite) with multistory "neighborhoods" that rise from gardens (above).

IMAGES: © SHOP ARCHITECTS

ings app that competes with the ubiquitous Zoom, as well as new products it is rolling out. It has also made this research public, and is applying the intelligence to the ambitious rebuilding of its own Redmond, Washington, campus headquarters.

The key findings can help inform the design or redesign of the physical office, as companies plan a return to at least some in-person work. The Microsoft research supports a shift toward hybrid work, a choice the company itself has embraced. For example, in a survey of its offices in China—where buildings reopened fairly early in the pandemic—69 percent said they preferred a hybrid work model that includes a return to the office, but not a requirement that people come in every day. Only 19 percent wanted fully remote work, and only 11 percent thought everyone needed to be in the office.

Remote work, the research confirmed, presents a range of barriers for many staffers, from burnout to emotional stress and isolation. Team-based collaborative projects and creative work suffers. People miss the camaraderie of the office. Managers fear the loss of ideas generated by casual meetings and informal encounters that many office designs have fostered with numerous informal gathering areas. When RECORD asked some architects what they are hearing from clients and how they are adapting their own workspaces, their guiding ideas happened to align with many of Microsoft's findings.

Indeed, firms that adamantly resisted any remote work or meeting via videoconference before Covid have become converts. Working from home is popular among people who want to trade the headaches of commuting for more time with their families, a consensus supported by Microsoft's research. Many noted that concentrated work was easier with fewer office interruptions—and they liked avoiding annoying coworkers.

But as the limitations of remote work have become all too evident, companies that once suggested people work permanently from home are now encouraging—or insisting—that their staffs return to the office. Besides isolation, the Microsoft researchers found



that many people struggled with fatigue and mental health issues at home, while self-reporting about productivity by those working from home was inconclusive: respondents were evenly split among those who assessed themselves as more productive and satisfied outside the office and those who reported no difference or felt less satisfied and productive. As many of us know from our own experience, many found themselves working longer hours to keep up.

Notably, women reported working through the evening to make up for time lost to parenting and household obligations, with such long days contributing to increased tensions. In one survey, 85 percent of women and 70 percent of men with childcare responsibilities fell behind in completing work tasks.

One serious deficit of remote work concerned new hires, who lacked the informal help of colleagues in getting to know people and adapting to the company culture. Managers were challenged in making sure everyone they supervised was engaged and connecting to colleagues; but at the same time, women and younger employees, as well as Black employees and others from underrepresented groups, feared being overlooked for promotions because they had fewer opportunities to demonstrate their skills and talents.

Days filled with videoconferencing are extremely fatiguing, and productive disagreements were hindered by an inability to perceive body language and to gauge emotions, the researchers concluded. While companies have tried to help people connect informally with virtual happy hours, there is as yet no app that replaces gathering around the water cooler.

In order to address some of the problems associated with virtual meetings, Microsoft has also begun to roll out "Teams rooms"—spaces in its offices that optimize interaction with an upgraded versions of its Teams app. They are intended to bring greater equity for those connecting remotely with others who are physically gathered in a meeting room.

But perhaps the biggest issue that has emerged is the hindrance to creativity and brainstorming of working remotely. Teams involved in the generation of new ideas suffered in spite of the array of virtual collaboration technology, according to the research. Those working on demanding projects missed the emotional bonds that can form, and team members "fell out of synch" with each other.

These findings are echoed in what tech companies are telling their architects. New York–based SHoP Architects' tech clients are bringing people back to their physical locations, because "the degree to which you need people in the office has to do with how much ideation, creativity, and innovation is happening," says Chris Sharples, a principal. "If you don't have a lot of creative work going on"—he names insurance companies as an example—"you don't need everyone in one place."

Though many businesses are bringing staff back to offices by early fall, architects aren't reporting wholesale redesigns to accommodate the post-Covid workplace yet, since uncertainties still abound. A rapid decline in social-distancing and mask requirements has organizations considering the end of plexiglass partitions and distanced seating. And the HVAC upgrades that a few months ago seemed essential may not be. But holdover Covid requirements may remain in place, since some jurisdictions may not permit vaccination mandates for workers. In talking with clients—especially about projects already designed but not yet built—architects are finding a change of emphasis, if not a dramatic rethinking.

In the workplace surveys, people looked to the office for everything from access to IT support to camaraderie with colleagues. So architects are asking, "What can the office provide that you can't get at home?" as Ryan Mullenix, co-leader of NBBJ's workplace-design practice in Seattle, puts it. Since creative and collaborative work is better in per-



TENTLIKE roofs shelter Google's headquarters in Mountain View, California, by BIG and Heatherwick Studio (opposite). A stair ascends through the 25 floors of NBBJ's offices for F5 Networks in Seattle (right).

son, architects are doubling down on settings that allow informal teamwork. "We have been thinking about a hotel lobby metaphor," says Sharples. "You encounter lounge seating, a place to huddle with your team, and pinup areas."

Architects also can help companies understand the sociology of working together and using design to support the company's culture. The Microsoft researchers wrote that workspaces can encourage the development of "weak ties," the large networks that people build with casual or occasional interactions outside their core group of colleagues. Some company cultures support these expansive networks because acquaintances become a source of ideas and problem-solving expertise.

Thus, places that ease such interaction—from stair-landing lounges and small breakout spaces next to conference rooms to coffee bars and fitness centers—are becoming part of the architect's brief. In a 44-story Seattle tower, as part of a tenant fitout project, NBBJ included an attractive stairway that opens to skyline views as it ascends through the 25 floors occupied by F5 Networks, an app-support and security company. Most elevators stop every fourth floor, encouraging people to use the stairs, where they can have serendipitous encounters and look into various team areas along the way. "You never know when the Eureka moments will happen," says NBBJ's Mullenix. "Rarely does anyone go to a conference room to innovate."

With so many people reporting stress, anxiety, and emotional exhaustion, architects are enhancing their client's spaces with more daylight, fresh air, greenery, and, where possible, views of nature. "Before the pandemic, we were hearing from tech clients about the importance of access to outdoors," says James von Klemperer, president of KPF. "Now outdoor space is a priority for the whole real-estate brokerage community." He cites the success of his firm's Hudson Commons project in Manhattan, which mounted a tower with lushly planted setbacks and balconies to an older warehouse building. That amenity was key to attracting the fitness-machine-maker Peloton as a major tenant, he adds.

NBBJ designed a complex for REI, the outdoor-equipment retailer, in Bellevue, Washington, around a connection to nature, with garden courtyards, green roofs, windowed stairs, and a vegetable garden. Largely completed last year, the strategy made sense for a company whose customers camp and climb mountains. Much of this outdoor space is shared with the public. "Employees who need to be in the office also get to be outside," says Mullenix. "Brains are hungry for the unexpected, people-watching, zoning out." The variety of settings also serves collaborating teams and fosters casual encounters. Yet REI, fearing Covid losses, sold the building, before ever occupying it, to Facebook, which liked its amenities and was expanding its Seattle-area presence.

Meanwhile, SHoP was designing, during Covid, the 40-story headquarters for software company Atlassian in Sydney, which pointedly blurs the boundaries between outside and inside. Within an operable glass facade, supported by an exterior tubular-steel diagrid, multi-floor "villages," framed in mass timber, rise from gardens. "In these 'between spaces,' we forge natural connections with daylight and vegetation," Sharples says. "The building begins to breathe." Such healthful environments, with an abundance of fresh air, send a message about a company's commitment to its staff's well-being.

Sharples offers ideas for existing buildings, even those in dense cities with deep floorplates and narrow windows facing dim alleys, as well as those in suburban office parks that too often subject tenants to vistas of parked cars. "Such buildings need to be adapted," he says. "By reducing the floor plate, bringing vegetation inside, and maximizing daylight."

PHOTOGRAPHY: © CHRISTOPHER MCANNENY (OPPOSITE); SEAN AIRHART/NBBJ



ON MANHATTAN'S far west side, KPF added a tower with planted setbacks to an existing warehouse building.

When all else fails, he says, advanced lighting technology can aid mental and physical health, changing across the day to support human circadian rhythms.

"The office has to be an attractive place to go," says Florencia Kratsman, the global director of space planning for the firm BIG. "You have to do everything better, both focused work and collaboration." As Google rethinks the way it wants to use its facilities, Kratsman expects a "comfortable transition" into three new buildings that BIG and Heatherwick Studio planned several years ago because, already, "we were very focused on health, biophilia, and sustainability," she explains. "These projects were so large that the design had to be broken down into neighborhoods"—a scale that virus-fearing workers can find reassuring. Under monumental tentlike roofs that accommodate clerestories, natural light will be widely accessible. "There are multiple access points, and multiple vertical cores, she added, "with their own coffee machines, their own courtyards, and meeting rooms aligned with groups"—all tactics that can aid group solidarity and help people feel safe in the post-Covid workplace. Given the benign climate in Mountain View, California, where these buildings are nearing completion, "outdoor spaces conceived as amenity spaces will shift to working spaces post-Covid," she notes.

With childcare a prominent source of stress for remote workers, Kratsman is also urging companies to consider on-site day care, a relative rarity in the U.S. Parents may feel more productive returning to the office if they can have ready contact with their children. "Every workplace that we are doing in Europe and in Latin countries has a childcare component," Kratsman observes. When European companies ask what their American counterparts do for workplace childcare, she has to answer "nothing."

What about Microsoft, now in command of such key data about its own workers? Covid and the research came after construction had begun on an overhaul of its 520-acre Redmond campus, an initial phase to replace 14 buildings and add three more, increasing its workspace by 2.5 million square feet and adding 500,000 square feet of amenities. The new buildings are grouped around outdoor space into the company's own version of "villages," with design commissions divvied among four architects: NBBJ, LMN, ZGF, and WRNS.

