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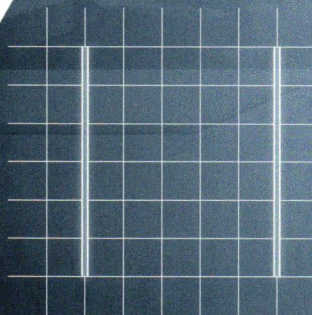
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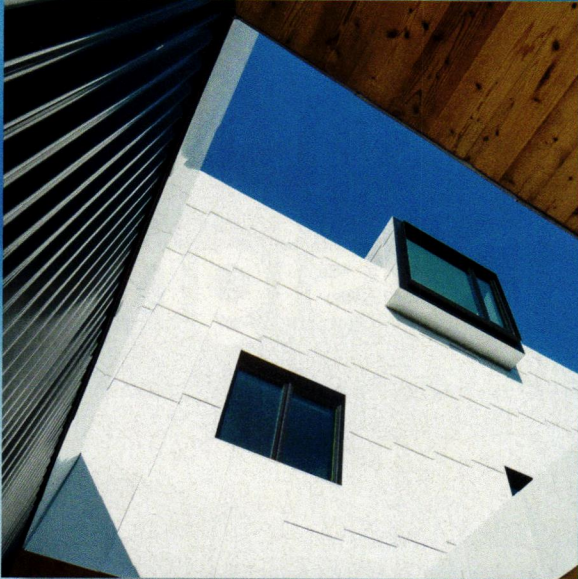
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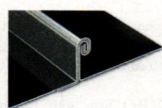
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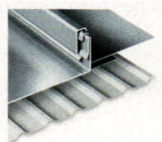
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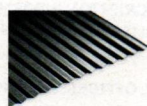
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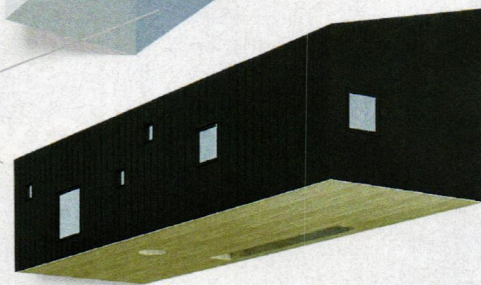
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ARCHITECTURAL RECORD (ISSN: Print 0003-858X Digital 2470-1513) December 2020, Vol. 208 No. 12.
Record is published 12 times annually, monthly by BNP Media II, LLC., 2401 W. Big Beaver Rd., Suite 700,
Troy, MI 48064-3333. Telephone: (248) 362-3700, Fax: (248) 362-0317.

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

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not be reproduced in whole or in part without the consent of the publisher. The publisher is not responsible for
product claims and representations. Periodicals Postage Paid at Troy, MI and at additional mailing offices.

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

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

CHANGE OF ADDRESS: Send old address label along with new address to ARCHITECTURAL
RECORD, P.O. Box 1440, Lincolnshire, IL 60069.

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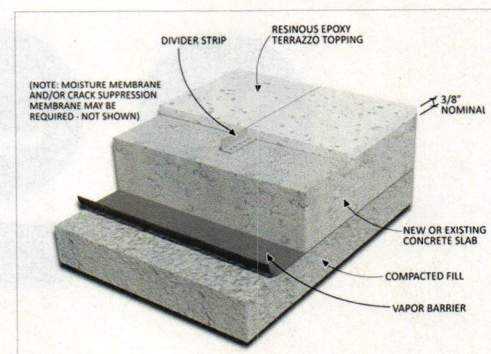
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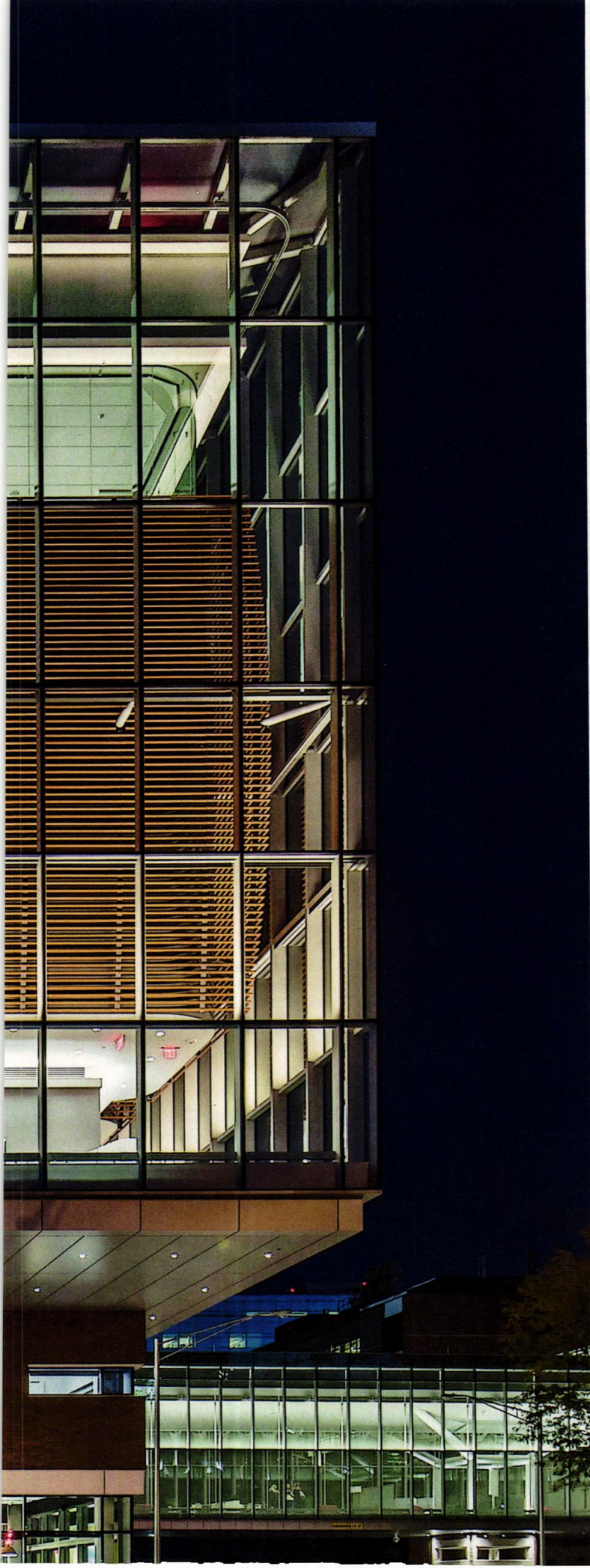
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COVER: PHOENIX CENTRAL PARK, SYDNEY, BY DURBACH BLOCK JAGGERS AND JOHN WARDLE ARCHITECTS. PHOTO BY ANTHONY BROWELL.





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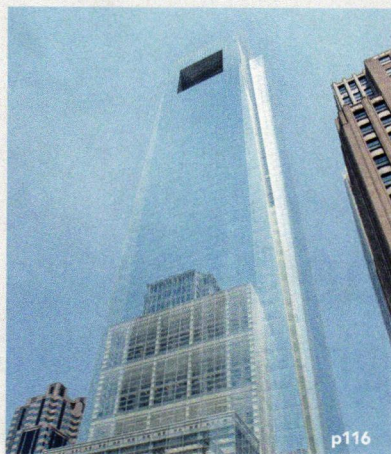
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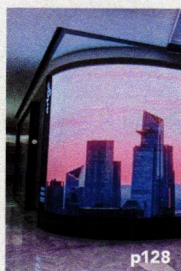


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Creating High-Performance Building Facades

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LED Technology and Support Structures: Advantages, Applications, and Attachment

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Understanding Metal Composite Material, Installation, and Systems

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Creative Building Solutions with Pre-Painted Metal Panels

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Window Code Fundamentals

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NFPA 285 and Metal Composite Materials

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Solar Facades: Understanding Building Integrated Photovoltaics and Pressure-Equalized Rainscreens

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A Hybrid Approach: Combining Mass Timber with Steel and Concrete

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Retractable Roofs: A Sustainable Solution

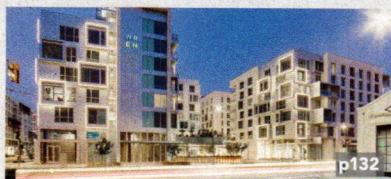
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Buildings that Breathe: Healthy Design in a Post-Pandemic World

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Structural Wood Building Systems

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Acoustic Design for Wellness in a Post-COVID World

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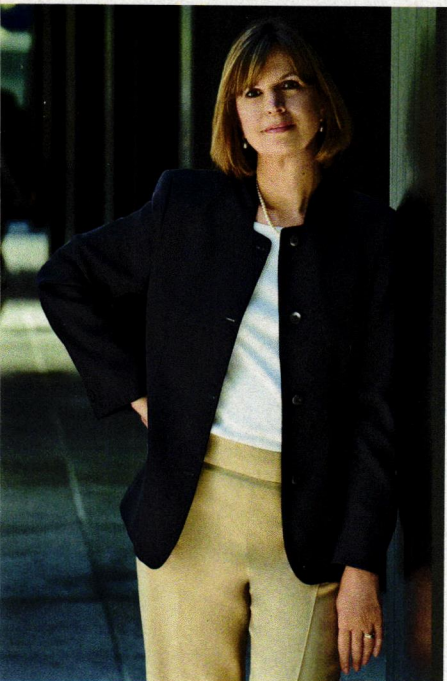
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The Long Game

While living through difficult, uncertain times, architects look at the future and see possibility.

NO ONE will be sorry to kiss 2020 goodbye—which will be about all you're allowed to kiss these days, given the global pandemic. It was a year that foregrounded the harsh realities of racial injustice, while personal losses and the economic and political turmoil cast our differences into especially sharp relief.

Architects did step up in these crises, moving quickly, for example, to create strategies for reducing coronavirus infections in health-care facilities and converting spaces for more hospital beds. They have adapted plans for safer schools, offices, and restaurants and looked at how to expand streetscapes and public places for everyone spending much more time outdoors.

As the profession began to confront, once again, embedded racism in the field and built environment, the advocacy work of the National Organization of Minority Architects (NOMA) took on renewed significance. HOK principal Kimberly Dowdell, NOMA's 2020 president (who was honored for her exemplary leadership in Record's Women in Architecture Awards in October), will be succeeded in January by Jason Pugh, an architect and planner with Gensler. He speaks in this issue about his new role in the organization (page 30).

Yet despite the gravity of current problems—including plummeting billings and layoffs, and clients slower to pay fees—the practice of architecture is usually a long game. Architects bring a unique perspective to envisioning the future. That promise was at the core of RECORD's first virtual Innovation Conference in late October, which reached an audience of nearly 5,000 around the globe. Jeanne Gang opened the two-day convocation, showing her studio's visionary work, engaging communities and the environment across every scale, from modest neighborhood amenities to buildings that sympathetically embrace both the skyline and the ground plane. The 2021 RIBA Gold Medal winner, David Adjaye, whose firm has offices in London and New York, spoke from his new base in Accra, Ghana (he is Ghanaian-British), and explained why he is expanding his practice in Africa, the continent with the world's youngest population (median age: under 20) and where he has several cultural and spiritual projects. Architect Neri Oxman, who focuses on cross-disciplinary research, unveiled a series of stunning experiments in materials and construction that lie at the intersection of technology and nature; she spoke of the future of the planet with both urgency and hope. Finally, Frank Gehry closed the conference by diving into social-justice work in Los

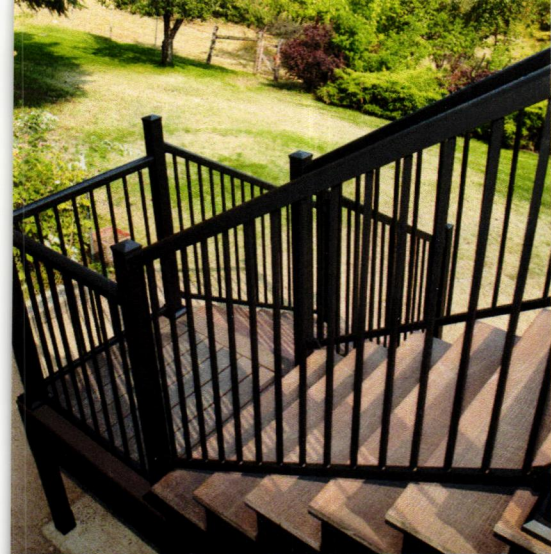
Angeles County: his office is the master planner for the 51-mile-long L.A. River basin, which cuts through many poor neighborhoods, where the 91-year-old architect is engaged with local communities in developing facilities such as an arts training center in South Gate.

Also joining the conference were the architects Thomas Phifer and Fabrizio Barozzi, each of whom is known for exquisitely detailed arts buildings that act as urban catalysts. Phifer's pairing of a theater and museum in central Warsaw will revitalize a vast post-war square, while the Barcelona-based firm Barozzi Veiga has designed cultural buildings that have cleverly invigorated their city surroundings, such as the Musée Cantonal des Beaux-Arts in Lausanne, Switzerland (RECORD, December 2019). The office is also working for the first time in the U.S., developing a new master plan for the Art Institute of Chicago. You can read more about the Innovation Conference in this issue (page 25) and access videos of the sessions in the Continuing Education center on RECORD's website.

Designing a cultural project can be the most aspirational and liberating work in architecture, making space for known, and as-yet unknown, creative production. In the pages ahead, we look at half a dozen such buildings, from an over-the-top collaboration by the architects Durbach Block Jagers and John Wardle for a private museum and performing complex in Sydney (page 78) to a 19th-century clapboard church in Sag Harbor, New York, reborn, thanks to architect Lee Skolnick, as an artist-in-residence center, where God is truly in the details (page 86). We also explore the luminous new building for the Museum of Fine Arts, Houston, by Steven Holl Architects (page 60); a dramatic circular museum in China by Tadao Ando (page 72); an austere Manhattan art gallery by Annabelle Selldorf (page 68)—as well as the Lindt Home of Chocolate on the shores of Lake Zürich by Christ & Gantenbein (page 55), with its curving vanilla facade and an interior atrium with a spiral concrete stair dramatic enough to stand up to the world's largest chocolate fountain nearby.

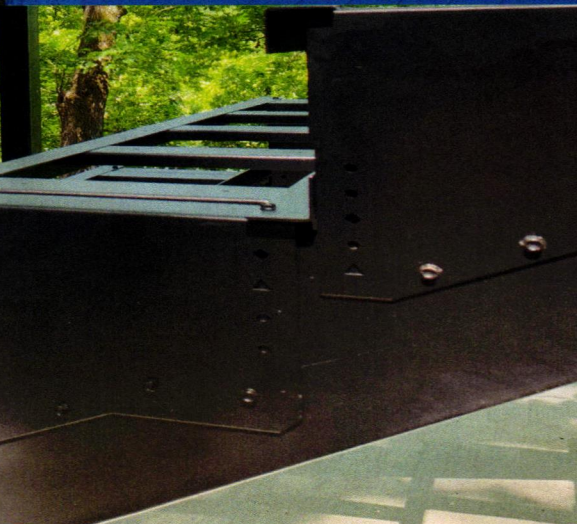
Cultural architecture is innately optimistic—and though theaters, concert halls, and museums have been hard-hit in the pandemic, they will, before too long, reopen and give us the experience of architectural imagination unleashed.

Cathleen McGuigan
Cathleen McGuigan, Editor in Chief



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Buildings that Breathe: Designing Healthy Spaces in a Pandemic World

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MEET THE PANELISTS



Florian Idenburg
Principal
SO - IL



Erik Frandsen
Partner
Lundgaard & Tranberg



Sophia Razzaque
Associate
Lake | Flato Architects



Josephine Minutillo
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Architecture schools should have faculty and students that look like the rest of society, in gender, race, ethnicity, and identity.

— Princeton University School of Architecture dean **Monica Ponce de Leon**, while accepting one of Record's Women in Architecture Awards for her work as an educator.

Profession Must Zero in on Carbon to Meet 2030 Climate Goals

BY JOANN GONCHAR, FAIA

YOU CAN'T IMPROVE what you don't measure: that's the idea behind the AIA 2030 Commitment, a voluntary program that asks design firms to track their progress toward creating carbon-neutral buildings. This fall, the AIA released data from participants for 2019 that showed continued advancement since the program's inception in 2009, and over the previous year, with more firms participating and showing better energy performance.

But, at same time, the report left significant room for improvement: only 311 of 682 signatory firms even submitted data, and only 27 of those (up from 16 of 549 total participants in 2018) met the commitment's performance thresholds. "With the climate crisis escalating, more needs to be done," said the report's authors, in an understatement.

The commitment supports the goals set by architect Ed Mazria's nonprofit, Architecture 2030. In 2006, Mazria challenged the AEC industry to meet efficiency targets on a schedule that grows more stringent over time, to reach carbon neutrality by 2030 in all new buildings and major renovations. Firms that sign the AIA pledge agree to disclose the predicted energy use intensity (EUI)—calculated on the basis of a building's size—of all their current work.

For 2019, the 311 reporting companies—among them, many of the profession's largest firms—disclosed data for 20,000 active projects, representing 3.3 billion square feet in more than 100 countries, from the earliest phases of design to construction. The data indicate savings equivalent to 20.2 million metric tons of carbon dioxide emissions and an overall 49 percent EUI reduction—a modest improvement over 2018's 46 percent reduction, but still far short of the 70 percent target. For 2020, the commitment's reduction goals ratchet up to 80 percent.

The experience of VMDO, a 74-person firm with offices in Charlottesville, Virginia, and Washington, D.C., illustrates the difficulties in trying to meet the 2030 targets. Despite having designed several net zero energy K-12 schools (each count as a 100 percent EUI reduction), the firm's average EUI reduction for its entire portfolio has yet



BNIM's Makers Quarter Block D office building in San Diego relies on tightly coordinated efficiency measures and renewable energy to meet its net zero target.

because of cost-cutting. As a remedy, staff are learning more about funding mechanisms—such as power-purchase agreements and PACE (property assessed clean energy) programs. "Financing is outside the usual scope of an architect's work," says Knoll, "but when it comes to value engineering, we want the critical aspects of a project untouched."

The working group and local AIA chapters are pushing to increase signatory firms and reporting. The group has also enhanced its platform, the Design Data Exchange (DDX), to streamline the reporting process. Other new features include a clearer outline of project phases and an option to track carbon embodied in materials.

to reach the program's target over its three years of participation. Some building types are difficult, explains Michelle Amt, director of sustainability, such as college residence halls, which tend to be vertical, with little roof area for solar panels relative to enclosed space. "We will have to dig into these typologies and step up our research," she says. According to Tate Walker, cochair of the 2030 Commitment working group, and sustainability director at OPN Architects, in Madison, Wisconsin, "The commitment isn't for your most high-profile work, or for when clients ask for it. It applies across the board."

That is a tough target. Even BNIM, the Kansas City, Missouri, firm long known for its environmental work and an early 2030 signatory, only met (and surpassed) the reduction goals for the first time in 2019. Associate principal Jeremy Knoll recently analyzed the firm's last decade of data and found that the target EUI as designed tended to be compromised as projects moved toward construction,

In addition, firms can now count off-site renewable energy toward targeted goals—especially significant for complex projects and those in dense settings. Vincent Martinez, COO of Architecture 2030, predicts that, with more renewable-energy options, the program's numbers will improve markedly. Since 2005, he notes, carbon dioxide emissions from buildings are down 21 percent in the U.S., even as 47 billion square feet of space was added—because of better design, efficiency retrofits, and tighter codes.

Walker is optimistic that the industry will achieve carbon neutrality by 2030. Though progress has been slow and incremental, technology is catching up, he says, pointing out that photovoltaics cost a fraction of what they did five years ago, and LEDs have cut lighting loads in half. "We have all the technical solutions," he says; "the last and hardest piece is cultural change." Can the design industry meet the challenge? The clock is ticking. ■

Adjaye Associates Unveils Plans for Edo Museum

BY CATHLEEN MCGUIGAN

ADJAYE ASSOCIATES, along with the Legacy Restoration Trust of Nigeria and the British Museum, last month unveiled plans for the Edo Museum of West African Art (EMOWAA). Sited next to Oba's Palace in Benin City, Nigeria, the new museum is a catalyst in a three-part effort: to create a home for the art and artifacts of Benin's heritage; to engage in archeological work in the ancient royal city, on the museum site; and to push for the restitution of objects looted during the colonial period, now in institutions across the UK, Europe, and North America. Among the most famous artworks are Benin bronzes—cast sculptures and plaques, many from the kingdom's palace—of which the British Museum has 900 in its collection.

The elegant bronzes (often composed of other metals) date from as early as the 13th century. The single most destructive event in their wholesale dispersal around the world was the brutal sacking and razing of the royal

A rendering of the museum shows the main entrance and courtyard.

city of Benin by the British in 1897.

The design of Adjaye's museum and surrounding landscape will incorporate those ruins—fragments of walls, moats, or gates—in what a press release calls "the most extensive archeological excavation ever undertaken in Benin." So far, \$4 million has been raised for funding the dig.

Some fragments may inspire forms in the museum's gallery pavilions that could "allow the objects themselves to be arranged in their pre-colonial context," says the press release. Adjaye calls his scheme "a new museum paradigm for Africa . . . undoing the objectification that has happened in the West" and creating "a place for recalling lost collective memories of

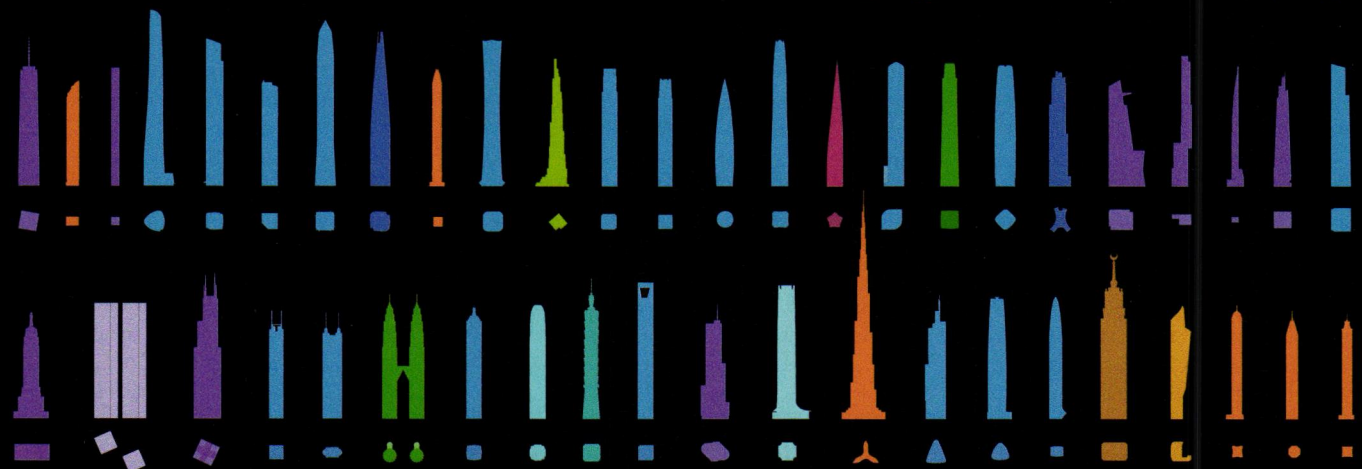


the past." The Ghanaian-British, RIBA Gold-winning architect, whose firm has offices in London and New York, is now based in Accra, with several projects in Africa under way.

While the introduction of the museum plans is helping pressure Western institutions to return Benin's patrimony, most are not committing to permanently return pieces but rather only lend them. Meanwhile, the website Digital Benin (digitalbenin.org) was launched last spring to catalogue the artifacts in collections all over the globe. ■

IMAGE: © ADJAYE ASSOCIATES

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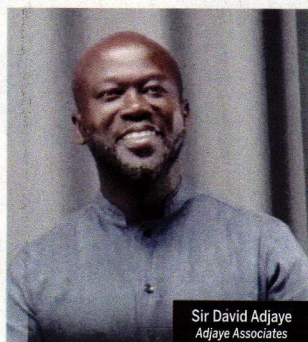
Virtual Innovation Spotlights Urbanism and Equity

BY ALEX KLIMOSKI

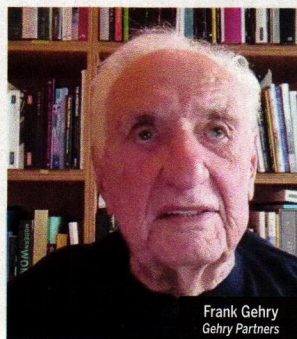
ALTHOUGH attendance at RECORD's 2020 Innovation Conference in October was virtual, one of the strongest themes throughout the two-day online event was how to bring people together. As a difficult year marked by disease and divisiveness—but also a remarkable push for social justice—comes to a close, the conference's group of renowned speakers reflected on how the built environment, when designed with empathy, can be a healing force.

The first speaker, architect Jeanne Gang of Chicago-based Studio Gang—perhaps most widely known for her skyscrapers—focused instead on the firm's outlook on “micro-urbanism,” a philosophy that grew from a 2008 community-center project in the Auburn-Gresham neighborhood. Recalling the ways in which that building served as a catalyst for the area's transformation, Gang discussed the need for good architecture—whether it be for a step street or a boathouse—to strengthen underserved areas. Through observation and conversation with local citizens about the deficits and assets of their urban environments, Studio Gang's proactive block-to-block approach to engaging communities in the design process—which has led to a number of workable projects—celebrates the idiosyncrasies and nuances within a neighborhood. “Architecture is a big part of urbanism. It's a spark that can really get change happening,” said the architect.

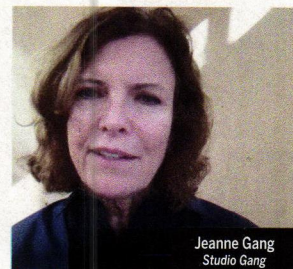
A panel on equity, access, and inclusion in public space, with Justin Garrett Moore, director of the New York City Public Design Commission, and Mitchell Silver, the commissioner of the New York City Department of Parks, continued the conversation on how architects and designers can be active agents of social change in urban communities. The discussion, as Moore put it, asked the audience to “question the architecture that creates a landscape of injustice,” whether it be poorly maintained parks or the use of potentially discriminatory language on placards, such as the words “no loitering.” The conference's other two panel sessions, which included educators from Yale University, Tuskegee University, the University of Texas at Arlington, NJIT, and IE University in Spain, touched on the various ways that architecture schools can more seriously address equity, not only in terms of creating more access for



Sir David Adjaye
Adjaye Associates



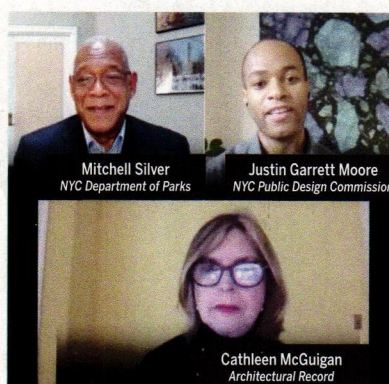
Frank Gehry
Gehry Partners



Jeanne Gang
Studio Gang



Neri Oxman
OXMAN



Mitchell Silver
NYC Department of Parks

Justin Garrett Moore
NYC Public Design Commission

Cathleen McGuigan
Architectural Record

Keynote speakers (top row) shared thoughts from their work and careers. New York served as a case study for a conversation between Mitchell Silver and Justin Garrett Moore (left) about public space. Polymath Neri Oxman (far left) discussed the intersection of design, technology, and biology.

students, but also through the expansion and reframing of core curricula.

New York-based architect Thomas Phifer—designer of art institutions such as Glenstone (RECORD, October 2018), in Potomac, Maryland, and the Corning Museum of Glass (RECORD, May 2015)—and Fabrizio Barozzi, of the Barcelona firm Barozzi Veiga (a 2014 Record Vanguard), each presented cultural works in Europe with a strong public-realm component. One of Phifer's ongoing projects, a theater and museum near Warsaw's Ministry of Culture, draws on the capital's rich cultural history to create a “direct, open, and optimistic architecture with a strong monumental presence,” said the architect, whose design, based on a series of arcades, allows citizens to “feel the pulse of the city.” Barozzi highlighted—when discussing his firm's Musée Cantonal des Beaux-Arts (RECORD, December 2019) in central Lausanne, a longitudinal concrete monolith that opened last year, and the Bündner Kunst in Chur, Switzerland, completed in 2016—the importance of “absorbing the character and atmosphere of a place.”

Similarly, the works of the Ghanaian-

born British architect David Adjaye, who delivered one of the conference's keynote addresses, seek dialogue with their surrounding cultural contexts. In conversation with editor in chief Cathleen McGuigan, Adjaye spoke of his religious buildings in Africa, including the planned National Cathedral of Ghana—which features a dramatic concrete roof that appears as “billowing fabric,” said the architect—and the Abrahamic Family House, an interfaith complex in Abu Dhabi comprising a mosque, church, and synagogue, slated for completion in 2022. “By renouncing differences and finding common ground in the roots of religion, the project uses architecture to bring about unity,” said Adjaye. The 2021 RIBA Gold Medal-winner (RECORD, November 2020) also showed the conceptual design for the Martyr's Memorial in Niamey, Niger, a rhythmic labyrinth of 65-foot-high concrete pillars accompanied by a multiuse gathering space and a new urban plaza. “I wanted to create something greater than a place for reflection,” said the architect, “something that has more of an everyday life.” (Read about Adjaye's newly unveiled



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A second discussion explored how to bring greater diversity and inclusion to architectural education.

large-scale structures. Multidisciplinary designer Neri Oxman, founder of the Mediated Matter Group at the Massachusetts Institute of Technology, offered

insight about how such tools might come into play. One of her projects, for instance, is a series of giant optical-lens prototypes, 3-D-printed with glass, that harvest solar energy. Oxman, whose work explores the nexus of design and biology, commented on the need for architects to invite scientific inquiry and to view buildings not as solitary objects but as complex parts of ecological systems. "Only then will the art of building

enable new forms of interaction between humans and their environment," she said; "only then will we be able to design and construct as equals."

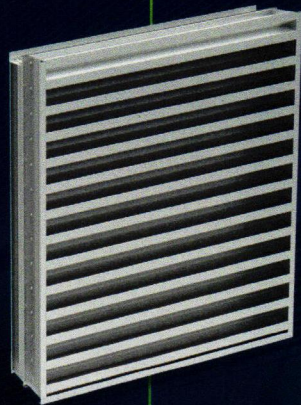
To cap off the two-day event, nonagenarian architect Frank Gehry brought the audience down to earth with some straightforward wisdom. Reflecting on his decades-long career in Los Angeles, Gehry stressed the importance of digital design tools, being on time and on budget, and his dislike of the label "starchitect." He appeared not as the designer of some of the world's most dynamic and beloved buildings, but as a humanitarian dedicated to arts education for disadvantaged children and "bringing the fishies back" to the Los Angeles River. When asked what advice he would give aspiring architects, Gehry remarked, "If they love it and need to do it, then they should do it." ■

Register to watch recordings of the conference sessions free at architecturalrecord.com/innovation-conference.

plans for the Edo Museum of West African Art in Nigeria on page 26.)

Another theme of the conference was the future role of computational design in the profession. Architectural-historian Mario Carpo, of the Bartlett School of Architecture, in London, lectured on the limitations of digital fabrication methods such as 3-D printing and CNC machines, namely the lack of reliable robotic tools for assembling

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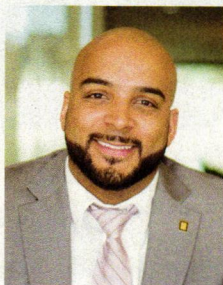


Q&A with NOMA's Jason Pugh

BY MIRIAM SITZ

CHICAGO-BASED architect Jason Pugh begins his two-year term as president of the National Organization of Minority Architects (NOMA) on January 1, 2021. The Denver native will be the group's first leader who is both a licensed architect and a certified planner.

A 2005 graduate of Howard University—one of seven of the Historically Black Colleges and Universities (HBCU) with an architecture accreditation—Pugh earned his Master of Science in Architecture and Urban Design from Columbia University. In his day job with Gensler, he is a passionate advocate for elevating underserved communities through high-quality affordable housing and participatory design. He spoke with **RECORD** by phone to discuss his goals for NOMA.



on access, legacy, and leadership. Building on that great foundation, my platform will be to educate, elevate, and empower members.

What does education look like?

We will expand and rebrand Project Pipeline to support young minority professionals all the way through licensure. There will also be a new focus on HBCUs, start-

ing with an advisory committee of students, faculty, and alumni from each school. And I think it's critically important for us to better track metrics. We need to know whether students who move through mentorship programs are graduating from architecture school and entering the profession, to see if we're really moving the needle.

As for elevating and empowering members?

The elevation piece will focus on our professional members, aiming to strengthen the performance and engagement of our local chapters and to enhance the value of being part of the organization. And, in terms of empowerment, we hope to create more economic opportunities for our members through an initiative called Leveraged Legacy, which will partner some of our more established NOMA firms with young entrepreneurs and early-career professionals, to share resources, contacts, and lessons learned.

This has been a tough year in many ways. Do you feel hopeful about the future?

I do. There has been so much uncertainty and conflict across the board, but I have also seen more support and understanding than ever before: I've seen people going the extra mile to have really tough conversations; I've seen industry players go out of their way to meaningfully engage with NOMA; I've seen firms start to look themselves in the mirror and focus on how they can do a better job.

I think the protests and unrest following the murders of George Floyd, Breonna Taylor, Ahmaud Arbery, and countless others have allowed us to zero in on some of our own inequities and disparities across the profession. I feel hopeful about what can be accomplished if we're all very clear and focused on the same target goals, which we haven't been before. That's what I'm seeing. ■

Tell me about your history with NOMA.

As an undergraduate, I helped resurrect the student chapter at Howard University and served as president. In '07, when I moved to Chicago, NOMA was one of the first organizations that I connected with. I eventually became president of the Illinois chapter.

What has the organization meant to you as an architect and as a leader?

When I think of NOMA, I honestly just think of family. I've met a long list of mentors and friends through the organization, including 2019–2020 president Kimberly Dowdell (**RECORD**, May 2020), who I met at my very first conference, in 2008, and Pascale Sablan. Pascale was just voted in as president-elect, so she'll be my successor and my right hand. Overall, NOMA offers a deep pool of people who inspire and challenge me. Seeing others excel in their own fields gives you fuel to find your own passion projects.

What are your goals as president?

Kim has done an amazing job of steering the ship during one of the most difficult moments in our country's history, and an unprecedented one. I have some tremendously large shoes to fill. Fortunately, there has been continuous dialogue between Kim, Pascale, and me over the last year. We want to sustain the momentum of Kim's platform, which focused

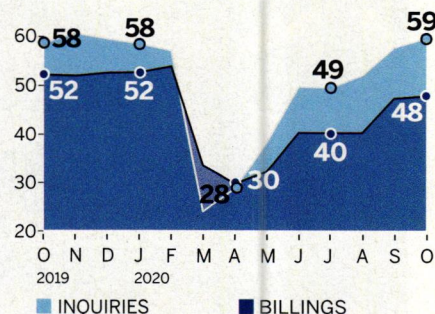
Record Recognizes Design Leaders

On October 29, **ARCHITECTURAL RECORD** hosted the seventh annual Women in Architecture Forum and Awards program (online for 2020) to recognize and promote women's design leadership. This year's honorees included Julie Eizenberg, founding principal of Koning Eizenberg Architecture; Stella Betts, founding principal of LEVENBETTS; Kimberly Dowdell, 2019–20 NOMA president and HOK principal; Lisa Gray, founding principal of Gray Organschi; and Monica Ponce de Leon, dean of Princeton University School of Architecture and founding principal of MPdL Studio.



Anna Heringer Wins Obel Award for Community Center in Bangladesh

The German architect has won the second edition of the annual prize recognizing architectural contributions to human development. Her two-story bamboo and rammed-earth structure, encircled by a ramp for accessibility, was built with local materials and craftsmanship. Called Anandaloy, it houses a therapy center for people with disabilities and a fair-trade textile workshop. Heringer won an Aga Khan Award in 2007 for a school she designed, also in Bangladesh.



Inquiries and Contracts Grow

The latest data from the American Institute of Architects show that the Architecture Billings Index moved from 47 in September to 47.5 in October. (A score below 50 indicates decreasing billings.) Design inquiries rose from 57.2 to 59.1; contracts, from 48.9 to 51.7.