Microsoft has altered some of the spaces within the buildings to recognize its new hybrid work style, "providing a more agile workplace that removes barriers between on-site workers and their remote colleagues," according to the company. In addition to its new Teams-rooms technology, it has also added app-based solutions that allow staff to verify vaccination status, guide on-site workers to meeting rooms, and book a desk space for the day. These new "location-management capabilities" will enable managers to monitor and control occupancy should a new need to minimize virus movement arise.

"According to our research, the vast majority of employees say they want more flexible remote-work options," writes Satya Nadella, Microsoft's CEO, in a blogpost published this spring. "They also say they want more in-person collaboration, post-pandemic." The results reflect the aspirations for a new workplace model that offers the opportunity to innovate and work together, whether in an office shared with colleagues or remotely at home, with maximum efficiency and capacity to create. The company continues to work to reconcile what Nadella calls the "hybrid-work paradox." ■

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Learning Objectives

1. Describe the post-Covid spectrum of office work, including work from home, full return to the office, and hybrid arrangements.
2. Explain the limitations of remote work uncovered by research.
3. Identify design tactics that can attract remote workers back to office settings.
4. Explain how office design can support collaborative, creative work.

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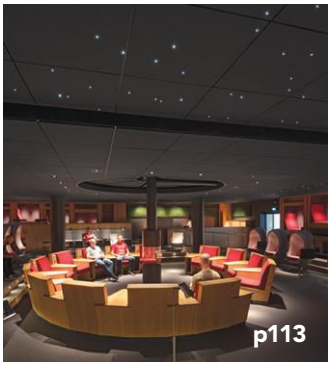
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How Ceilings Can Contribute to Biophilic Design

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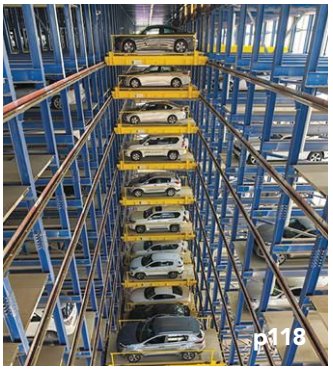
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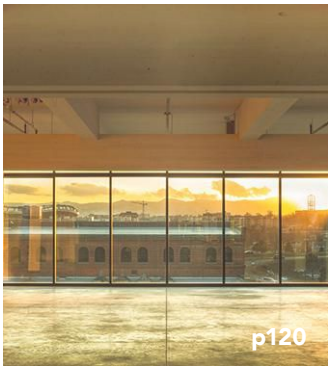
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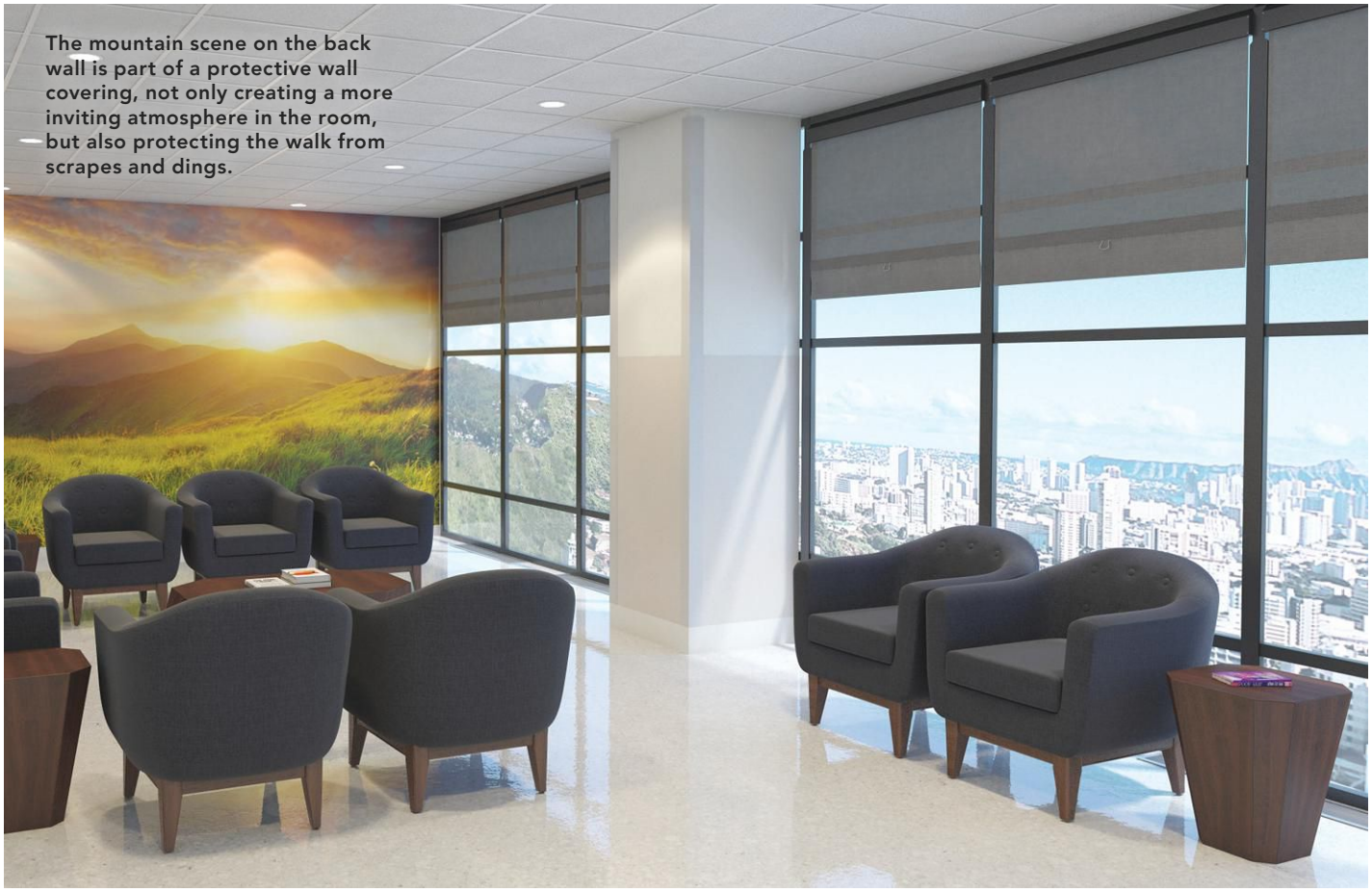
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AC	ACOUSTICS	**IN**	INTERIORS	**RE**	RESIDENTIAL	**SU**	SUSTAINABILITY
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The mountain scene on the back wall is part of a protective wall covering, not only creating a more inviting atmosphere in the room, but also protecting the walk from scrapes and dings.

Photo courtesy of Inpro

Sustainable Design and the Cost of Healing

Ensuring efficiency, health, safety, and welfare at the systems level

Sponsored by ASI Group, CRL, Inpro, and New Millennium Building Systems

By Jessica Jarrard

In health-care facilities, daylighting, aesthetics, and the flexible use of space can promote healing for patients and allow health-care workers to spend more time treating patients and less time adapting a space for their ever-changing needs. These large facilities are most efficient when designed from a systems approach, ensuring that all systems work together to encourage the health, safety, and welfare of all occupants.

FLOOR SYSTEMS

In multistory buildings, the structural design of a floor, which then becomes the ceiling for the floor below, can elevate the performance of the entire building. A long-span composite floor is engineered to address heavy stationary equipment dead loads as well as live loads in the way of moving equipment and human traffic, including patients and visitors. The longer-spanning floor structures open the way to fewer load-bearing beams and walls

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Learning Objectives

After reading this article, you should be able to:

1. Explain the benefits of daylighting and its effect on the health, safety, and welfare of patients.
2. List building features that lead to energy efficiency, sustainable design, and occupant comfort.
3. Describe how materials provide a systems approach that positively impacts patient safety and outcomes.
4. Understand how high-quality materials lead to long-term cost savings and reduction of waste.

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that can disrupt the flow of a space or limit its capacity for future moves, adds, or changes. These "thin-slab" floor structures, built using composite steel deck and concrete, are up to 40 percent lighter than cast-in-place concrete or hollow-core plank floors. Their design allows for faster construction, often without shoring during the erection process. The resulting larger spaces can readily be adapted to fit the evolving needs of health-care facilities.

EXTERIOR GLASS ENTRANCE SYSTEMS AND INTERIOR GLASS PARTITIONS

Exterior glass entrance systems allow the lobbies and entryways of health-care facilities to be brightly lit with natural light, inviting occupants into a place of health and wellness. Large glass doors and windows also help occupants connect with nature and feel more at ease in hospitals and health-care facilities when the purpose of their visit has likely caused uneasiness or stress. Interior glass partitions help create smaller, more separate areas in a facility while continuing to allow daylight from exterior windows to filter in. Interior partitions provide the perfect balance of privacy and connection in large health-care facilities.

WALL PROTECTION AND SOLAR SHADES

In interior spaces where exterior windows are not an option (such as interior waiting rooms and hallways), designers can specify colorful digital wall art depicting scenes from nature to help calm and sooth occupants in health-care facilities. These beautiful walls also provide protection from unsightly scrapes, dings, and other damage. For windows that provide too much light, solar shades can be used to protect against glare while allowing occupants to still see views of nature outside.

DAYLIGHTING, CLIMATE CONTROL, AND THE USE OF SPACE

There are many factors that contribute to patient outcomes in a health-care setting. Aside from the direct care received from medical personnel, patients can be positively or negatively affected by their experience inside the building, treatment rooms, recovery rooms, etc.

Factors such as daylighting and occupant comfort, climate control, images of nature, and ample space can contribute to positive patient outcomes. Providers can also benefit from working in environments that allow them to adjust the use of the space as needed to accommodate the ever-changing needs of patients.