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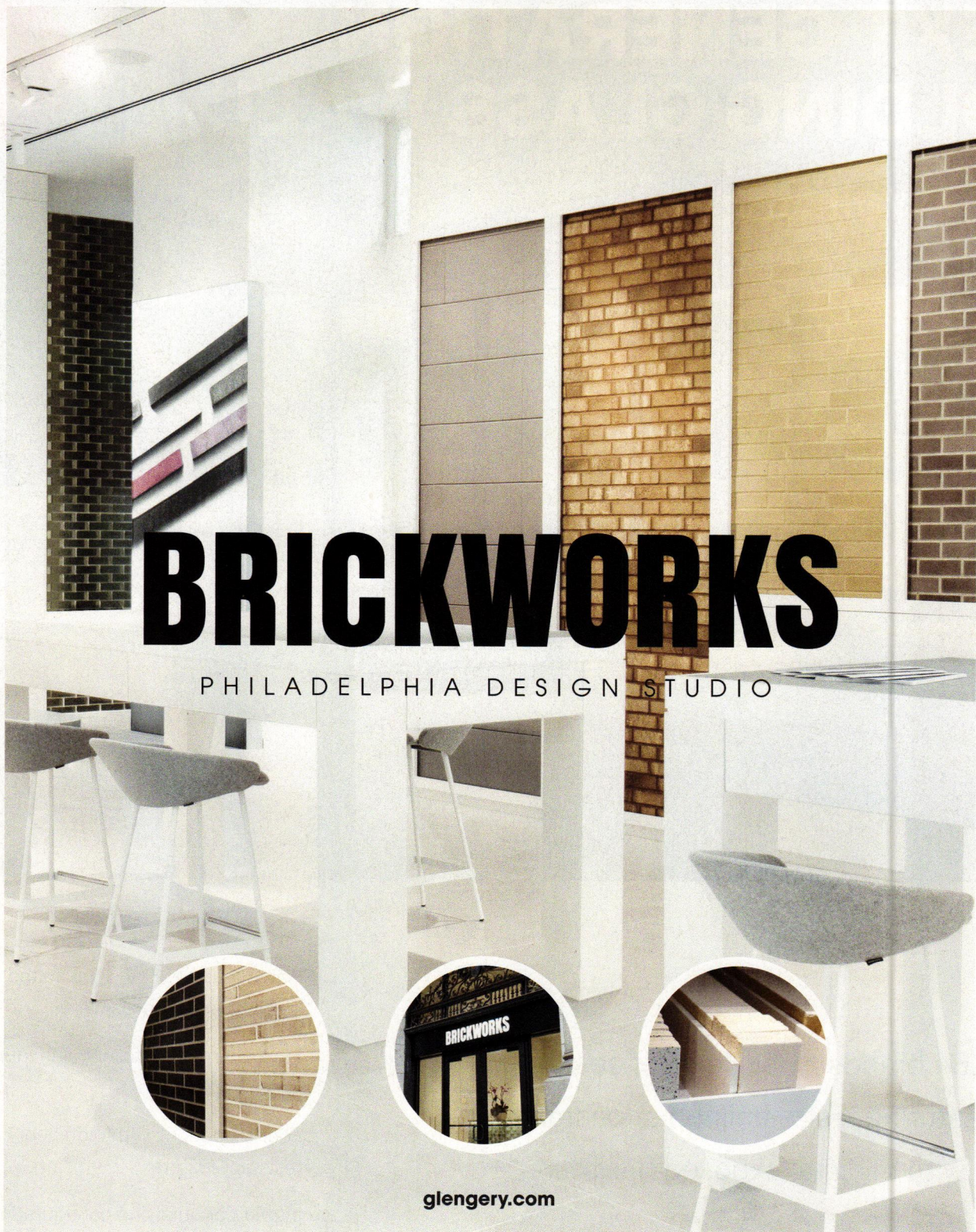
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HOUSE of the Month

A HOUSE IN ASPEN DESIGNED BY CCY ARCHITECTS FITS DISCREETLY INTO THE LANDSCAPE. **BY WENDY MOONAN**



The levels (above, left) spill down the hillside. A living/dining room sits atop the sleeping level, (left); adjoining is a heated terrace (above).

The floor below, for the most part submerged into the site, contains a game and “rec” room, screening room, and bowling alley. Five guestrooms, sitting along the eastern perimeter under a cantilevered portion of the main level above, do have windows.

The structure is steel-framed, with a poured-in-place base and precast concrete panels. The earth-toned concrete complements burned, brushed, and sealed cedar cladding inside and out. Ceilings are sheathed in pale hemlock. “Our forms are very spare,” says Cottle. “But the materials are textural and tactile.”

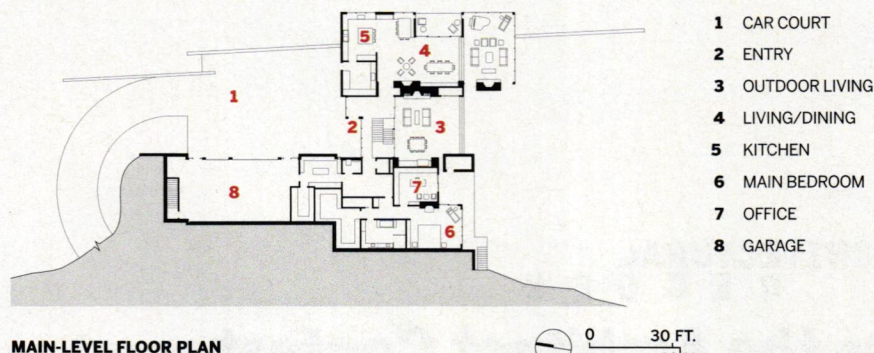
The house may have an ambitious program, but, in its massing and choice of materials, it is deliberately unpretentious. “We are so fortunate to have this landscape,” says Cottle, who enhanced the surroundings by planting native vegetation around protruding parts of the house. “The best we can do is highlight its natural features, to get the architecture to fit in.” ■

“**MANYHOUSES** in Aspen are overwhelming in scope and mass,” says Mark Iola, the owner of this year-round house. “We wanted a contemporary house, but the environment had to be a priority.” The setting was five acres of grassy meadows that slope down to a confluence of two rivers. To design their house, Iola and his wife, Sarah, found a kindred spirit, John Cottle of CCY Architects (Cottle Carr Yaw) of Basalt, Colorado. “The idea was to get the architecture to nestle into the meadow,” Cottle says.

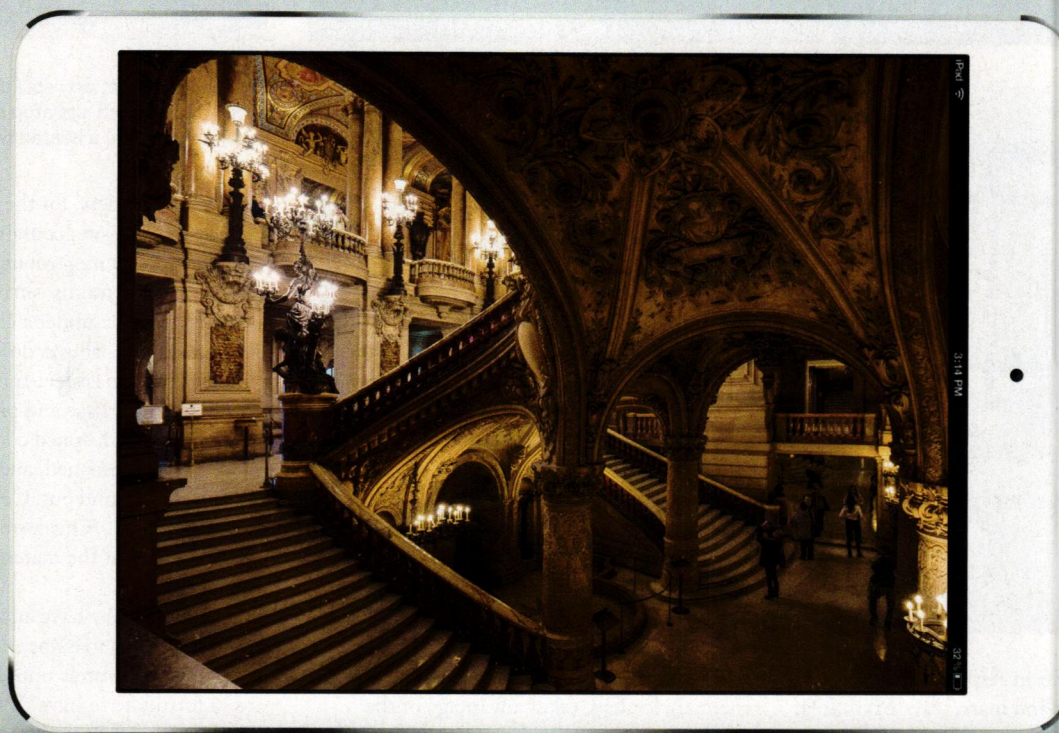
The only part of the house visible from the driveway is the entry structure and a volume for the home office that protrudes from a mound above. Not seen are two additional floors below the office, which are embedded in the slope. Over 75 percent of the 14,000-square-foot residence is tucked below grade.

The upper of the two levels, where the

living and dining areas and the main bedroom are located, takes advantage of the spectacular mountain views with glass walls facing south and east. (The occupants cannot see the rivers, but can hear them.) Also facing south is a large heated terrace with a glass roof for year-round dining and lounging.



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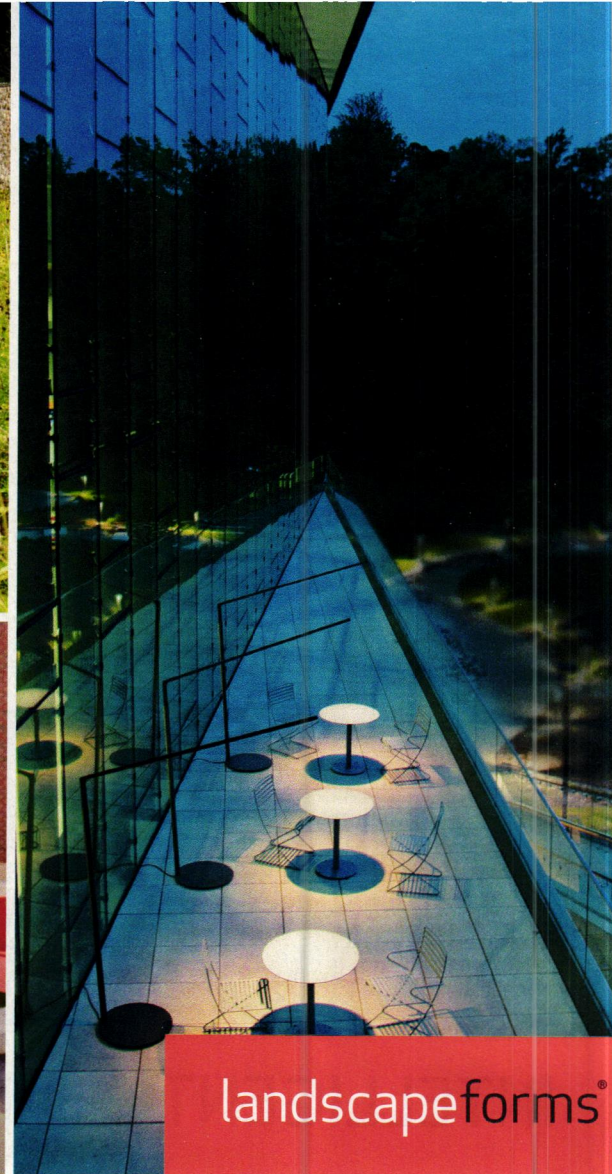
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THE SEEDS of one of Australia's newest wineries and culture parks were sowed long before the fundamentals of the project were determined: the owners of Pt. Leo Estate, which is an hour south of Melbourne, in the heart of wine country, first planted their vineyards decades ago with the vision of one day opening to the public. With the recent completion of the estate, Melbourne-based Jolson architects has helped the clients realize their longstanding dream, which has evolved to include a winery, two restaurants, and a sculpture park on a sprawling 50-acre site along the rugged Mornington Peninsula coast.

Capitalizing on the property's dramatic location, the team embedded the 38,000-square-foot crescent-shaped facility, with its winery and restaurants, in a manmade hillock at the site's highest point. Visitors are drawn into the building through an hourglass-shaped walled forecourt of poured-in-place concrete and granite paving. The courtyard's form, notes firm director Stephen Jolson, is an abstraction of wine pouring from a bottle. "We wanted to design a building that almost became a sculpture itself and brought together all the aspects of its context," he says. The procession through the forecourt leads to a single entrance cut into the ribbon-like concrete wall, which defines the outside space and forms the front facade of the building.

The estate's art collection includes over 50 sculptures, many of which are large landscape commissions. Jolson's 20-person studio designed the master plan (assisting curators with the art installation throughout the property), the forecourt, the building, and interiors. Hassell, an Australian landscape firm, executed the design of the grounds, including the meandering pathways across the park. Jolson explains that they didn't want the building to steal the spotlight from the whole of the

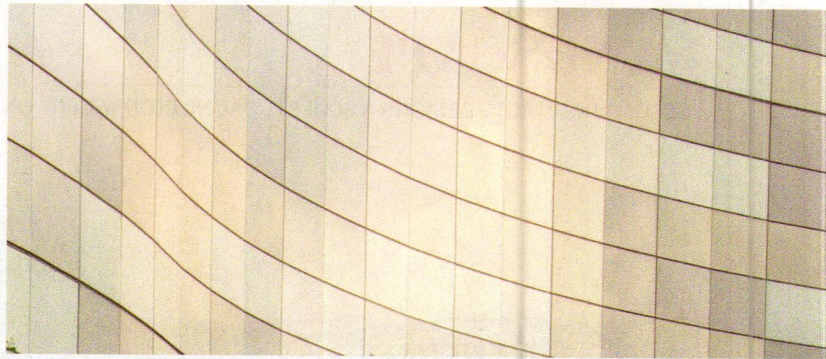
complex, so they fused the structure with natural elements, fringing the forecourt with newly planted grapevines that slope up toward the entrance and climb the concrete walls. Other flora, throughout Pt. Leo Estate's landscape, includes native plantings, such as a bottle tree, inserted in the forecourt.

Jolson calls the winery the "quintessential Australian experience," celebrating an overall quality of life achievable by enjoying fine wine, intense sunsets, and rugged landscapes. "This property captures it all," he says. ■



A sculpture by Australian-German artist Inge King anchors the forecourt leading to the building's entrance (above).

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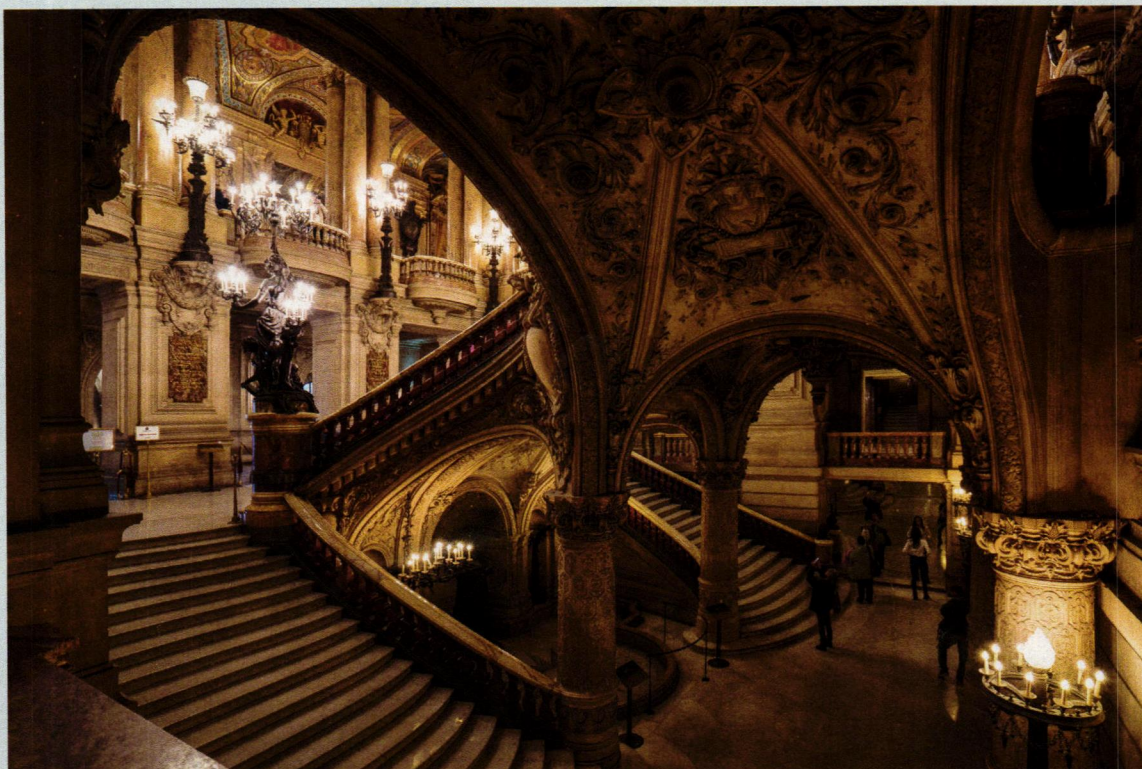


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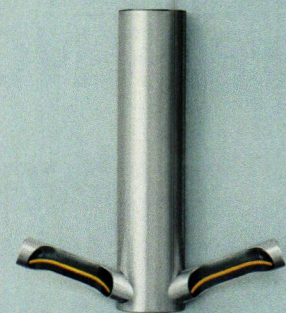
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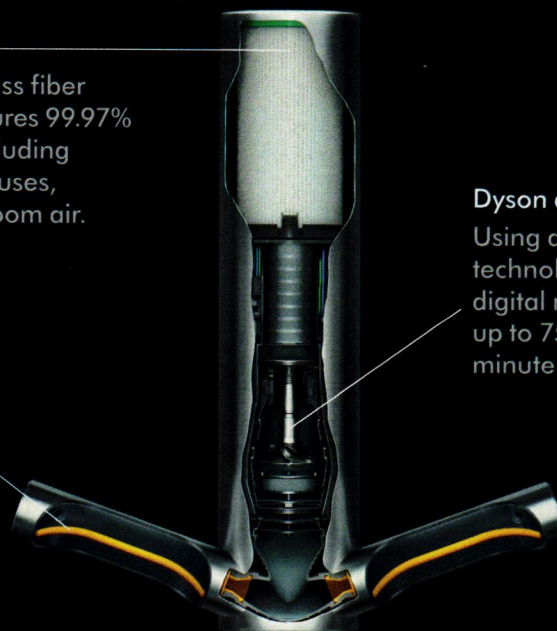
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This past September, the *Island Fox* tugboat helped the *Point Counterpoint II* music barge maneuver out of Florida.

Music to Our Ears

After decades traversing the globe, it seemed like the next stop for Louis Kahn's enchanting concert boat was the scrap heap. It's now been saved and is on its way to a makeover and a new home in Philadelphia.

BY GINA POLLARA

CONDUCTOR Robert Boudreau can finally relax. For over 60 years, he and his wife, Kathleen, plied waterways around the world, much of that time aboard the *Point Counterpoint II*—an unusual boat, designed by Louis Kahn—to bring the joy of music to hundreds of thousands of people. Now, having narrowly escaped the scrapyard, this 195-foot-long double-hulled steel vessel will finally dock permanently in Philadelphia—coincidentally the city Kahn called home.

In the 1950s, Boudreau, a trumpeter who graduated from Juilliard, had an peculiar dream: to assemble an orchestra composed of just wind, brass, and percussion instruments that would travel by water on a floating stage. The American Wind Symphony Orchestra (initially called the American Wind Ensemble) played its first free concert on land in 1957; it only took another year before the orchestra set sail. The first boat to convey the musicians, a flat-deck barge that had been dredged from the Delaware River, the *Point Counterpoint*, had no means of propulsion and had to be towed to each destination, most often relying on the kindness of passing tugboat captains to hitch a ride.

Boudreau's friendship with Kahn began in 1960, when the maestro asked the architect to design an additional floating stage for the orchestra's tour along England's River Thames (the rig stayed there following the trip). Several years later, Boudreau began discussing building a self-propelled boat with the architect, but it wasn't until the approach of the 1976 Bicentennial of the United States that their conversations got serious. Boudreau was planning an ambitious 76-city tour to celebrate the nation's birthday and needed a boat that could move under her own power.

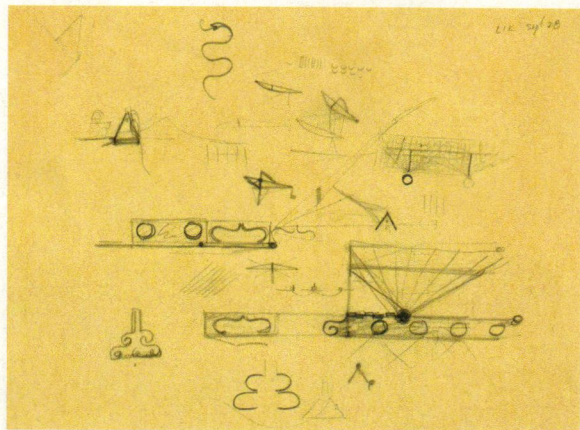
Kahn designed a vessel with a long, low profile that resembles a flute and includes variously sized portholes to mimic the instrument's keys. Dubbed the *Point Counterpoint II*, it also doubles as a floating art

gallery, an integral part of the concept. Once docked, the center of the boat opens like a clamshell to reveal a concert stage, for an audience gathered along the banks of the waterway.

In his 2003 Oscar-nominated film, *My Architect*, Kahn's son, Nathaniel, met Boudreau on the *Point Counterpoint II*. The visit created an emotional scene that displayed the deep connection the musician had with Kahn, and also showed a little book of drawings the architect had made with his son called *The Book of Crazy Boats*. "It had a boat made out of a spoon and a sausage boat with toothpicks stuck in it to keep it upright," Nathaniel recounts of this childhood memory of his father. "At the time I had no idea that he was going to build a crazy boat."

When Kahn died unexpectedly in 1974, he had completed the schematic design for the boat, but it had not been built. British architect George Djurkovic took on the task of completing the project for her inaugural 1976 tour. In the decades since, *Point Counterpoint II* has journeyed countless nautical miles up and down the Mississippi, Ohio, and other rivers, the Great Lakes, the Erie Canal, and the east and south coasts in the U.S., as well as venturing to Jamaica, Puerto Rico, Ireland, Finland, Germany, France, and Russia (it was transported across the Atlantic in a dry dock within a huge ship), to name just a few of its many international ports of call.

In spite of *Point Counterpoint II*'s far-flung travels, few people were aware of the vessel's existence until the cellist Yo-Yo Ma made a plea in 2017 in *The New York Review of Books* to save "this remarkable mobile cultural institution" from the scrap heap. Boudreau had just turned 90, and he and his wife decided to retire after five decades of running the barge. Since then, the boat has moved from city to city, as Boudreau chased interest in establishing a new home base from Buffalo and



Kahn's sketches from 1966 of *Point Counterpoint II*'s operable roof and hinge mechanisms.

Kingston, New York; Chicago; and Toledo, Ohio; finally landing in Pahokee, Florida. But this last promising attempt also fizzled out.

In late 2019, a group in Sag Harbor, New York, including the architect Lee Skolnick, learned the barge would soon be scrapped. They launched a last-ditch effort to salvage her

for their culturally rich community—which has a theater company, a soon-to-open film center, and a visual-arts nonprofit called the Church, created by artists Eric Fischl and April Gornik and designed by Skolnick (page 86)—but the regulatory challenges were daunting. Serendipitously, through Fischl, Skolnick was introduced to Dean Adler, CEO of Lubert-Adler Real Estate Funds, who is developing the long-abandoned 1917 Delaware Power Station in Philadelphia into an arts and culture hub. Adler was, oddly enough, actually looking for a music barge. “We are thrilled to have been introduced to this floating architectural jewel designed by Philadelphia’s own Louis Kahn,”

says Adler, “and to be able to save this landmark from what would have been its imminent destruction.” The team has towed the barge up from Florida to a shipyard in South Carolina for work on the hull before docking it on the Delaware River, alongside the renovated power station, where its interior will be refurbished before serving as the key musical component of the arts complex when it opens in 2022.

“To honor one of the greatest architects by helping to rescue this boat and ensure its future as a major cultural and educational resource is a highlight of my career,” says Skolnick.

As for Robert Boudreau—who, at 93, still exhibits the tremendous energy that fueled this decades-long adventure—he is all set to pass his baton to the next generation. ■

As executive director, Gina Pollara oversaw the construction of Kahn’s FDR Memorial/Four Freedoms Park in New York and is part of the group to save the barge.

IMAGE: COURTESY LOUIS I. KAHN COLLECTION, UNIVERSITY OF PENNSYLVANIA AND THE PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION

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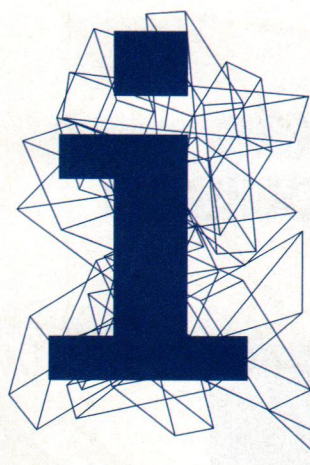
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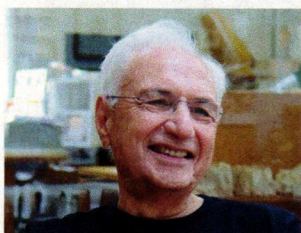
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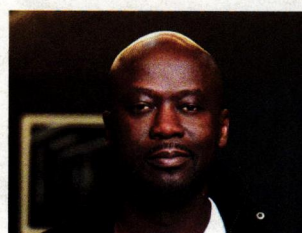
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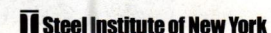
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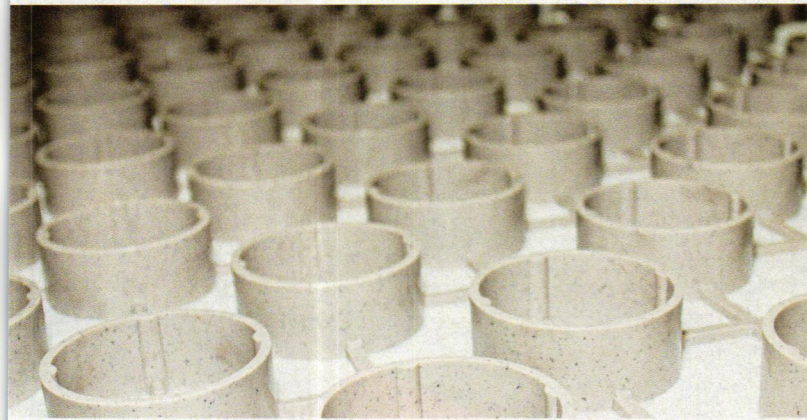
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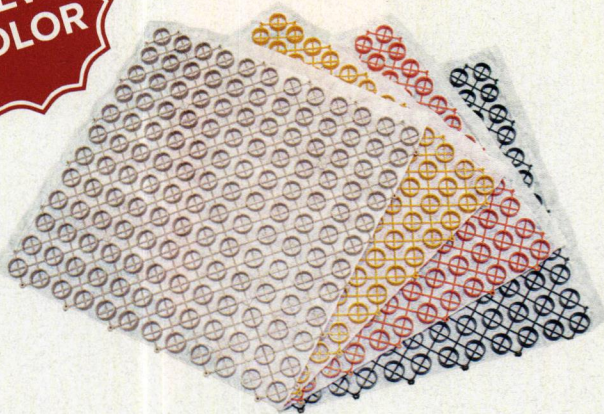


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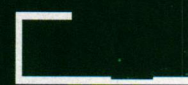


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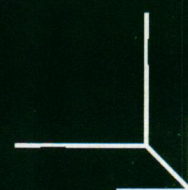


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Reading to Ring in a Bright New Year

This year, we have been glued to our laptops and TV's, following the twists and turns in news of an election and a once-in-a-century pandemic while keeping up with work on endless Zoom calls. As 2020 comes to a close, disconnect and unwind with a book on architecture. The editors of RECORD recommend these recently published monographs and collections of essays.

Balkrishna Doshi: Architecture for the People, edited by Mateo Kries, Khushnu Panthaki Hoof, Jolanthe Kugler. Vitra Design Museum and the Wüstenrot Foundation in cooperation with Vastushilpa Foundation, 383 pages, \$85.

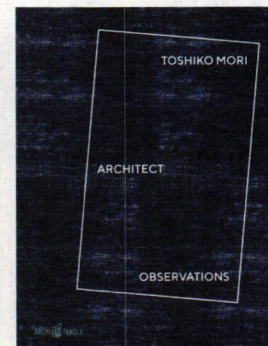
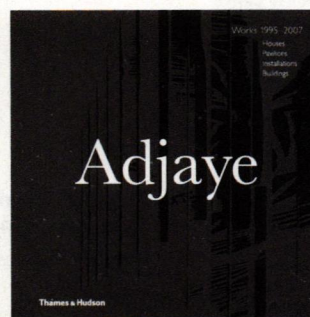
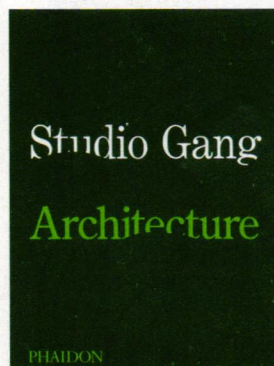
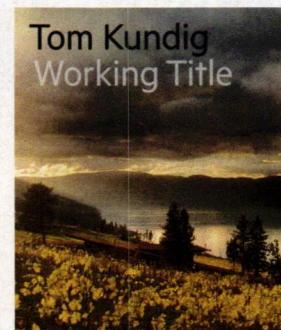
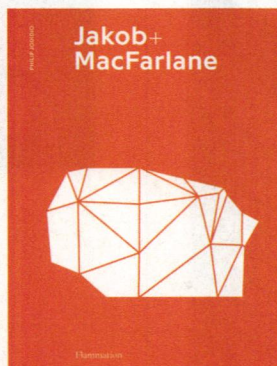
Conceived as the catalogue for a traveling exhibition of the same name, this survey of the Pritzker Prize-winner's work nevertheless stands on its own. With essays by Kenneth Frampton and Juhani Pallasmaa, among others, it explores Doshi's fusion of classical modernism with India's vernacular. Richly illustrated, the book includes recent photos that show the buildings, created over the course of a nearly seven-decade career, not as static, pristine objects, but as lived-in environments that encourage change over time. *Joann Gonchar*

Jakob + MacFarlane, by Philip Jodidio with the architects. Flammarion distributed by Rizzoli NY, 304 pages, \$85.

Partners Dominique Jakob and Brendan MacFarlane have been exploring the potential of digital technology since they launched their firm in 1998, challenging architectural norms in France with assertive structures that respond to context and to client needs, as well as to societal and environmental challenges. In English and French, this monograph examines 25 projects—completed and in progress—using 350 drawings and full-page photos of ebullient works like the Orange Cube and Euronews HQ in Lyon. *Linda C. Lentz*

Tom Kundig: Working Title, foreword by Mark Rozzo. Princeton Architectural Press, 368 pages, \$80.

Principal of Seattle-based Olson Kundig, Tom Kundig discusses 29 projects that in-



clude high-performance mixed-use buildings, a museum and a winery in the Pacific Northwest, and private houses in Switzerland, Australia, and Brazil. Sumptuous large-scale photos convey his love of materials and the craft of his architecture, and, every now and then, one of his kinetic "gizmos" shows up. *Josephine Minutillo*

Studio Gang: Architecture, with an introduction by Jeanne Gang. Phaidon, 271 pages, \$79.95.

Over the last 20 years, Jeanne Gang has built a thriving practice and a diverse portfolio of projects. What connects the work, says Gang, is a notion of "actionable idealism": visualizing big ideas and accomplishing them through design. Studio Gang's first comprehensive monograph presents 25 projects—from a surprising marble curtain installation to a diminutive community center to soaring mixed-use towers—organized in thematic sections that underpin the firm's sensibility. Succinct descriptions and abundant images—drawings, sources of inspiration, process photos, models, and diagrams—reveal the ideas and explorations behind the visionary work. *Beth Broome*

Adjaye: Works 1995–2007, edited by Peter Allison. Thames & Hudson, 300 pages, \$90.

While David Adjaye's career has been on fire in recent years, with the completion in 2016 of the National Museum of African American History and Culture in Washington D.C. and several international commissions for prominent cultural buildings since then (see page 24), this book looks back on his early career. Covering projects mainly in London that are less familiar to North American audiences—from conversions and interior remodels to his first new build, the curious Elektra House—they are, as Adjaye puts it, the foundation of the thinking for his current work. *JM*

Toshiko Mori Architect Observations, edited by Cristina Steingraber. ArchiTangle, 240 pages, \$58.

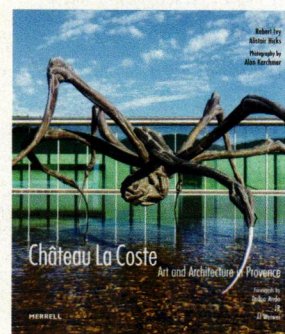
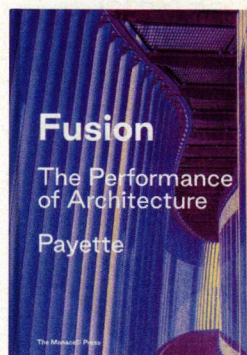
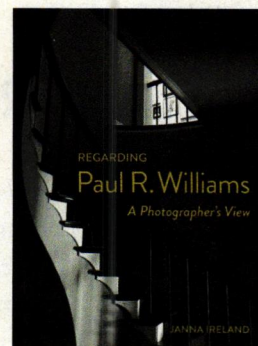
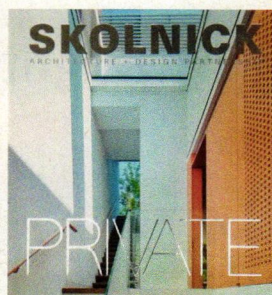
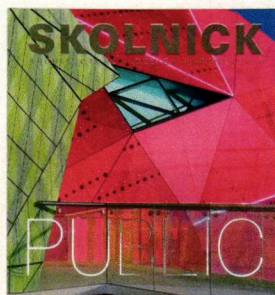
As her firm is about to celebrate its 40th year in practice, Toshiko Mori reflects on observation as the foremost, indispensable method in developing her architectural process. The book not only presents her built projects across the globe, but her work as a curator and as part of the think tank VisionArc, which she cofounded in 2009. *JM*

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Skolnick Architecture + Design

Partnership: Public/Private, foreword by Paul Goldberger. Pointed Leaf Press, 248 pages, \$95.

The book, with two striking covers, compiles photographs from nearly 40 years of the integrated design firm's work across both the public and private sectors—from a children's museum to twin villas in Anguilla. (Its latest projects are featured on pages 41 and 86.) With text by founding principal Lee Skolnick, *Public/Private* offers valuable insight into the planning and development of buildings as well as exhibition and graphic-design projects. *JM*

Regarding Paul R. Williams: A

Photographer's View, by Janna Ireland. Angel City Press, 224 pages, \$50.

What began as a proposal from architect Barbara Bestor to shoot the buildings of the late Los Angeles architect Paul R. Williams (1894–1980) evolved into a personal journey for photographer and artist Janna Ireland, one that was inspired by the rigor and breadth of Williams's prolific 50-year career. The first African-American AIA and FAIA member and, posthumously, the 2017 Gold Medal winner, Williams designed celebrity houses (many, ironically, in segregated communities) as well as public projects, banks, churches, schools, and social housing. Enriched by Ireland's own reflections, along with those of the L.A.-based Bestor and architect and educator Ingalill Wahlroos-Ritter, the volume's

collection of more than 200 black-and-white photographs goes beyond an academic documentation of Williams's architecture—it evokes the aura of his city and celebrates a body of work that helped to define it. *LCL*

Fusion: The Performance of Architecture,

by Payette; foreword by Z Smith; introduction by Kevin Sullivan. Monacelli Press, 312 pages, \$50.

This book explores the work and design philosophy of Payette, a firm known for its expertise in the technically demanding building types of laboratories and health-care facilities. Through essays and detailed project case studies, the monograph reveals Payette's process for successfully integrating aesthetics, programmatic and functional performance, and sustainability. *JG*

Château La Coste: Art and Architecture in Provence,

by Robert Ivy and Alistair Hicks. Merrell, 255 pages, \$70.

In 2002, businessman Patrick McKillen purchased a 17th-century vineyard outside of Aix-en-Provence, France. With the guidance of Tadao Ando, he has created a sprawling outdoor museum where artists and architects—from Ai Wei Wei to Sean Scully, Frank Gehry, and Renzo Piano—have dotted the verdant landscape with their inventive installations and pavilions. With vivid text, and photography by Alan Karchmer, the book transports readers to this experimental and experiential destination. *BB*



The Transformative Power of New Lighting Technologies for Art

By Cecilia Ramos, Sr. Director, Architectural Market, Lutron Electronics

Art is inextricably connected with light.

It's not just in the interplay of brightness and shadow, or in the brilliance and texture of color. In illuminating a painting, a photograph, or a sculpture, light is essential in helping the art tell a story. Today, museum curators, architects, and lighting designers can leverage many aspects of light including color temperature, intensity, and a balance of daylight and electric light to expand their creative design palette and realize their visions.

A new technology well-suited to art is Ketra, a revolutionary, dynamic LED line with world-class optics that can produce high CRI light across the white light spectrum, or render millions of colors all from one light source in a simple, flexible way.

In addition to flexibility in color temperature, Ketra's high color rendering index (CRI) and Vibrancy features can showcase colors faithfully or in an exaggerated fashion. The curators at the Art Institute of Chicago leveraged this flexibility not only as an aesthetic tool, but also to augment historical narratives in their display of a 16th-century sculpture of Saint Catherine of Alexandria. The sculpture had previously been displayed under standard gallery lighting, making it appear chalky and dull. Ketra light gave the curatorial team an easily controllable medium to recreate the historically accurate lighting effect desired.



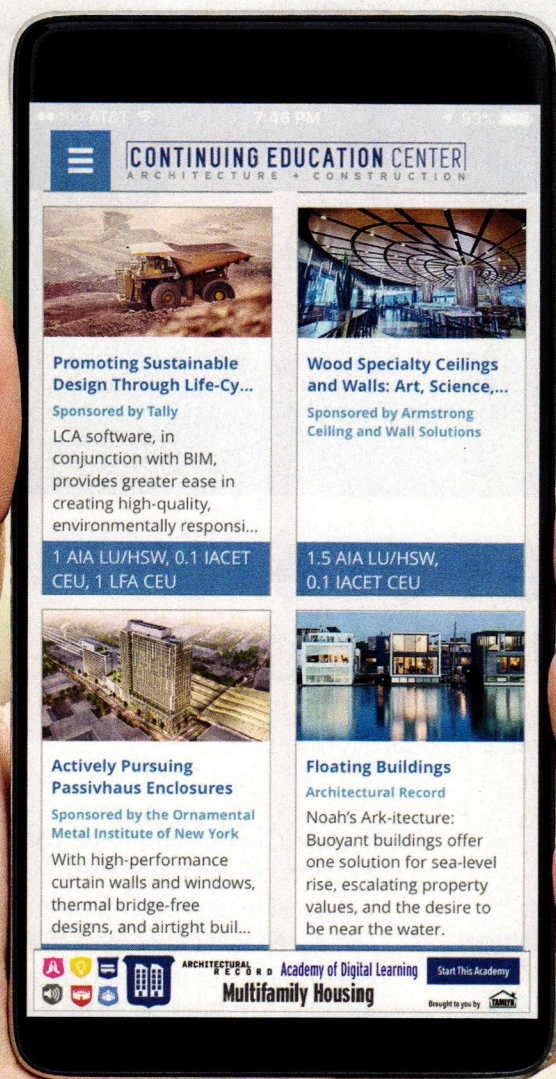
Art Institute of Chicago

Together, Lutron and Ketra can support a variety of exhibition goals, including the conservation of art pieces through lighting and shade control, the creation of ambiance, or the celebration of an art piece. Such flexibility is further supported by robust control systems like Lutron's new Athena solution that enable the designer or curator to reconfigure and rezone spaces quickly without rewiring and easily set scenes via the Lighting Designer app.