Photo courtesy of New Millennium Building Systems

Composite long-span floor systems are ideal for multistory buildings, as they provide for more open and versatile spatial designs.



Photo courtesy of C.R. Laurence

Glass entryway systems provide visitors with a warm welcome, allowing natural light to illuminate common areas around the entrance.



Photo courtesy of Inpro

The soothing image of a creek flowing through the woods creates a calming atmosphere in this waiting room.



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Project: One Museum Square
Product: Unitized Glass Railing System
Developer: J.H. Snyder Co. / Dreamscape
Architect: MVE + Partners
Glazier: Rountree Glass Co.
Photo: Chipper Hatter

Flexible Use of Space

When designing a medical facility, it is important to consider how the space will be used. Large expansive spaces can easily be broken into smaller spaces with walls, curtains, or freestanding dividers. Walls and freestanding dividers allow for patient privacy and can also help reduce noise. Large spaces can also be broken up into smaller or medium-sized rooms to encourage connections between smaller groups of people or privacy in waiting areas. As situations change, hospitals must be able to quickly adapt their spaces to be prepared for whatever comes their way. It is much easier for health-care providers to divide larger spaces into smaller spaces than it is for smaller walled-in spaces to be converted into larger, multiuse rooms.

Long-span floor systems can maximize clear floor space by allowing column spacing to be as great as 36 feet with a deep-ribbed composite deck and up to 60 feet and longer for composite joists. These spaces are characterized by fewer support columns that can break up the flow of a room. Room configurations can be easily changed as the needs of the facility change.

If needed, large spaces can be converted into smaller spaces by adding walls. In most health-care facilities, solid walls make up one of the largest elements of an interior. In high-traffic areas, wall protections are recommended to reduce damage to walls caused by carts, gurneys, wheelchairs, and other items transported throughout a hospital.

Large areas can also be converted into smaller spaces through the use of freestanding glass partitions. By using glass instead of solid opaque materials, occupants can experience the perfect blend of connectedness and privacy. This is especially important for patients who may need to be physically isolated to reduce the risk of infection or ICU patients that need to be closely monitored by health-care providers.

Daylighting

Building professionals and medical professionals alike are increasingly recognizing the benefits of daylighting on occupant health and welfare. Hospitals and medical facilities support a wide range of occupants including patients receiving both inpatient and outpatient care as well as medical staff (doctors, nurses, medical assistants, pharmacists, etc.) and other employees (schedulers, front desk attendants, logistical support, etc.) who contribute to ensuring that the facility and its health-care staff can provide the best care to patients while also creating an inviting environment that encourages patients to come and receive care.

Photo courtesy of C.R. Laurence



Freestanding glass partitions allow designers to cordon off areas while also allowing daylight from exterior light sources to filter into the space.

Daylighting refers to the strategic placing of exterior windows, skylights, and reflective surfaces to utilize natural sunlight to provide adequate indoor lighting. Occupants receive the benefits of natural light while the facility reaps the rewards of reducing additional energy costs needed for indoor lighting throughout the day. To achieve proper daylighting, designers must consider the building's orientation as well as specify the right materials for the job.

In the past, many hospital environments were brightly lit, noisy, sterile environments that triggered anxiety in both patients and family members alike. Proper daylighting can have a positive impact on all building occupants by helping to regulate melatonin and hormones that can lead to better, more restful sleep.

The positive impacts of daylighting have been documented in multiple studies and scientific papers. According to the National Institutes of Health, a comprehensive study of 15 years of data pertaining to 38,788 patients with a bed near the window and 46,233 patients with a bed near the door showed that patients with a bed near the windows had significantly shorter hospital stays than those with similar health conditions whose beds were positioned by the door. (All patients in the study were 79 years old or younger.) The same study also showed that "[i]nadequate light has a direct effect on fatigue, diseases, insomnia, alcohol addictions, suicides, and other psychiatric diseases. Therefore, light has been emphasized and used in the design of medical facilities."[1]

Decreased sunlight can also disrupt circadian rhythms and lead to a lack of sleep and delirium, which is especially concerning for ICU patients. Wunsch et al. (2011) state that "[m]any ICUs have either no or very few windows. One study published 30 years ago suggested that critically ill patients cared for after surgery in ICU rooms with windows may have a decreased incidence of delirium."[2]

In addition to direct health outcomes related to proper daylighting, patients also indirectly benefit from the positive experiences that medical and hospital staff derive from natural light and a connection with nature. Several studies have also documented how light can reduce depression and decrease fatigue while also enhancing one's alertness.[3] Improved lighting helps enable health-care professionals to better use their vision to perform tasks more accurately and to reduce eye strain and irritability caused by lack of light, too much light, unwanted glare, or shadows from artificial light sources.

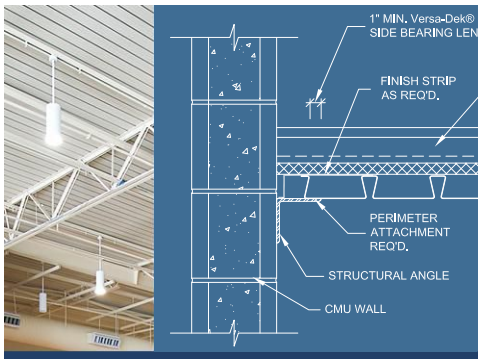
Health-care providers with access to comfortable outdoor spaces, such as balconies, rooftop decks, or courtyards, have additional opportunities to connect to nature as a way of improving morale and helping to reduce stress.



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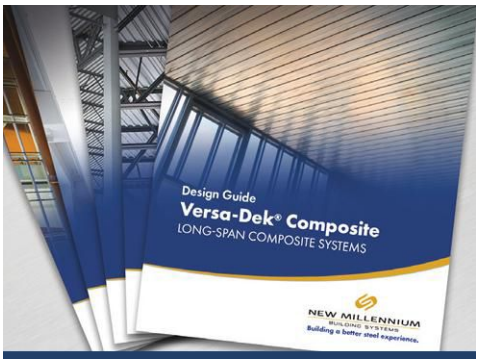
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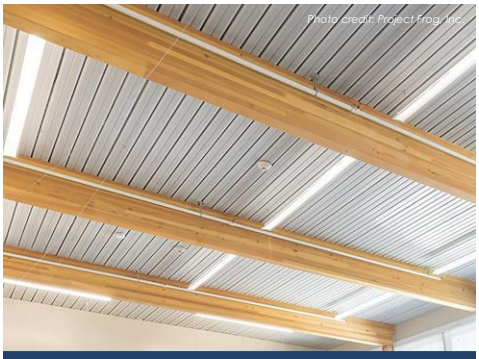
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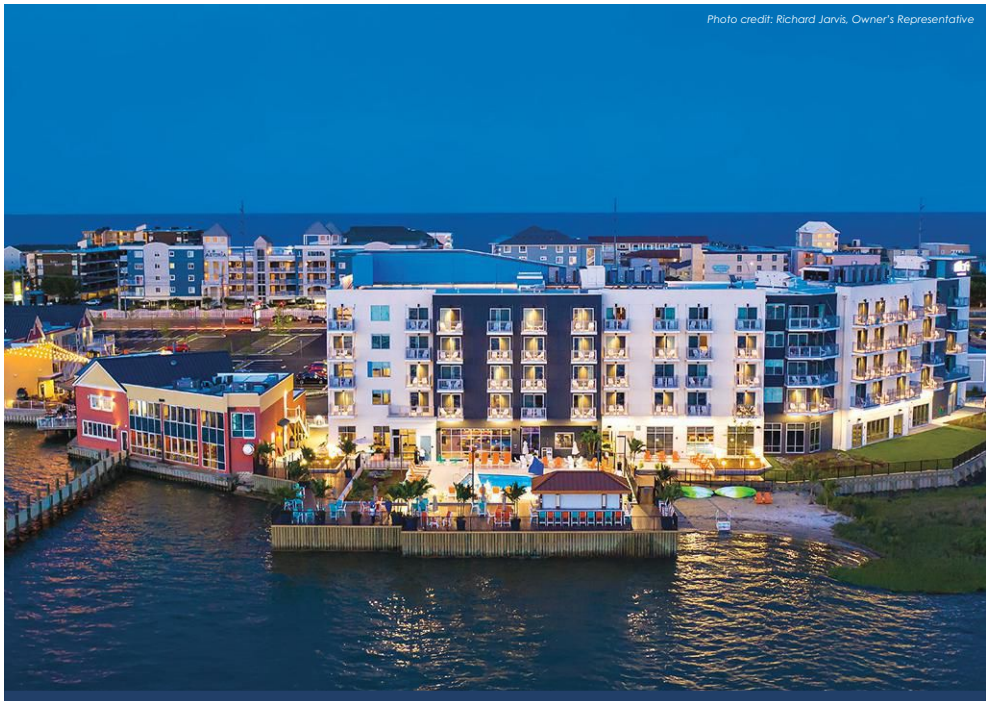
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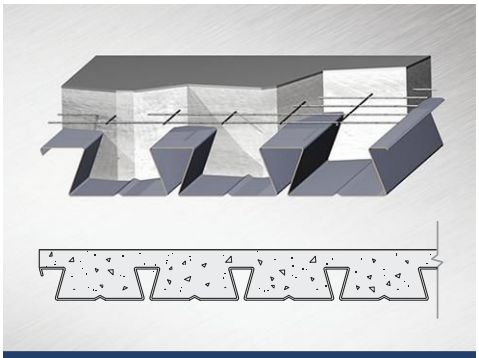


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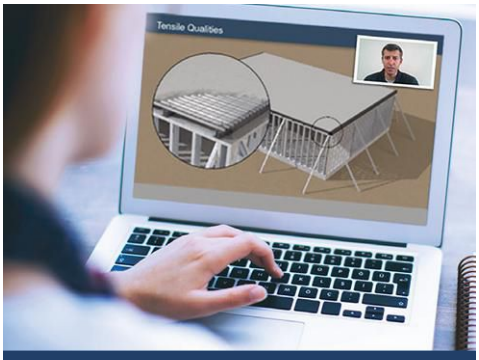




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Building a better steel experience.

Photo courtesy of C.R. Laurence



Outdoor spaces provide an opportunity for fresh air and sunlight, which is especially important in large health-care facilities where patients, their families, and hospital employees may not be able to leave the premises for long periods of time.

COVID-19 AND BURNOUT

Burnout has long been a topic of discussion in the medical field. While many medical professionals work long shifts all hours of the day, lack of adequate rest and recuperation can lead to negative outcomes for both the medical professional and the patients in their care.

COVID-19 created many new obstacles for medical professionals worldwide, leading to increased burnout and emotional trauma on a global scale. A year later, vaccines provide hope while the world anxiously awaits the population developing herd immunity. Many people have begun turning a cautiously optimistic eye toward the future.

As we physically begin to beat this disease, we are also becoming increasingly aware of the mental health impacts of the pandemic that have been felt and will continue to be felt for some time. Burned-out health-care workers, laid-off wait staff and their families, to name just a few, are all having to work through the pressures coming from lives turned upside down. Several sources point to a post-COVID-19 surge of mental health cases lasting for three years or longer as patients work through the post-traumatic stresses of the pandemic. As the BBC reported, a sizable minority could be left with mental health challenges that outlast the pandemic.

Access to proper daylighting for those in hospital care as well as those providing the care can provide positive impacts for both patients and providers, especially in hospital settings where the strain of COVID-19 has been strongly felt. Brighter facilities are welcoming and encouraging to those who may be reluctant to seek medical or mental health care on the heels of the global pandemic.

In the design phase, architects must assess building orientation as it pertains to sun exposure throughout the year. This helps architects and designers determine window and glass placement as well as the types of window glazes to use. Historically, glass fenestration systems have not been considered energy efficient because they weren't very effective at mitigating heat transfer. Fortunately, architects no longer have to sacrifice aesthetics for performance. New technologies have resulted in advanced glass and glazing systems that offer exceptional thermal performance.

Climate Control

Many health-care professionals work long shifts, actively moving throughout the building or in their workspace. Consistent temperature and climate control can also enhance their experience as well as their ability to perform their job. Conversely, patients in long-term care also spend a significant amount of time in a health-care facility, but typically aren't as mobile and therefore have different temperature needs. A properly specified HVAC system can provide occupant comfort for all. However, because the building is a complete system, the materials used in the building envelope can affect the output and efficiency of the HVAC system. Proper window glazing can contribute to the overall system, keeping interior temperatures cool during the summer and warm during the winter. This is especially important as we continue to see an increase in extreme weather and extreme temperatures due to global climate change.

Maintaining comfortable interior temperatures places less strain on heating and cooling systems, thus enhancing energy efficiency for more sustainable health-care facilities.

Continues at ce.architecturalrecord.com

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

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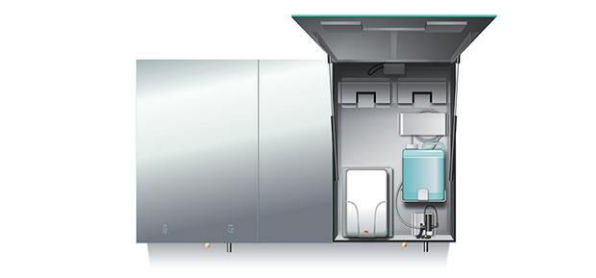
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PRODUCT REVIEW

Sustainable Design and the Cost of Healing

ASI Group

Photo courtesy of ASI Group



Velare™ BTM Collection

ASI's Velare™ Behind the Mirror system is designed to elegantly conceal clutter. The stainless-steel cabinet houses a hands-free automatic soap dispenser, and choice of a paper towel dispenser or high-speed hand dryer with a HEPA filter. The mirrored door featuring ¼-inch-thick tempered glass is supported by twin damped gas springs when opened, and etched backlit icons that direct users to their choice of soap and hand-drying option. The sophisticated, high-capacity design makes it ideal for iconic buildings and high-traffic environments.

www.asigroup.us

CRL

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Klarity Freestanding Glass Partition

Klarity seamlessly defines interior spaces using expansive glass spans that maximize transparency and daylighting. The system features ultra-slim ¾-inch posts that provide virtually unobstructed views and spacious floor plans. Klarity is available in 5-foot, 6-foot, and 7-foot post heights, making it ideal for applications with high or exposed ceilings.

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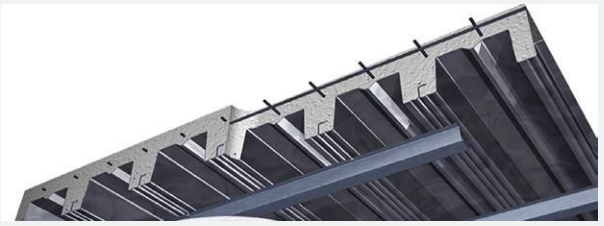
Imagining the Possibilities

Surf's up! In a medical facility? Large-scale imagery can provide patients, guests, and hospital staff visual cues to connect areas within the building. Whether it is a logo, artwork, or photography, Inpro will bring it to life. The company offers solutions that work together to create a cohesive interior.

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New Millennium Building Systems

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Deep-Dek® Thin-Slab Floors

Deep-Dek® Composite is a long-span composite floor system ideal for multistory projects capable of open spans up to 36 feet—including unshored pours up to 22 feet—and low-profile floor slabs as thin as 7.635 inches. Its space-saving capabilities create column-free spaces that maximize ceiling height and reduce building height. Versatile and efficient, Deep-Dek® Composite weighs less than equivalent concrete floors, yet installs faster—leading to earlier building occupancy. It can be left exposed for a bold, deep-fluted appearance, while a cellular deck option creates a smooth surface with thin structural ribbing. The cavities created by its deep-ribbed design facilitate mechanical, electrical, and plumbing (MEP) integration or can accommodate options for acoustic control.

www.newmill.com



Trade shoes for slippers and transform your perspective by entering the reading room at Ekonomikum. Located underground at Uppsala University in Sweden, the space envelopes visitors with serenity, including a centerpiece starry sky spanning its entirety.

Photo: © Ola Österling

How Ceilings Can Contribute to Biophilic Design

The science behind connecting the built environment with the natural world

Sponsored by Rockfon

Humans instinctively gravitate toward spaces that are filled with natural light, fresh air, and the sights and sounds of nature. This affinity, called biophilia, is rooted in our DNA. But industrialization and digitalization of the built environment has cut us off from many of these basic experiences. The burgeoning field of biophilic design can help rekindle the connection with the natural world.

By introducing sunlight, fresh air, greenery, and natural shapes, materials, and patterns into buildings, biophilic design can help support building occupants' health and well-being while helping create aesthetically beautiful buildings. It can also help enhance efforts to make buildings both healthier and more sustainable.

Continues at ce.architecturalrecord.com

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Learning Objectives

After viewing this multimedia presentation, you should be able to:

1. Define terms such as biophilia, biophobia, and nature-deficit disorder, and discuss how they relate to human health and well-being.
2. Identify the key elements of biophilic design.
3. Describe several key ways that biophilic design can positively impact human health.
4. Explain how acoustic ceilings contribute to biophilic design, and consequently, to human health and well-being.

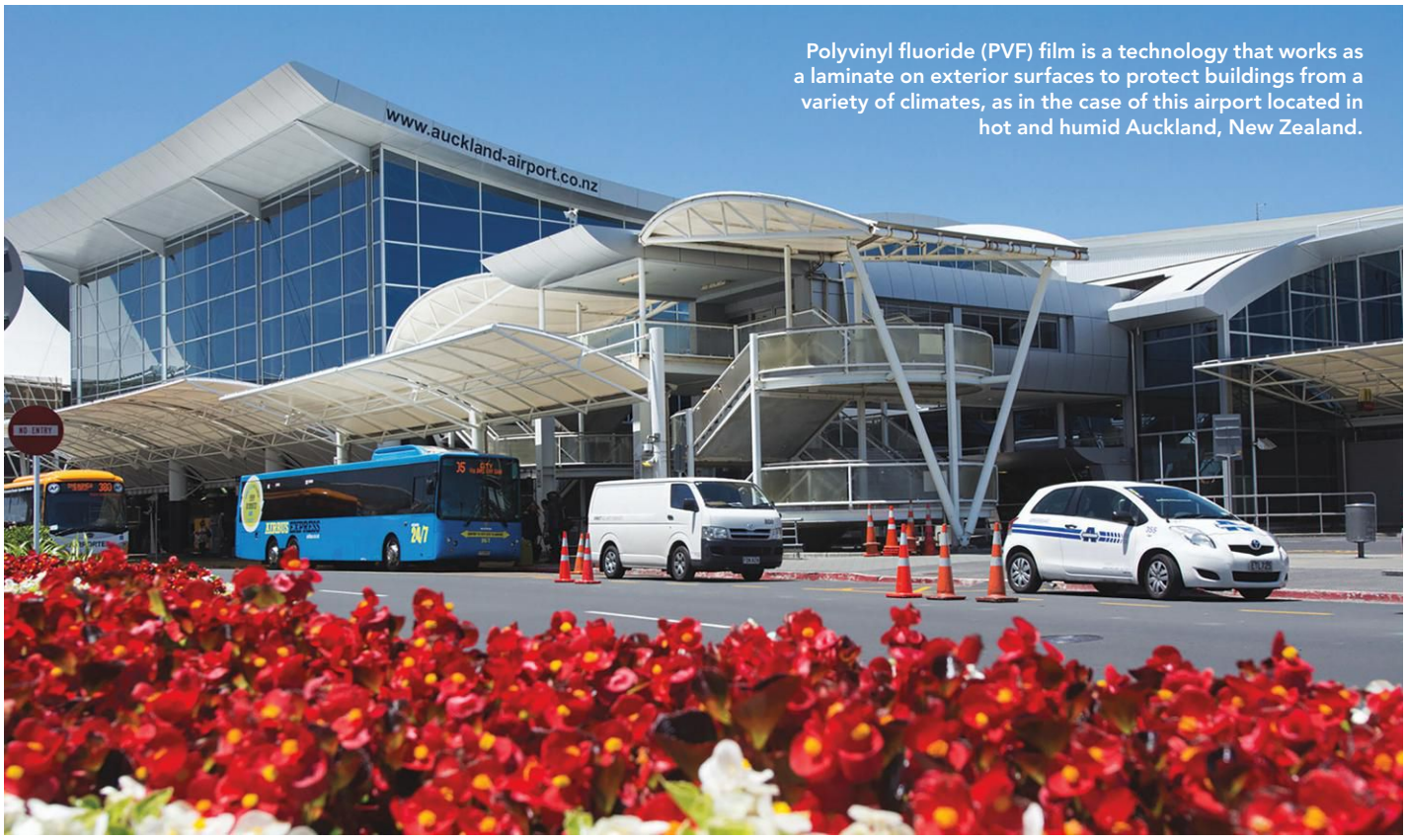
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Rockfon provides customers with a complete ceiling system offering, combining stone wool ceiling panels with suspension grid systems, metal ceiling solutions, and now wood ceilings. Its products help create beautiful, comfortable spaces. Easy to install and durable, they protect people from noise and the spread of fire while making a constructive contribution toward a sustainable future. **www.rockfon.com**