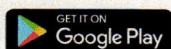
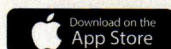
Whether it's calling attention to the tiniest brushstroke, bringing natural light indoors, or simply making a display space more welcoming, lighting and controls can accomplish a host of objectives. With control, light and art are more than connected – they're partners in making art and spaces into grand statements of beauty and purpose.



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BOOKS

Modern Architecture and the Lifeworld: Essays in Honor of Kenneth Frampton, edited by Karla Cavarra Britton and Robert McCarter. Thames & Hudson, 352 pages, \$60.

The *Festschrift*, essays celebrating a scholar, can hold the key to the intellectual history of a period—in this case, from the late 1960s to today, and epitomized by the contributions of architect, historian, critic, and educator Kenneth Frampton. During this time, theory and practice, and history and criticism became more intertwined, and Frampton, now 90, played a major role in that discourse. London, where he worked as an architect and editor in the early '60s, was the locus for critical and theoretical activity. As Mary McLeod insightfully writes in this collection, his social and political interests, joined to his strong commitment to Modernism, led Frampton to read such cultural critics as Walter Benjamin and the Marxist-oriented Frankfurt School leaders Theodor Adorno and Herbert Marcuse. Those figures, as well as the political philosopher Hannah Arendt, influenced Frampton's critical approach to architecture and his questioning of Modernism's susceptibility to industrialization and corporate capitalism. In *Modern Architecture: A Critical History* (1980), he brought together his research that was undertaken in England and, later, in Princeton and New York after his move to the U.S., on topics such as Russian Constructivism and Pierre Chareau's *Maison de Verre* in Paris. Frampton also became absorbed with phenomenology—simply put, the kinesthetic and haptic experience of the body in space—which, as critic Alberto Perez-Gomez points out, came out of Frampton's rejection of “formalistic . . . and self-consciously stylistic attitudes.” These are among the many illuminating moments in this collection of tributes from Joan Ockman, Anthony Vidler, Jean-Louis Cohen, and others, which add not only to our understanding of this major thinker but of the architectural culture of the time. *Suzanne Stephens*

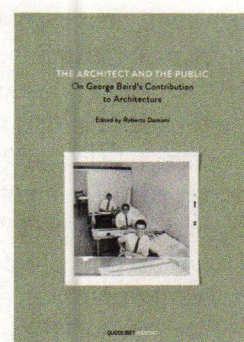
Modern
Architecture
and the
Lifeworld
Essays in Honor
of Kenneth
Frampton

Edited by Karla Cavarra Britton and Robert McCarter

Thames
& Hudson

The Architect and the Public: On George Baird's Contribution to Architecture, edited by Roberto Damiani. Quodlibet, 343 pages, \$43.

This book of essays on the work of George Baird points out how, throughout a long career, the 81-year-old Canadian architect, planner, academic, and critic elucidated certain theoretical influences affecting architecture culture. Baird has proved to be a thoughtful and dependable guide along the ramparts of architectural discourse on both sides of the Atlantic, from the late 1960s, as a graduate student in London, to the present day in his hometown of Toronto. Baird took on early semiotics (he edited, with Charles Jencks, *Meaning in Architecture* in 1969). Yet, like his colleague, Kenneth Frampton, Baird was drawn to Hannah Arendt's concepts on communication and action in public space, which resulted in his 1995 book, *Space of Appearance*. The editor, Roberto Damiani, helps turn this investigation of Baird into an archaeological dig of ideas, movements, and lively debates, with essays by scholars such as Hans Teerds and Joan Ockman, and interviews with colleagues Frampton, Michael Hays, Peter Eisenman, and others. *SS*



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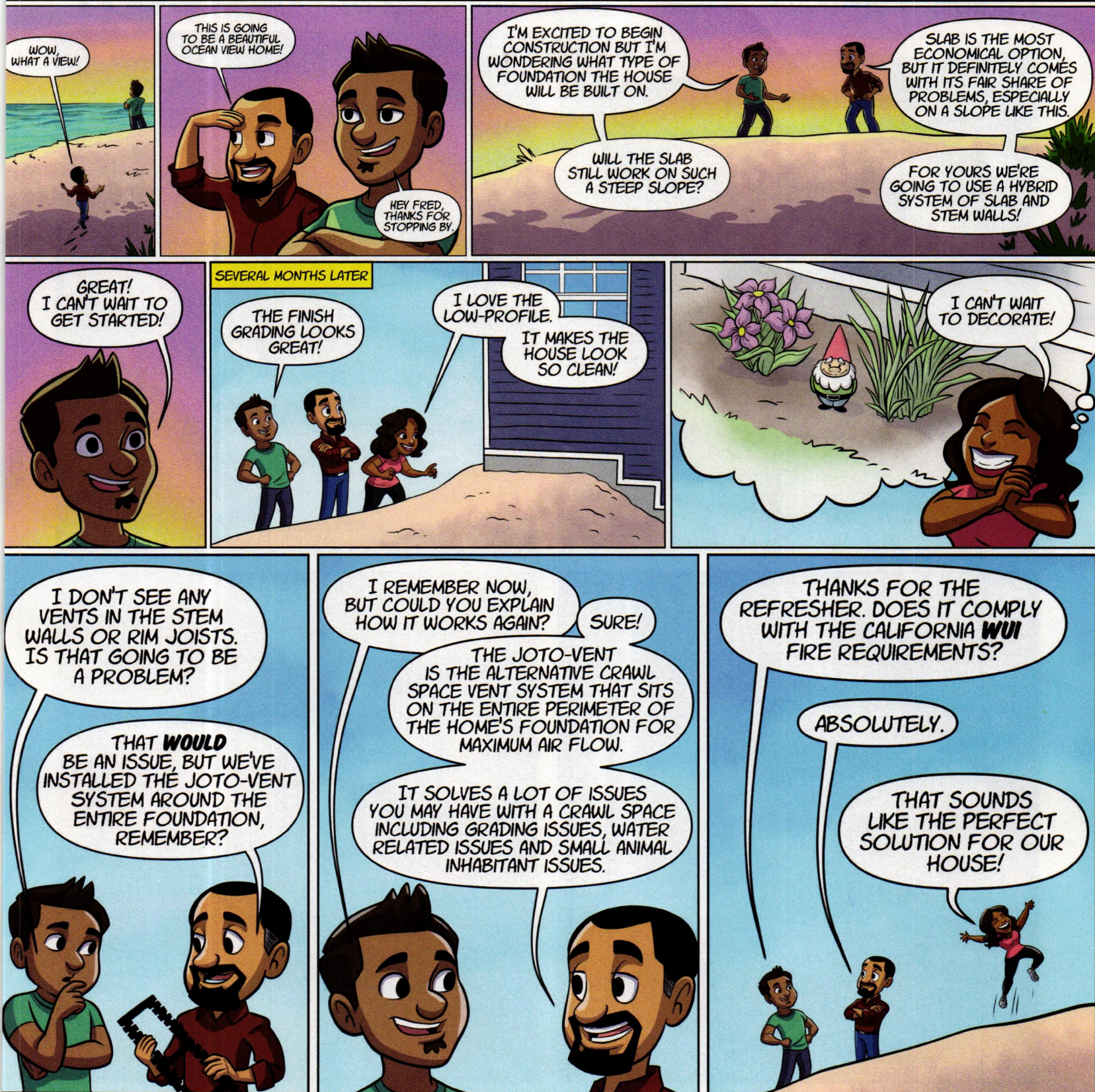


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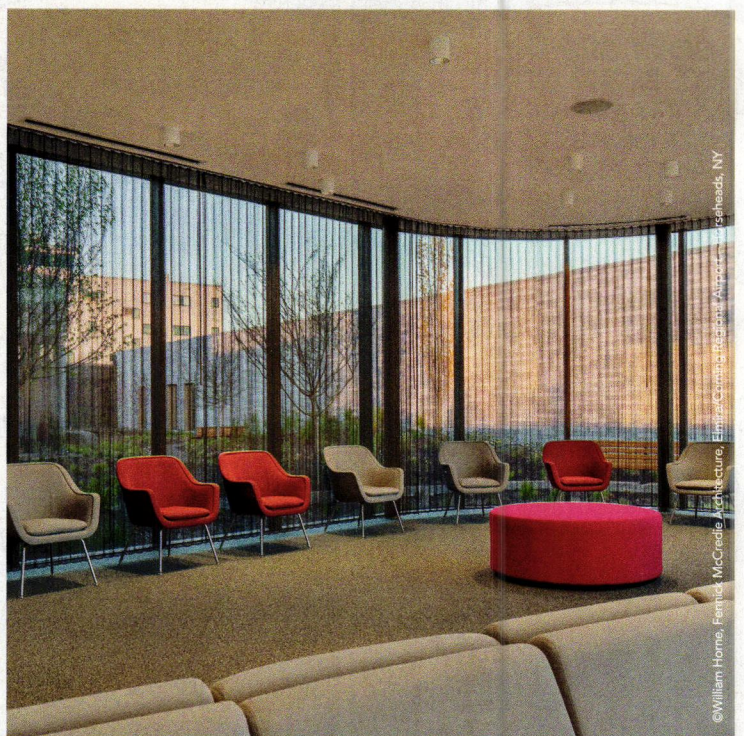
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Home Sweet Home

Guided by Swiss pragmatism, Christ & Gantenbein's design for the Lindt Home of Chocolate near Zürich indulges in architectural fancy.

BY ANDREW AYERS

"I INSIST upon my rooms being beautiful!" declares Willy Wonka in Roald Dahl's 1964 children's classic *Charlie and the Chocolate Factory*. "I can't abide ugliness in factories!" It's a feeling that was evidently shared by the charitable Lindt Chocolate Competence Foundation when, in 2014, they organized an architectural competition for the Lindt Home of Chocolate (LHC) at Lindt & Sprüngli's historic manufacturing site on the shores of Lake Zürich in Kilchberg. Combining a public chocolate "museum"—a 16,000-square-foot multimedia display accompanied by the obligatory shop, café, and auditorium—with a small, publicly visible production facility, office space for both the foundation and Lindt, and a research lab for the development of new techniques in chocolate production, the 215,000-square-foot facility was designed by Basel-based architects Christ & Gantenbein (C&G). Realized under a design-build contract by Eiffage Suisse, with museum displays by Atelier Brückner, the \$109 million LHC does not, in the words of C&G founding partner Emanuel Christ, seek "common standards" of beauty, instead taking its cues from the aesthetic tropes of its 20th-century industrial context.

Located at one end of the factory, on the site of the employee parking lot (which has now gone underground), the LHC is sandwiched between railroad tracks at the rear and a public thoroughfare out front. Filling the entirety of the plot, apart from one corner where a chunk has been scooped out to form a modest entrance plaza, it takes the form of a largely blank box clad primarily in contextual rust-red brick—indeed, you'd be forgiven for assuming it was a banal warehouse, were it not for the giant curved entrance wall which, rising higher than the rest, sports brilliant white-glazed bricks emblazoned with the LHC logo in large golden letters. As you approach, however, subtleties in detailing began to tell a more nuanced story—the pointing and external sun blinds colored to match the red bricks, for example, or the striated frieze that binds the main and subordinate facades together and integrates bands of windows on the lateral and rear elevations.

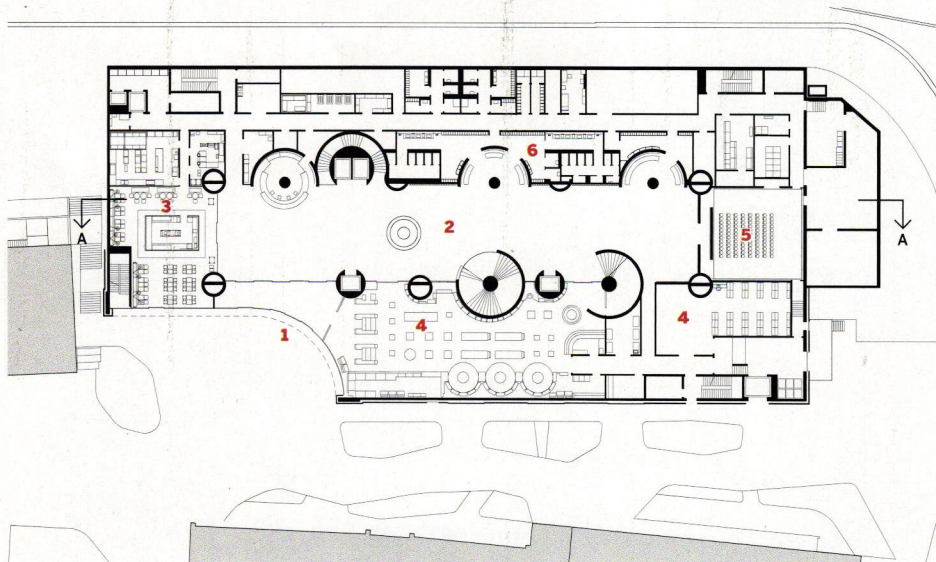
Public entry is gained via the glazed base of the entrance wall, depositing you in front of the welcome desk. What you don't immediately realize, until you turn your head to the right, is that you have arrived in a cavernous 210-foot-

DISC-SHAPED skylights, a concrete footbridge, and spiraling stairs are architectural highlights of the 210-foot-long atrium, the center of which contains the world's largest chocolate fountain.

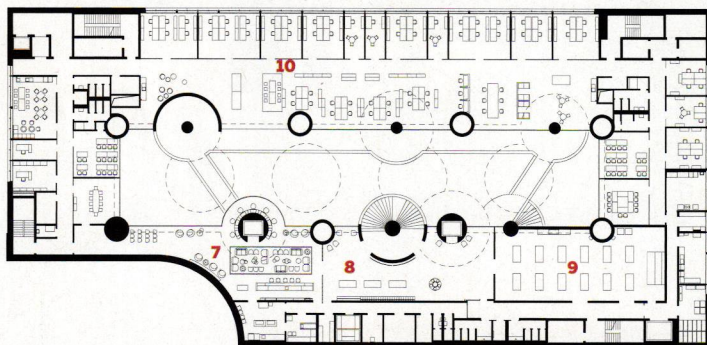
PHOTOGRAPHY: © MARK NIEDERMANN



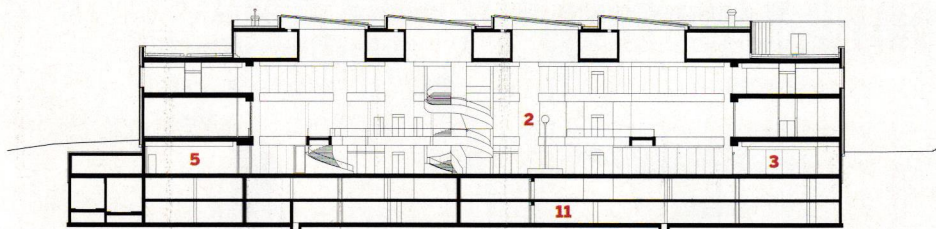




GROUND-FLOOR PLAN

0 30 FT.
10 M.

SECOND-FLOOR PLAN



SECTION A - A

- | | | |
|------------|---------------------|----------------|
| 1 ENTRANCE | 5 AUDITORIUM/CINEMA | 9 CHOCOLATERIA |
| 2 ATRIUM | 6 COAT ROOM | 10 OFFICES |
| 3 CAFÉ | 7 LOUNGE | 11 PARKING |
| 4 SHOP | 8 LOBBY | |

long, 49-foot-high top-lit concrete atrium at whose center stands the world's largest chocolate fountain (another Atelier Brückner confection), whose 1,000 liters of brown gooiness fill the space with evocative aromas. Viewed from the entrance, a concrete footbridge whizzes above your head, framing the fountain and, beyond it, a bravura concrete spiral stair that takes you up to the first level, where you enter the museum; after negotiating its suite of black-cube rooms, you come back out at the footbridge you previously saw from below, which you cross to arrive at the other side of the atrium, continuing your *promenade architecturale* alongside the production line (protected behind glass), and then around and back down to the ground floor. Here the route strongly encourages you to exit through the shop and, if you're in need of refreshment, to try out the café next to the entrance. Or you can climb to the building's third and final level, which contains offices at the rear, meeting rooms at the sides, and, on the street side, the Chocolateria, a chocolate-making atelier that offers lessons or can be hired for functions. As for the research lab, it is discreetly hidden at the back, behind the production line.

"In terms of planning and coordination, this is one of the most complex projects we've ever done," says Christ about the elegant simplicity they've managed to pull off at the LHC. "You have to deal with all the regulations relating to public buildings, but at the same time the complex requirements that come with food

Credits

ARCHITECT: Christ & Gantenbein — Emanuel Christ, Christoph Gantenbein, founding partners; Mona Farag, partner; Astrid Kühn, project leader

ENGINEER: Conzett Bronzini Partner (structural)

GENERAL CONTRACTOR: Priora/Eiffage Suisse

CONSULTANTS: Feroplan Engineering, Keller Ziegeleien (facades); Enea (landscape); Ahochn (building services coordination); Bakus Bauphysik & Akustik (thermal and acoustics); Atelier Zürich (interior design: shop, café, lounge, Chocolateria); Ernst Basler + Partner (traffic planning)

CLIENT: Lindt Chocolate Competence Foundation

SIZE: 232,000 square feet

COST: \$109 million

COMPLETION DATE: September 2020

Sources

BRICK: Keller

BRICK GLAZE: Koninklijke Tichelaar Makkum

CURTAINS: Annette Douglas Textiles



production, plus offices, different people flows, etcetera.” What’s more, after what they describe as a “very tough” 18-month competition process, C&G had to fight just as hard “to defend and guarantee architectural quality” under a design-build contract for a project that, they say, involved “a real sense of economy.” But guarantee quality they did, as becomes clear when, on closer inspection, this seemingly “simple” building turns out to be rather rich and subtle, full of conscious and subconscious references to the history of architecture.

“We are practitioners, but we have the ambition and, as we feel it, the obligation to reflect on what we’re doing in terms of a theoretical discourse,” says Christ. Before we’re even through the door, he’s already mentioned Venturi (the “decorated shed”) and Palladio (the Redentore’s workaday brick rear fronted with a white-marble entrance screen) in reference to the LHC’s exterior, while inside he invokes Kahn and Parisian department stores in relation to the highly expres-

ONE CORNER has been scooped out to form a modest entrance plaza where a curved wall in glazed white brick rises higher than the rust-red brick walls. A striated frieze binds the main and subordinate facades.

sive concrete mushroom columns of different diameters, which not only hold up the atrium glazing but contain elevators, stairways, and HVAC ducts. Before you know it, you’re playing the game too—surely the atrium is also a bit Johnson Wax? And isn’t that classicizing frieze rather AEG turbine factory, not to mention a quote from C&G’s own Kunstmuseum Basel?—and sharing Christ’s enthusiasm for the “cathedrals of industry” that inspired the LHC’s vocabulary. Moreover, since you’re no chocolate junkie and find the whole experience disappointingly slick and commercial, you’re more than relieved by a certain Swiss structural sobriety, and appreciative of an architectural gesture that has proved strong enough to resist every kitsch marketing ploy thrown its way. ■

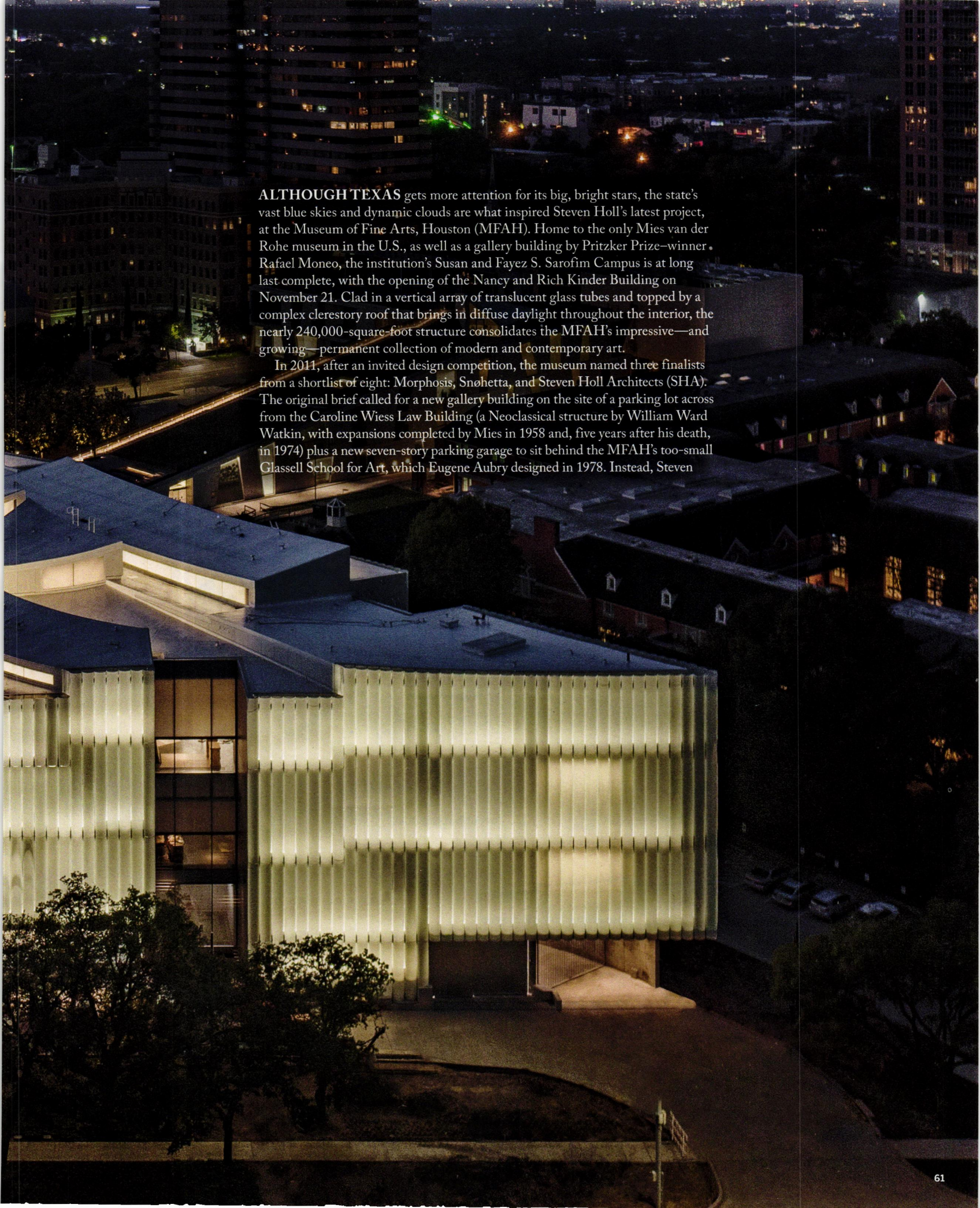
The Light Inside

A luminous new gallery building by Steven Holl Architects completes the campus of the Museum of Fine Arts, Houston.

BY MIRIAM SITZ

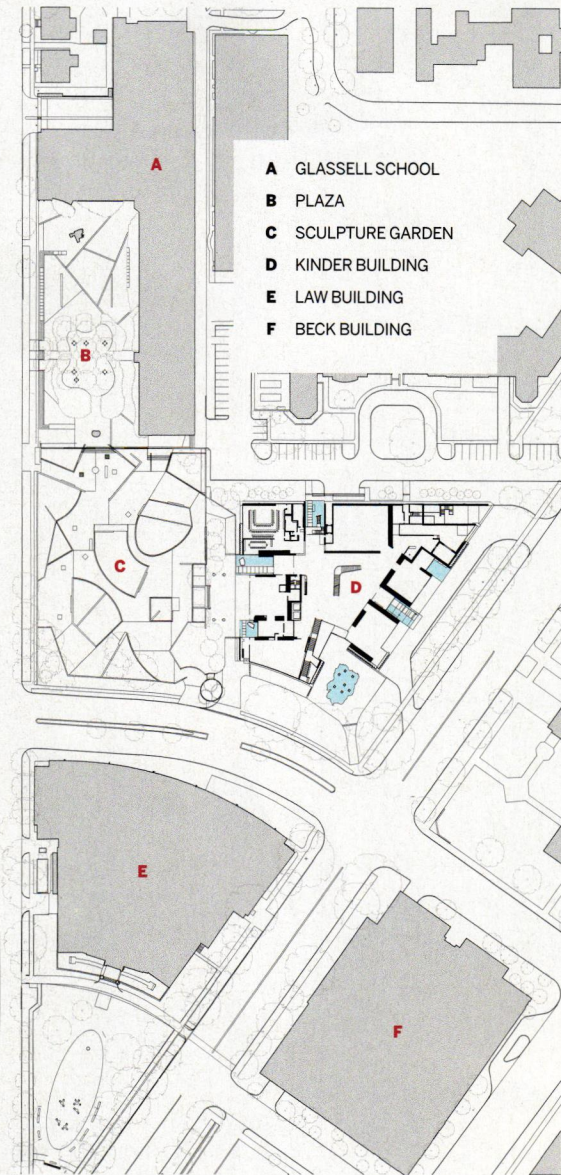
PHOTOGRAPHY BY RICHARD BARNES



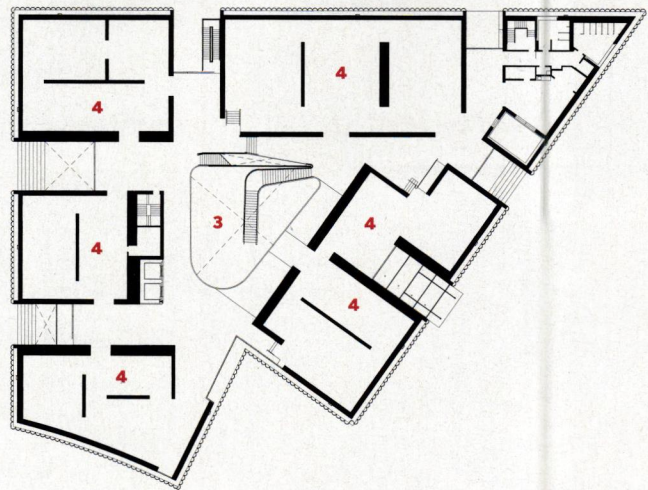


ALTHOUGH TEXAS gets more attention for its big, bright stars, the state's vast blue skies and dynamic clouds are what inspired Steven Holl's latest project, at the Museum of Fine Arts, Houston (MFAH). Home to the only Mies van der Rohe museum in the U.S., as well as a gallery building by Pritzker Prize-winner Rafael Moneo, the institution's Susan and Faye S. Sarofim Campus is at long last complete, with the opening of the Nancy and Rich Kinder Building on November 21. Clad in a vertical array of translucent glass tubes and topped by a complex clerestory roof that brings in diffuse daylight throughout the interior, the nearly 240,000-square-foot structure consolidates the MFAH's impressive—and growing—permanent collection of modern and contemporary art.

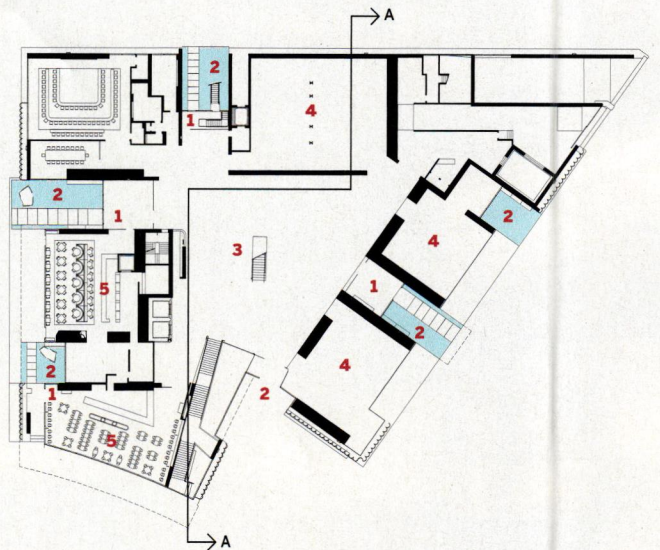
In 2011, after an invited design competition, the museum named three finalists from a shortlist of eight: Morphosis, Snøhetta, and Steven Holl Architects (SHA). The original brief called for a new gallery building on the site of a parking lot across from the Caroline Wiess Law Building (a Neoclassical structure by William Ward Watkin, with expansions completed by Mies in 1958 and, five years after his death, in 1974) plus a new seven-story parking garage to sit behind the MFAH's too-small Glassell School for Art, which Eugene Aubry designed in 1978. Instead, Steven



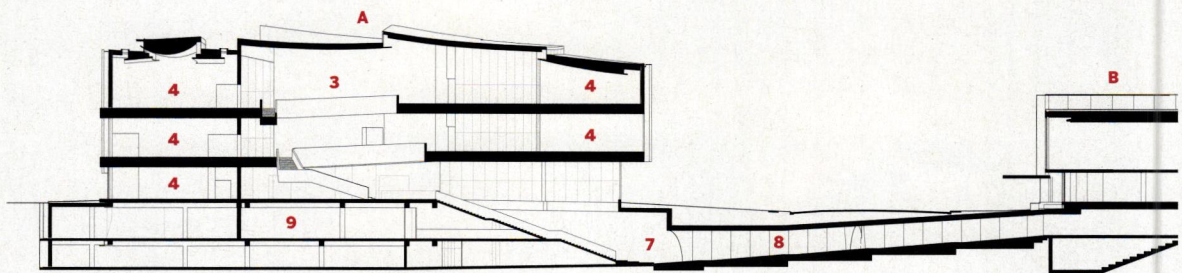
SITE PLAN



SECOND-FLOOR PLAN



GROUND-FLOOR PLAN



SECTION A - A

- 1 ENTRANCE
- 2 REFLECTING POOL
- 3 ATRIUM

- 4 GALLERY
- 5 DINING
- 6 CONFERENCE CENTER

- 7 LOWER ARRIVAL HALL
- 8 TUNNEL TO LAW BUILDING
- 9 PARKING



CLAD IN half-tubes of etched glass (left), the translucent facade is punctuated by a section of clear curved glazing near an entrance (above).

Holl and his team decided to rewrite the program, offering an alternative vision for a cohesive campus with subterranean parking under both a new art school and a separate gallery building. “I told the jury it was like a freight train going down the tracks,” recalls Holl. “They could simply throw the switch now and change the course of the museum’s future.” Although SHA’s proposal increased the museum’s overall fundraising goal to \$450 million and extended the construction timeline, the firm received unanimous approval for the project, including a new, larger Glassell School and a public plaza, which opened in May 2018, and now the Kinder.

While Holl’s vision for the gallery came from the shifting shape of clouds, its form was derived from its trapezoidal site in Houston’s increasingly pedestrian-friendly Museum District. (New York-based landscape-design firm Deborah Nevins & Associates has transformed Bissonnet Street, which splits the campus, adding an esplanade and improving street crossings.) The Kinder’s southern exposure arcs along Bissonnet, mirroring the uniquely curved facade of Mies’s Law building, while the east side engages the one-acre sculpture garden designed

by Isamu Noguchi in the mid-1980s. Weaving together the campus’s various components, the architects have created a dramatic but respectful expansion for the institution, capitalizing on two principles that, as Holl and his partner Chris McVoy note, underpin much of the firm’s work: porosity and light.

The idea of using translucent glass tubes for cladding arose early in the competition, as the design team considered what materials and shapes would harmonize with the glass-and-steel Mies addition, Moneo’s limestone Audrey Jones Beck Building, and SHA’s new precast-concrete Glassell School. “When expanding or adding to an existing structure, as at the Nelson-Atkins Museum of Art, we often play off the context,” says McVoy, referring to the glazed and partly underground expansion by the firm for the Kansas City institution (RECORD, July 2007). “But here, contrasting with more than one building, it had to be even more dynamic.” Half-cylinders of etched, laminated glass, with a PVB resin interlayer, up to 19½ feet in length, allowed the architects to achieve their desired visual effect while carrying the necessary wind load and meeting budgetary constraints.



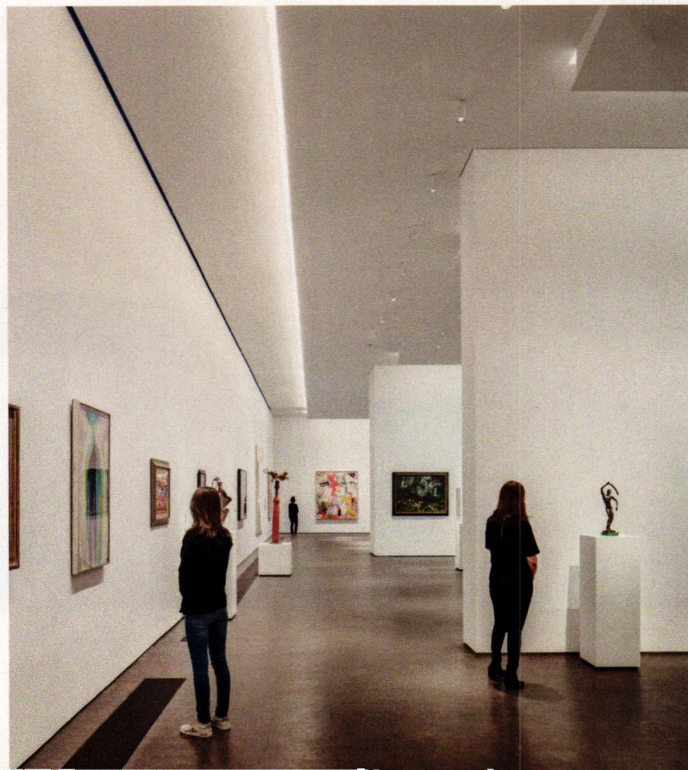
ALEXANDER CALDER'S
International Mobile (1949)
hangs in the atrium (above),
suspended from the "cloud"
panels of the clerestory roof
(opposite, top). Large-grain
terrazzo floors (left and above)
echo those in Mies's Law
building. Galleries (opposite,
bottom) are grouped in suites,
permitting curatorial flexibility.

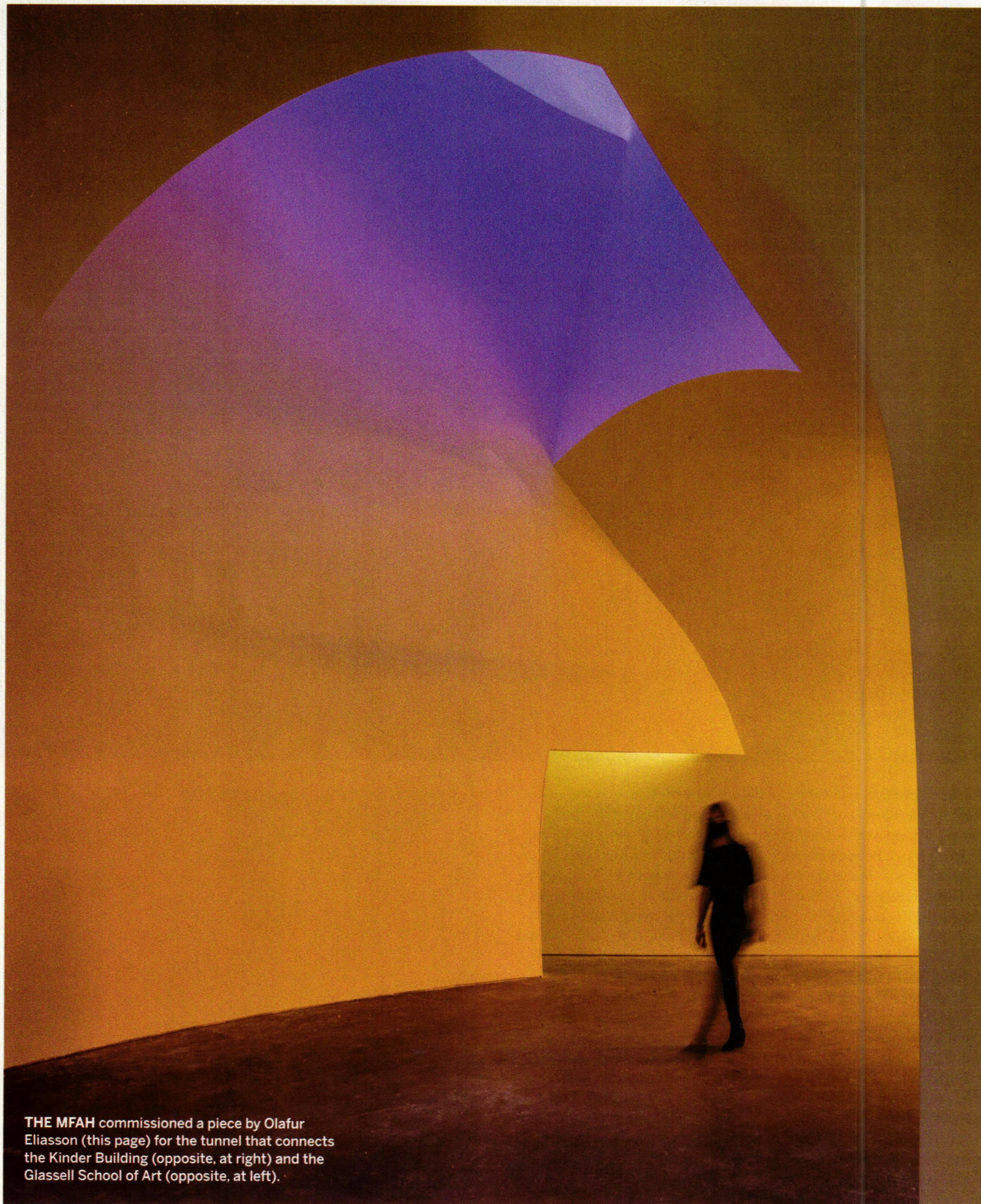


Enclosed by mesh at the top and bottom to keep birds out, the ventilated facade allows hot air to passively rise up and out of the cavity between the glass tubes and the structural cast-in-place-concrete walls, explains Larry Burns, principal of associate architect Kendall/Heaton Associates, who has worked on MFAH projects since 1993. Modeling by climate engineers Transsolar revealed that the assembly could reduce overall cooling requirements by some 40 percent. Appearing opaque by day, the building is translucent at night, as windows behind the tubes on the north and west facades emit a soft glow. Linear up-lighting washes over the eastern and southern elevations.