All images courtesy of DuPont Tedlar



Polyvinyl fluoride (PVF) film is a technology that works as a laminate on exterior surfaces to protect buildings from a variety of climates, as in the case of this airport located in hot and humid Auckland, New Zealand.

Weathering the Storms: How PVF Film Technology Preserves and Elevates Building Exteriors

In an accelerated and real-time test, PVF film proves a multitude of aesthetic and structural benefits

Sponsored by DuPont Tedlar | *By Erika Fredrickson*

The convenience of material goods and consumerism culture have created a throwaway society—one that has become used to cheap products that will break and can be replaced. But in the world of architecture, it is not desirable or even feasible to invest in materials that will degrade easily or require constant maintenance. When a building is constructed, it needs to last for decades with little maintenance required in order for it to be cost-effective.

The challenge in the AEC industry is with materials that are impacted by events out of our immediate control, such as pollution and the elements. Building exteriors protect us in all kinds of weather and from a multitude of external forces, but what protects the buildings themselves? The next

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Learning Objectives

After reading this article, you should be able to:

1. Describe how outdoor environments can stress exteriors, leading to high maintenance and early replacement issues in building exteriors.
2. Explain how using a laminated film offers optimal coverage and uniform thickness on substrates to aid the performance and durability of the exterior.
3. Discuss how materials that consider environmental, durability, and maintenance factors can aid in sustainability and long-term upkeep.
4. Illustrate the ways that accelerated tests and case studies have predicted long-term outdoor performance.

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

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A true test of PVF film's capabilities is in real-time examples, such as the Pullman Hotel Montparnasse in Paris, France, whose laminated exterior has not had to be updated since it was built in 1974.

section will discuss the negative impacts that building exteriors face and how polyvinyl fluoride (PVF) film offers a solution.

THE PROBLEM WITH BUILDING EXTERIORS

Buildings go through a variety of stresses—and one is the weather. The first component that weather refers to is temperature, which includes the fluctuation of temperatures within day and night cycles as well as longer cycles within seasons. The second component of weather is water, which can come in the form of snow and rain, and which happens in cycles of dry and humid environments. The third component is the wind, which can bring mechanical strain onto structures through a range of force, but it also brings with it particulate that contributes to the erosion of surfaces. All of these weather components can also come in the form of sudden weather events, such as hurricanes, and happen within a short period of time and on an extreme scale.

There are also other environmental stresses that can affect a building. If a building is next to a coastline, it is likely to be impacted by saltwater. Saltwater will be more corrosive toward metallic structures. Other stresses come from human impact. Urban environments often deal with graffiti on surfaces, though graffiti can be found in rural areas as well. The graffiti itself can damage a surface, but the process of cleaning up graffiti using any variety of cleaning solvents can also do damage to a surface. A building in a heavily polluted area, such as in an industrial town or in polluted urban locations, will deal with issues like acid rain or particulates in the air that cause stress on building exteriors. Finally, a building surface can suffer from general daily use from people or animals nearby, such as dogs who might relieve themselves on a building's siding and, just like with weather, damage the integrity of a building envelope.

All of these stresses can wreak havoc on building surfaces. In coastal and tropical or subtropical environments, where temperatures, humidity, and salt spray are high, these pollutants concentrate and stagnant, creating an atmosphere of corrosion. Metals and other surfaces exposed to these environments are highly susceptible to damage from oxygen, moisture, impurities, acids, salt ions, dust, and surface deposits. The issue may be most apparent in environments where extreme weather events happen regularly or where pollution is overwhelming, but still, all buildings—no matter where they are located—will need some mechanism for protecting themselves from chemicals, abrasion, water, wind, and other problems that over time lead to corrosion, coating failure, mold and mildew, cracking, gloss loss, and color change.

In light of all these issues, what is the best exterior protection for a surface?

First, it is necessary to have a surface that is resilient to physical damage—not just in use but in installation. Second, it is necessary to have a surface that is chemically inert. Paint used for graffiti tends to be solvent based, so the surface needs to be able to resist the solvent-based paint while also needing to resist the potentially damaging chemicals found in cleaning solutions that would be used for graffiti removal. Third, it needs to resist the weather by having a surface with ultraviolet (UV) protection through UV-reflective material. This means having a material that can handle thermal changes, seasonal changes, day and night cycles, and sudden weather events. Finally, it is necessary that the surface protection be permanently adhered to the substrate so it can carry out its mission of protecting it.

If these aspects are not managed, there will be a failure of the surface to protect the underlying substrates, and these failures can be seen in different shapes and forms. Gloss loss on the surface, in which a shiny surface is reduced to a low-gloss appearance, changes the original aesthetic. Color changes and cracking of the surface are also symptoms of failed protection. Cracking of the surface associated with a metallic substrate can create corrosion issues, leading to further color problems such as brown and green stains. On other surfaces when there is cracking, mold and mildew can begin to appear, changing the aesthetic and ultimately the strength of the surface.

PVF Film Resistance: A Flexible, Durable Solution

Around the world, we see buildings that stand the test of time—that appear to remain virtually unchanged for decades. What is their secret? One solution that has helped building surfaces withstand these issues is PVF, a technology that works as a laminate on surfaces. While many other protective coatings, including paint, often fade, chalk, crack, blister, or check from UV exposure, acid rain, or dirt, PVF film has shown to prevent UV degradation and the breakdown of building material due to external forces.

Continues at ce.architecturalrecord.com

Erika Fredrickson *is an independent writer and editor focusing on technology, the environment, and history. She is a frequent contributor for continuing education courses and publications through Confluence Communications.* ***www.confluencec.com***

DUPONT Tedlar

DuPont Tedlar PVF films have proven long-lasting protection for interior and exterior architectural applications. Tedlar superior durability helps safeguard a building from corrosion, pollution, or chemical breakdown and resists ultraviolet rays. Specify Tedlar PVF surface protection film to extend the lifetime of metal, architectural fabric, or wall panels for your next project. **www.tedlar.com**



Shown is a clear-view glass partition system with a swing door.

Photo: Geoff Captain; courtesy of C.R. Laurence

Beyond Energy: How Glass in Architecture Contributes to Occupant Well-Being and Comfort

Glass as a multifaceted solution for post-pandemic commercial and residential construction

Sponsored by The National Glass Association | *By Erika Fredrickson*

Glass is a significant architectural technology featuring versatile applications and the ability to achieve several purposes at once. The multifaceted material is used for transparent glazing in the building envelope to harness natural light and provide views. At the same time, it can incorporate safety characteristics that prevent severe weather or guard against assault—such as intentional breaking in or bullets—from affecting the building and its occupants. Glazing technologies have improved in the form of high-performance thermal systems, which

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Learning Objectives

After reading this article, you should be able to:

1. Explain how new glass technologies can help support wildlife and bird safety through new anti-collision design.
2. Describe new trends using glass for artistic and decorative expression in workspaces and commercial buildings that promote well-being and comfort.
3. List some ways that daylighting has contributed to the health and well-being of students and workers.
4. Discuss vacuum-insulating glazing and how it is used in various applications for the benefit of occupant safety, comfort, and well-being.

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

AIA COURSE #K2107B

All images courtesy of National Glass Association



The City of Seattle's Cedar River Municipal Watershed Headquarters located in North Bend, Washington, features bird-friendly glass with acid-etched designs so that birds can identify the glazing and avoid collision.

can help building owners hit or surpass sustainability goals. The wide range of aesthetic possibilities make it a unique design element inside and outside, while still being functional on other levels. More recently, in light of a worldwide pandemic, glass offers a solution for homes and commercial buildings to help decrease virus transmission and make healthier, happier spaces for people.

BIRD-FRIENDLY GLASS

There are so many functions that glass can perform in combination with its basic natural-light qualities. In fact, the glass industry is always finding new ways to meet design needs. One example is bird-friendly glass, which has recently become a hot topic in the glass world.