In contrast to the diffuse light admitted through openings behind the glass facade, bright sunlight streams into the museum's atrium, thanks to six reflecting pools that occupy notches in the base of the building. Floor-to-ceiling windows on the innermost wall of these indentations, which cut into the concrete structure, grant views out to the landscape from all three floors, while the liminal interior spaces they animate become moments of respite between suites of galleries.

Holl looked to exemplars of museum architecture in Texas when envisioning the Kinder's interior illumination. "I wanted to design a building with a light as inspiring as Lou Kahn's Kimbell Art Museum," he says, "but more organic, more dynamic—like the clouds." The solu-





THE MFAH commissioned a piece by Olafur Eliasson (this page) for the tunnel that connects the Kinder Building (opposite, at right) and the Glassell School of Art (opposite, at left).

PHOTOGRAPHY © PETER MOLICK (OPPOSITE)



tion came in the form of a “luminous canopy” roof, made of structural “petals” that swoop down to form an assemblage of clerestory windows. The design of these cloudlike petals went through many iterations—evolving from gestural watercolor paintings to detailed 3-D modeling to full-scale mockups—as SHA collaborated closely with structural engineer Guy Nordenson & Associates, Transsolar, and lighting-design firm L’Observatoire International. The team ultimately devised a system of curved, custom I-beams, milled from lightweight steel, to create a paneled roof system that admits and diffuses just enough light for the safe display of art. Within the galleries, the light is gentle and balanced from floor to floor, with northern and southern exposures on the third level offering noticeably cooler and warmer illumination, respectively. Glass and translucent stretch fabric enclose the clerestories, allowing additional LEDs to be concealed within. Elsewhere, focused, tunable LEDs are tucked neatly into “flaps” that bend 10 inches down from the ceiling, recalling the organic shape of the roof petals.

Both plan and program contribute to the building’s inviting nature. Numerous ground-floor entrances as well as two restaurants and several large, street-facing sculpture galleries, visible through generous expanses of clear glass, make the Kinder accessible to passersby—though many visitors will enter directly from the new underground parking, via stair or elevator. Those who start their visit in one of the MFAH’s other gallery buildings, or in the Glassell School, can enter through two new subterranean tunnels, with light installations by Olafur Eliasson and the late Carlos Cruz-Diez. Circulation feels intuitive; regardless of how you enter the building, you are drawn into the

central atrium, where a monumental curving stair wraps around and up the triple-height space, the museum’s center of gravity.

For Holl, the symbiotic relationship of the project to its urban context cements it as a highlight of his career. “It’s not a standalone building,” he says. “It’s a building that’s about a campus.” As a literal beacon among the MFAH’s august grouping of structures, the Kinder graciously draws the public into the museum—then encourages them to see the collection, and the city beyond, in a new light. ■

Credits

ARCHITECT: Steven Holl Architects — Steven Holl, principal; Chris McVoy, partner in charge; Olaf Schmidt, senior associate; Filipe Taboada, associate

ASSOCIATE ARCHITECT: Kendall/Heaton Associates — Laurence C. Burns, Jr., Saman Ahmadi, principals

ENGINEERS: Guy Nordenson & Associates, Cardno/IMEG (structural); ICOR Associates (m/e/p); Transsolar (climate)

CONSULTANTS: L’Observatoire International (lighting); Knippers Helbig (facade); Deborah Nevins & Associates, Nevins & Benito (landscape)

GENERAL CONTRACTOR: McCarthy

PROJECT MANAGER: Legends

SIZE: 237,000 square feet

PROJECT COST: withheld

COMPLETION DATE: November 2020

Sources

GLAZING: Gartner, ShenNanYi (curved rainscreen); Guardian

LIGHTING: QuarkStar, Litelab, Ecosense

ACOUSTICAL PLASTER: Fellert

DOORS: Jansen

METAL PANELS: McNichols

ROOFING: Sika Sarnafil

PRECAST CONCRETE: Gate Precast

The Art of the Real

Selldorf Architects' gritty concrete-block gallery building for Hauser & Wirth avows its New York roots.

BY SUZANNE STEPHENS

PHOTOGRAPHY BY NICHOLAS VENEZIA

SINCE ANNABELLE SELLDORF opened her office in 1988, she has attracted gallery owners and museum clients who admire her chaste modern architecture as a proper setting for displaying art. Her subtle, minimalist interiors allow painting, sculpture, and objets d'art to stand on their own without succumbing to "architorture." Her approach stems from a nonaggression pact with works on display, as shown in New York's Neue Galerie (RECORD, May 2002) or the Clark Art Institute in Williamstown, Massachusetts (RECORD, August 2014). In recent years, Selldorf Architects has designed whole buildings for galleries—such as the David Zwirner Gallery on West 20th Street in Chelsea (RECORD, June 2013)—and their exteriors evoke Adolf Loos's early 20th-century houses, with a taut, volumetric play of the planar and the plain.

Upon hearing that Selldorf was doing another ground-up gallery structure, this time for Hauser & Wirth nearby on West 22nd Street, some wondered if she would reprise Zwirner's materials of creamy

beige board-formed concrete and teak for door and window frames. But no. "David [Zwirner] and Iwan [Wirth] are friends and competitors," Selldorf says of her two frequent clients. "You want to make sure the different character of the two operations is expressed."

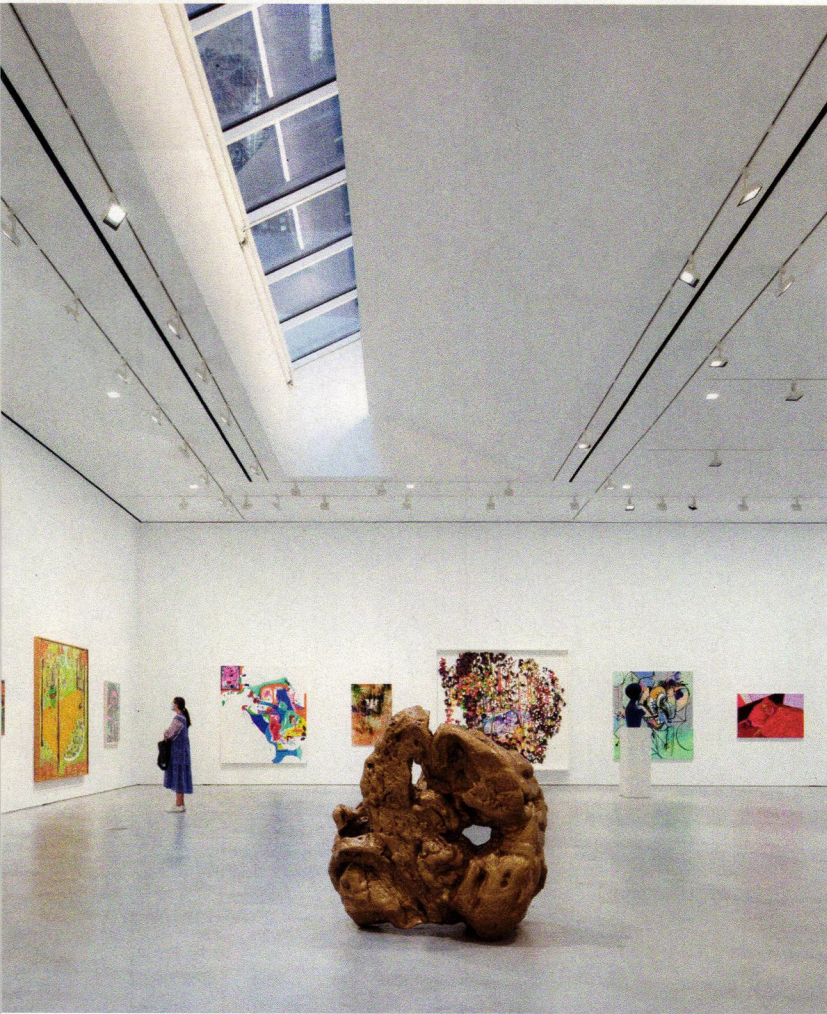
Selldorf has been associated with Hauser & Wirth since Iwan and Manuela Wirth and Ursula Hauser founded the gallery in 1992 in Zurich. Her array of adaptive-reuse projects for their art establishments has ranged from a brewery complex in Zurich to a former flour mill in Los Angeles, a townhouse on Manhattan's Upper East Side, and what was, until a few years ago, the former Roxy roller rink and disco in Chelsea.

Like the Zwirner, Hauser & Wirth's new structure, a five-story, 36,000-square-foot building, commands attention, yet its austere exterior is not a buttery poured-in-place concrete—it is a recycled fly ash concrete block, charcoal-colored and gritty in its gestalt. The



IN NEW YORK's Chelsea, known for its art galleries, a dark fly ash concrete block, zinc panels, and black-painted steel framing distinguish the north facade (this page). Large glazed doors open into the gallery (opposite).



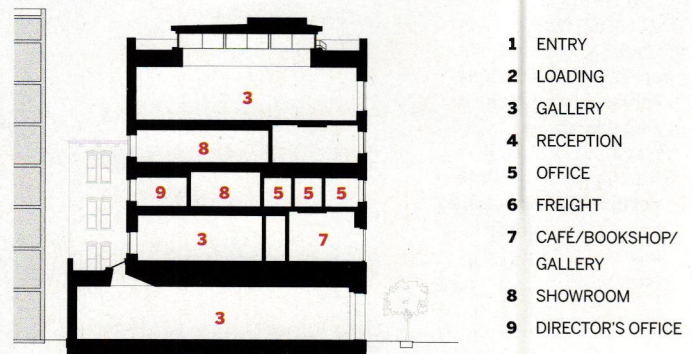


crisply modular blocks are honed, not polished. "It's texturally nice to touch," says Selldorf. "I've always liked black. I wanted this color to express depth and dimension." Zinc panels and black-painted steel frames add to the facade's flinty integrity.

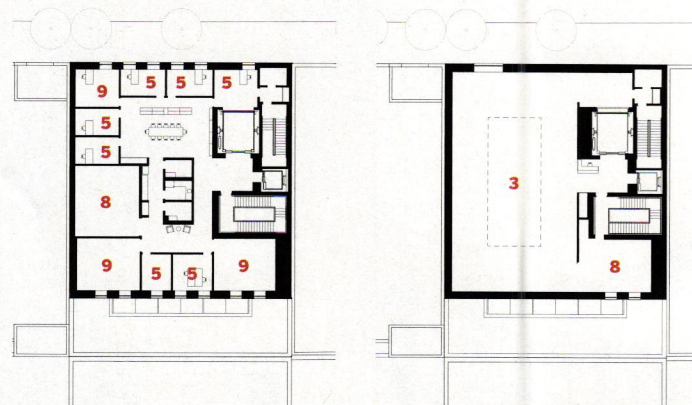
Selldorf points out that the dark concrete block fits in with Hauser & Wirth's own adventurous attitude toward art installations. The new building rises cheek by jowl with an existing loft-like gallery Hauser & Wirth leased from the Dia Art Foundation, where it has installed the famous down 'n' dirty Roth Bar (an operational bar/café honoring the late artist Dieter Roth). For the new gallery next door, which replaces a smaller warehouse, Selldorf kept a certain rough feel, while still adhering to her astringent aesthetic.

The structure's concrete frame allows 16-foot-high glazed doors to pierce the street elevation of the ground floor and for 12-foot-high folding glass doors (with a glass balustrade) to bring more space and light into the second floor. Column-free interiors easily accommodate differently sized installations against a smooth backdrop of white plaster walls and polished concrete floors.

As visitors proceed through the ground floor, they discover a large rectangular skylight running across the back of the L-shaped exhibition space. Since special district zoning required a setback of 20 feet from the rear property line above the first floor, the architects extended the ground floor into the backyard and placed this glazed insertion,

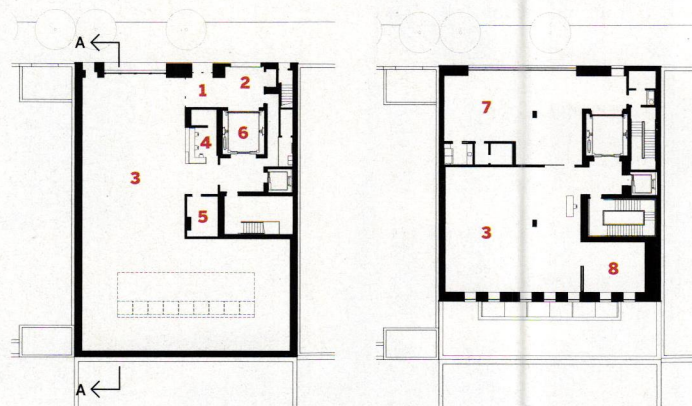


SECTION A - A



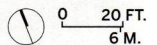
THIRD-FLOOR PLAN

FIFTH-FLOOR PLAN



GROUND-FLOOR PLAN

SECOND-FLOOR PLAN



supported on a 75-foot-long beam, on its roof. The daylight supplements LED track lighting, and, when needed, solar and blackout shades mitigate glare.

Visitors who take the trim black-steel frame and mesh fire stair to the second floor find that a gallery/café/bookshop area overlooks the street through those folding glass panels. Its exposed ceiling and rough-hewn reclaimed-wood floor planks give this space a brute character quite different from the rest of the subdued interiors. Since the third and fourth floors are reserved for offices and client viewing rooms,

A SKYLIGHT illuminates the back of the ground floor (opposite). Folding glass panels and balustrade enclose a gallery/café/book-store space on the second level (right). Bands of clerestories (right, below) top the fifth floor.

gallerygoers can hop the elevator to the 18-foot-high fifth-floor gallery (or stay with the stairs). Here the column-free space is topped by a large 20-by-45-foot monitor projecting up 4 more feet, fitted with clerestories on four sides. On top is an aluminum 10-by-20-foot hatch, so art pieces too large for the loading elevator can be dropped in by crane. The museum-grade HVAC is located on a mezzanine between the first and second floor.

The inaugural exhibition in October—a variegated assemblage of contemporary art sold to benefit art institutions financially affected by Covid-19—tested the interior’s adaptability for display. Selldorf’s spare environment provided a foil for the brash, larky work of George Condo, Lynda Benglis, and Kara Walker, among others. She will have more opportunity to prove her architectural mettle in the near future as construction on the extension to the Frick Collection on the Upper East Side gets under way this spring. There, in the land of stately Beaux-Arts and Georgian-style residences and institutions, the architect’s abstracted Loosian proclivities, as expressed on the design’s exterior, could unsettle the neighbors. But her careful attention to materials and detailing attest to Modernism’s capacity for luxe, calme, and volupté. ■

Credits

ARCHITECT: Selldorf Architects — Annabelle Selldorf, principal and lead designer; Sara Lopergolo, partner in charge; Michael Baskett, Melissa Rivers, project managers

ENGINEERS: GZA GeoEnvironmental, Derosier Engineering (civil); DeSimone Consulting Engineers (structural); Frank Seta & Associates (envelope); Arup (m/e/p)

GENERAL CONTRACTOR: Westerman Construction

CONSULTANTS: Dharam Consulting, (estimator); Flux Studio (lighting); Synergy Associates (IT)

CLIENT: Hauser & Wirth

SIZE: 36,000 square feet

COST: withheld

COMPLETION DATE: September 2020

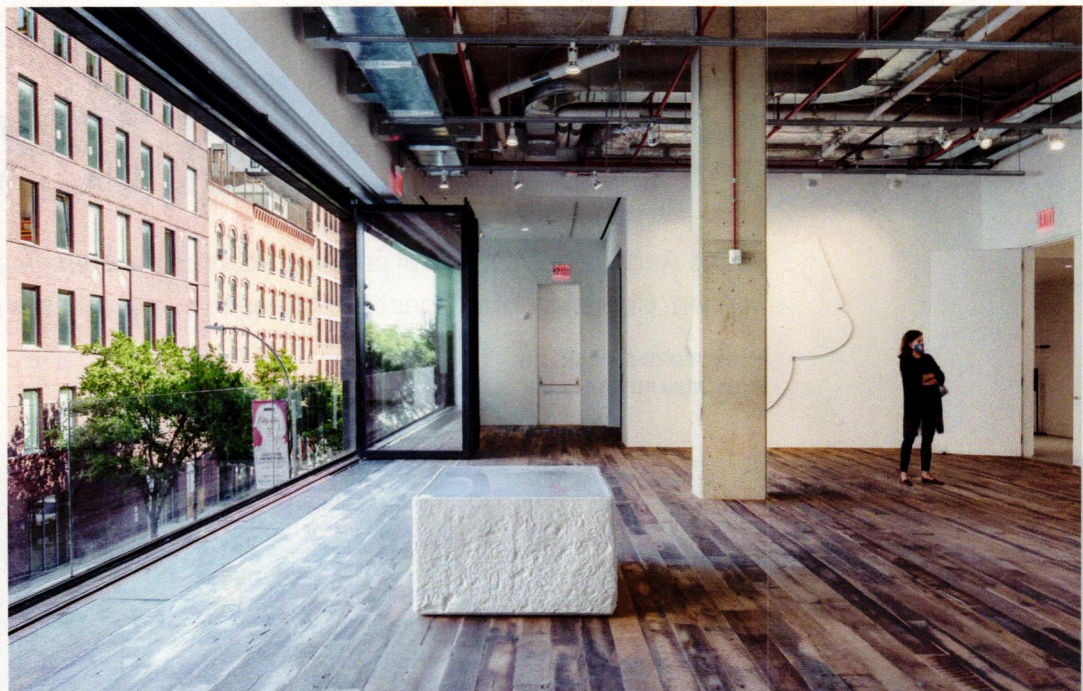
SOURCES

MASONRY: Kingston Block

METAL PANELS: VM Zinc (ground); Dri-Design (rooftop clerestory)

METAL FRAME WINDOWS AND SKYLIGHTS: Schuco

GLAZING: Saint Gobain



Ripple Effect

Tadao Ando drops a cultural pebble into a rapidly changing urban setting in Foshan, China, and its impact emanates to surrounding areas.

BY CLIFFORD A. PEARSON
PHOTOGRAPHY BY HEM

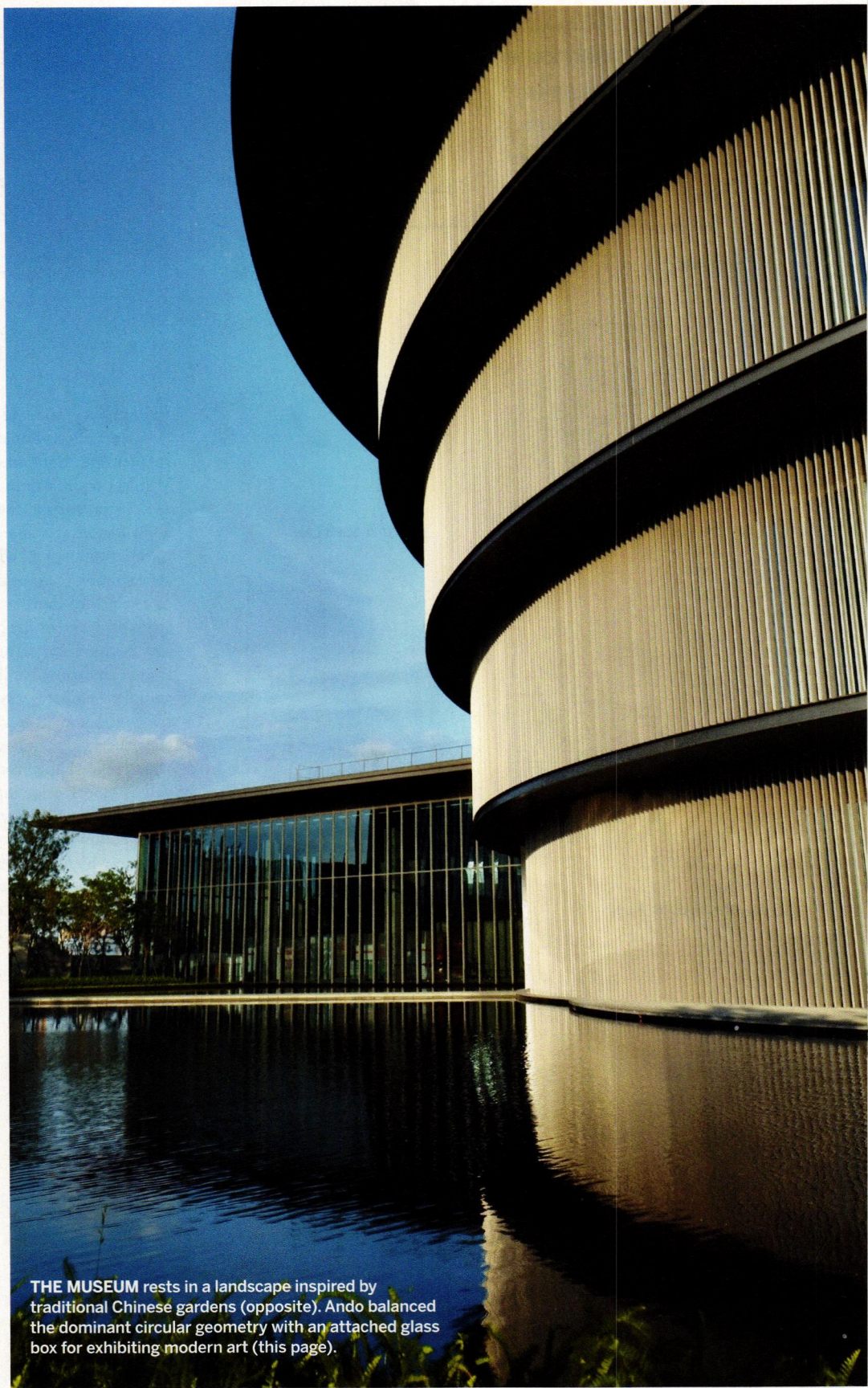


MAKING SIMPLE geometry resonate in complex ways is a hallmark of Tadao Ando's work. Whether it's embedding platonic volumes in the earth, as he did at the Chichu Museum on Naoshima Island (RECORD, October 2005), or inserting a cross of glass into a thick concrete box, as he did at the Church of the Light in Osaka (1989), the 79-year-old architect knows how to give emotional depth to buildings assembled from basic forms and honest materials. He's done it again at the He Art Museum (HEM) in Foshan, a city in the Pearl River Delta about 20 miles southwest of Guangzhou and 110 miles north of Hong Kong. As he has before, Ando integrates architecture with landscape and water to create a project that's both universal in its appeal and specific to its place.

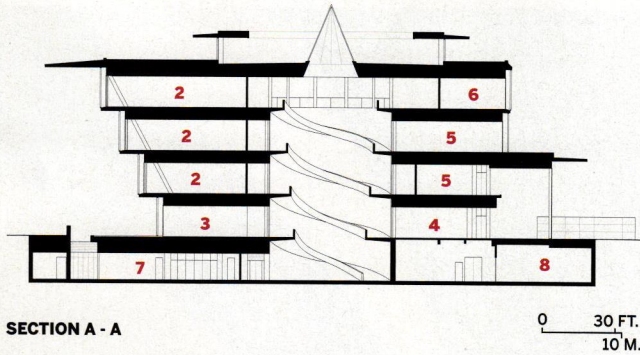
Commissioned by He Jianfeng, a 53-year-old tycoon who has assembled an art collection ranging from traditional works to international and Chinese contemporary pieces, Ando rooted his design in beliefs from the area's Nanyue culture, which flourished 2,000 years ago in a territory that stretched from Vietnam through today's Guangdong, Guangxi, and Hainan provinces. According to Ando, the circle symbolized harmony in the Nanyue kingdom, and the Chinese character He represents peace and harmony, an opportune convergence. The site, though, presented challenges, as it sits south of a busy commercial district, where the client's family has the headquarters of one of its businesses, and north of a public park—two areas with very different features.

"I fully embraced the idea of harmony as an architectural concept," says Ando. To do so, he reached out to the surrounding areas with pathways radiating from a circular main building, while balancing hardscape with water and planted zones. A series of free-standing concrete walls slicing through the landscape to the north and west buffer the museum from nearby office buildings and read as hardened ripples emanating from a powerful force at the center of the site. The walls choreograph an entry sequence that eases visitors from the busy commercial area to a refuge of culture and art. Inspired by Chinese garden design, this progression offers glimpses and oblique views of the museum as visitors arrive. "I wanted to create a dynamic contrast between the natural and the man-made to provide unique surprises," says Ando.

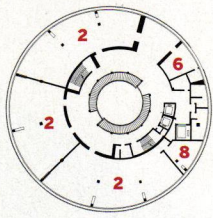
For the 176,000-square-foot museum, Ando stacked a set of shallow cylinders, each one expanding a bit farther in plan as the building rises. So the diameter of each gallery



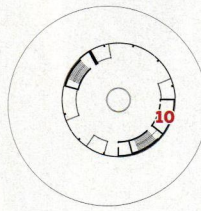
THE MUSEUM rests in a landscape inspired by traditional Chinese gardens (opposite). Ando balanced the dominant circular geometry with an attached glass box for exhibiting modern art (this page).



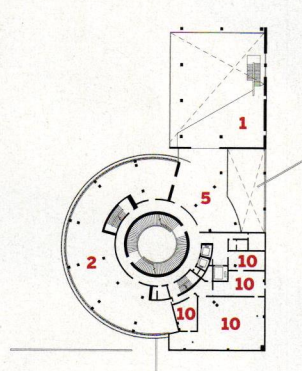
SECTION A - A



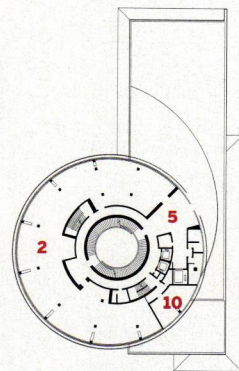
FOURTH-FLOOR PLAN



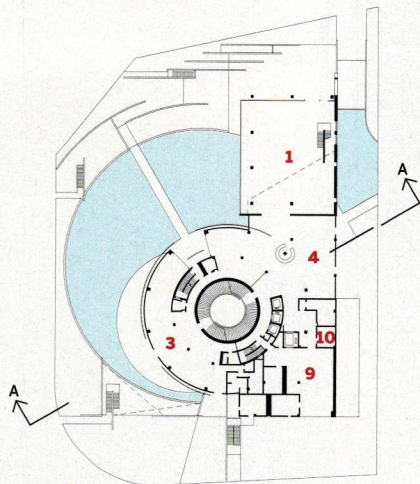
FIFTH-FLOOR PLAN



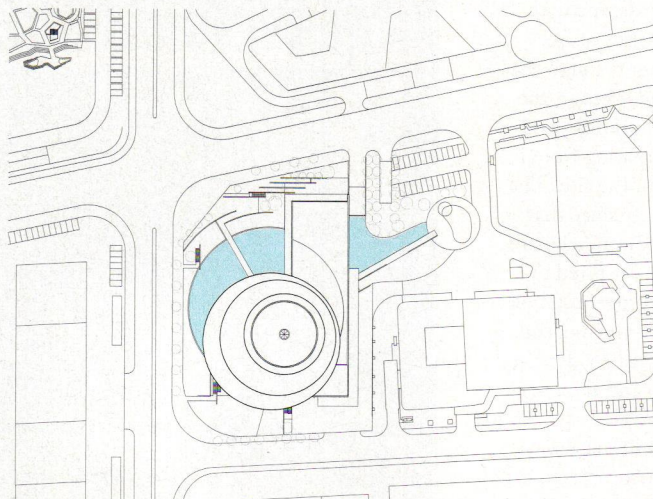
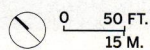
SECOND-FLOOR PLAN



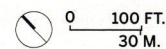
THIRD-FLOOR PLAN



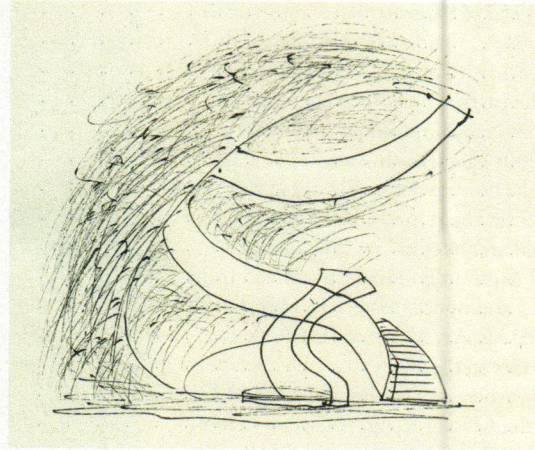
FIRST-FLOOR PLAN



SITE PLAN



- 1 SPECIAL-EXHIBITION HALL
- 2 GALLERY
- 3 CAFÉ
- 4 LOBBY
- 5 LOUNGE
- 6 VIP ROOM
- 7 OFFICE
- 8 STORAGE
- 9 LOADING
- 10 MECHANICAL



floor grows—from 42 meters (138 feet) at ground level to 45 meters (148 feet), then 48 meters (157 feet), and finally 51 meters (167 feet). A smaller fifth floor on top serves as mechanical and maintenance space. While a skylit atrium rising through the center of the building serves as a spatial anchor, the gallery floors slip past one another eccentrically, a few meters at a time. By doing this, Ando injects a subtle dynamism to the composition, which he accentuates with a dramatic double-helix stair spiraling through the atrium. The stair is a poured-in-place concrete element cantilevered from the surrounding walls; it serves as the structural core of the concrete-frame building. “The central void is the soul of this architecture,” explains Ando. Building the double-spiral stair with exposed architectural concrete was difficult because of the complex geometry, says the architect, but a challenge that was met by the contractor. “It is a testament to the great leap forward in the level of construction technology in China today.”

Large V-shaped concrete columns run near the perimeter of the gallery floors, allowing a great degree of flexibility for mounting exhibitions in the 12½-foot-high spaces. Instead of using the building’s architecture to define exhibition areas, Ando created a mostly blank slate on which temporary partitions and installations can be drawn. But the museum’s curving envelope shapes visitors’ lines of sight through the interiors, creating a flow of spaces that conceals some

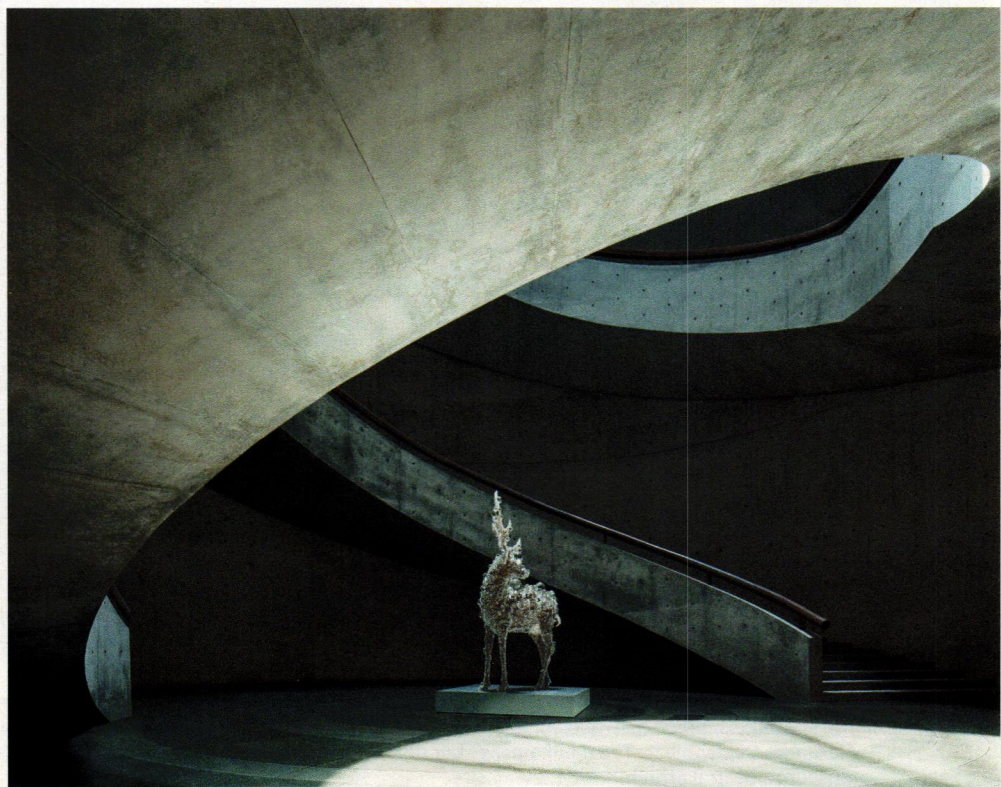


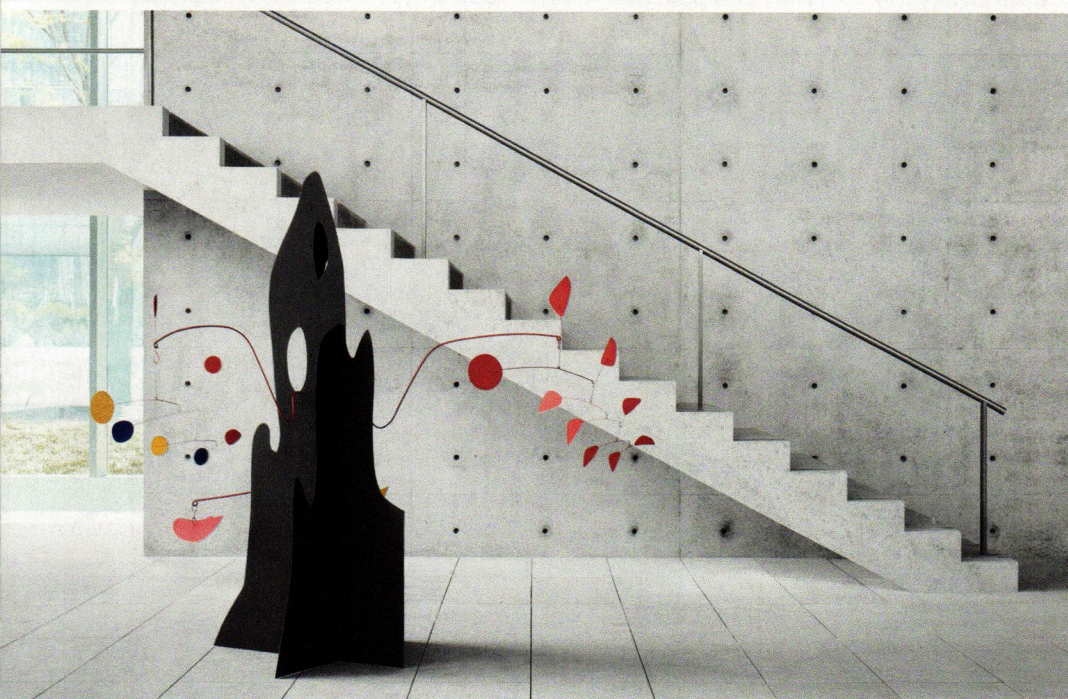
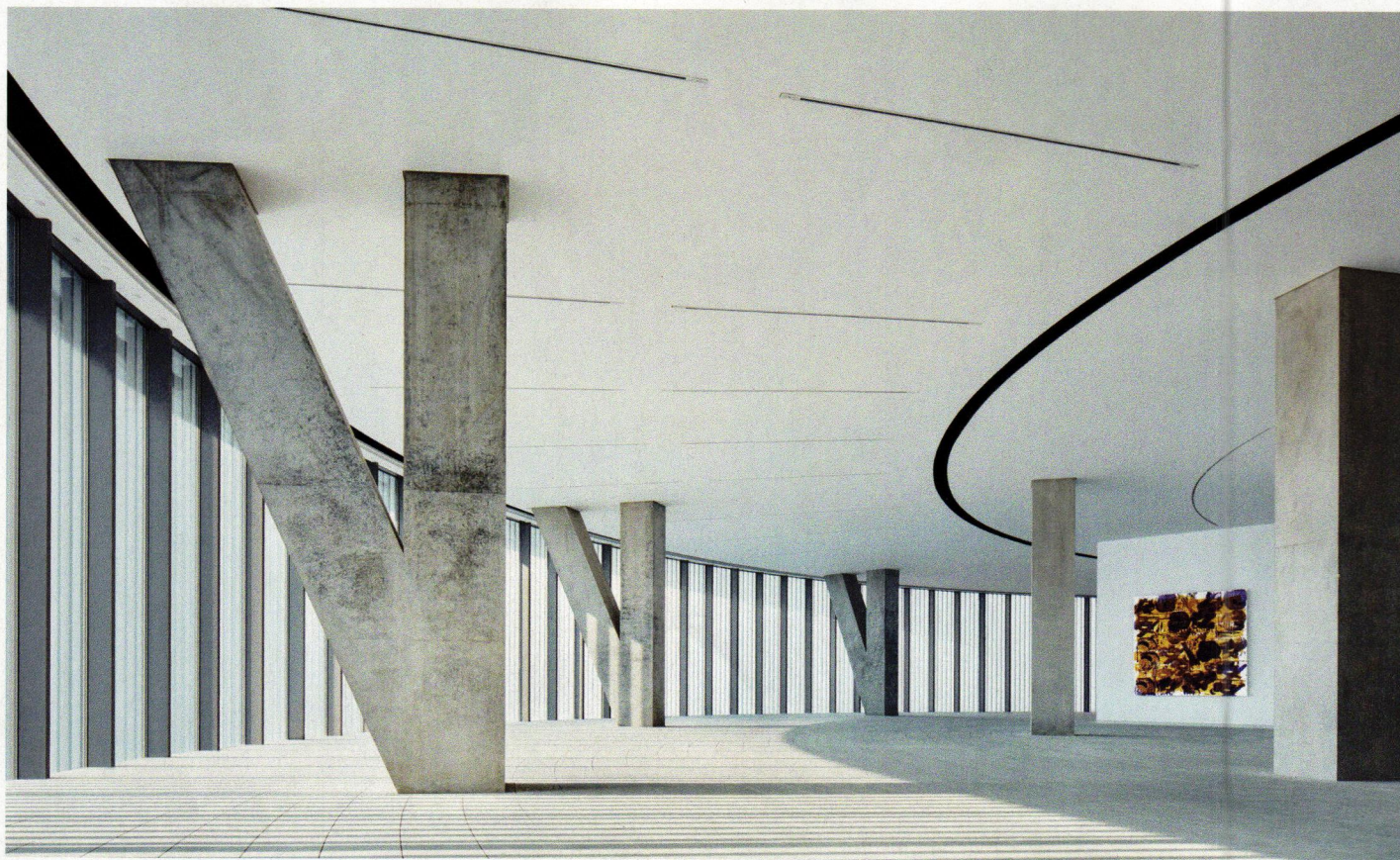
A POURED-CONCRETE double-helix stair in the central atrium imprints the building with its architectural DNA (above). A mixed-media sculpture by Kohei Nawa helps anchor the space (right).

views as it reveals others. A large box with 29-foot-high ceilings attached to the northeast section of the main building accommodates exhibitions of modern art and helps balance the dominant circular character of the museum with a rectilinear counterpart.