According to the American Bird Conservancy (ABC), about 1 billion birds die annually from colliding with public and private buildings. The passive, invisible killer? Clear and reflective architectural glass. Windows of all sizes in both commercial and residential buildings in urban, suburban, and rural landscapes are thought to be invisible to most or all birds due to fly-through conditions, reflected habitat conditions, or a black-hole effect.

A fly-through condition is created when architectural elements provide birds with a clear line of sight to sky or vegetation on the other side. A reflected habitat condition is a condition in which the reflected image in glass is undisturbed and blends with the surrounding habitat (i.e., sky, vegetation). A black-hole effect, also known as a "passage effect," is a condition in which glass can appear black due to lighting conditions and create the appearance of a cavity or passage through which birds can fly. All of these conditions can create hazardous environments for birds.

Specific buildings may accrue more bird deaths than others due to the large amount of glass and vegetation present. Bird collisions occur throughout the world at all times of day, in every season of the year, and under all weather conditions.

Even just 10 years ago, there was little science for bird-safe technology and very few products available to architects. Over the past decade, however, increased media attention to the issue has attracted the interest of the public as well as building industry professionals such as glass manufacturers, architects, developers, and landscape designers. The demand for bird safety has resulted in many products tested and marketed as bird safe, and research on bird-glazing collision prevention has guided the development of bird-friendly building design.

The key to bird-safe glass is in transforming clear and reflective glazing into barriers that birds will see and avoid.

Solutions and Mitigation Strategies

Creating visual markers: Research has shown that birds begin to perceive buildings and houses as objects to be avoided when the distance between features or patterns on the glass is approximately 11 inches, with the most effective pattern distance at 4 inches edge-to-edge or less. The denser the pattern, the more effective it becomes in projecting itself as a solid object that is perceived by birds. The following glass and glazing products can help minimize bird-related injuries by creating visual markers:

- Etch
- Frit
- Film
- Decals
- Fenestration patterns of vertical and horizontal mullions
- Decorative grilles and louvers
- Artwork
- Ultraviolet (UV) patterns

Making architectural glass safe for birds is a responsible bird-friendly building design practice. The application of markers that are visible to birds and humans or visible to birds only and spaced 2 inches vertically or 4 inches horizontally on the outer pane of a window, with markers ideally located on or adjacent to the outer glass surface, will reduce bird-window collisions.

Continues at ce.architecturalrecord.com

Erika Fredrickson *is an independent writer and editor focusing on technology, the environment, and history. She is a frequent contributor for continuing education courses and publications through Confluence Communications.* ***www.confluencec.com***

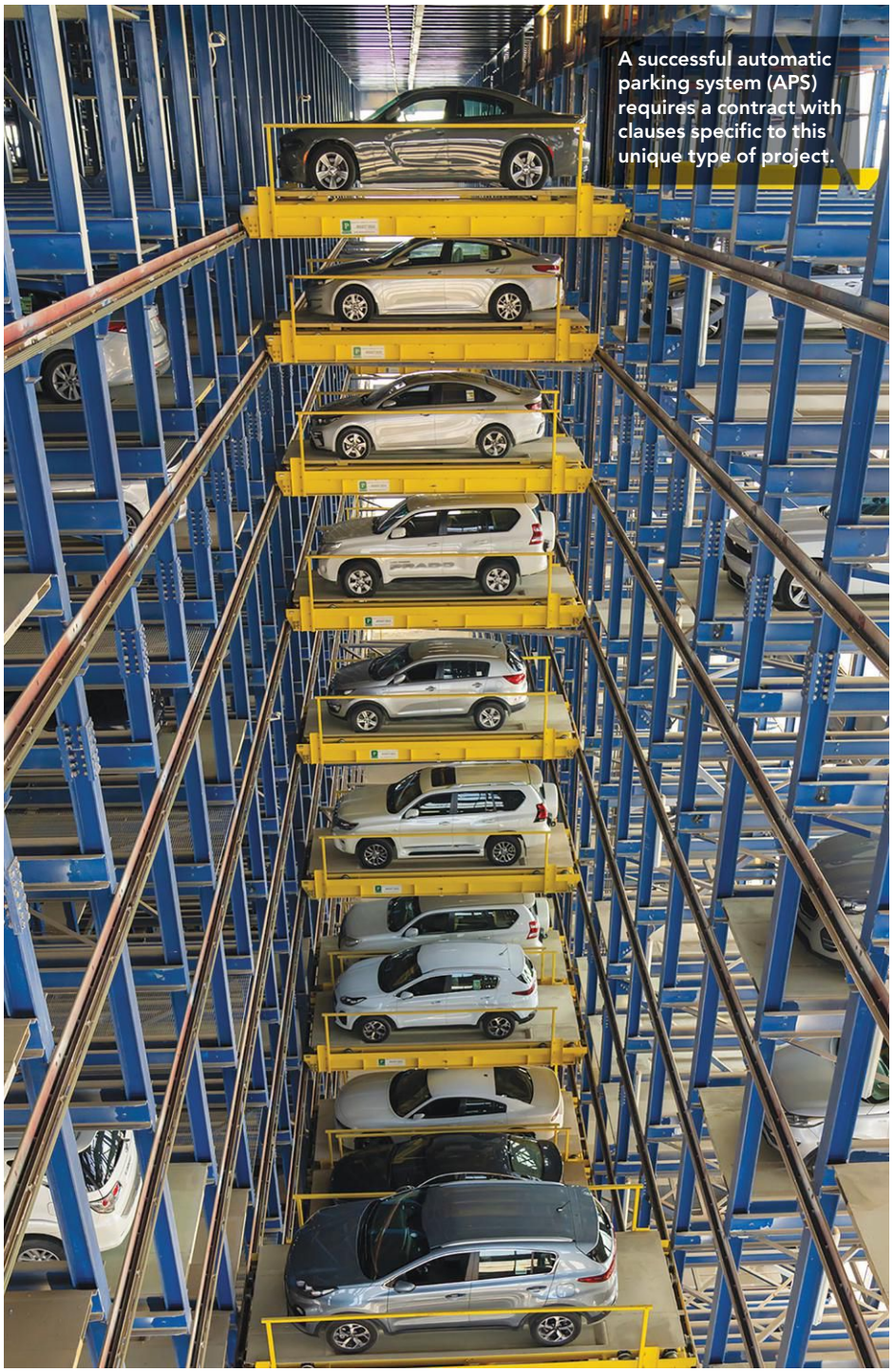
NGA
NATIONAL GLASS ASSOCIATION with GANA

The National Glass Association (NGA) is the largest trade association serving the architectural glass and metals industry. A technical and educational resource, NGA envisions a future in which glass is the material of choice to enhance spaces where people live, play, learn, and work. **www.glass.org**

What Is in the Contract?

A successful automatic parking system—and the document that made it happen

Sponsored by Robotic Parking Systems, Inc.



A successful automatic parking system (APS) requires a contract with clauses specific to this unique type of project.

All images courtesy of Robotic Parking Systems, Inc.

What is in the contract? This important document contains the guiding principles in any project, before, during, and after design and construction. When it comes to an automatic parking system (APS), however, there is no widely accepted standard contract to guide a project from inception to completion.

This course provides elements from such a contract. The model contract demonstrates the importance of providing neutral, comprehensive, and industry contract specifics and specs that—in the interest of all involved from users, owners, planners, and providers—are vital for the success of automatic parking in general. In addition, the course presents a comprehensive case study of the largest APS in the world that was successfully executed—manufactured in the United States, delivered overseas, and installed—using the model contract expanded upon here.

What Is an Automatic Parking System (APS)?

In the 1990s, automatic parking was still largely just a discussion about possibilities. While there were some old mechanical garages and systems in New York and New Jersey, to most people in the parking industry, a robotic garage was one where the entry and

CONTINUING EDUCATION

AIA Continuing Education Provider

1 AIA LU/ELECTIVE

Learning Objectives

After reading this article, you should be able to:

1. Identify important points when contracting an automatic parking system (APS).
2. Explain the principle of standard of care: design responsibilities and fit for purpose.
3. Provide reasonable ways to secure performance.
4. Demonstrate performance measurements for APSs.
5. Share as an example the case study of a 2,314-space APS, certified by Guinness World Records as the largest in the world, that was successfully manufactured, delivered, and installed using this model contract.

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

AIA COURSE #K2107H

exit gates went up and down automatically. The concept of a software system running a garage was still futuristic.

This was the environment in 1994, when one company coined the term 'robotic parking' and established the Florida-based company that designed, built, transported, and installed what would be certified as the largest robotic parking garage in the world. This company developed the lift-and-run system, a software-controlled system that ran three separate sets of machines for the X, Y, and Z axis motions to take a car from an entry bay terminal to an upper level, park it, and bring it back to the terminal on demand.

The lift-and-run system, integrating mechanical capability with software control, was a monumental breakthrough in the parking industry because it can handle 20, 30, or more simultaneous car transactions inside the system and thus drastically increase peak traffic performance. As the *New York Times* mentioned in a 2000 article, this company's working garage in Hoboken, New Jersey, was the country's first fully automatic garage.

Standard of Care

In the standard of care directive, a design professional has the responsibility or duty that anything that is designed needs to "fit for the intended purpose of use." This is a very general and broad definition. However, it becomes more and more important as it has been implemented by the courts during the past 10 to 15 years. In the automatic parking industry, it means that if an architect, engineer, or an automatic parking engineer knows that 400 parking spaces, for example, are needed for a residential development, s/he then has the obligation to make sure the associated required peak traffic capacity for a specified APS is designed in accordance with industry standards. It has to move the vehicles in and out of the system in a timely manner consistent with standards.