In addition to giving the museum its distinctive form, the projecting cylinders of the main building shade the ones below, the deep eaves reducing solar loads. Narrowly spaced fixed vertical louvers around the building's perimeter glazing also contribute to this effort, while reflecting pools at ground level help cool the subtropical air.

Originally scheduled to debut in March, HEM was delayed by the Covid-19 pandemic and finally opened on October 1. Its inaugural exhibition, *From the Mundane World*, occupies the second and third floors of the main building and examines man's impact on nature. In addition to traditional Nanyue pieces, the museum's collection includes works in ink on paper by artists from the Lingnan School, which revolutionized traditional Chinese art in the late 19th century, as well as pieces by modern and contemporary artists such as





A TYPICAL gallery floor offers a ceiling height of 12½ feet and flexible space for displaying art (top). The special-exhibition hall (above), which has 29-foot ceilings, can display modern art such as an Alexander Calder piece. The double-helix stair (opposite) offers more sculptural interest in the museum's central atrium.

Zao Wou-ki, Zhang Daqian, Pablo Picasso, Damien Hirst, Yayoi Kusama, Anish Kapoor, and Roxy Paine.

HEM represents the strides China has taken in recent decades, helping to transform what had been an industrial part of Foshan into one with sleek office buildings and, now, cultural institutions. Ando's design connects the area to its ancient Nanyue past, while delivering a modern destination for the country's increasingly affluent and sophisticated population. Balancing old and new, circle and square, land and building, Ando creates a place of dynamic tension. ■

Credits

ARCHITECT: Tadao Ando Architect & Associates — Tadao Ando, Masataka Yano, Kazutoshi Miyamura

ARCHITECT OF RECORD: Midea Real Estate Holding

GENERAL CONTRACTOR: China State Construction

CLIENT: He Art Museum

SIZE: 176,000 square feet

COST: withheld

COMPLETION DATE: July 2020





THE TALLER, gallery portion of the building is topped by a crown of corbeled bricks.

Double Feature

Durbach Block Jagers and John Wardle Architects design distinct interiors for performance and exhibition, wrapped in a unifying whole, for an arts complex in Sydney.

BY JOSEPHINE MINUTILLO

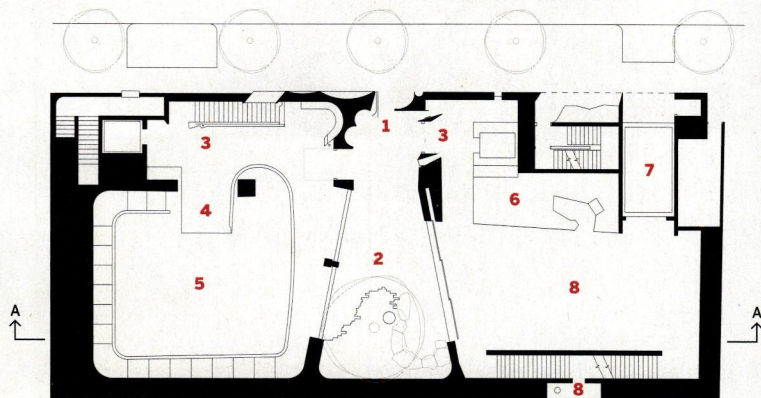
WITH A PATRON who plays by her own rules, it was clear from the outset that nothing about Phoenix Central Park, a striking cultural center completed at the end of last year, would be conventional. The client, Australian billionaire art collector Judith Neilson, said she sought “something as close to the perfect ideal of architecture itself,” and commissioned not one but two firms to achieve it.

“There was almost no brief,” recalls John Wardle, whose Melbourne-based studio formed a unique collabo-

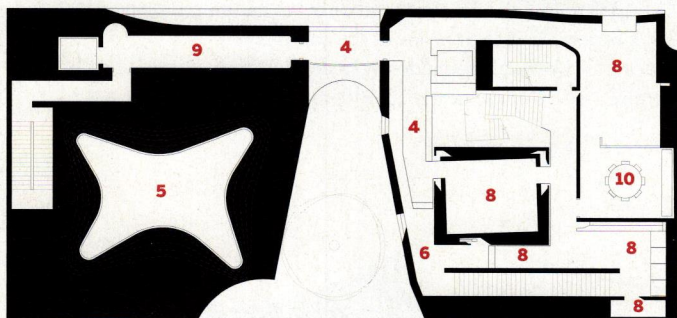
ration with Sydney firm Durbach Block Jagers (DBJ) on the design of a building that would combine visual with performing arts. Wardle tackled the taller, gallery space on the east end of the rectangular site, where a burned-down factory once stood, and DBJ the shorter space for performance on the opposite side. “It was a real trial for us,” says Wardle of the division of labor between the friendly offices, “but also the joy of the commission.” Though they worked independently to develop their respective aspects of the nearly 13,000-square-foot proj-



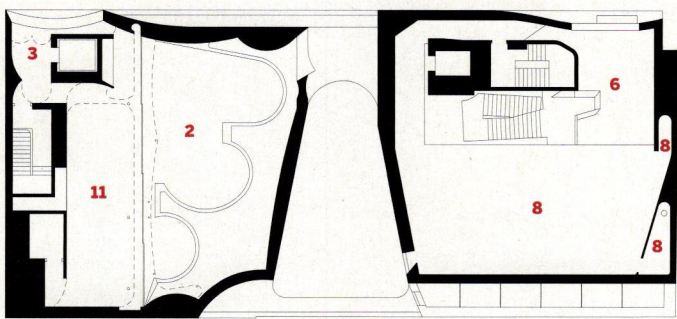
CULTURAL BUILDINGS



GROUND-FLOOR PLAN



SECOND-FLOOR PLAN



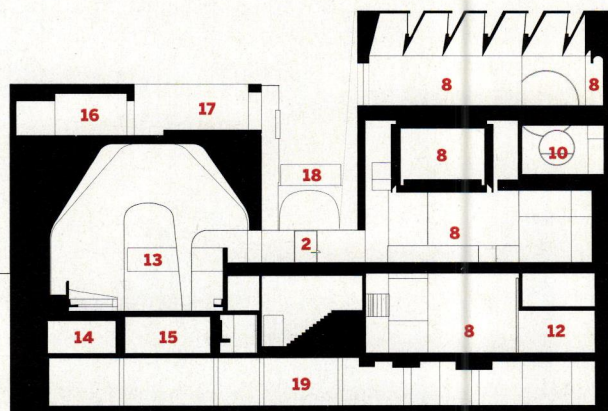
THIRD-FLOOR PLAN

0 15 FT.
5 M.

- | | |
|-------------------------------|----------------------|
| 1 ENTRY | 11 OFFICE |
| 2 COURTYARD GARDEN | 12 ART STORAGE |
| 3 LOBBY | 13 PERFORMANCE SPACE |
| 4 BALCONY | 14 KITCHEN |
| 5 VOID OVER PERFORMANCE SPACE | 15 RESTROOMS |
| 6 VOID OVER LOWER GALLERY | 16 MEETING |
| 7 CAR ELEVATOR | 17 ROOF GARDEN |
| 8 GALLERY | 18 BRIDGE LINK |
| 9 SKY GALLERY | 19 PARKING |
| 10 LIBRARY | |



WITHIN THE crenellated top of the gallery building (above) is a mesh of steel trusses that form the coffered skylights of the top-floor gallery (opposite).



SECTION A - A

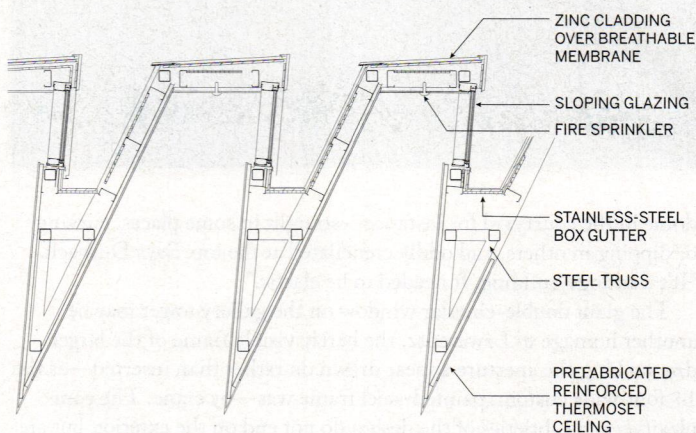
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ect, they “came together constantly” to create a cohesive brick-clad concrete structure separated by a triangular courtyard on the ground floor but connected through several levels above and below grade.

Located in Sydney’s Chippendale neighborhood, Phoenix is the latest evidence of the transformation this once-rundown inner-city suburb, previously home to manufacturing, has experienced in the last decade. Neilson herself—a familiar, if somewhat bewildering denizen to locals—is a driving force behind that evolution. In 2009, she opened White Rabbit Gallery there, a free-to-the-public exhibition space inside a former Rolls-Royce service depot, that displays her vast collection of contemporary Chinese art. Sydney architect William Smart, who converted that space, also designed Neilson’s house; her instructions for that reportedly included a staircase you could ride a horse up. A monument of sculpted concrete completed in 2015, the residence is situated directly next door to Phoenix’s gallery tower and is connected to it via a private passageway.

The house had a clear impact on the design of the arts center: the facade of its imposing structure culminates, like a mailbox slot, in a swooping light well, matched in height, and bravura, by the jagged crown of the new gallery beside it. The architects chose a light gray-brown Roman brick to make it compatible with the exposed concrete of the house. “Any other material would have felt oppressive,” says DBJ partner Neil Durbach. Though they had intended for the brick to be



SKYLIGHT SECTION DETAIL

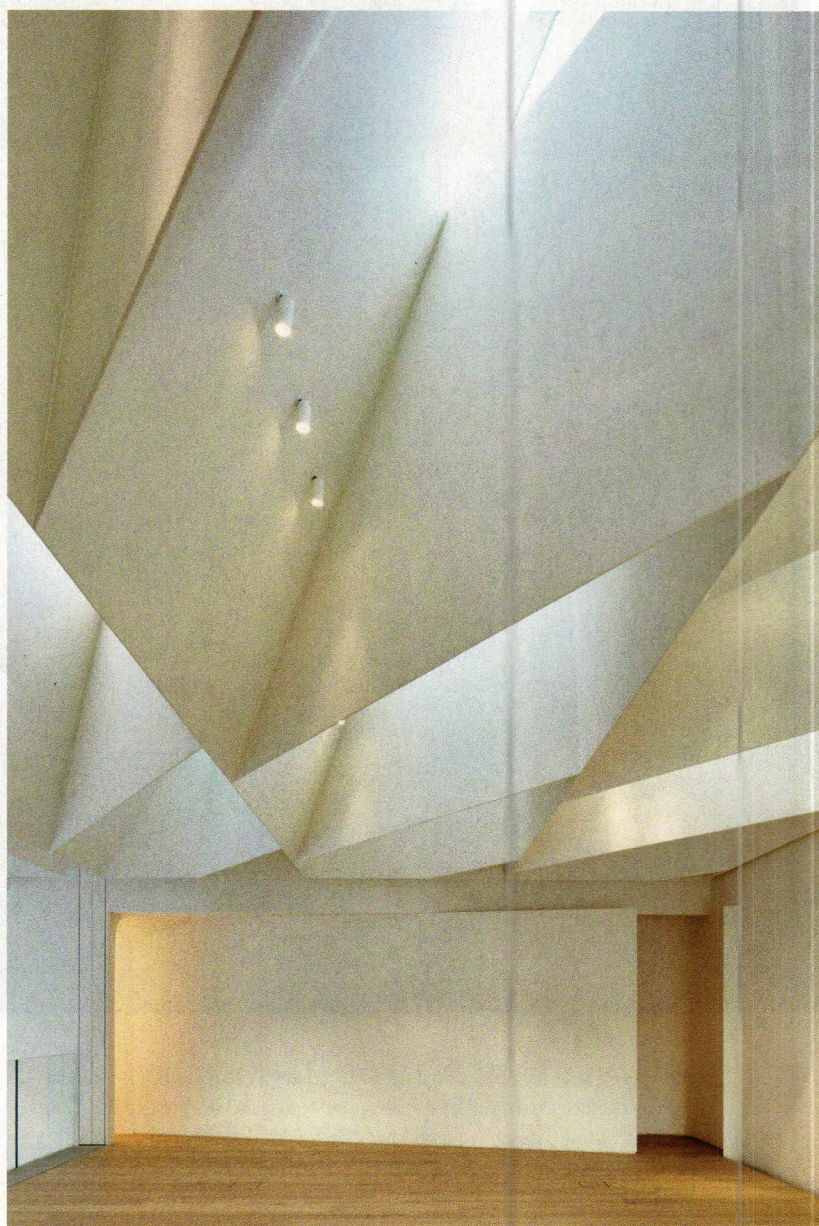
laid with the eccentrically thick mortar joints that Swedish architect Sigurd Lewerentz used in his late church projects, where the masonry blocks seem to float like aggregate, the contractor would not comply. Instead, the finished exterior walls have a ratio of $\frac{1}{3}$ mortar to $\frac{2}{3}$ brick. The effect nonetheless is that of a thin building skin, like fabric, wrapped over a structure of many concavities and complexities—a half



dome in the courtyard for instance—straight in some places, curving or dipping in others, and oddly crenellated at the top. Says Durbach, “It’s a strange building. It needed to be elastic.”

The giant double-circular window on the gallery tower may be another homage to Lewerentz, the barely visible frame of the larger disc making the aperture appear drawn on rather than inserted—as the 14-foot-wide custom, painted-steel frame was—by crane. The complexities and subtleties of the design do not end on the exterior, but are instead magnified in the contrasting interior spaces.

Wardle, who won the Australian Institute of Architects 2020 Gold Medal, the organization’s highest honor, is known for the craftsmanship of his buildings. In Phoenix, artwork in subterranean galleries hangs on plaster walls. Aboveground are expansive poured-concrete walls where art is affixed to a grid of holes left behind from the construction process. The large galleries give way to several intimate ones as you travel up the building, via two staircases, one clad in scalloped European oak—an

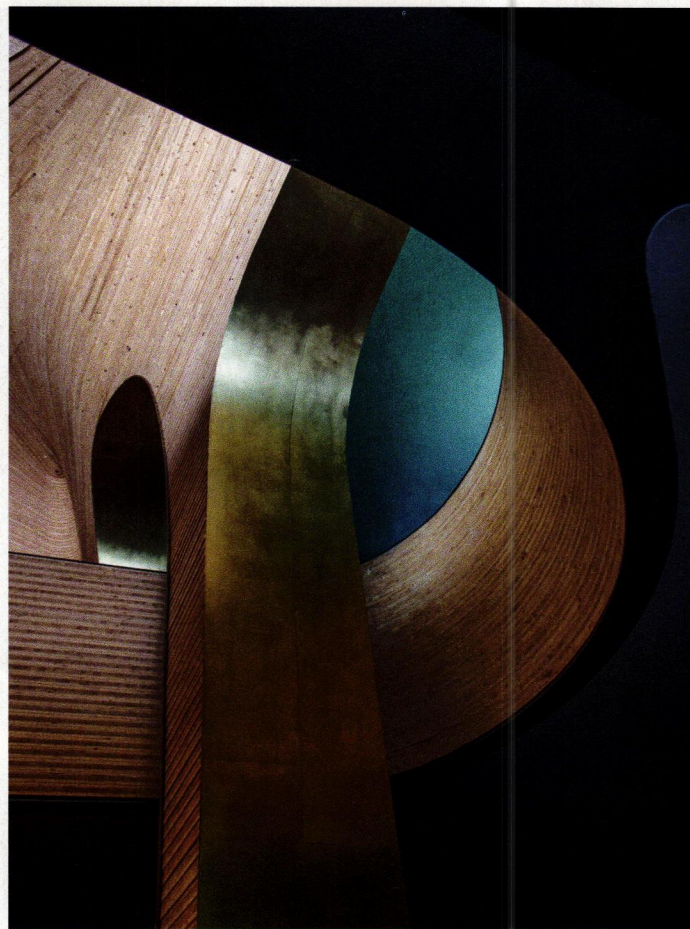


THE GEOMETRY of the double oculus in the library (above, left) contrasts sharply with the diamond-shaped skylights of the top-floor gallery (above). A ground-floor exhibition space opens into the courtyard (opposite, top) and features expansive poured-concrete walls (opposite, bottom).

objet d’art itself as it hovers in open space. Wardle points to Sir John Soane’s Museum in London as a reference for this “meandering journey through a collection.” The journey ends on the daylit top floor, where 32 diamond-shaped coffered skylights—constructed from a dense mesh of steel trusses positioned several degrees off the orthogonal plan—create a light so diffuse, Wardle calls it “fuzzy.”

The labyrinthine galleries juxtapose with the spiraling performance space on the opposite side. Designed as a theater-in-the-round, the bell-shaped timber-clad volume, entered one level below grade, accommodates small audiences, up to 150 or so, dispersed across its flat floor, stepped landings, large balcony, and the various alcoves saddling





A ROOFTOP garden above the theater erupts in pastel colors (left). The underside of the swooping arches in the performance space is lined in brass (above and opposite, left). The undulating timber contours produce a soft space (opposite, right).

the upper areas, for performance art and music recitals. “We wanted a singular space that would offer a sense of gathering and focus,” explains DBJ partner Camilla Block. The 4-inch-thick shell, corbeled in some areas like the brick outside, is made not of a fine material but a gritty, industrial-quality cross-laminated timber, selected in part for its acoustic qualities, that lends an overall softness to the space. Modeled on the computer and verified in large-scale maquettes that “you could put your head inside,” the heavily contoured timber puzzle was cut in Germany and erected by two carpenters on-site in three weeks, says Block. The theater was presciently set up to broadcast performances, which continue through the Covid lockdown, videos of which can be viewed online. Above that swelling moody room is a rooftop garden that erupts in an array of pastel colors. “We like to say it’s like going to heaven.”

“We have old ideas about architecture,” says Durbach. “Ideas about volume, threshold, intrigue. We want to make buildings that are mysterious and joyful.” Not regularly open to the public as White Rabbit is, Phoenix will remain, in part, mysterious to most. The building is, in spirit, an extension of Neilson’s home, where “the poetry of light, the pleasure of use, and the magic of materials” come together, according to Neilson—“a bit,” as Block describes its enigmatic nature, “like Judith herself.” ■

PHOTOGRAPHY: © TOM FERGUSON (LEFT); ANTHONY BROWELL (TOP); MARTIN MISCHKULNIG (OPPOSITE, LEFT); JULIA CHARLES (OPPOSITE, RIGHT)



Credits

ARCHITECTS: Durbach Block Jagers — Neil Durbach, Camilla Block, David Jagers, Simon Stead, Anne Kristin Risnes, Deb Hodge, Xiaoxiao Cai, Adam Hoh

John Wardle Architects — John Wardle, Stefan Mee, Diego Bekinschtein, Luca Vezzosi, Alex Peck, Adrian Bonaventura, David Ha, Ellen Chen, Andy Wong, Manuel Canestrini, Meron Tierney

ENGINEERS: TTW (civil, structural); Pells Sullivan Meylink (geotechnical); Evolved Engineering (building services)

GENERAL CONTRACTOR: Belvarde Construction (early works and superstructure); FDC Group (structure and fitout)

CONSULTANTS: Philip Chun & Associates (accessibility); Marshall Day (acoustics)

CLIENT: Judith Neilson

SIZE: 12,755 square feet

COST: withheld

COMPLETION DATE: December 2019

Sources

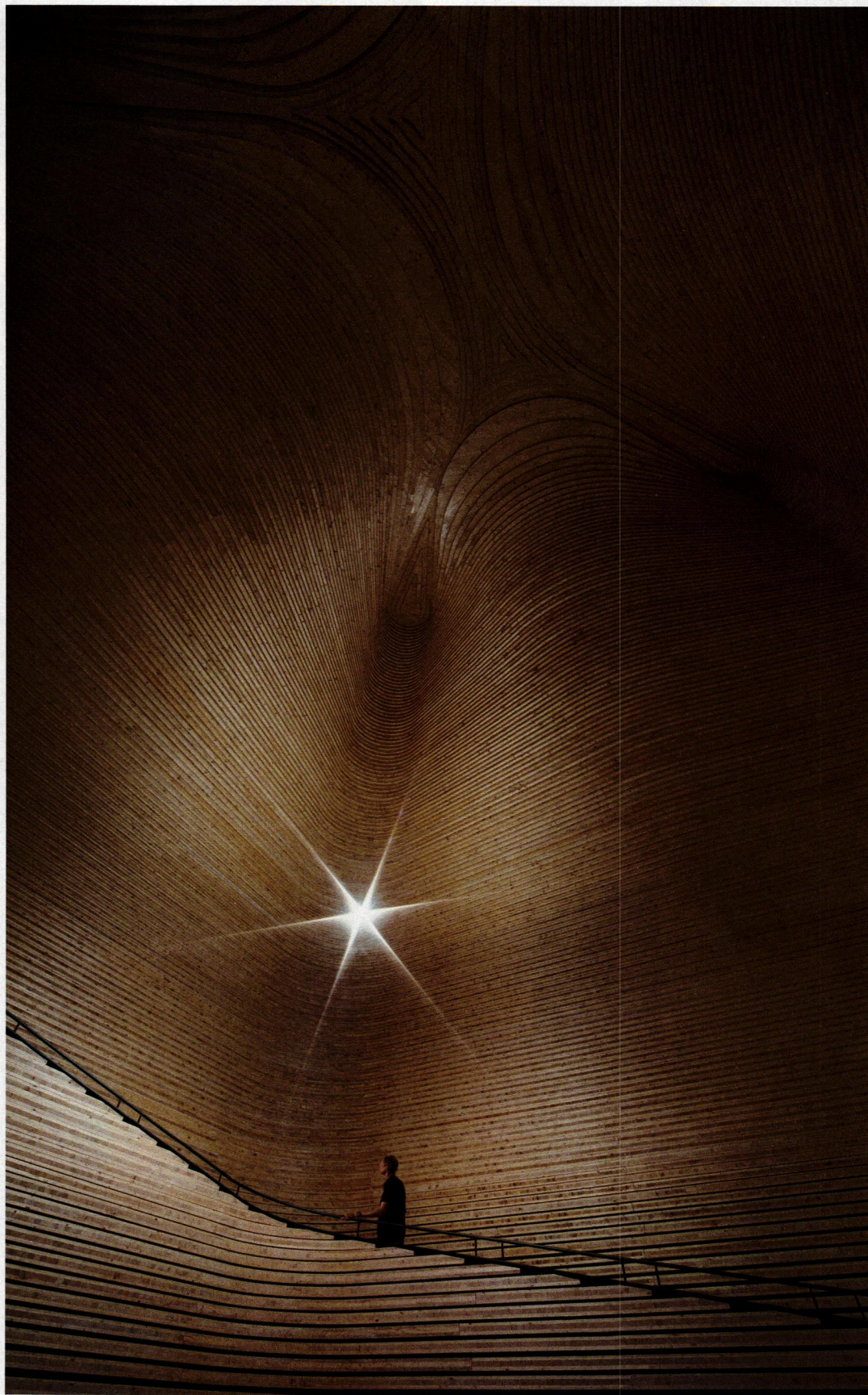
MASONRY: Krause Bricks

SPECIALTY GLASS: Ozsea, Definitive Glass

TIMBER: Dinesen

HARDWARE: Keeler

ELEVATORS: Kone (passenger); Hamilton (car)





LIGHT GLOWS through the original stained-glass transom above the entrance. A white oak-and-steel staircase ascends to the main floor (right).

Past Is Prologue

Lee Skolnick resurrects a 19th-century church in Sag Harbor, New York, as a new arts incubator.

BY SARA HART

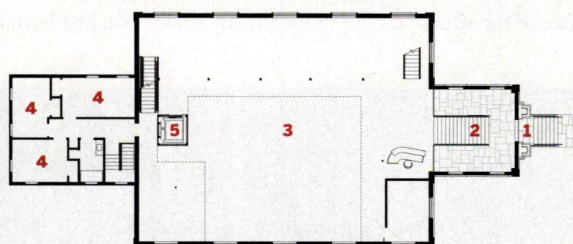
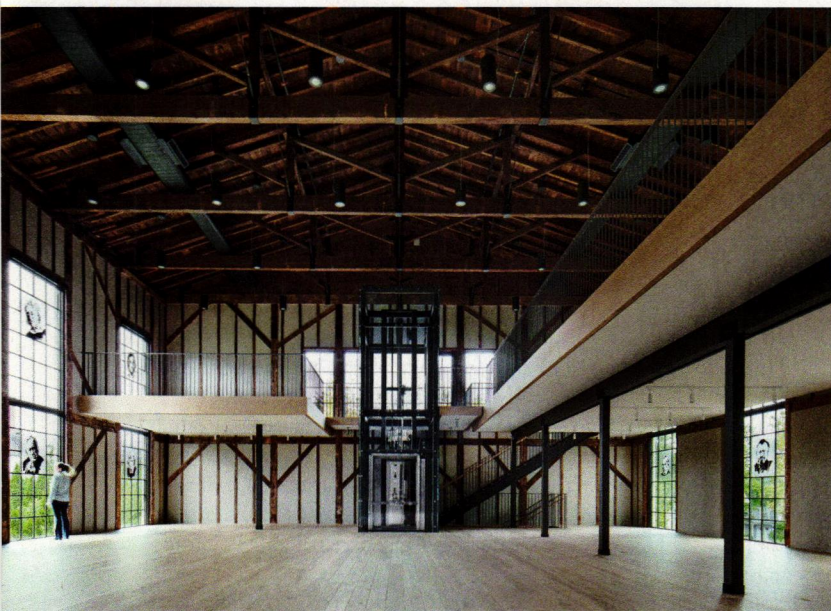
PHOTOGRAPHY BY SCOTT FRANCES

ADAPTIVE REUSE is actually a hybrid of building types, one that integrates the construction techniques used in restoration, preservation, retrofitting, and new construction. Globally, a vast inventory of structures exists that have outlived their original purposes but not lost their embedded value. Churches have proved to be excellent opportunities for adaptive reuse. Usually formulaic in plan and section—a voluminous sanctuary wrapped in a series of ancillary rooms and passageways—and built to last, older churches tend to be structurally sound, with thick masonry foundations and old-growth timber trusses. An ideal example is an 1832 former Methodist Church in the village of Sag Harbor, New York. Deconsecrated in 2008, it was sold and then

resold before being acquired by the prominent artists and community activists April Gornik and Eric Fischl. Now permanent residents of Sag Harbor, they envisioned converting the 12,000-square-foot church into a community-focused cultural incubator that will feature an artists-residency program with on-site accommodations, studios, exhibition galleries, a library, and a public garden. They entrusted the transformation to Lee H. Skolnick, with whom they have collaborated for 35 years.

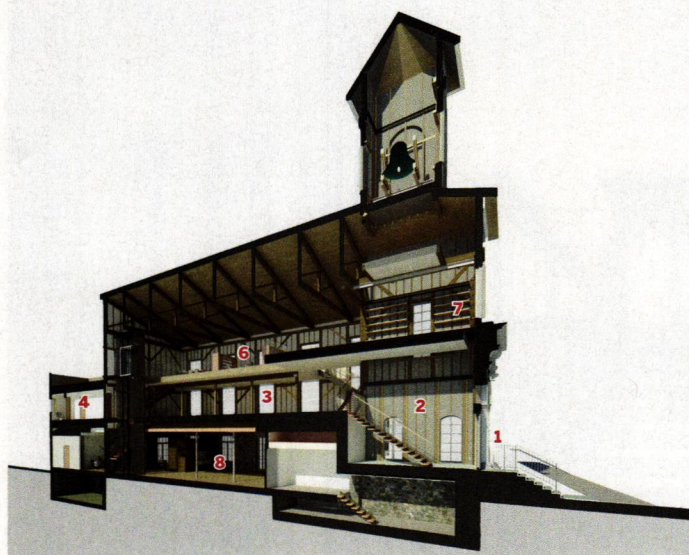
“I don’t have a specific style that I apply to every project,” explains Skolnick, whose architecture firm is based in New York. “I respond to the essence of the situation. The story already exists. You just have to





MAIN-FLOOR PLAN

0 16 FT.
5 M.

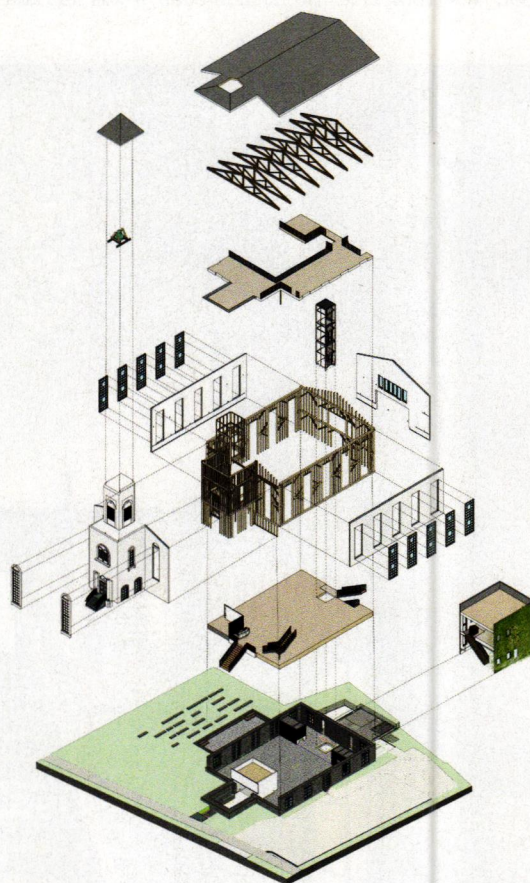


PERSPECTIVAL SECTION

- | | |
|-------------|--------------------|
| 1 ENTRANCE | 4 ARTIST RESIDENCE |
| 2 FOYER | 5 ELEVATOR |
| 3 MAIN HALL | 6 MEZZANINE |

find it." The church exterior itself is not architecturally unique. Rebuilt to the original specifications, the clapboard-clad structure and architectural details form a quaint collage of different styles—Italianate brackets under the eaves; tall, unadorned windows; handsome Greek Revival entry with the original stained-glass transom; and a newly shuttered belfry with the historic church bell reinstalled.

The interior, on the other hand, is spatially dynamic, beginning with the long flight of wide stairs that carries you up into the capacious 51½-foot-by-67-foot former sanctuary. Skolnick made historic value a key part of the story. "The goal was to tread lightly. I didn't want to intervene more than was absolutely necessary," he says. One of the first decisions became a reference point going forward. He instructed the skilled crew to remove the plaster on the interior from the lath, and the lath from the structure, revealing the studs and joists. They then filled in the spaces between the vertical members with gypsum board painted light gray. In an inspired move, Skolnick had them reclaim the lath, to create partitions to enclose an office near the entrance and for storage spaces for the artist studios at the lower level. The tightly stacked horizontal lath boards create a refined yet rustic surface. By restricting the scope of intervention and making the right decisions, the architect and builder gave hidden elements of the church a new purpose.



EXPLODED AXONOMETRIC

- | |
|--------------------|
| 7 LIBRARY |
| 8 STUDIO/WORKSPACE |



THE NEW mezzanine (above) hovers beneath the historic wooden trusses and along the windows displaying Fischl's artist portraits, while the library occupies the space under the belfry (right). The former sanctuary is now the main space (opposite).

Other innovative details accumulated over the course of construction. "Every selection—hardware, paint color, textures, fixtures—becomes critical," says Skolnick. "It's all in the details. That's all there is. The rest of it is pure space." For instance, railings for an open staircase leading to a new mezzanine are supported by thin steel rods painted gray, giving a rhythm to the ascent. The new mezzanine, replacing an existing balcony, wraps the main space on three sides, but allows the volume to soar from the main floor up 35 feet to the original trusses and beams, now exposed. The matte-finished white oak floor appears to float away from the walls, with the gap between the mezzanine edge and the perimeter walls discreetly filled with glass inserts, or with grills in the library on that upper level. From there, the bell can ring when someone pulls the heavy rope descending from the open belfry. The result is a lightness that eschews the minimalist austerity or generic mediocrity that are risks of adaptive reuse.

The ground level, under the sanctuary, offers studio space and storage for the artists in residence. This level's 20-inch-thick, 11-foot-tall stone walls are the foundation for the structure above. Existing openings were enlarged for oversize steel doors, which allow large artworks to be moved in and out of the building.

The north and south walls of the sanctuary have 20-foot-high win-





THE SOUTH-FACING elevation of the main floor receives ample daylight through 20-foot-high windows; steel doors in the stone foundation open to a small amphitheater in the landscape.

dows, which rise uninterrupted from the main floor past the new mezzanine. Skolnick designed the new windows with thinner mullions and muntins than the original ones and painted them gunmetal gray. Fischl had an ingenious idea, to use the windows as homage to the village's cultural heritage. "Churches do stained-glass images of saints," the artist explains. "We chose to canonize those great artists who had a relationship to Sag Harbor's history. I wanted the portraits to celebrate this pantheon of creative people as well as reflect the diversity of our community."

Fischl employed a monochromatic painting technique, called grisaille, dating to the Renaissance, in which only shades of gray are used. "The images were painted on frosted mylar and then photographed. Each image was printed twice and then registered on-site in predetermined spaces in the window grid. "Basically, the portraits are decals," admits Fischl. While only 20 portraits can be displayed at one time, Fischl has identified 150 artists, whose portraits will be rotated as they are completed. The 20 faces of the inaugural display include George Balanchine, Langston Hughes, E.L. Doctorow, Elaine Stritch, and Spalding Gray.

Skolnick designed a two-story addition at the rear of the church, with a separate entrance, to house visiting artists. Its massing differs intentionally from that of the church, and it will eventually be covered with vegetation. The public garden, designed by landscape architect Edmund Hollander, features a gently sloping grass amphitheater with irregularly cut stone slabs to provide seating. (Installed prior to the pandemic, the stone placement nonetheless appears to adhere to the rules of social distancing.)

Every new detail—visually and programmatically—supports every original detail: the rebirth of the Church is simultaneously a continuation of its past. Although its current mission is a secular one, it embodies, as Fischl likes to say, "an energy that has served people in need. I think that's the nature of a church." ■

Sara Hart, a former RECORD editor who trained in architecture, writes frequently about design.

Credits

ARCHITECT: SKOLNICK Architecture + Design Partnership — Lee H. Skolnick, principal; David Vimont, project manager; Jason Hudspeth, Shaad Zaidi, architectural designers

ENGINEERS: Steven L. Maresca & Associates (structural, civil); P.W. Grosser (public works)

GENERAL CONTRACTORS: Moises Cerdas Builders; Lettieri Construction

CONSULTANTS: Hollander Design (landscape); The SEED (lighting)

SIZE: 12,500 square feet

COMPLETION DATE: November 2020

Sources

WINDOWS: Marvin

HARDWARE: Baldwin (locksets); Yale (closers and exit devices)

ELEVATOR: Savaria (Northern Lifts & Westhampton Architectural Glass)

LIGHTING: Luminis Lighting (interior ambient); USAI Lighting (downlights); Intense Lighting (track lighting); Ecosense (cove lighting)

LIGHTING CONTROLS: Lutron

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Plugged In

An all-electric movement charges ahead in the race to reduce carbon emissions.

BY JOANN GONCHAR, FAIA





EHDD is a California firm with a long history in deep-green design, and several net zero energy buildings—such as the David and Lucile Packard Foundation in Los Altos, California, and the Exploratorium, on San Francisco's Embarcadero—in its portfolio. But one-off projects like these, says principal Scott Shell, can't provide a remedy at the speed and scale we need to tackle the climate emergency. "We need a solution for a majority of buildings, not just for exceptional buildings."

Shell and many others see potential in a trend known as electrification, a term that describes substituting oil- and gas-burning equipment with electric systems for space- and water-heating, and using all-electric technologies for cooking. By transitioning from burning fossil fuels on-site and instead relying on the grid, we can significantly reduce greenhouse-gas emissions, since electricity is increasingly being generated from carbon-free resources like wind and solar energy.

States and cities—many of which have ambitious climate targets—are propelling this movement forward. The first to act was Berkeley, California. In July 2019 it banned gas connections to new small and midsize residential buildings. Since then, similar policies have been sweeping that state, with 38 additional jurisdictions adopting regulations that either prohibit or discourage gas infrastructure in new construction. Some California cities are already broadening the scope of regulations adopted only a few

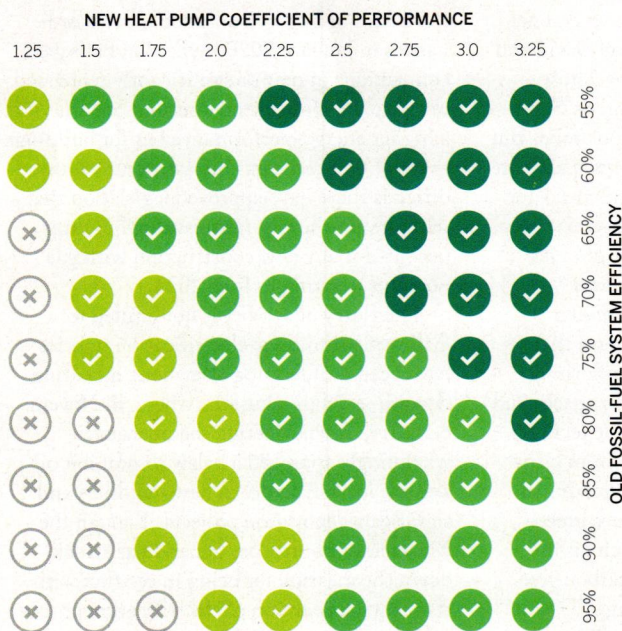
months earlier. For instance, in San Francisco, the Board of Supervisors adopted two ordinances in January 2020—one that bans gas connections in new or significantly renovated municipal facilities, and a second one that sets a higher energy-performance bar for buildings that opt to include gas infrastructure. Now officials there have approved legislation that will prevent the city from issuing building permits for any new construction with gas hookups, starting in June 2021.

The flurry of activity is not limited to California. Building-electrification policies have been proliferating elsewhere, including Brookline, Massachusetts, where, in November 2019, Town Meeting members overwhelmingly approved a bylaw to prohibit oil and gas infrastructure in new buildings and significant renovation projects. Though the Massachusetts attorney general has struck down the measure for being in conflict with state laws, a coalition of electrification proponents, including AIA Massachusetts, is now recommending legislative action at the state level. Meanwhile, officials in Seattle are in the final stages of adopting a code that eliminates gas space-heating in new commercial buildings and gas water-heating for new hotels and multifamily buildings taller than three stories. An executive order, signed by the mayor, is already in place that prevents new municipal buildings from using fossil fuels for space- and water-heating or cooking. And in Washington, D.C., the district's Department of Energy

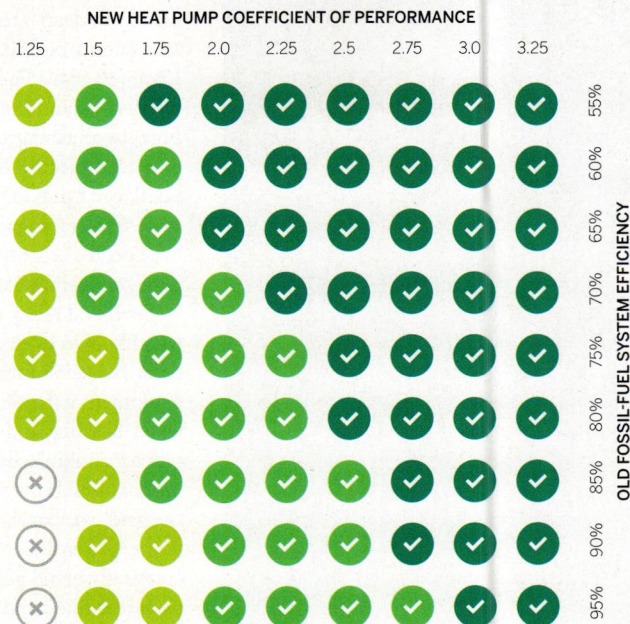


PHOTOGRAPHY: © ROBERT BENSON (LEFT); SOPHIA PANOVA (RIGHT)

THE KING OPEN/Cambridge Street Upper Schools and Community Complex (left and above), has been designed by William Rawn Associates with Arrowstreet as the first all-electric, net zero emissions school in Massachusetts.



HEAT PUMP EMISSIONS SAVINGS: SHORT-TERM GRID



HEAT PUMP EMISSIONS SAVINGS: LONG-TERM GRID

RETROFITTING New York's multifamily buildings to electric space- and water-heating would achieve carbon savings now (left), according to the Urban Green Council. The savings would be enhanced as more renewable capacity is added to the grid (above).

& Environment has laid out an electrification timetable that ends gas hookups in new construction or major renovations by 2026. It also requires that replacement heat and hot-water systems be electric by 2035, and calls for residential construction, both new and existing, to be all-electric by 2050.

A confluence of developments is making all-electric buildings a powerful strategy to help alleviate the climate crisis. The most consequential is the transition toward a cleaner grid. In 2019, approximately 38 percent of the country's electricity was generated from non-fossil-fuel sources, including nuclear, wind, hydropower, and solar, up from about 30 percent two decades ago, according to the U.S. Energy Information Administration. The proportion of electricity generated from, in particular, wind, solar, and biomass is rapidly expanding. According to Headwaters Economics, a nonprofit research group, between 2012 and 2020, 891,383 megawatts (mW) of new generation capacity from these sources was added to the grid, while only 35,302 mW of natural gas capacity was added. At the same time, coal-fired power plants are being retired, notes Mike Henchen, a principal on the carbon-free buildings team at the Rocky Mountain Institute (RMI), a research

and consulting organization focused on resource efficiency. "The grid has gotten cleaner faster than many people realize," he says.

Sources say electrification makes good climate sense even before the grid is entirely fossil-fuel-free. For instance, the Urban Green Council, a New York-based sustainable-building nonprofit, has studied the carbon implications of retrofitting the city's multifamily buildings with all-electric space-heating and hot-water systems. Currently, oil- and gas-burning equipment in residential buildings accounts for 40 percent of New York's overall carbon emissions, says John Mandyck, the council's CEO. The analysis modeled the new systems and those they would replace at various levels of efficiency, and took into account the evolving nature of the electrical grid. For nearly all scenarios, it determined there would be carbon benefits to making the switch in the near term, even though two-thirds of the city's electricity is currently generated by burning oil and natural gas, and despite the fact that its power supply will become even more carbon-intensive with the shutdown of an aging nuclear power plant in nearby Westchester County slated for 2021. Urban Green predicts emissions reductions will be even greater from such retrofits

once renewable generation capacity is added to the electrical grid in 2030 and beyond.

In addition to a cleaner grid, technological advances are propelling the electrification movement forward. Improved equipment for space heating and hot water are making the transition practical: the game-changer is the greater efficiency of heat pumps, devices similar to air conditioners, but that provide heating as well as cooling. With the help of refrigerants, compressors, and the second law of thermodynamics, air-source heat pumps (the most common type) pull heat from outside and transfer it indoors in the winter, and, in the warmer months, they extract heat from the indoor air and release it outside. Although the technology isn't new, the latest generation of these machines, unlike earlier ones, work when temperatures dip well below freezing, making them a legitimate space-heating option for colder regions of the country. They are more efficient than their fossil-fuel burning counterparts, since they transfer more thermal energy than they consume.

Innovations in electric kitchen appliances, namely the induction stove top, are also making the transition practical. While consumers have been slow to embrace the technology due to "cultural barriers," says Panama Bartholomy,

director of the electrification-advocacy group Building Decarbonization Coalition, he and others tout the benefits of all-electric cooking, including improved indoor air quality (gas ranges and ovens emit toxic gases such as nitrogen dioxide and carbon monoxide); efficiency; and a cooler kitchen.

Some housing developers are betting the public will come around. A 40-story all-electric building slated to break ground in downtown Brooklyn next year will be New York's first all-electric residential tower, according to Alloy, its architect and developer. AJ Pires, the company's president, cites a number of factors in switching from burning fossil-fuel energy on-site, including the difficulty of coordinating underground infrastructure in a dense urban environment, near a major subway and commuter-rail hub, and the requirements of New York's Local Law 97, the 2019 legislation that set tough limits on the amount of carbon that buildings can emit. Pires believes that electric boilers for hot

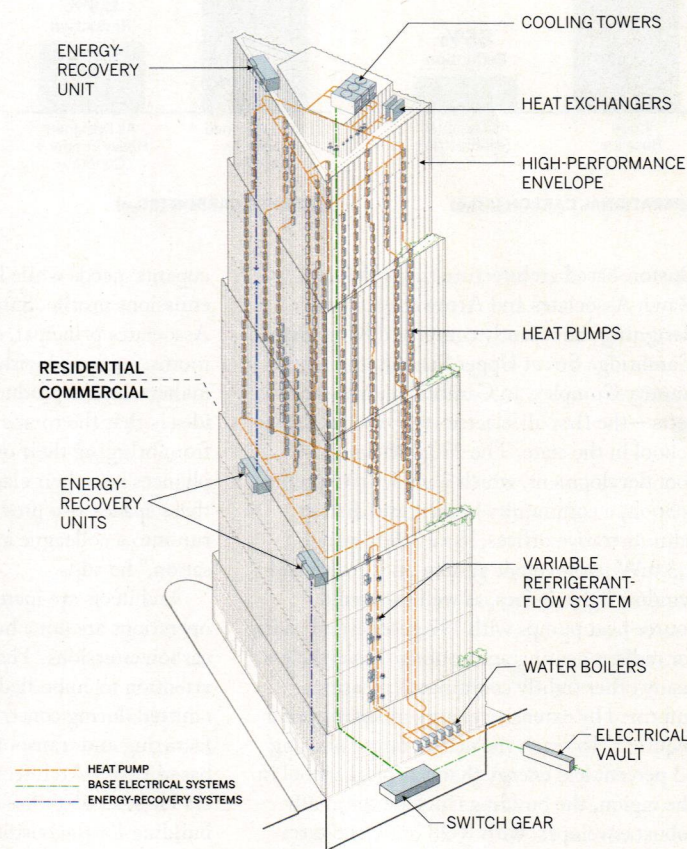
water, heat pumps for space-heating, an energy-recovery system, and the induction cooktops will appeal to prospective tenants: "We think the appliances will provide a market advantage," he says.

Beyond climate benefits and the health and comfort of occupants, analyses show that going electric often can save money. A recent RMI study compared the cost of building and operating a new all-electric single-family house to that of one relying on gas for cooking, space-heating, and water-heating in seven U.S. cities: Austin, Texas; Boston; Seattle; Columbus, Ohio; Denver; Minneapolis; and New York. Some findings were surprising, says RMI's Henchen. Though up-front costs for the mixed-fuel house were higher in most of the cities analyzed, in Minneapolis—which was the coldest climate considered and required the most expensive heat pump—the cost of building the two options was roughly equivalent. However, operating costs for the non-gas house were 9 percent lower, due to

a special winter electric-heating rate offered by the local utility. The analysis of Boston, meanwhile, revealed higher annual utility rates for all-electric, but these were outweighed by savings in up-front costs. All of the cities showed considerable carbon savings for the electric-only scenario, especially Seattle, where greenhouse-gas emissions with all-electric over the next 15 years would be a stunning 93 percent lower.

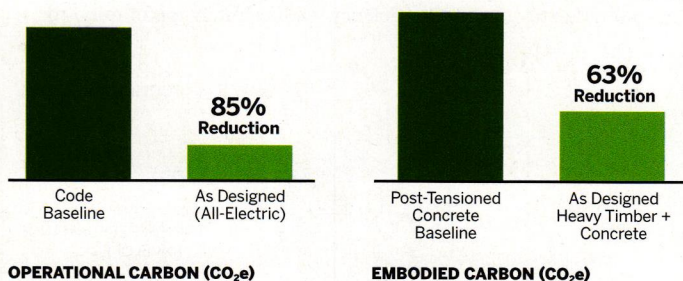
Electrification fans say that such remarkable emissions reductions don't mean that architects can ignore efficiency. "I worship at the church of the envelope," jokes Bartholomy. A highly insulated enclosure is critical for improving heat pump performance and containing costs, he explains. That, along with other sustainable-design fundamentals, such as proper solar orientation, daylighting, and the optimal configuration of mechanical systems, will prevent the overbuilding of renewable-generation capacity.

Efficiency was definitely top of mind for



ALL-ELECTRIC DIAGRAM

A 40-STORY TOWER planned for downtown Brooklyn will have all-electric systems, including those for cooking. Its designer and developer, Alloy, is betting that this strategy will provide a market advantage.



BY FORGOING a connection to the central steam plant and using mass timber, LMN Architects has cut carbon emissions substantially in its design for a building at the University of Washington's business school.

Boston-based architecture firms William Rawn Associates and Arrowstreet when designing the recently completed King Open/Cambridge Street Upper Schools and Community Complex, in Cambridge, Massachusetts—the first all-electric, net zero emissions school in the state. The 270,000-square-foot development, which includes two public schools, a community library, and district administrative offices, has a 3,600-panel, 1.3 mW photovoltaic system on its roofs and window light shelves, as well as ground-source heat pumps with 197 geothermal wells for radiant heating and cooling. Nevertheless, many other tightly coordinated measures informed by extensive energy modeling were required. To reach the design target of using 43 percent less energy than a typical school in the region, the buildings include thermally robust envelopes, with R-28 brick and terracotta wall sections, and R-40 roofs; a lighting scheme that prioritizes daylight over electric illumination; and displacement ventilation tempered by the radiant system. The architects also engaged the users as part of the design process to help them understand oc-

cupants' needs while lowering the complex's emissions profile. Samuel Lasky, a Rawn Associates principal, cites shared staff workrooms, equipped with fridges and coffee makers, as one product of this process. The idea is that the rooms will deter teachers from bringing their own power-hungry appliances into their classrooms. "Hopefully, these spaces also provide an opportunity to run into a colleague and have a useful conversation," he adds.

Architects are increasingly aware that operations are not a building's only source of carbon emissions. They are paying closer attention to embodied carbon, the carbon emitted during construction and the manufacturing and transport of materials. Seattle-based LMN Architects, in designing Founders Hall, an 85,000-square-foot academic building for the business school at the University of Washington, now under construction, convinced the client not to hook up to the university's gas-fired central steam plant and to go all-electric. That approach, and additional strategies such as naturally ventilating the building's offices, is expected to reduce

operational carbon by 85 percent compared with a building that complies with Seattle's already stringent code. But, on top of that, its mass-timber structure is also a significant source of emissions savings, reducing embodied carbon by 63 percent when compared to using post-tensioned concrete, according to LMN's calculations.

To shrink the emissions profiles of buildings will take all the tricks that design and construction professionals, clients, and regulators have up their sleeves. And to take full advantage of the all-electric trend, they will need to do more than swap out one set of appliances for another. Success will entail additional renewable-generation capacity, improved energy-storage options, and innovations in grid-friendly technologies so that utilities can better manage demand. We will also need equitable funding mechanisms so that low-income communities, who often bear the brunt of the climate crisis, can reap the rewards of an electrify-everything movement.

Significantly, such financing must address the retrofit market, since, as Urban Green's Mandyck points out, much of our current building stock will be here for a very long time: in New York, 90 percent of the structures that will exist in 2050 are already standing. If we don't confront that challenge soon, he says, we will run out of ways to reduce emissions. "Our carbon footprint will already be baked in." ■

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Learning Objectives

- 1 Explain how electrification reduces the carbon emissions profile of the built environment.
- 2 Describe current policy and regulations that incentivize or require all-electric construction.
- 3 Explain what a heat pump is and how it works.
- 4 Describe strategies for optimizing energy efficiency in all-electric buildings.

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Presented by: Westfalia



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1 AIA LU/Elective
Presented by: Fiberlite and ArchitectExec



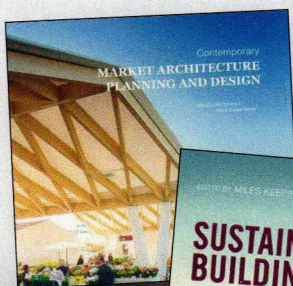
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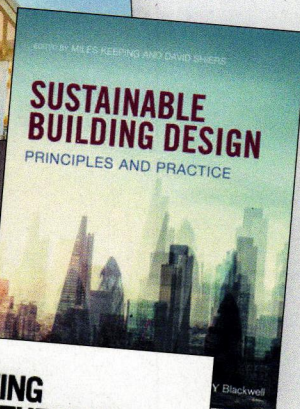
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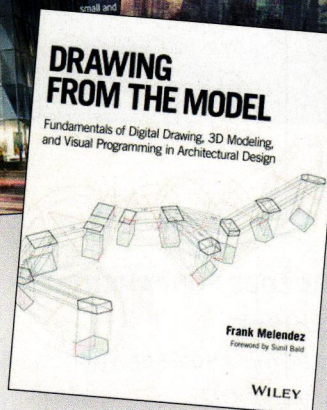
A.



B.



C.



D.

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An inside view of how one of the world's leading architecture and engineering practice does business, *Sustainable Built Environments: Principles and Practice* offers detailed, environmentally sound design solutions to a wide range of building engineering challenges. The text uses case examples and project data provided by engineers and designers at Arup Associates. It covers a broad range of relevant issues, with focused commentaries and explanations presented in an accessible format for use by students, busy practitioners and informed clients.

C. BIM for Design Firms: Data Rich Architecture at Small and Medium Scales - \$75.00

This book expands on BIM (Building Information Modeling), showing its applicability to a range of design-oriented projects. It emphasizes the full impact that a data modeling tool has on design processes, systems, and the high level of collaboration required across the design team. It also explains the quantitative analysis opportunities that BIM affords for sustainable design and for balancing competing design agendas, while highlighting the benefits BIM offers to designing in 3D for construction. The book concludes with a deep look at the possible future of BIM and digitally-enhanced design.

D. Drawing from the Model: Fundamentals of Digital Drawing, 3D Modeling, and Visual Programming in Architectural Design - \$79.00

Drawing from the Model: Fundamentals of Digital Drawing, 3D Modeling, and Visual Programming in Architectural Design presents architectural design students, educators, and professionals with a broad overview of traditional and contemporary architectural representation methods. The book offers insights into developments in computing in relation to architectural drawing and modeling, by addressing historical analog methods of architectural drawing based on descriptive geometry and projection, and transitioning to contemporary digital methods based on computational processes and emerging technologies.



Record Products 2020

The year 2020 has demonstrated that everything is unpredictable—almost everything. RECORD's annual product competition continues to celebrate industry innovations in categories ranging from cladding to textiles. This year's independent jury of architects and designers reviewed hundreds of entries to select the 63 winners featured above and on the following pages. Products awarded Best in Category received the highest scores from the judges, while those labeled Editors' Choice were staff favorites.

Written by **Sheila Kim, Paul Makovsky, Alice Liao, Megan Mazzocco, Rita Catinella Orrell**

**Best in
Category**

OUR GOLD BADGE
denotes winners
with the highest jury
score.

**Editors'
Choice**

BLUE-RIBBON BEST
reflects the Record
editorial staff's picks
in each category.

The Jury

Barry Richards

Principal and studio leader at Rockwell Group, Richards has designed sets for film, TV, and theater (such as the Academy Awards), and cultural projects, including the Center for Civil and Human Rights in Atlanta and Walt Disney Family Museum in San Francisco. Also a product designer, he has collaborated with brands like Knoll and Gessi.

Kirsten Murray, FAIA

A principal and owner of the Seattle practice Olson Kundig, Murray has worked on projects at every scale—from historic renovations and urban design to private and multifamily residences—some of which have won local, regional, and national AIA awards. She is currently working on projects for Nike and Simon Fraser University.

Manuel Navarro, IIDA

Design director and a principal of the Austin office of IA Interior Architects, Navarro has designed workspaces for Fortune 100 technology and financial-services clients; these include household names such as Dropbox, Paypal, and Whole Foods. He has also guest-lectured at Colorado State University, among other schools.

Vanessa Kassabian, AIA

Principal and design leader at DLR Group's New York office, Kassabian is working on projects such as Wenling Cultural Center in China and the Cleveland Museum of Natural History expansion. She was previously a director at Snøhetta and a project architect for OMA/REX. She is also a design critic for Columbia University and RPI.

Teal Brogden

President and senior principal at the Los Angeles studio of women-owned lighting-design firm Horton Lees Brogden (HLB), Brogden draws inspiration from her background in engineering and the arts. Her works include the Scioto Mile Riverwalk and Promenade in Columbus, Ohio, and iconic Griffith Observatory in Los Angeles.

Lighting

Ceiling | Wall | Outdoor | Controls

**Best in
Category**



Motive

This Landscape Forms cast-aluminum family of outdoor LED luminaires offers interior-quality light in a choice of four color temperatures and up to three distribution patterns. The concealed light sources are shielded with clear or diffused lenses, depending on the fixture. Both decorative and utilitarian, the line includes area, path, wall-mounted, and pendant lights, as well as an outdoor floor lamp.

landscapeforms.com



Blade R

This recessed ring-shaped system is constructed of die-cast aluminum, accommodating six to 30 LED cells compactly. But the real innovation, now undergoing certification in the U.S., is integrating accessories—cameras, sensors, etc.—at the center of this circular luminaire to reduce visual clutter.

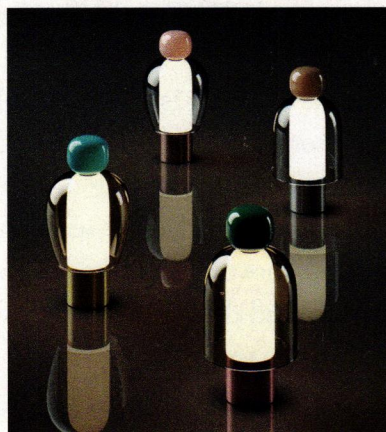
iguzzini.com



Infra-Structure Episode 2

This Vincent Van Duysen design for Flos is a playful modular lighting system that, on its own, looks like an art installation. Architects can mix and match its structural components at various lengths and drops to create linear grids, rows, or constellations along the ceiling, and finish these with a selection of geometric luminaires ranging from discs to cones.

arch.flosusa.com



Easy Peasy

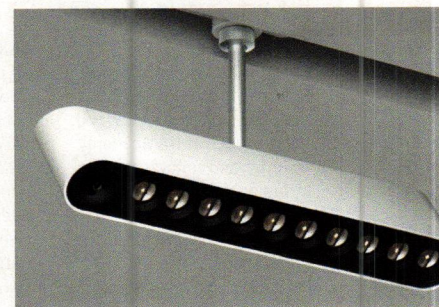
Portable and rechargeable, this whimsical table lamp designed by Luca Nichetto features a bell-shaped glass shade topped by a knob, together resembling a human figure. It houses a dim-to-warm LED diffused by methacrylate and dimmed by rotating the knob. Easy Peasy is available in four color combinations, while the blown-glass body comes in a cylindrical- or tapered-bell silhouette.

lodes.com

Hero

Glint Lighting's LED track luminaire uses a row of 10 tiny, movable reflectors and a joystick to aim light in any direction while the fixture remains stationary. Available in four beam widths and four color temperatures, the fixture, about 12" x 1¾" x 3", can be mounted in tight spaces such as architectural coves, recessed in a ceiling, or installed as a track system or a monopoint pendant.

glintlighting.com





Editors' Choice

"Motive evokes a feeling of serenity and crafted care. The proportions are in harmony, robust yet somehow resting lightly in the space, while paying attention to delivery of light, from low-glare optics to multiple beam options."

Teal Brogden, president and senior principal, HLB Lighting



Stellr

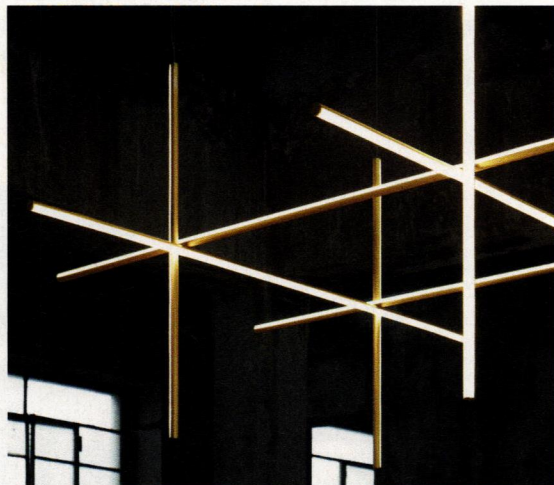
Lucifer Lighting's ceiling-mount fixture is an all-in-one 10"-diameter work-horse that provides downlight, subtle layered light, or soft ambient light thanks to the combination of a high-tech polymer diffuser and volumetric waveguide technology. There is also an option to implement circadian-rhythm-supporting warm dimming.

luciferlighting.com

Coordinates

Designed by Michael Anastassiades for Flos, these customizable Cartesian-grid-inspired chandeliers and pendants each consist of interlocking linear luminaires in a champagne-gold finish. The Coordinates system features warm-white 2700K LEDs with a color-rendering index of 95%. A complementing floor lamp is also available.

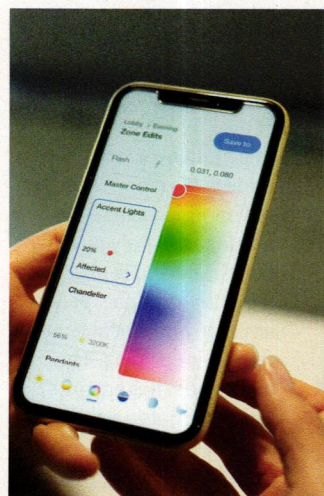
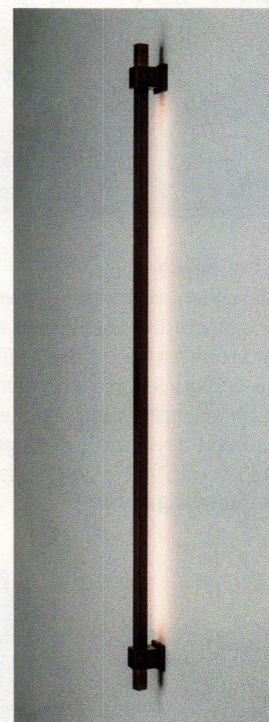
arch.flosusa.com



Axis Sconce

This Boyd Lighting bath light may look like a basic LED channel, but its mounting brackets conceal hardware that allows the tube to be rotated 280°. This feature enables users to aim the light wherever it is needed. Mountable on a mirror or wall, Axis is just 2" deep and available in a choice of four finishes.

boydlighting.com



Athena

Lutron's all-in-one control system enables users to program, customize, and adjust the lighting schemes for residential and commercial spaces in real-time via an app. It implements electric and daylighting strategies, as well as intelligent shades, from a single control hub, and can integrate the company's Ketra fixtures and lamps with those of other manufacturers.

lutron.com

Kitchen and Bath

Fixtures | Fittings | Surfaces



City Bricks

More than an ordinary subway tile, Walker Zanger's City Bricks collection is a hybrid of that popular urban surface infused with the rustic texture of, well, brick. Each is handcrafted in Mexico of recycled postindustrial materials and locally sourced clay. City Bricks is available in eight colors, with matte- and gloss-finish options.

walkerzanger.com

Editors' Choice



AA/27

Created for Aboutwater by Boffi and Fantini, designer Michael Anastassiades's bath collection is a sculptural series comprising deck- and wall-mounted faucets, deck- and floor-mounted tub fillers, a hand shower, and a wall-mounted shower and tub filler. All come in brushed stainless steel or gunmetal finishes.

fantiniusa.com

Best in Category



Holiday and Dove Bathtubs

Designed in collaboration with Gensler, Devon&Devon's Holiday (rimmed) and Dove (rimless) bathtub systems take a modular approach: architects specify material and taps for the tubs, which can be inserted into an outer vessel or mill-work surround (Holiday only). Modernized claw-feet are an option for Dove.

devon-devon.com/eu

Reach One Piece Toilet

Top-mount actuators on this streamlined toilet offer two different flushes (0.8 or 1.28 gallons per flush) to help conserve water—potentially up to 6,000 gallons per year. The toilet's other highlights include an easy-to-clean skirted trapway that lends a sleek contemporary look, and an elongated soft-close seat.

kohler.com



Fenix

This multilayer laminate—made with paper, resins, and nanoparticles—was developed in Italy by Arpa Industriale and is produced in North America solely by laminate and surface manufacturer Formica. The nonporous, fingerprint-resistant material comes in 16 colors.

fenixforinteriors-na.com

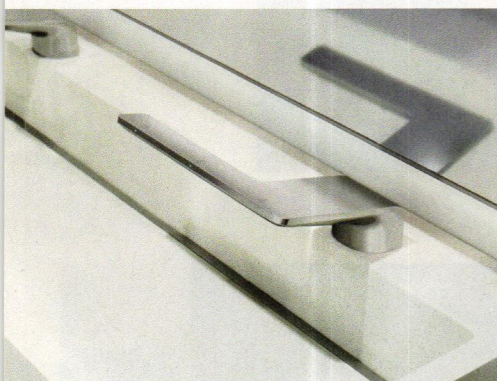




Crue Kitchen Faucet

The semi-pro version of Kohler's Crue faucet collection offers ambitious home chefs pull-down, pull-out, and bar-style models. This smart faucet is compatible with Amazon Alexa, Apple Home Kit, and Google Home, allowing users to monitor water usage, turn the faucet on and off via voice command, or request water filling to a precise amount.

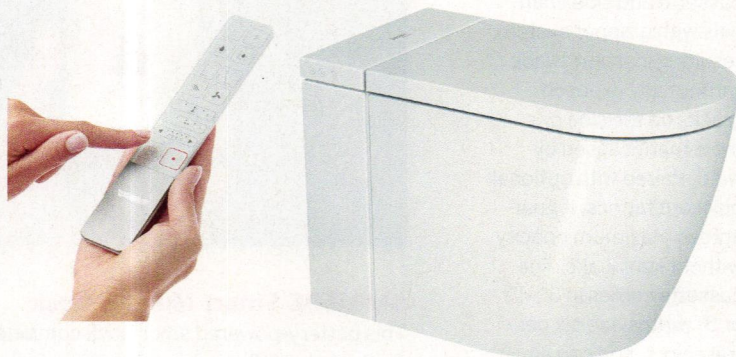
kohler.com



Next Generation Wash Bar

Bradley's touch-free all-in-one WashBar has a sleek L-shaped profile with a single connection point, giving the illusion that it's hovering above the basin. The product offers two flow rates, adjustable dryer, and intensities for LED icons that guide the user through the handwashing process.

bradleycorp.com



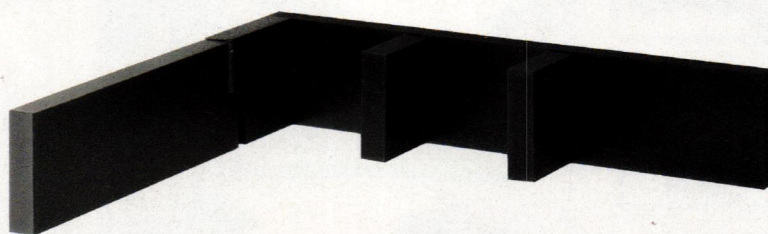
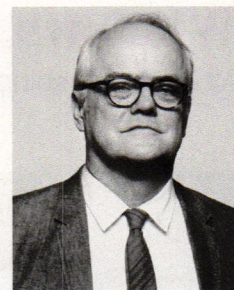
SensoWash i

Designed by Philippe Stark for Duravit, the SensoWash i shower toilet is a balanced blend of design, hygiene, and comfort for the bathroom. The minimalist self-contained fixture combines a flat-rim bidet style with an electronic flush system and antimicrobial personal-cleansing wand. The latter offers a selection of Rear, Lady, and Comfort wash as well as a heated seat and individual adjustments for water and drying-air intensity, spray angle, and the seat's heat levels.

duravit.us

"The modular systematic approach is an innovation for the bathtub market. This gives the designer the ability to adapt the tub to specific aesthetic and practical considerations."

Barry Richards, principal and studio leader, Rockwell Group



AK/25 Faucet

Designed by Korean architect Paik Sun Kim, this faucet, from Aboutwater by Boffi and Fantini, comes in a gunmetal finish. The AK/25 single-hole deck-mounted or wall-mounted fitting features a pivot design, giving it the ability to be tucked away when not in use. Floor- and deck-mounted tub fillers and a shower system are also available.

fantiniusa.com



48" Professional Range

This Fisher & Paykel dual-fuel range gives home chefs cooking flexibility by combining the convenience and safety of an induction cooktop with four gas burners. Other features include a touch screen control for 15 different oven functions and cooking guidance and two independently operating self-cleaning ovens.

fisherpaykel.com/us

Windows, Doors, and Hardware

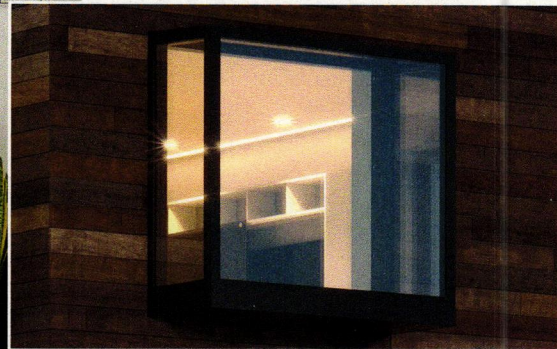
Alcoves | Openings | Smart Locks

**Best in
Category**

Marvin Skycove

An immersive glass alcove, Skycove extends a living space by up to 20 square feet as it projects from the side of a house. Made with a patent-pending steel structure and integrated bench, the window seat-like unit becomes a comfortable nook for one or more people while also opening views out of its four glazed surfaces.

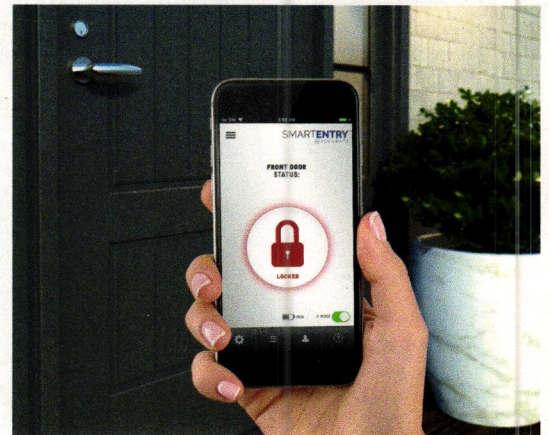
marvin.com



B-Box Zip

This roller shade comprises an aluminum cassette and side channels with a zipper system, resulting in a taut shade without any exposed cracks on the side or movement caused by wind. Paired with optional blackout fabrics, it guarantees maximum opacity without light leaks. The cassette comes in 3", 4", or 5" widths and six neutral colors, and can accommodate shades of up to 220" wide x 157" high. Additionally, a child-safety system secures the chain to the wall.

bandaluxusa.com



SM9159E Smart Mortise Lock

This battery-powered smart lock combines Accurate Lock & Hardware's mechanical expertise with innovative technology to provide keyless entry via Bluetooth devices. A proprietary app allows the user to grant access to up to 25 users 24/7 or on a set schedule. The lock is fully customizable for installation on virtually any style of architectural trim, without exposed electronics.

accuratelockandhardware.com

Marvin Awaken

This skylight is automated and customizable to maximize access to natural light and air while affording unobstructed views. It also boasts smart features not available in conventional skylights. The unit has tunable LED lighting that mimics natural light throughout the day, and an intelligent rain and environment sensor that measures VOC and humidity levels, as well as temperature. These tools are all accessible on an intuitive user-friendly mobile app. marvin.com

Editors' Choice



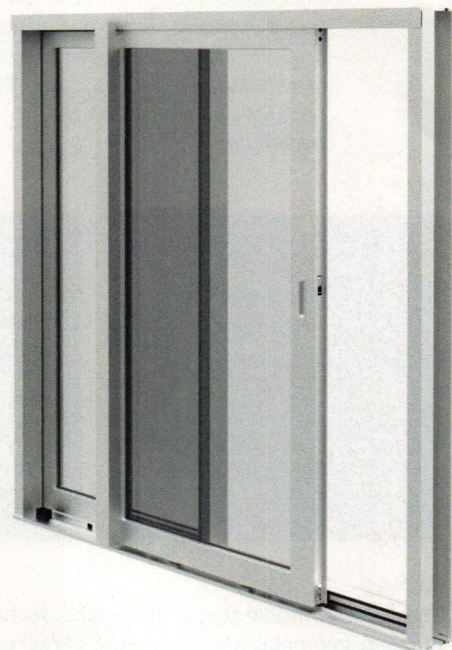
Best in Category



SL84

This NanaWall door is the slimmest, most energy-efficient folding glass wall to date, making it ideal for indoor-outdoor spaces. It features a unique Gothic Arch roller system, in which only the sides of the rollers touch the track; this enables smoother operation regardless of panel weight. SL84 can accommodate panels of up to 11' 6" high, which can move in stacks of 4 or 6 and stack at either side of the opening.

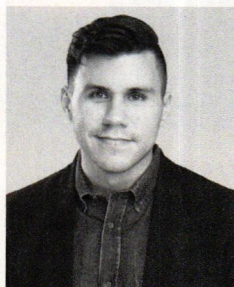
nanawall.com



YSD 600 TUH

YKK AP has enhanced its thermally broken YSD 600T sliding glass door on two fronts: the new model is hurricane-resistant—giving architects a new option for projects in hurricane-prone regions—and features a low threshold, to address accessibility. The door is customizable and best suited to multifamily housing and hotels.

ykkap.com



"Skycove is a jewel box that extends the use of one's home, whether for immersive stargazing or getting cozy with a book. SL84 not only blurs the line between indoor and outdoor, it's energy-efficient."