Continues at ce.architecturalrecord.com

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

STEP-BY-STEP: MANUFACTURING AND INSTALLING AN AUTOMATIC PARKING SYSTEM (APS)

While the three buildings shown here look strikingly different from each other, they all have something in common behind their facades: an automatic parking system (APS) that robotically parks the same number of cars in one-half to one-third the volume of space needed for conventional parking garages. This proves parking, while a necessity, is not the highest and best use of land on any project. The space saved by APSs allows developers and architects to use the space for additional revenue, green space, common areas for the community, or other uses that benefit the project as a whole. These parking facilities also offer more security, fewer emissions, and greater convenience for users.

This course illustrates, from start to finish, the building of a 2,314-space garage at the Al Jahra Court in Kuwait. This automatic garage was manufactured in the United States by a company with 25 years in APSs and then shipped to the site in Kuwait, where it was assembled and commissioned. It is the Guinness World Record holder for the largest automated parking facility.

The elements of the model contract illustrate the often unique aspects of automatic parking garages that must be spelled out to all parties to achieve success with such a massive, sophisticated project, involving more than 1,293 tons of machinery, electronics, and automation equipment.







Shown are three different APSs, including the one featured here.

Every Project Is Custom

Every APS starts with a custom design. The manufacturer works closely with architects and developers around the world to design automatic parking garages that maximize site development.

The design of the parking facility considers:

- The dimensions of the buildable area, including height above and/or below grade.
- Any building or property restrictions.
- The number of parking spaces needed.
- The expected peak traffic per hour.
- Numerous other factors.

The result is creative parking solutions that fit within the available space in any project.



APSs do not need to accommodate people driving cars with ramps and elevators and lighting. The robotic machinery and sophisticated software do the job. This model shows a conventional garage on the bottom with automatic parking above.

Robotic Parking Systems, Inc.

Founded in 1994, U.S.-based Robotic Parking Systems, Inc. pioneered the development of the high-capacity, scalable automated parking garage. A robotic parking system reduces the space needed for cars by 50 percent or more. The patented technology creates opportunities for projects to profit from the space-saving, environmental, and safety benefits.
www.roboticparking.com

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



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

How to Calculate the Wood Carbon Footprint of a Building

Expanding the possibilities of wood building design

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

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

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

CONTINUING EDUCATION

AIA Continuing Education Provider — 1 AIA LU/ELECTIVE

1 GBCI CE HOUR

Learning Objectives

After reading this article, you should be able to:

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

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

AIA COURSE #K2009B
GBCI COURSE #0920022367

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

WHY BUILDINGS MATTER

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

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

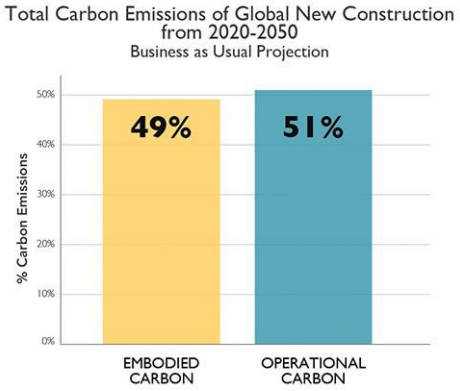
Architects and engineers are setting aggressive goals to help reduce emissions. Architecture 2030 has issued the following challenge to the global architecture and building community for embodied carbon: "The embodied carbon emissions from all buildings, infrastructure, and associated materials shall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

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

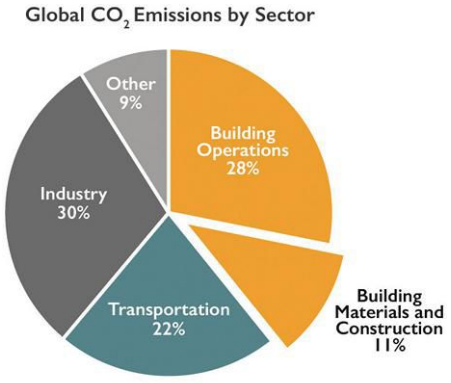
CARBON FOOTPRINT IN THE CONTEXT OF BUILDING MATERIALS: A PRIMER ON THE TERMS

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

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



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



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Continues at ce.architecturalrecord.com

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

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

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EDUCATIONAL-ADVERTISEMENT



Whether an organization wants its office to be occupied full-time post-pandemic or serve as a critical part of a hybrid working model, it has the potential to act as a great equalizer—a shared facility specifically designed to support employees' work and well-being.

Photo: Vincent Lions Photography

In Pursuit of Acoustical Equity

Controlling the properties of sound within the built environment

Sponsored by LogiSon Acoustic Network | *By Viken Koukounian, Ph.D., PE, and Niklas Moeller*

Given the intense focus on health and safety as well as the changes in work/life balance precipitated by the COVID-19 outbreak, it is not surprising that the pandemic has accelerated the healthy-building movement and people-first mindset spearheaded by standards such as WELL Building Standard and Fitwel. There is burgeoning consensus that buildings need to be designed with deep commitment to the well-being of their occupants.

Effective acoustics are key to healthy buildings. After all, noise is known to provoke physiological stress responses that can negatively impact occupants. The World Health Organization describes it as an "underestimated threat" that contributes to stress, high blood pressure, cardiovascular disease, dementia, and diabetes. Hence, WELL and Fitwel take acoustics into consideration; however, it remains a poorly understood indoor environmental quality (IEQ) parameter—and the lowest rated.[1]

RETURNING TO THE WORKPLACE

Low scores have added significance in today's climate. Many employees found a silver lining in the ways in which stay-at-home orders enriched their family lives, even as the scope of their work and social lives contracted. As companies start to bring—or attempt to draw—them back to the office, occupant satisfaction is more important now than ever before.

Continues at ce.architecturalrecord.com

Viken Koukounian, Ph.D., PE, *is an acoustical engineer at K.R. Moeller Associates Ltd. and an active member of numerous international standardization organizations.* ***ca.linkedin.com/in/vikenkoukounian***

Niklas Moeller *is the vice president of K.R. Moeller Associates Ltd., manufacturer of the LogiSon Acoustic Network and MODIO Guestroom Acoustic Control.*

CONTINUING EDUCATION

AIA Continuing Education Provider — 1 AIA LU/HSW

Learning Objectives

After reading this article, you should be able to:

1. Introduce the concept of acoustical equity.
2. Discuss the role that acoustical privacy plays in achieving acoustical equity.
3. Describe the need to control the temporal, spatial, and spectral qualities of background sound within the built environment.
4. Explain the importance of tuning minimum background sound to meet a masking spectrum.

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

AIA COURSE #K2107M

LogiSon Acoustic Network has been dedicated to the design and manufacture of sound-masking technologies for more than 40 years. After completing this course, readers should find the topic of workplace acoustics less mysterious—and feel inspired to create spaces that sound as good as they look. **www.logison.com**

Upcoming Exhibitions

Designing the Social
Rotterdam, Netherlands
July 5, 2021–July 7, 2024
The Het Nieuwe Instituut presents archives from the National Collection for Dutch Architecture and Urban Planning to highlight different perspectives on communal forms of living for its exhibition on 100 years of idiosyncratic arrangements in the Netherlands. Designers, researchers, and curators have selected pieces from a century of social design for a series of rooms that investigate the interaction between design and society. The semipermanent exhibition will engage with themes like the minimum dwelling space, squatting as strategy, community center, second-wave feminist design, and the socioeconomic experiment of the De Ploeg weaving mill. See hetnieuweinstituut.nl/en.

Mark Bradford
Menorca, Spain
July 17–October 30, 2021
Hauser & Wirth Menorca, the new gallery on Isla del Rey in the port of Mahon in Menorca, will be inaugurated by an exhibition featuring an array of new paintings and sculptures by Mark Bradford. Through a conservation project over a two-year period, Hauser & Wirth has repurposed historic buildings on the island to create an art center that includes a sculpture trail with works by Louise Bourgeois, Franz West, and Eduardo Chillida, among others. The center has also created an education program to engage both visitors and members of the local community in contemporary-art workshops, screenings, and talks. See hauserwirth.com.

Improvisation in Wood: Kawamata x Munakata
New York
September 30, 2021–January 16, 2022
Japan Society presents an ambitious exhibition of major works by two preeminent Japanese artists of different generations: Tadashi Kawamata (born in 1953) and Shikō Munakata (1903–75). Kawamata pays homage to Japan Society's building—the first structure in New York built by a Japanese citizen, Junzo Yoshimura—as well as to the master 20th-century woodblock artist Munakata. Kawamata's site-specific installation engages prints by Munakata and draws inspiration from his signature materials of wood, paper, and ink. See japansociety.org.

Ongoing Exhibitions

Theaster Gates: How to Sell Hardware
Chicago
Through July 31, 2021
Gates's immersive exhibition at Gray Warehouse tells the story of the artist's ongoing engagement with a family-owned hardware store formerly on Chicago's South Side, paying homage to material history through both modern architecture and utilitarian items and those who employ them. The solo exhibition, as in much of Gates's practice, memorializes the store's changing context and urban landscape while preserving often neglected cultural and social narratives. For more, see richardgraygallery.com.

Zaha Hadid—Abstracting the Landscape
Zurich
Through July 31, 2021
Planned by Galerie Gmurzynska in collaboration with Zaha Hadid before her death in 2016, the exhibition pays homage to her visionary architecture. Opening on the fifth anniversary of Hadid's demise, it features site-specific objects and never-before-exhibited designs, and includes models, drawings, and sculptural objects, integrated into a custom floor design. See gmurzynska.com.

Niki De Saint Phalle: Structures for Life
New York
Through September 6, 2021
The exhibition at MoMA PS1 presents over 200 works of feminist American and French artist Niki de Saint Phalle (1930–2002), including sculpture, prints, jewelry, clothing, and archival materials created from the mid-1960s on. The selected pieces showcase the artist's interdisciplinary approach, which engaged with both social and political issues, to transform individuals, the environment, and society as a whole. See moma.org/ps1.