Manuel Navarro, principal and design director, IA Interior Architects

Ceilings and Wallcoverings

Acoustical | Tile | Panels



Cursive Wall Tile Collection

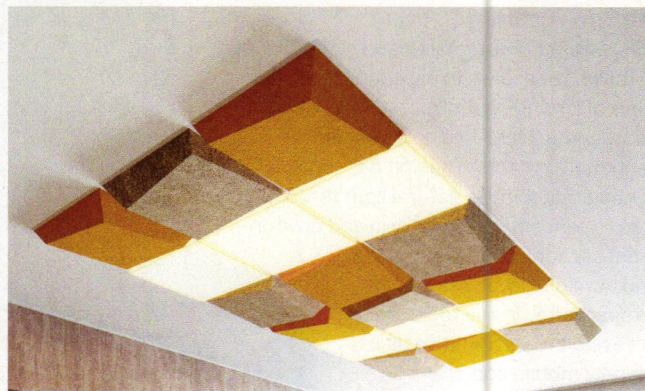
This ceramic-tile series from Crossville is an eclectic mix of geometric shapes and modern hues, with a handcrafted look. Architects can mix and match selections from among the vast offerings of sizes, shapes, and colors using the manufacturer's online "pattern visualizer" to create custom installations.

crossvilleinc.com

WAFL BAFL

This waffle-like ceiling treatment was designed to dampen sound in spaces with exposed industrial or gypsum ceilings—or just to break up the monotony of a ceiling grid. It is made up of individual units with diagonal PET-felt fins positioned at a 45° angle within the frame.

frasch.co



Ori

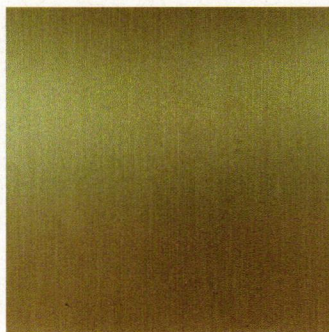
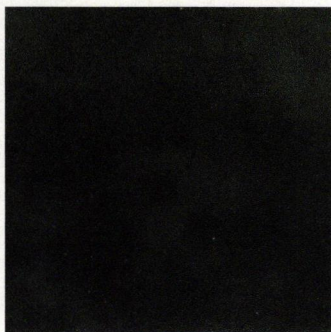
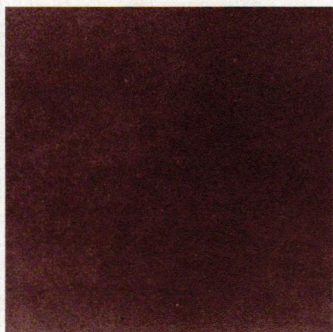
Inspired by the paper-folding art of origami, Ori acoustic tiles will turn a ceiling plane into a striking dimensional landscape. It is available in 10 design variations ranging from undulating units to others with alternating sharp ridges. The collection is made of polyester PET felt in 31 hues, Declare-certified, and Red List-free.

focalpointlights.com

Editors' Choice



Best in Category



Atmos

These customizable aluminum surfaces feature a selection of timeless patinas and hues that capture the subtleties of popular metals like bronze, titanium, gunmetal, and brass. Pure + FreeForm achieves this using a newly developed finishing technology and Lumiflon resins. The 100% recyclable Atmos is Red-List- and VOC-free, HPD-compliant, and contains at least 20% recycled content.

purefreeform.com



SoundScapes Shapes 60° Triangles, Trapezoids, and Parallelograms

Armstrong's SoundScapes acoustic ceiling clouds previously comprised only 90° shapes. Now a new 60° panel affords architects even greater design flexibility. An included grouping frame takes the guesswork out of panel spacing for maximum performance.

armstrongceilings.com



Six-S

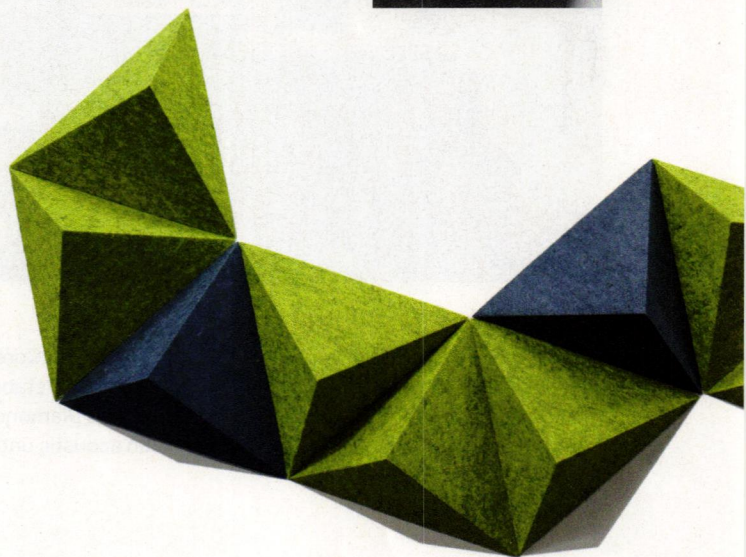
Neolith's lightweight and recyclable Six-S Collection is a durable stonelike surface material that is easy to clean, suitable for high-traffic areas, and resistant to scratching, freezing, hot temperatures, and UV rays. Many patterns are available, from simulated marble to weathered wood.

neolith.com

"One of the first things I look for in a product is sustainability. Atmos is quite beautiful as well as Red List-free and 100% recyclable.

It has the potential to truly transform a space without harming the planet."

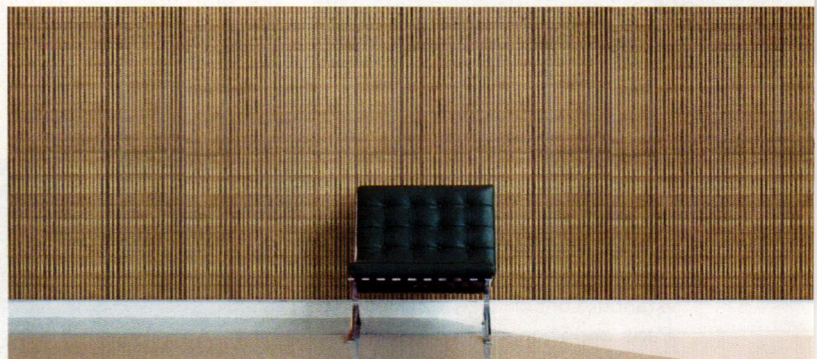
Vanessa Kassabian, principal and lead designer, DLR Group



Cubism

This acoustical wall and ceiling collection consists of four distinct shapes that can transform flat surfaces into dimensional topographies. The 100% PET modules are strategically hollow, making them capable of achieving an NRC rating of 0.85, and come with a patent-pending hidden mounting system that allows installers to avoid using adhesives. The Cubism series is available in 37 colors.

frasch.co



Durapalm Wall & Ceiling Systems

Smith & Fong has expanded its Durapalm series with these new wall- and ceiling-panel systems featuring patterns that draw from the manufacturer's popular Plyboo bamboo linear wall collection. Well suited to retail, hospitality, and office interiors, the carved panels—made of coconut and sugar palm—measure 47" x 95".

durapalm.com

Flooring

Resilient | Carpet | Porcelain



Empower Rigid Core Flooring

Comprised of Armstrong's innovative Reinforced Mineral Core, this wood- and stone-simulating vinyl offers comfort and stability with waterproof performance. Its wear layer features Diamond 10 coating for scratch and stain resistance, while an acoustic underlayment helps dampen sound.

armstrongflooring.com



RevoTile

This porcelain-tile floating-floor system doesn't require mortar, cutting installation times significantly—it requires just an acoustic underlayment and grouting. RevoTile realistically mimics the look of 26 stone, marble, wood, and concrete textures and colors, with details such as unique veining and wood grains.

daltile.com



Editors' Choice

Smart City

Inspired by the Gensler Cities Climate Challenge, this carpet-plank system translates transit maps from Berlin, Istanbul, London, New York, Paris, and Shanghai into carpet for commercial interiors. It comes in a 12" x 36" format and nine colorways and is Living Product Challenge Petal-certified.

mohawkgroup.com



Best in Category

Sonata Elements

Inspired by modular carpet tiles, this 18" x 36" LVT plank collection presents a dimensional, striated, textile aesthetic for commercial environments. The series features five all-over-striated designs, 10 colorways, and an aluminum oxide surface treatment that enhances scratch and stain resistance. It can be used to create visual cues such as wayfinding and physical distancing.

american-biltrite.com



MedinPure with Diamond 10 Technology

The homogeneous-sheet product is a PVC- and Red List-free patent-pending flooring that is extremely scratch-, stain-, and slip-resistant for safety and easy maintenance. Available in vibrant hues and complementary neutrals inspired by landscapes of the American West, it comes with a Declare label, EPD, and HPD.

armstrongflooring.com

"I had a hard time believing this wasn't carpet—one can only imagine the surprise of first stepping onto it. This is a fun alternative if you're interested in carpet but feel the performance of vinyl is better for the project."

Vanessa Kassabian, principal and lead designer, DLR Group



Furnishings

Seating | Tables

AT Mesh

This Wilkhahn task chair adapts to the fluid and intuitive movements of an individual user. Its breathable mesh backrest—made predominantly of recycled PET—is available in six colors and enhances airflow for comfort. Optional black or white armrests are available, while the star base comes in four finishes. wilkhahn.com



Editors' Choice



Vala Swivel Recliner

The Hlynur Atlason-designed Vala—which means “pebble” in Icelandic—is a recliner from Design Within Reach with rounded edges that allude to pebble-like forms. Its scaled-down and discreet design greatly contrasts with the typical bulky-recliner archetype and enables it to be specified for smaller spaces. It's available in leather or upholstery. dwr.com

Aston Club

Designed by Jean-Marie Massaud, this lounge chair is height-adjustable and features a weight-triggered mechanism that responds to a user's reclining preferences. The chair can be specified with fabric, leather, faux leather, or the customer's own textile. But the unseen beauty of this chair is that it utilizes no glue, and all components can be recycled or upcycled. arper.com



Reprise

Designed by Norm Architects for L.Ercolani, the Reprise chair channels Danish midcentury design and responds to the trend of using residential furnishings in office environments. Steam-bent turned-wood spindles form the curve of the chair's backrest. It is available in whitened, natural, or darkened ash or walnut. lercolani.com

Best in Category

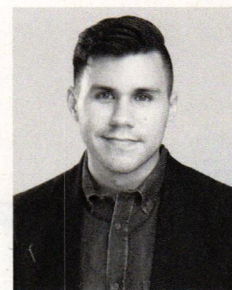


Crew

This patent-pending innovation from Halcon pairs the familiar form of a classic table with the ingenuity of flip-top mobility. Power and data are integrated into the table edge to conveniently meet technology needs without creating visual clutter. Available in a full range of sizes, from 30" to 36" widths, and a choice of seven metal-leg finishes, the Crew collection also includes fixed tables and credenzas. halconfurniture.com

“The Reprise chair is a classic example of simplicity in form, function, and materiality. It's a piece that easily stands the test of time and, like a chameleon, can fit into work, home, and social settings.”

Manuel Navarro, design director and principal, IA Interior Architects



Outdoor Furniture

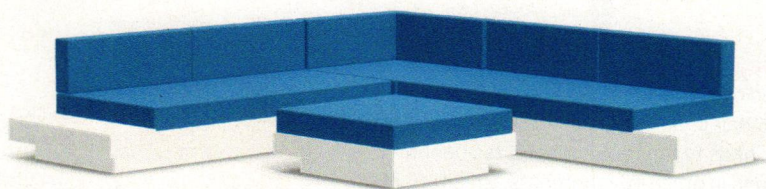
Shading | Seating | Cooking

**Best in
Category**

Americana Chair

Available in four vibrant colors, this chair from Landscape Forms revisits the iconic Adirondack chair, modernizing the classic design language by using the high-performance material of high-density polyethylene. It makes a bold visual statement while ensuring that the chair stands the test of time in public spaces. Accessories include a hanger underneath the arm for securing a bag or purse and an optional tablet arm.

landscapeforms.com

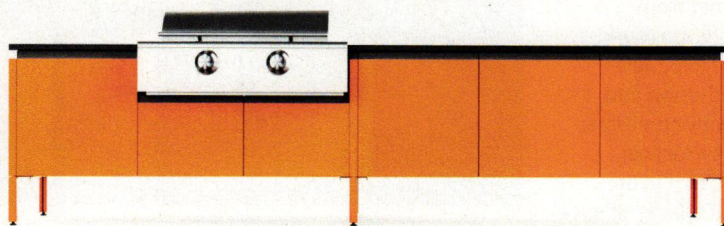


Sunnyside Collection

Developed in collaboration with designers Brad Ascalon and Ghislaine Viñas, Sunnyside fuses high-end styling with ideas of a perfect outdoor hideaway. Made of recycled HDPE—offered in nine colors—it comprises seating and tables with grooved frames that allude to slatted porch furniture. The cushions are upholstered in Sunbrella fabric.

loll designs.com

**Editors'
Choice**



Elements by Tecno

Continuing its collaboration with architect Daniel Germani, Brown Jordan Outdoor Kitchens has launched this modular-furniture-inspired system, bringing sleek European aesthetics to outdoor environments. The stainless-steel modules come in a variety of finishes, and their 360° functionality allows access to storage from either side of the modules.

brownjordanoutdoorkitchens.com



Platform One Collection

This modular series by Loll Designs features a customizable frame that allows for an array of style options and configurations to meet personal preferences and spatial parameters. The collection's sofas, lounges, and ottomans offer deep seating and weather-resistant Sunbrella fabric cushions. Side tables are also available.

loll designs.com



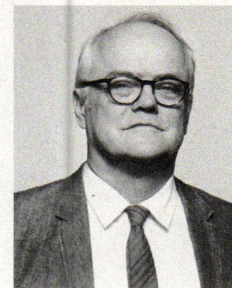
Disc, Peak, and Stretch

Inspired by the simplicity of post-and-beam construction, designer Scott Klinker reimagined traditional sun shading in a contemporary vernacular for Landscape Forms. Disc, Peak (left), and Stretch each present a streamlined umbrella design of solid or perforated aluminum panels that are rotationally adjustable and finished in lead-free powder coating.

landscapeforms.com

"When I saw Americana, I immediately wanted to go sit in it and move it around. Even though it is another take on the classic Adirondack, it seems fresh, thoughtful, and adaptable to how we want to live and work outside today."

Barry Richards, principal and studio leader, Rockwell Group



Textiles and Upholstery

Bold | Decorative | Durable | Hygienic



Sunbrella Assure

This new bleach-cleanable fluorine-free technology produces fabrics that are water-repellent, stain-resistant, and durable, with a bio-based source. Balance is the first collection to feature Sunbrella Assure, but, in time, more of the company's contract fabrics for health-care and other uses will feature Assure. sunbrella.com



UP Series

In collaboration with HBF Textiles, Kelly Harris Smith was inspired by objects from her hometown of Boston such as telephone poles, paver stones, and iron fences. All five textiles in the series utilize post-consumer recycled polyester content and are woven at employee- or family-owned mills in North America. Also approved for panel applications, UP is SCS Indoor Advantage Gold-certified. hbftextiles.com



Best in Category



Editors' Choice

Stripe It

KnollTextiles has developed a bleach-cleanable and antimicrobial all-loop épinglé fabric for indoor and outdoor upholstery applications. Inspired by the structure and linework of modern architecture and the defined rows of tulip fields in the Netherlands, the acrylic-polyester blend is Clean Air GOLD-certified and comes in five colorways. knoll.com

Roy, Screen, and Score

This update to Wolf-Gordon's Woven Upholstery collection includes the three patterns named above in complementary scales and colors. The polyester blend is well suited to seating and is approved for use in panel applications for noise reduction or social distancing in active environments. wolfgordon.com

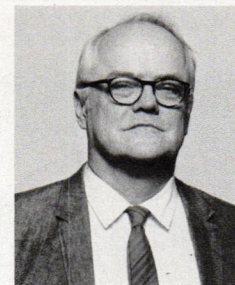


Designtex + West Elm Collection

These woven upholstery fabrics take inspiration from classic textiles and mid-20th-century fashion. The four styles—Boucle Melange, Chenille Chevron, Chunky Tweed, and Corded—come in subtly retro colorways. Because the fabrics feature Crypton, they're durable, stain-resistant, and easily cleanable. designtex.com

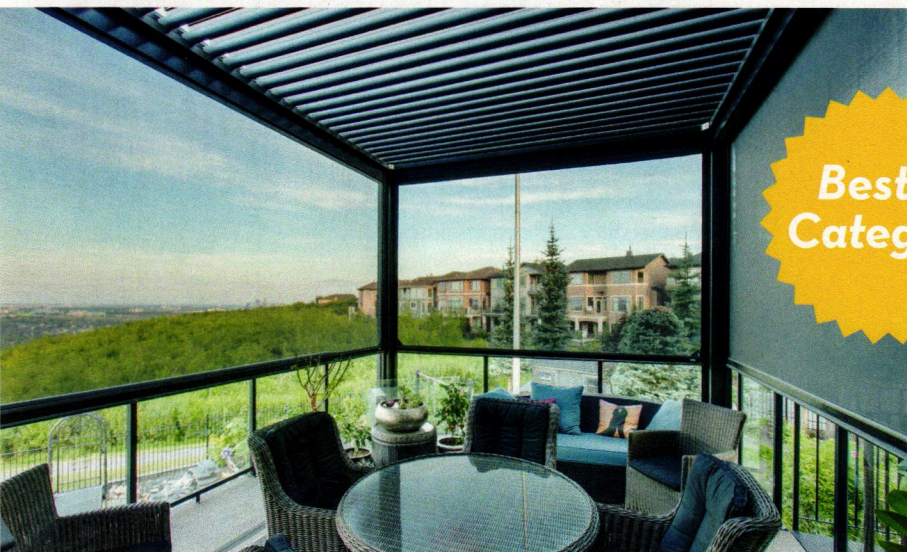
"I applaud the Sunbrella collection for its being fluorine-free and Healthier Hospitals-compliant—an important aspect for the safety of health-care workers. And its performance can substantially extend the product's lifespan."

Barry Richards, principal and studio leader, Rockwell Group



Building Systems and Components

HVAC | Conveyance | Daylighting



**Best in
Category**

Climate Responsive Outdoor Retractable Enclosure

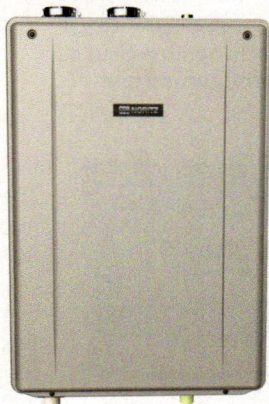
This environmentally responsive outdoor complex combines Phantom Screens' retractable screens with StruXure Outdoor's "smart" automated pergolas and Somfy motors and controls. The resulting system can detect and respond to outdoor conditions using integrated sensors to control the retractable enclosure's roof louvers and lower or raise its screen "walls."

Info.phantomscreens.com

NCC199CDV Commercial Condensing Water Heater

This tankless water heater from Noritz can be wall-mounted easily and features reengineered dual stainless-steel heat exchangers with improved corrosion resistance and heat-shock durability. Facilities managers can control its functions and be alerted to maintenance reminders remotely via an app.

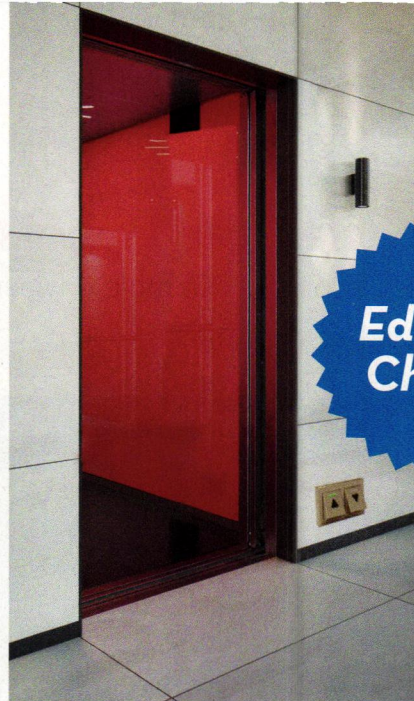
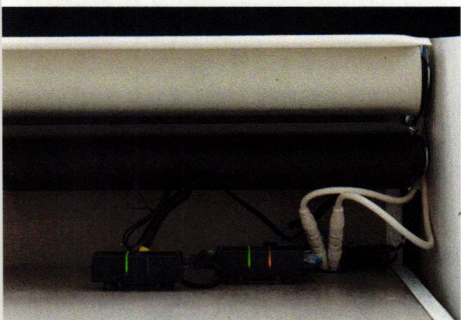
noritz.com



IntelliFlex I/O

This Draper interface for motorized shade control uses sensors to track and react to sky, wind, and thermal conditions in up to four different zones. It can also model a building's location and orientation to adjust shades accordingly. For whole-building solutions, the system detects the sun's actual location to allow a specified amount of light to infiltrate the building.

draperinc.com



**Editors'
Choice**

Schindler CleanMobility Solutions

This suite of sanitization options for elevators, escalators, and moving walkways can enhance hygiene for user peace of mind. Sanitizing Ultra UV/UV Pro can be installed onto existing escalator handrails; CleanAir Ion generates ions in small spaces to help combat airborne contaminants; and CleanCall Wave uses motion sensors to eliminate touching of elevator buttons.

schindler.com

Evolution Steel Stair System

Fortress Building Products developed this ready-to-assemble steel-deck stair system, offering a comprehensive solution for decking applications. Architects can choose from three different rise/run bracket options and use any type or brand of decking to top the foundation.

fortressbp.com



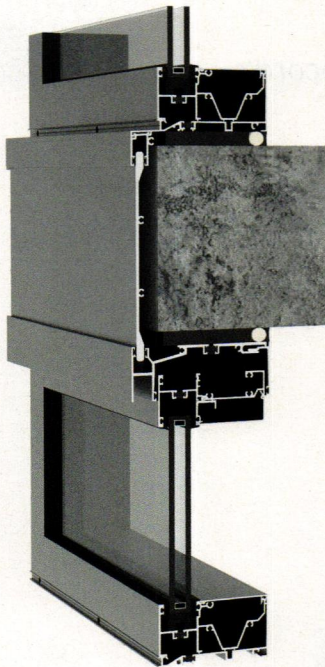
"The Phantom Screens product has nice design qualities: good proportions, clear functionality, and clean lines. In these times, it's also a possible solution for clients looking to enhance their indoor/outdoor living."

Kirsten Murray, principal and owner, Olson Kundig



Building Envelope

Glazing | Cladding | Rainscreen

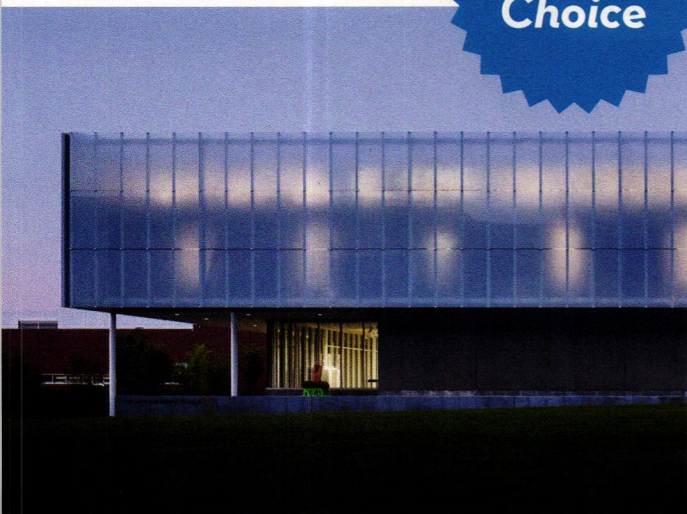


YWW 50 TU

Responding to the demand for unitized shop-glazed products, YKK AP has expanded its window-wall portfolio with a system that offers higher thermal performance and accommodates oversize glass panels. Made of aluminum with polyurethane thermal breaks, it comes in many finishes. Mullion options include interior, exterior, or a more minimal two-sided structural silicone glazing.

ykkap.com

Editors' Choice



Lumi Frit Projectable Glass Rainscreen

Bendheim's new glazing features a translucent fritted pattern that reflects light to create an ultrawhite effect during the day. At night, the glass doubles as a facade onto which images can be projected. The rainscreen attaches directly to the building walls, without any bulky steel substructure, resulting in a look that is shadow-free.

bendheim.com



Best in Category

formparts.fab

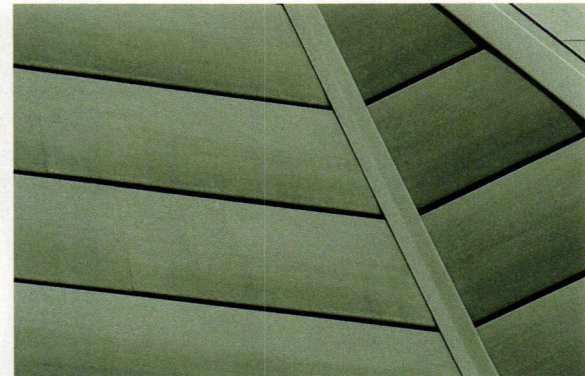
Adding to its formparts brand of folded-concrete panel and fin lines, Rieder NORAM has developed GRFC elements with a 0.12" chamfer, enabling architects to create crisper dimensional facades. The 5"-thick elements are lightweight and integrate discreet fastening anchors for a cleaner appearance.

rieder.cc

Rheinzink-Granum Zinc

This recyclable architectural-grade zinc alloy is now available in two shades of gray: Basalte and a lighter Skygrey. Both have matte finishes achieved with a special phosphate coating. Ideal for roofing and wall cladding, the weather- and corrosion-resistant material will develop a natural patina over time.

rheinzink.us



Solstex Solar Façade

This solar facade system allows architects to incorporate lightweight, large-format photovoltaic panels into a building's facade instead of putting them on its roof. The PV panels consist of thin-film CdTe technology encapsulated between two sheets of heat-strengthened glass. Solstex reduces a building's carbon footprint and guarantees LEED credits and savings.

elemex.com

"Concrete has formed some of the greatest designs in history. GFRP has made it more flexible, as formparts.fab demonstrates. The panel's aesthetics, sustainability, and light weight have me looking for potential ways to use it in the near future."

Vanessa Kassabian, principal and lead designer, DLR Group



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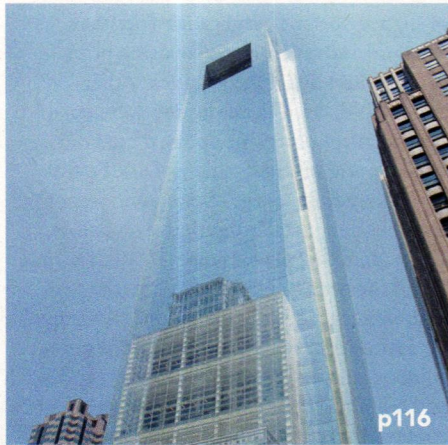
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Photo courtesy of Vitro Architectural Glass



Creating High-Performance Building Facades

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Understanding Metal Composite Material, Installation, and Systems

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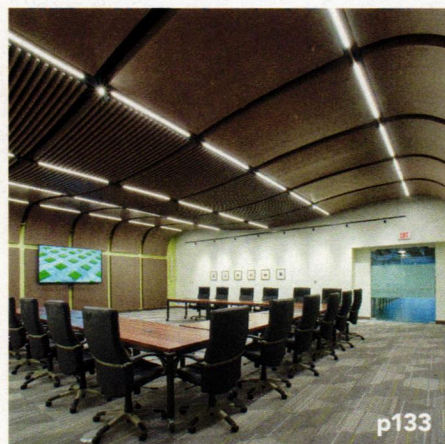
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Acoustic Design for Wellness in a Post-COVID World

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Creating High-Performance Building Facades

New materials, products, and systems create better results that enhance designs

Sponsored by Azon, HOFMANN FACADES, Inpro, Neolith®, and Vitro Architectural Glass | *By Peter J. Arsenault, FAIA, NCARB, LEED AP*

Advances in design, fabrication, and materials allow for greater creativity in building facades while still meeting or exceeding performance requirements.

Photo courtesy of Vitro Architectural Glass



Building facades continue to command a great deal of design attention. Some of that is driven by the ability to use advanced computer programs that allow for the analysis and development of shapes, surfaces, and geometries that were previously unthinkable using prior drafting and design techniques. Other activity is derived from the development and advancement of new or updated materials, systems, and products that provide better performance, better aesthetics, and smoother construction installation than ever before. Yet in all of this newness and creativity, there is still the need to pay attention to the basics of making facades weather-tight, allowing for appropriate expansion and contraction, complying with building and energy codes, and remaining budget friendly. In this context, this course looks at several current facade products and systems. First, we look at some innovative materials that are being used for opaque portions of facades that offer new looks, innovative mounting techniques, and better performance overall. Next, we focus on the transparent portions of a facade by looking at glass and glazing systems that use advanced product development to achieve higher levels of energy performance.

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Learning Objectives

After reading this article, you should be able to:

1. Identify and recognize the structural, aesthetic, and performance aspects of opaque, insulated portions of building facades.
2. Assess the energy performance and wellness aspects of glazing systems and glass as they relate to sustainability and code compliance.
3. Explain the importance of specifying and installing the appropriate seals to use in facade joints and expansion joints.
4. Determine ways to incorporate the principles presented in this course into specific building facades as shown in case studies.

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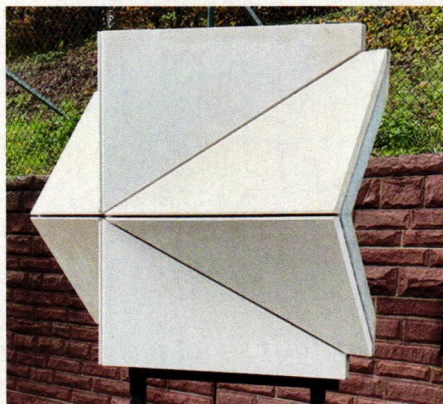
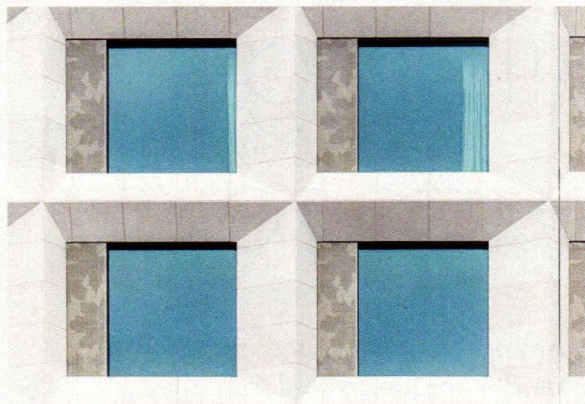
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Photos courtesy of HOFMANN FACADES



Ultra-high-performance concrete (UHPC) is being used to create building facade panels that are visually striking, custom designed, lighter weight, and easier to install. An example is the case shown above, where UHPC was combined with a beige limestone veneer.

Finally, we address the need to pay attention to the joints and seams of a facade, particularly where expansion joints are involved for overall longevity and durability. Collectively, all of these features combine to allow architects to create 21st century building facades meeting a variety of design goals and performance needs.

OPAQUE FACADE AREAS

The design of many commercial building facades looks for the best balance of opaque and transparent areas. Historically, heavy, opaque structural stone and concrete made up the majority of a facade, with windows set in prescribed openings. The advent of structural steel and reinforced concrete framing systems allowed the facade to be separated from the main structure. This produced design freedom to incorporate more glass and experiment with more creative forms. The contemporary means to develop a facade has grown out of this approach by using a cladding system or a curtain wall system hung to a structural frame. This retains the nonstructural aspect of the facade while allowing a wider variety of materials to be incorporated. Quite often, these materials include some type of natural stone, terra cotta, masonry, or concrete that can emulate a historic style or provide a certain aesthetic that is durable and long-lasting.

Without the need to provide structural support to the building, only to itself, cladding and curtain wall systems are often designed and installed as comparatively lightweight, customized, modular sections. There are several aspects that come together to make this a successful undertaking.

Coordination

The first thing to address is that during the design or shop drawing stage, there is a great deal

of coordination between the design architect, engineers, and facade contractor. There may also be a specialized consultant involved who focuses on curtain wall and cladding systems. In some cases, the fabricator of the curtain wall or cladding system may offer extensive design and engineering services for their products. They may also serve as a one-stop source for both cladding materials and support systems. The key is to engage everyone in the process early on so that design options can be reviewed, construction capabilities or limitations confirmed, installation processes reviewed, and costs controlled.

Material Selections

Exterior architectural cladding can be made from a variety of natural and man-made products. Quarried natural stone cladding is popular because it is a proven product that is highly versatile with many finish options. Varieties can include granite, limestone, sandstone, or others, each of which will have different visual and performance characteristics. As a natural material, it has a very low carbon footprint and requires comparatively low amounts of energy to produce. It is also typically very durable, requiring very little maintenance.

An emerging facade material is ultra-high-performance concrete (UHPC) formed into a panel and hung as part of a curtain wall or similar system. Aesthetically, its appeal is found in the virtually endless finish options in the color and texture of the concrete. It is also readily possible to integrate thin layers of other materials onto the outer surface, such as terrazzo, brick, terra cotta, wood, ceramic tile, or thin natural stone veneers. This is intriguing on flat surfaces but enhanced by the ability to readily form concrete into three-dimensional

sections or panels that can add visual interest and depth to a facade.

In addition to the visual aspects of UHPC panels on a facade, its physical properties are notable too. The cast panels are typically thinner, lighter, and longer spanning than some stone or masonry materials. This equates to a reduction of the dead load weight on concrete or steel frame superstructures and foundations. Depending on the design, thinner systems mean more space for insulation and fireproofing, or it can mean a gain of usable (or rentable) interior floor space. Using less material helps to improve the overall carbon footprint of the building too.

Installation Techniques

The choice of materials and the type of system selected will directly influence the means for installing the facade. Heavier, thicker, and larger facade panels will likely require a crane for their installation. Smaller, lighter panels such as those made with UHPC can often be floor set and brought into place without the need for tower cranes or even scaffolding in some cases. The lighter weight also means that there may be fewer anchor points and penetrations of structural elements. All of this adds up to shorter installation cycles on-site and improved construction time schedules.

Philipp Hofmann, managing partner of Hofmann Facades, saw the advantages of UHPC facade panels play out very well at a recent hospital project in Germany. He notes, "This project led to the idea of a thin limestone facade, entirely unitized on UHPC instead of hand-setting it into place. This meant the project could be installed without any scaffolding, thus reducing cost and construction time."

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SINTERED STONE FACADES

Sintered stone is a proven material that has been used on facades both in the United States and in Europe for some time. Sintering refers to the atomic diffusion of particles, which occurs most quickly at higher temperatures. Applying this to sintered stone produces a thin, lightweight, and very strong material with properties similar to, but better than, porcelain ceramic tile. The primary difference is that sintered stone products are made from selected natural minerals and only the atmospheric humidity that they contain. The manufacturing process relies on the use of natural raw materials that are reduced to fine powders. The powders are then arranged by color and pattern and subjected to pressures on the order of 15,000 psi. The resulting thin slabs are then fired in a kiln producing large-format panels that can be 4 feet by 12 feet or 5 feet by 10 feet, among others. Thicknesses are generally available in 1/8 inch, 1/4 inch, and 1/2 inch.

Visually, sintered stone panels can be created that look like natural stone, a solid surface, textured surfaces, or custom looks in a wide range of colors. As a very dense, lightweight, and sustainably produced material (at least one manufacturer is carbon neutral as of 2019), sintered stone has been regarded by many architects worldwide as a facade material of choice suitable for the most demanding exterior building projects, whether commercial or residential. Its physical properties make it a high-performing, low-maintenance, easy-to-clean product that resists scratches, abrasion, graffiti, and ultraviolet light. It has been tested as a non-combustible product that does not propagate fire, heat, or smoke. It also exhibits a very low porosity (less than 0.08 percent), making it virtually waterproof without the need for additional coatings or sealers. As such, it can contribute directly to the longevity and resilience of the building facade.

From a construction standpoint, sintered stone panels are lightweight and easy to work with. They can be securely applied relatively quickly, creating efficiencies in the construction process compared to other materials. Specifically, for facade systems, there are three common methods of attachment:

- **Exposed mechanical cleating:** Recognizing the common desire for providing ventilated rainscreen style facades, sintered stone panel manufacturers have worked to provide systems to suit these situations. Comprised of a self-supporting metal structure originally designed to support

ceramic tiling in different formats and thicknesses, it has been refined to suit sintered stone panels too. This approach is based on a visible mechanical fixing system comprised of supports made from vertical T- or L- shaped profiles and safety clamps to which the sintered stone panels are attached.

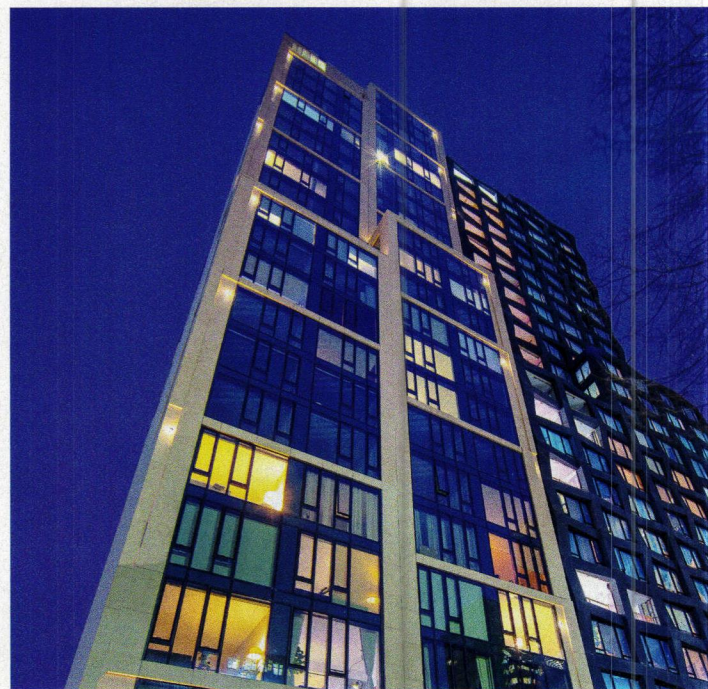
- **Hidden chemical fixation:** In cases where concealed fastening is preferred, hidden support systems are available that use a longitudinal elastic chemical adhesive with vertical aluminum supports. Those supports can be in either T- or L-shaped profiles depending on whether they are used to coincide with the joints between the sintered stone panels or to reinforce the center of them.
- **Hidden mechanical (hybrid) fastening:** At least one manufacturer has created a mixed (chemical and mechanical) hidden profile system that works due to the pressure created by the system in the rear of a sintered stone panel. This is achieved with a double groove at opposing 45-degree angles (like a dovetail in carpentry terms), where two aluminum profiles are inserted and fixed with structural adhesive to secure the channels to the panels. The connected channels are then secured to the aluminum support system holding up the whole facade. The panels can hang and be levelled either to align with adjacent panels or be staggered without needing to increase the number of vertical supports. In all cases, this method of attachment allows the support system to become invisible due to the concealed fastening and aluminum members. It also allows for easy removal and replacement of panels if ever necessary.