With Eyes Opened: Cranbrook Academy of Art Since 1932
Bloomfield Hills, Michigan
Through September 19, 2021
The Cranbrook Academy of Art is debuting its first book and largest exhibition, chronicling the school's 90-year history of radical experimentation in arts education. The four-year research project that informs the exhibit encompasses the entire museum and showcases more than 220 artists, with a specific focus on artists and designers of color, and on women. The show features some 275 works,



both historical and contemporary, from interdisciplinary areas of study including architecture, ceramics, design, fiber, metals, painting, printmaking, photography, and sculpture. See cranbrookartmuseum.org.

Time Space Existence
Venice
Through November 21, 2021
The European Cultural Centre presents the biennial architecture exhibition in its fifth iteration. It features both completed and ongoing projects, in addition to innovative proposals and research, with over 200 participants investigating the fundamental themes of time, space, and existence and how they relate to design of the built environment. With the goal of creating an exchange among architects, developers, photographers, artists, engineers, universities, emerging studios, and established global presences, the center aims to bring together those helping shape the future. See ecc-italy.eu.

Melvin Edwards: Brighter Days
New York
Through November 28, 2021
The Public Art Fund is showcasing a survey of the career and work of Melvin Edwards through five sculptures created between 1970 and 1996, and a sixth large-scale work commissioned in 2020 on display at City Hall Park—historically, the site of the African Burial Ground and also of recent protests calling for action to end systemic racism. Edwards's work in monumental civic sculpture fuses abstract forms, often including chain or welded ropes as symbols of oppression or liberation and connection, with the artist's personal history of engaging with issues of race, labor, and the African diaspora. For more, see publicartfund.org.

The Fabricated Landscape
Pittsburgh
Through January 17, 2022
At the Heinz Architectural Center, the Carnegie Museum of Art spotlights 10 contemporary practices from around the world to examine the role of architecture and design in our daily lives. Designed by IN-FO.CO and curated by Raymund Ryan, *The Fabricated Landscape* showcases work by Assemble, Frida Escobedo, Go Hasegawa, Anna Heringer, Anne Holtrop, LCLA, MAIO, OFFICE Kersten Geers David Van Severen, SO – IL and UMWELT. Each practice—many of which are led by women or based in Central or South America—showcases three innovative projects that combine traditional crafts with new digital technology to create sustainable solutions. See cmoa.org.

Justice is Beauty: The Work of MASS Design Group
Washington, D.C.
Through September 25, 2022
The National Building Museum's exhibition displays the MASS Design Group's portfolio,



Architectural Record congratulates our editor in chief, Cathleen McGuigan, who is being honored with the Architecture in Media award during AIA New York's 16th annual Honors and Awards Luncheon. In addition to recognizing recipients of this year's AIA NY Design Awards, the event also serves as an important fundraiser for the chapter and its ongoing mission to show that design matters.

Cheers to this year's winners.



including applied research, proposals, and completed buildings related to the architecture of health. Focused on themes of engaging, healing, and conserving, the exhibition incorporates photographs, videos, renderings, and models. It is accompanied by *The Gun Violence Memorial Project*, an installation by the artist Hank Willis Thomas in collaboration with the Everytown for Gun Safety Support Fund and Purpose Over Pain. The memorial is comprised of four "houses" of glass bricks containing mementos representing lives lost to gun violence in America. For more information, see massdesigngroup.org.

Events

Magic Lies Outside
Grand-Métis, Quebec
Through October 3, 2021
The International Garden Festival's 22nd edition unveils selected contemporary installations, at Les Jardins de Métis/Redford Gardens, from landscape architects and designers. Of 160 projects, five have been selected, from four countries—Canada, the United States, France, and Sweden—that offer a mix of curated environments, nature, horticulture staging, and human creativity. For more, see internationalgardenfestival.com.

Venice Architecture Biennale 2021
Venice
Through November 21, 2021
The 17th International Architecture Exhibition, curated by architect Hashim Sarkis and organized by La Biennale di Venezia, includes over 100 participants from 46 countries. Weekends on Architecture, composed of a series of lectures and programs with architects and scholars from around the globe, addresses the title question, "How Will We Live Together?" Topics include the challenges of climate crisis, the role of urban space in public uprisings, changing forms of collective housing, the architecture of education, and the relationship between curation and architecture. See labiennale.org/en.

Metropolis: The New Now
Berlin
August 11–14, 2021
The city of Berlin will host the fourth edition of Berlin Questions international conference. Experts in the fields of politics, science, art, and activism will meet to discuss their experiences of the pandemic, issues of civil responsibility, quarantine economies, local and global solutions, and visions for urban life moving forward. Hosted by Berlin's mayor Michael Müller, Berlin Questions 2021 will include High Line architect Elizabeth Diller, mayor of Dakar Soham El Wardini, and cofounder of Turntoo Sabine Oberhuber. For more, see berlinquestions.com.

Built Environment Summit
London & online
October 27–29, 2021





Together with Architecture 2030 and Architects Declare, the Royal Institute of British Architects will host a three-day summit from London via live webcast, ahead of the United Nations' 2021 Climate Change Conference in Glasgow. Supported by the Global Alliance for Buildings and Construction, the American Institute of Architects, and ALA Assoarchitetti, the participants will analyze the built environment's relation to the UN's zero carbon goals, calling on governments around the world to provide support. For more information, go to builtenvironmentsummit.org.

Competitions

AIA Film Challenge

Deadline: August 16, 2021

The 2021 challenge invites filmmakers to share stories of collaborative partnership among architects, civic leaders, and communities to achieve zero carbon, resilient, healthy, just, and equitable designs for the built environment. To win the $7,000 prize, participants can produce one-and-a-half- to three-minute documentary films with any device. Winner announcement: December 1, 2021. For more, see aiafilmchallenge.org.

Fentress Global Challenge 2021
Airport of the Future

Deadline: October 1, 2021

Fentress Architects has announced that the 2021 challenge is open for entries. The eighth year of the annual international competition will aim to challenge students from around the world to envision innovative terminal designs for future airports. Shortlist announcement: November 1, 2021. Winner announcement: December 1, 2021. For more information, see fentressarchitects.com.

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

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MATERIALS

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Mid-Atlantic Timberframes is a leading authority on timber design and construction.

Product Application

- Semans-Griswold Environmental Hall at Washing-ton College in Chestertown, MD
- Party Barn in Willow Street, PA
- Vacation Home in British Columbia

Performance Data

- Custom design, craft, and build timber structures
- Provide quality and expertise through every step of the building process



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717.288.2460 | Sam Ebersol

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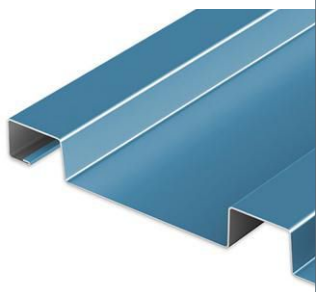
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Product Application

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Performace Data

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Product Application

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- Larken Associates, multiple properties

Performance Data

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- Hidden supports for attractive appearance
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Advertisers Index

Advertiser	Page
Aluflam Na LLC	**123**
ARCAT	**CVR3**
Architectural Record - Academy of Digital Learning	**67**
Architectural Record - Academy of Digital Learning NGA	**43**
Architectural Record - Academy of Digital Learning Rockfon	**101**
Architectural Record - AIA Award Honors Cathleen McGuigan	**124**
Architectural Record - AIA Awards	**70**
Architectural Record - Design:ED Podcast	**19**
Architectural Record - Education Exchange	**6**
Architectural Record - eNewsletters	**102**
Architectural Record - July Webinars	**68**
Architectural Record - Record House Live	**95**
Architectural Record - Record Products of the Year	**47**
Architectural Record - American Framing Exhibit UIC	**51**
Architectural Record - Tall Building Symposium	**69**
Armstrong World Industries, Inc.	**CVR2, 1**
ASI Group	**111**

Advertiser	Page
Benjamin Moore & Co.	**8**
C.R. Laurence	**107**
CAST CONNEX	**21**
CERSAIE	**13**
Dupont	**114, 115**
EarthCam, Inc.	**18**
Feeney Architectural Products	**30**
Fortress Building Products	**2, 3**
Georgia-Pacific Gypsum	**24**
Goldbrecht	**17**
Hormann High Performance Doors	**4**
Huntco Supply	**16**
Inpro	**105**
Invisible Structures, INC	**35**
Joto-Vent System USA, Inc.	**32**
Julius Blum & Co., Inc.	**5**
Landscape Forms, INC.	**26**
Logison	**122**
Mid-Atlantic Timberframes	**11**
modular Arts	**31**

Advertiser	Page
NanaWall	**CVR4**
National Terrazzo & Mosaic Association	**7**
New Millennium	**109**
NGA	**116, 117**
PABCO Gypsum	**14**
Petersen Aluminum	**28**
Reef Industries, Inc.	**125**
Robotic Parking	**118, 119**
Rockfon	**113**
Skyscraper Museum, The	**125**
Think Wood	**120, 121**

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Ⓡ Regional AD



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A SERPENTINE steel-and-timber staircase rises through the Musée Carnavalet in Paris—newly revamped by Snøhetta and Chatillon Architectes—introducing a sleek foil to the museum's collection of artworks and artifacts, which tell the story of the city. Located in the Marais, Paris's oldest museum—the product of two 17th-century mansions—closed in 2016 for renovations focused on addressing issues of accessibility. With its intervention, the design team incorporated improved circulation and graphics, plus additional exhibition, teaching, and research spaces, while preserving the historic institution's original features and spirit. *Ilana Herzig*

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