In addition to the above, there are other aspects of sintered stone that make it an exceptional choice for facades in urban environments. A significant new coating process (supplied by a third party) is now available to reduce outdoor air pollution. This coating uses an additive with titanium dioxide in a nanoparticle-based treatment that can be specified and

baked-in during the manufacture of the sintered stone slabs. The treatment uses the process of photocatalysis in an ongoing chemical reaction between the added titanium dioxide and sunlight falling onto the facade. When sunlight (or some LED lights) shine on the surface, the titanium dioxide particles are activated using the light energy to transform moisture in the air into oxidizing agents. This destroys nitrogen dioxide particles and other contaminant compounds, and chemically transforms them into harmless water vapor and salt. This photocatalysis process is repeated millions of times per second until all contaminants are destroyed, meaning the surface as well as the surrounding air are constantly being self-treated and cleaned.

Tahir Demircioglu, principal architect of the firm Buildt, chose treated sintered stone panels for a facade in a recently completed New York skyscraper. He explains, "The initial selection of the sintered stone panels was for their lightness and aesthetic qualities, but once we found out that they came with this air-cleaning element, we said, 'Of course!' It is a huge plus that these treated panels also limit the amount of maintenance required. Instead of using chemicals and power-washing the facade, the material is hydrophilic, so it cleans itself."

Photo courtesy of Neolith®



Sintered stone panels provide a lightweight, durable, easy-to-work-with facade material that is available in a wide range of colors, textures, and finish treatments.

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ENERGY-CONSERVING FENESTRATION SYSTEMS

Fenestration usually figures prominently in most building facades. This can include windows, doors, louvers, vents, wall panels, skylights, storefronts, curtain walls, and sloped glazed systems. For any of these systems to be installed in a building facade, they need to have a manufactured frame to hold them in place and secure them to the rest of the building. In most commercial buildings, the material of choice is usually an aluminum frame or support system of various types. The reasons for its use are based on its lightweight but inherently strong nature as a material, its ability to avoid rust or corrosion, its rather economical workability, and the variety of colors and finishes in which it is available. However, it is also an excellent conductor of heat, which makes its use on building facades a concern when addressing energy-conserving design and compliance with energy codes, as the aluminum acts as a thermal bridge between inside and outside. This is true in both cold and warm climates as well as extreme weather conditions.

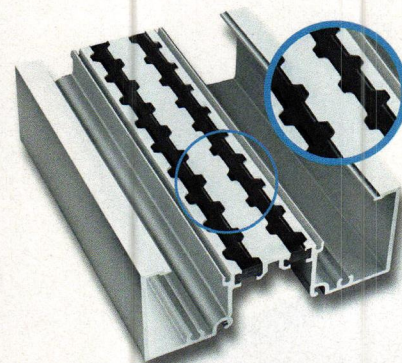
Manufacturers of aluminum framing systems for fenestration have been addressing the thermal issue for decades and continue to develop products that maintain their structural integrity while offering improved thermal performance. The key component is the addition of a thermal break or barrier in the aluminum frames, usually in line with the location of glass or other glazing in the frame. The intent is that the interior and exterior portions of the frame are separated with a structurally rigid but less thermally conductive material. The details of how that break is created and the choice of materials used are what tend to differentiate various products from each other.

Commonly, there are three choices of material used as thermal breaks or barrier material in commercial fenestration systems: vinyl plastic, polyamide nylon, and polyurethane polymer. Each has different thermal and structural properties, so finding the best choice is a combination of understanding these properties and the way they work with the details of a particular aluminum frame profile. This relationship is what manufacturers work on improving and perfecting to provide products that are reliable, economical, and functional.

Photo: © Paul Cosby Architectural Photography; Image: © Tubelite Inc.



The aluminum framing used in fenestration systems include tested and proven thermal breaks or barriers to improve thermal performance while maintaining structural integrity and overall performance.



Pour and de-bridge thermal barrier dual-pocket storefront

Of late, polyurethane has received a good bit of attention as a thermal-barrier material in aluminum frames since it can provide superior thermal performance to other choices. For example, using standard test procedures based on the National Fenestration Rating Council (NFRC) 101, U-factors of frames with different thermal-barrier materials can be determined. In a comparison of thermal conductivity of materials according to ASTM C518 standard test method, polyamide 6.6 with 25 percent glass fiber showed a thermal conductivity of 2.08. By contrast, a vinyl barrier produced a better (i.e., lower) result at 1.18, while polyurethane performed the best at 0.84. The significance of the differences in performance, as it relates to the design of the aluminum frame, is that a lower-conducting material will not need as wide a gap to achieve a targeted thermal performance. For example, in at least one frame comparison, a polyamide thermal barrier was used to achieve a U-factor of 0.39 but required a 24-millimeter gap to do so. By contrast, a polyurethane barrier was used to also achieve a U-factor of 0.39 but only required a 15.8-millimeter gap. A smaller gap can mean better structural performance of the frame and possibly thinner overall profiles of products. Hence, achieving better thermal performance in thinner breaks has advantages when seeking to create better fenestration products that allow better sightlines, more structural integrity, and durability.

The most proven approach to effectively install the thermal-barrier material that isolates the inner and outer frames

is referred to as a “pour and de-bridge” process. This is based on first creating an extruded aluminum profile that has been designed with a strategically placed channel in the middle of the frame piece. This channel is typically U-shaped and open to the top to receive the thermal-barrier material. Once ready, the thermal-barrier material is installed using specialized equipment designed for this purpose. If polyurethane is used, then it is literally poured in liquid form into the predesigned channel. Then, within minutes, polyurethane solidifies into a very strong structural polymer. The final step in the process cuts and removes the metal thermal bridge from the bottom of the channel to produce a true, non-metal-to-metal structural thermal barrier. This pour and de-bridge method is suitable for withstanding demanding climates and conditions with high-performance requirements in terms of impact resistance, shear strength, and heat distortion.

Remarking on the capabilities of such systems, Mary Avery, vice president of marketing at Tubelite, explains, “In colder climates, this type of system provides superior energy results and condensation resistance using multiple thermal barriers, while providing structural integrity and aesthetic flexibility.” She continues, “Optimizing thermal performance helps lower the load on HVAC systems and reduces associated energy costs, while maintaining a comfortable interior temperature.” She also notes that the reduction of condensation can improve a building’s appearance and minimize moisture damage to adjacent building materials.

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HIGHER-PERFORMANCE GLASS

The use of glass in building facades is not only ubiquitous, but it can also be the dominant aspect of the aesthetic look of many commercial building designs. When it is used in even a moderate quantity, it directly affects the thermal performance of a building too. This is true in cold climates, where the concern may be heat loss from inside to outside, and in moderate to warm climates, where the concern is heat gain from outside to inside.

Glass manufacturers have responded with increasingly sophisticated approaches that involve improvements not only to double-paneled insulated glass units (IGUs) but also the treatments applied to the glass surfaces. All of this is coupled with general improvements in glass types that produce greater clarity, less coloration, and more visibility—all while mitigating the potential negative impact on thermal performance. And, because this is becoming widely adopted, the cost of this latest generation of glass products is in line with many project budgets. This is all good news for architects since it means that there are now more opportunities to meet higher performance requirements without sacrificing design requirements in building or renovation projects. How are these impressive results achieved? Typically, by combining better glass choices with better coating technology.

Improving Clarity

“Clear” glass is popular in a variety of architectural applications. However, design professionals know that clear glass is not completely clear—it has a distinct green hue when viewed under normal light conditions. Since the green color comes from the presence of iron in the glass when it is manufactured, the way to overcome that condition is to use glass made with lower amounts of iron. “Low-iron” glass can be 60 percent less green than “standard” clear glass for everyday projects, or up to 87 percent less green for projects demanding the utmost transparency.

Of course, a double-glazed IGU consists of two glass lites, separated by an airspace. Manufacturers point out that design professionals often specify a double-glazed IGU with low-iron glass as the exterior lite—typically to achieve greater transparency and color fidelity—and then use clear glass as the interior lite. However, this compromises the design intent of maximizing daylight and color fidelity, as the green hue that is inherent in clear glass will dilute the clarity of the low-iron glass on the exterior

lite. Using low-iron glass for both lites in a double-glazed IGU will help achieve a truly transparent look.

Enhancing Performance

Low-emissivity (low-e) coatings are commonly applied to glass in the interest of reflecting heat away from the glass. These coatings consist of extremely thin layers of silver that are applied to the glass substrate through a magnetron sputter vacuum deposition (MSVD) process. These layers of silver reflect infrared (heat) radiation back away from the glass, helping to keep a room either warmer or cooler as desired. This makes the glass-enclosed spaces more comfortable while also helping to control energy costs related to heating and cooling the space. The relative transparency of these coatings also helps transmit natural daylighting, which can improve health, wellness, and productivity, while also allowing electric lights to be turned down or off.

Optimizing Results

Different building projects require different glass solutions to achieve the best results. In cases where clarity, color correctness, and energy performance are all required, it makes sense to consider combining high-performance low-e coatings on low-iron glass. Manufacturers who offer such glass systems point out that they combine exceptional solar-control performance with neutral aesthetics, enabling larger expanses without sacrificing occupant comfort. Options are available that offer excellent clarity even using a mix of low-iron and low-e choices. For example, a 1-inch IGU with a mid-range low-iron glass, with an advanced low-e coating as the outboard lite and uncoated mid-range low-iron glass as the inboard lite, can achieve visible light transmit-

tance (VLT) up to an impressive 53 percent with a solar heat gain coefficient (SHGC) of a very low 0.23.

It is worth noting that this approach can be used for all types of glass conditions, including the emerging need for bird-friendly installations. Recognizing that expansive areas of glass can cause birds to accidentally collide with them, regulations are in place or pending in many parts of the United States, Canada, and Europe to address this situation. As a result, manufacturers are offering high-performing solar-control, low-e glass that is combined with bird-safe, acid-etched patterns that can satisfy local and/or federal bird-safe glass codes. By placing acid-etched visual markers on the first surface of an IGU, which is preferred to prevent bird collisions, a low-e coating can be applied to the second surface—which is ideal from a solar-control standpoint.



Low-iron glass is available at different levels of clarity to suit design and budget requirements.



High-performance glass can help create interior spaces that are comfortable for people while reducing energy costs for heating, cooling, and lighting.

Photos courtesy of Vitro Architectural Glass

Images courtesy of Inpro

BETWEEN THE LINES: CHOOSING EXPANSION JOINT FILLER SYSTEMS

All facade materials and systems are made up of distinct parts or sections. The edges of those sections abut each other and require the use of a material to seal the joint between them. Similarly, on larger buildings, intentional expansion joints (gaps) are needed in the structure to allow for the movement of different parts of the building due to thermal expansion and contraction, seismic loads, or other conditions. Since all of these types of joints can interrupt the thermal, moisture, and air barriers in a facade, how they are treated and addressed will determine the continuity, or not, of these barriers across the joints.

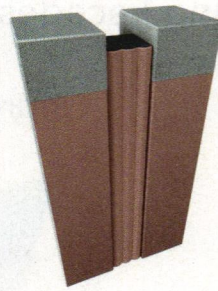
From the standpoint of their performance, the key to successful joints often comes down to the selection of the material or type of system used to fill the gap in the joint. Effective choices include the use of manufactured foam seals, infilled “pan” systems, and metal cover systems. We will look at some of the choices below and comment on their suitability for different facade applications.

Closed-Cell Foams

Closed-cell foams are very watertight and do not allow the moisture to enter the body of the foam. This is the best application for horizontal runs where water could pool. These are tougher to compress but can be placed under tension or be pulled to expand quite well. The other key advantage of closed-cell foams is that they take well to heat-welding of seams. This renders a monolithic installation that reduces the risk of water infiltration.

A good rule of thumb/best practice when using closed-cell foam seals is to limit their application to a joint width of no more than 8 inches (200 millimeters) or smaller. Use of foams for expansion joints larger than even 6 inches leads to two things:

1. Exceeding the foam's performance characteristics. Plus, the weight of “super-wide” foam seals can lead to sagging in vertical applications.
2. Dramatically higher costs compared to other expansion joint cover systems.



Foams and pleated seals can be used in narrow joint openings and compress or expand in relation to the building movement. They may not be the most cost-effective choice in some cases, however.

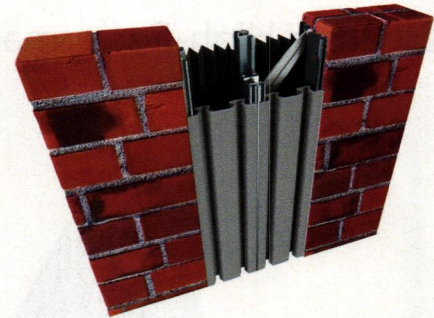
Open-Cell Foams

Yes, these products do allow for some flow-through of water vapor. Like many exterior veneer systems, if moisture becomes trapped in a wall cavity, building systems allow the moisture to wick out. This is a good attribute and a major focus to eliminate potential mold issues in vertical applications. Hence, open-cell foams should be employed only in vertical installations, where gravity can wick any absorbed water downward and away from the building enclosure.

Architects should also be aware that open-cell foams for expansion joints come in a maximum length of 5 feet, and because they are not heat-weldable, caulk must be used at the seams. This can introduce a future failure point as well as higher periodic inspection and maintenance costs should the seams need to be repeatedly re-caulked to prevent leakage. It is also important to know that while in a compressed state all foams may look the same, they are not.

Pleated Seals

As their name implies, pleated-seal joint systems are installed into a blocked-out joint area, and they absorb movement through compression and expansion of the pleats in the seal. The rubber-looking, corrugated joint material is also an excellent option for exterior application where waterproofing is required. These seals are best employed for heavy pedestrian and moderate vehicle loading. Proper use of two-part epoxies ensure solid adhesion to the deck, and heat-welded seams ensure watertight performance. The nominal joint width for these systems should not exceed 3½ inches to 4½ inches (89 to 111 millimeters) since the material cannot really handle wider applications



than that. Since these are often left exposed, building facade aesthetics can be enhanced using colored compression seals.

Metal Covers

For larger openings on facades that require greater durability, it is often more economical and appropriate to use a metal expansion joint cover system. These systems rely on base elements that are secured to either side of the building joint with a cover plate that allows the building to move behind it. Properly fabricated and installed, these systems can be weathertight by using a flexible barrier behind the metal.

Infilled Pan Systems

For cases where the appearance of the exposed metal cover plate is not desired, there is another option. Some metal systems are designed to receive a finish material in the center portion of the expansion joint cover while minimizing the exposed joint filler material. Referred to as an infilled pan system, these can be appealing for exterior and interior locations where larger joints need to be filled and durability addressed all in a manner that blends in with the general appearance of the surrounding surfaces, such as a building facade.

► Continues at ce.architecturalrecord.com

Peter J. Arsenault, FAIA, NCARB, LEED AP, is a nationally known architect and prolific author of over 225 continuing education articles advancing building performance through better design. www.pjaarch.com, www.linkedin.com/in/pjaarch



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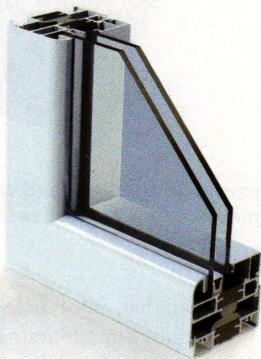
PRODUCT REVIEW

Creating High-Performance Building Facades

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Azon

Photo courtesy of Azon



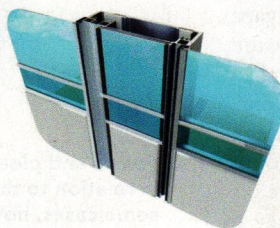
Azo-Core™ Thermal Barrier

Azo-Core™ high-density foam thermal barrier by Azon for aluminum framing first made its debut in Europe. Thermal results of 0.25 U-value with double low-e insulating glass are achieved through actual testing. Beyond high thermal performance, Azo-Core maintains the structural aspects of the aluminum fenestration product.

www.azonintl.com

Inpro

Image courtesy of Inpro



601 Expansion Joint System

Inpro's 601 hinged-wall expansion joint system can be infilled with glazing, metal panels, stone, brick, and more to disguise the exterior expansion joint. It is the ideal system for use on high-end exterior systems or conditions where the structural joint is located in a visible position on the building veneer.

www.inpro.com

Neolith®

Photo courtesy of Neolith®



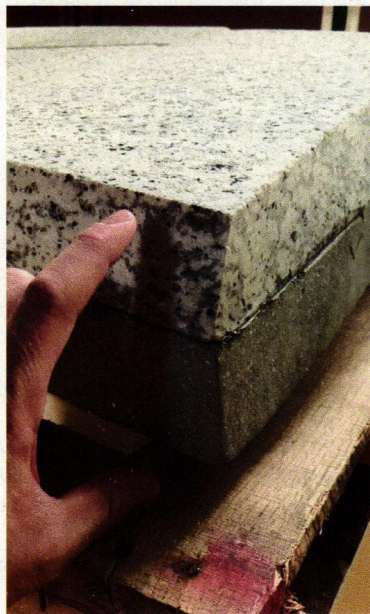
Neolith® Calacatta Surface

Neolith's award-winning Calacatta surface is one of its most popular patterns, particularly for facades. Inspired by Italian Carrara marble, it delivers a sophisticated, luxurious, and urbane look to any building exterior. Lightweight, waterproof, highly resistant, sustainable, and low maintenance, architects are assured this material will stand the test of time.

www.neolith.com

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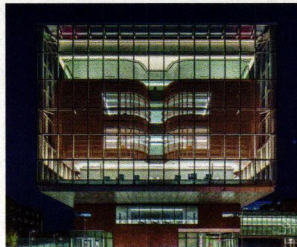
Ultra-High-Performance Concrete Veneer Facades

Thin, lightweight facade panels made from natural stone and backed with ultra-high-performance concrete are bringing prefabrication for tightly jointed stone facades to another level. The panels are suited for complex three-dimensional geometries beyond current size or weight limitations. The ultra-thin, full-floor-height elements no longer require tower cranes, so floor space is maximized and durability is enhanced.

www.hofmann-facades.com

Vitro Architectural Glass

Photo: Tom Kessler



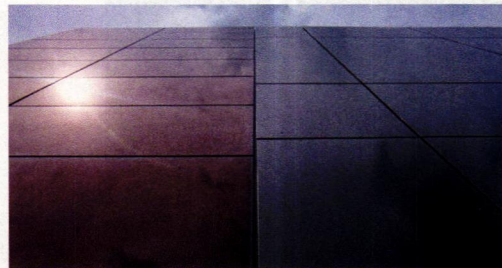
Affordable Low-E, Low-Iron Glass System

Design an ambitious facade and realize it. Vitro Architectural Glass engineered the Solarban® Acuity™ low-e, low-iron glass system to combine the color fidelity of affordable Acuity low-iron glass—which is 60 percent less green than ordinary clear glass—with the performance that customers expect from the Solarban glass family.

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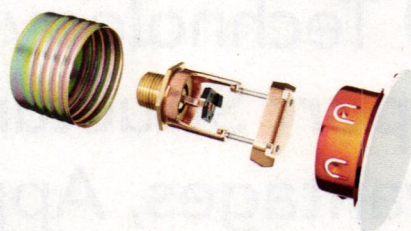
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Photo courtesy of Draper Inc.

LED Technology and Support Structures: Advantages, Applications, and Attachment

High-quality LED display mounting systems are key to ensuring a crisp, seamless appearance

Sponsored by Draper Inc. | By Barbara Horwitz-Bennett

Versatile, energy efficient, and attention grabbing, light-emitting diode (LED) displays are growing in popularity as an effective signage option in a wide variety of applications. An emerging technology, tens of thousands of LEDs combine to present a bright, beautiful, eye-catching display in pictures, videos, and other formats.

From advertising the latest sales to restaurant menus to corporate branding to public information messaging, LED displays are an effective way to communicate key information.

To optimally design, size, and mount these displays, an in-depth understanding of LED display technology, mounting systems, installation parameters, and project planning

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Learning Objectives

After reading this article, you should be able to:

1. Compare LED, LCD, and projection technologies.
2. Review pixel pitch, viewing distances, and other factors when evaluating LED display systems.
3. Evaluate adjustment capabilities and wall, floor, and ceiling attachment details when selecting an LED mounting system.
4. Discuss ADA requirements and best practices for designing and installing LED displays in corridors and hallways.

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is essential. Further, the LED display will only project the highest-quality visual if it is mounted with a high-quality structure capable of offering a very fine level of adjustment and high precision.

COMPARING LED TO LCD AND PROJECTION

In analyzing LED, the technology offers a number of advantages in the realm of lifespan, brightness, power use, and configurability.

For starters, LED displays are capable of operating 80,000 to 100,000 hours before reaching their half-life. In comparison, the half-life of liquid crystal display (LCD) is 50,000 hours, and with laser projection, it is 20,000 hours.

Putting this into perspective, an LCD video wall lasts approximately five years and needs to be serviced annually to calibrate color and brightness, whereas an LED display can last for approximately 10 years and only requires a one-time calibration during initial setup. Consequently, when calculating the initial setup, lifespan, and maintenance, any LCD/LED cost gap quickly closes.

In addition to longevity, LED technology has the ability to be exceptionally bright, with levels ranging between 800 and 10,000 nits. Nits is the measured intensity of visual light,

with one nit equaling one candela per square meter. In contrast, LCD video wall displays range from 350 nits to 700 nits, and projection offers roughly 500 nits in a dark room.

These brighter outputs allow for LED displays that can compete with direct sunlight, which is a noted advantage for outdoor and window displays.

"The most obvious advantage with direct-view LED is the largest and brightest video images without the noticeable seams that you see with LCD video walls and with contrast ratios that you just cannot achieve with projectors," states Scott Simpson, CTS-D, DMC-D-4K, audiovisual consultant, associate, PAE, Portland, Oregon.

To better qualify a display's brightness, it is important to understand emissive, transmissive, and reflective technologies. LCD uses a transmissive display, which means that the light emitted from a backlight is transmitted through the LCD layer and is then diffused. This results in a much more subtle appearance and also lower contrast.

Projection uses a reflective technology that does not perform well in bright ambient light conditions. This is due to the reflection of the surrounding ambient light on the surface of the screen, which washes out the image and results in very poor contrast.

As opposed to LED displays, which can selectively power each pixel, with no need to power the pixels in the black spaces, LCD and projection technologies use a light source projecting a constant brightness over the entire active image area, although some LCDs have dynamic backlight that helps reduce power consumption. Because of this, the power consumption will be fairly constant regardless of the content being shown. Further, commercial applications are typically set at the brightest available setting, which also consumes the most power.

Because LED is an emissive technology where light is emitted directly from each LED or pixel, the power consumption is directly related to the brightness of the content shown on each pixel. So with proper content creation, focusing on darker backgrounds with higher contrast, an LED display can yield lower power consumption.

In typical indoor applications, LEDs are generally set to a level that is below 50 percent of the display's capable brightness. If content is created with power saving in mind, and an ambient light sensor is employed to manage the brightness throughout the day and night, the overall power consumption will be even lower, as the black areas will remain unpowered, and the overall display will dim and brighten as ambient conditions allow.

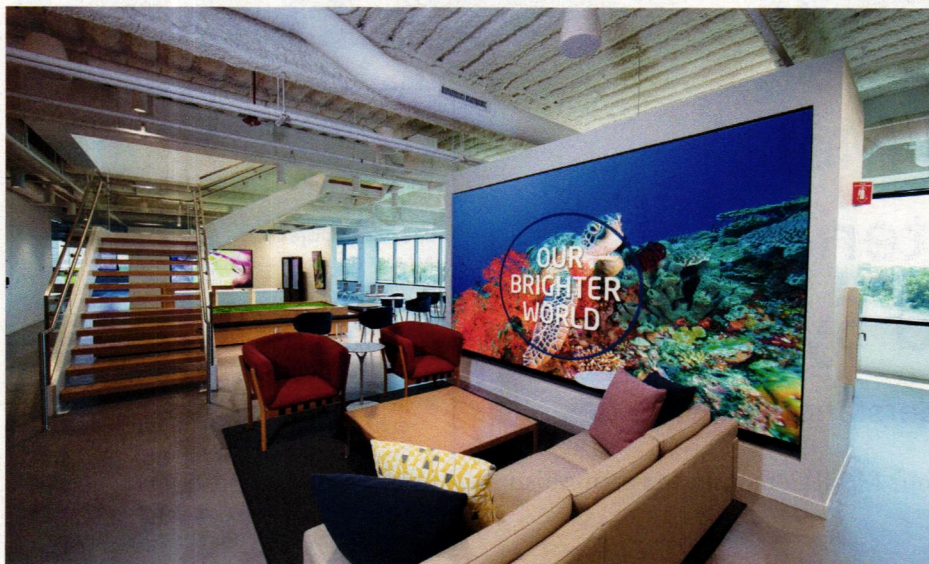
Regarding configurability, LED offers a high level of flexibility since the video walls do not need to fit within a certain standard aspect ratio, such as 4:3 or 16:9. The LED display uses LED panels that allow for a modular display configuration, so arrays can be 2x2, 2x4, 2x8, or any number of configurations. The LED video wall can also be quite large and still deliver a high-quality image.

Here Simpson notes that LED video walls support wider off axis viewing angles than LCD or projection.

Continues at ce.architecturalrecord.com

Barbara Horwitz-Bennett is a veteran architectural journalist who has written hundreds of CEUs and articles for various AEC publications. www.bhbennett.com

Photo courtesy of NEC Display Solutions



Since LED technology is much brighter than projection or LCD, when the module's brightness level is turned down, this enables energy savings and increased longevity.



Draper Inc. creates core, advanced, and tailored solutions for the professional audiovisual marketplace, including projection screens, custom AV mounts, structures, enclosures and lifts, as well as window shades and video conferencing solutions. Established in 1902, Draper markets through a network of dealers and distributors to the commercial, architectural, education, and residential markets. To learn more about Draper, visit www.draperinc.com.

Rush University Medical Center's Tower Hospital in Chicago features a unique and functional exterior facade made of metal composite material, or MCM.



Photo: Robert R. Gigliotti; courtesy of Metal Construction Association

Understanding Metal Composite Material, Installation, and Systems

Distinguishing quality and understanding warranties

Sponsored by Metal Construction Association's Metal Composite Material Alliance

By Jessica Jarrard

While many products are marketed as metal composite materials, a significant number are not actually metal composite materials at all. Metal composite material (MCM) is made from several different components. It is a factory-manufactured panel consisting of metal skins bonded to both faces of a solid plastic core.

METAL COMPOSITE MATERIAL (MCM) HISTORY AND BACKGROUND

The term metal composite material is a more general and inclusive term than its predecessor, aluminum composite material (ACM).

The first ACM was developed in Europe in 1969. It was not until 1979 that the first ACM was produced in North America.

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Learning Objectives

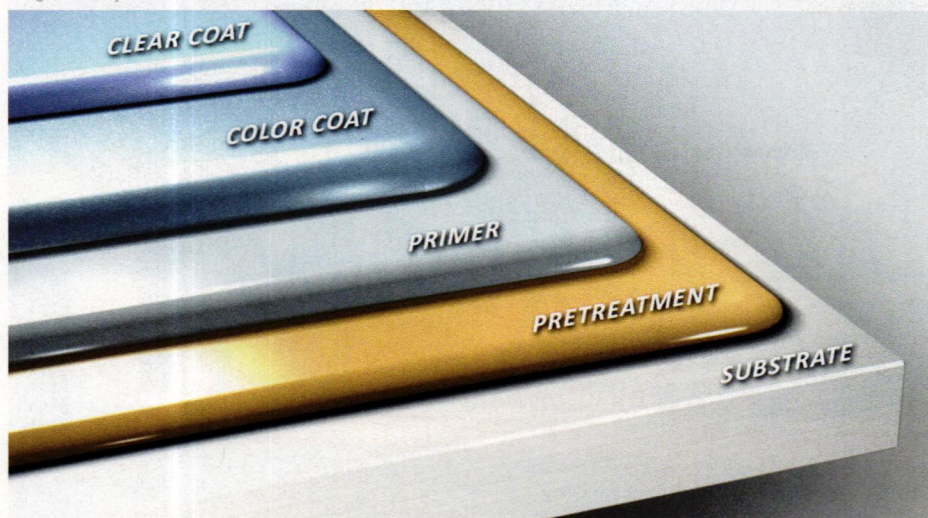
After reading this article, you should be able to:

1. Explain the difference between metal composite material (MCM) fabricators and MCM manufacturers.
2. Identify key actions that should occur during MCM installation.
3. Discuss characteristics and applications of dry-seal, wet-seal, and rainscreen systems.
4. Describe the distinguishing characteristics of quality fabricators and manufacturers.
5. Review codes and testing methods that apply to MCM fabricators and/or MCM manufacturers.

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Image courtesy of Metal Construction Association



This illustration shows the layers of an MCM panel.

In the early 1980s, there were a number of companies worldwide producing ACM and shipping to North America for architectural projects. By the 1990s, there were several ACM manufacturers producing products in North America. In addition, several other countries around the world were also manufacturing and providing ACM for North American import.

While the name ACM originally referred to products primarily made using aluminum coil, innovations and technological advances led to the use of alternate skin materials, such as copper, zinc, steel, stainless steel, and even titanium. With all these new skin material options, the common name of this material was changed to metal composite material (MCM).

Incorporating additional metals did not only provide more variety in function and cost, but it also provided more options when specifying aesthetically pleasing facades. MCM is often used in exterior cladding or rainscreens to help protect the building envelope from unwanted air and water intrusion. MCM products are available in many colors and finishes, allowing specifiers to provide unique facades while also providing health, safety, and occupant comfort. Today, the number of MCM manufacturers continues to grow worldwide, and the amount of variation in product offerings and quality continues to expand along with it.

MCM MATERIALS

MCMs are comprised of “skins” on both sides of the core. Skins often have finishes that enhance the appearance of the facade.

Skins

Skins can be a variety of metals, including stainless steel, zinc, copper, and even titanium just to name a few. Variations in metal, metal thickness, and finish are now much more common than they were just a few years ago.

When specifying materials, one should consider skin thickness first and foremost. A minimum thickness of 0.019 inch (0.5 millimeter) is required as a weather covering by the International Building Code (IBC). This thickness provides an acceptable protection layer for the material that resists normal exposure without significant visual damage.

Skins have three main purposes: to provide a substrate that can be painted or left in its natural state, providing a visually appealing product for a long period of time; to transfer the wind loading from the surface of the panel to the anchorage system; and to play a role in the overall fire performance of the panel.

Together, the panel limits unwanted air and moisture intrusion that impacts the facade performance, causes costly damage to building materials, and affects occupant safety and comfort.

Finishes

The metal skins provide a surface for the application of finishes. These skins will not expand or contract excessively due to temperature and will not negatively impact the finish.

There are many finish options and colors available for aluminum skins. Skins are typically painted with any one of a variety of finishes meeting the performance requirements of American Architectural Manufacturer's Association (AAMA) 2605. These finishes are available in everything from earth tones with low-gloss finishes to rich, vibrant colors with high-gloss finishes. Other options include finishes imitating wood, marble, granite, and other natural materials. Some finishes also have an additional clear coat added to protect the finishes and enhance the look to be metallic, prismatic, brushed, polished, or anodized.

Other sold metal plates, such as copper, zinc, stainless steel, and titanium, which would otherwise be very expensive for an architectural facade, could also be utilized at a fraction of the cost.

STRUCTURAL PERFORMANCE

MCM panels not only provide aesthetically pleasing facades but also protect buildings from the elements. Weather is uncontrollable. From high winds to ice and snow to excessive rainfall, the exterior cladding must protect the building from the overall impact of severe weather. Durability, long-lasting building materials and installation systems that perform over many years are critical for both new construction and retrofit.

Due to the extreme flexibility of MCM panels, with metal skins on both the interior and exterior sides, excessive wind loads generally do not create a permanent problem with the visual appearance of the panels. While the MCM does deflect in high winds, the panel returns back to the flat appearance that was originally fabricated and installed on the building.

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.confluencece.com



The MCM Alliance is a group of MCA member companies focused on increasing awareness of metal composite material (MCM) for the architectural building envelope. The alliance supports product performance testing, initiates research, and promotes education and actions to influence public policies for the utilization and growth of MCM in the marketplace. www.metalconstruction.org

Photo: Kevin C. Korczyk/K2 Creative

Los Angeles' first Type III double-podium design, WREN is a 362-unit multifamily community that earned rave reviews from the owner, tenants, city officials, and design community.

Structural Wood Building Systems

Choosing the right material for a sustainable, safe, and resilient project

Sponsored by Think Wood

Whether designing for light-frame or mass-timber structural systems, project teams that opt for wood can benefit from the material's versatility, sustainable supply chain, and benefits to occupants, as well as thermal, acoustic, seismic, and fire performance. Wood can also help to maximize value through gains made in square footage and building height.

Light-frame wood construction has long been the go-to framing choice for low-rise and, increasingly, midrise residential and commercial buildings. Cost-effectiveness, material-use efficiency, ease of assembly, minimal environmental impact, and the ready availability of labor and materials make light-frame construction the most common type of wood construction in North America. Typically, nail-assembled light-frame construction uses a formulaic combination of dimensional lumber, I-joists, trusses, structural composite lumber, and

plywood and oriented strand board (OSB) decking and sheathing for floors, walls, and roof decks.

While mass-timber structures are often built as components off-site and assembled at the project site, light-frame construction typically occurs entirely on-site. Increasingly, however, elements of light-frame buildings are fabricated off-site and assembled on the job. Off-site construction offers greater control over construction conditions and improved safety oversight for all material types, while requiring less skilled labor on-site and contributing to faster construction timelines.

LIGHT-FRAME ROOFS AND FLOORS

Typical light-frame roof and floor systems consist of repetitive framing members, such as rafters or trusses with wood structural panel decking.

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Learning Objectives

After reading this article, you should be able to:

1. Compare key differences between light-frame and mass-timber structural systems, and explain how each can contribute to sustainable and resilient design.
2. Describe the applications for both light-frame and mass-timber structural systems, and the classes of buildings where they are appropriate.
3. Identify performance benefits for each system, including fire safety, seismic stability, and wind resistance, as well as pertinent codes related to each.
4. Examine several case studies that feature light-frame and mass-timber projects, all of which incorporate environmentally sensitive design.

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Think Wood is a communications campaign that provides commercial, multifamily, and single-family home design and build resources to architects, developers, and contractors, including education, research, design tools, and innovative project profiles. www.thinkwood.com

Photo courtesy of Armstrong Ceiling & Wall Solutions



Perforated wood ceilings are one of many ways beyond traditional acoustical tiles to reduce noise, adding sound absorption and sound blocking for quieter spaces.

Acoustic Design for Wellness in a Post-COVID World

Addressing growing noise challenges resulting from interior design changes due to the pandemic

Sponsored by Armstrong Ceiling and Wall Solutions

In a post-COVID world, building owners and occupants want assurance that the buildings they own and occupy are healthy and safe. Many of the modifications enabling health and safety are likely to create higher noise levels. Acoustical comfort, including the ability to focus, collaborate, or have confidential conversations, will need to be addressed in a way that is both effective and aesthetically pleasing.

This course will help building professionals meet the challenges of designing, renovating, and maintaining facilities, and the role that the ceiling can play in addressing new noise concerns without detriment

to design. It will explore the negative effects of noise and solutions to lessen these to promote wellness, as well as factors impacting acoustics as a result of changes in material and layout criteria to address cleanliness, de-densification, and physical/social distancing. The course will also take a close look at the role that ceiling systems can play in creating well-designed sound, and identify solutions that are currently available to enable positive experiences for human health, well-being, and comfort in the built environment.

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Learning Objectives

After reading this article, you should be able to:

1. Describe the factors impacting acoustics as a result of changes in material and layout criteria to address cleanliness, de-densification, and physical/social distancing in this post-COVID time.
2. Explain the negative effects of noise and solutions to lessen these while designing projects with acoustics in mind from the start.
3. Review the four steps to well-designed sound and two aspects that work together to create balanced sound.
4. Identify solutions currently available to enable positive experiences for human health, well-being, and comfort in the built environment.

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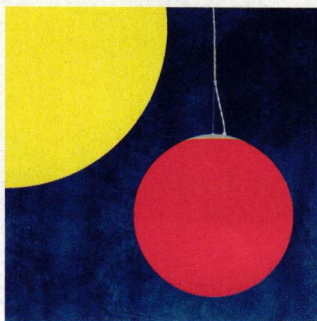
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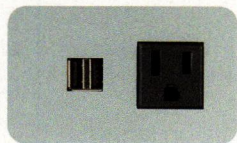
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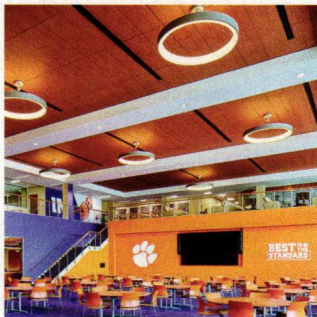
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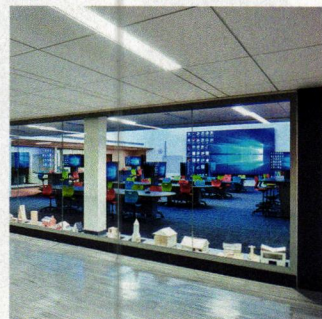
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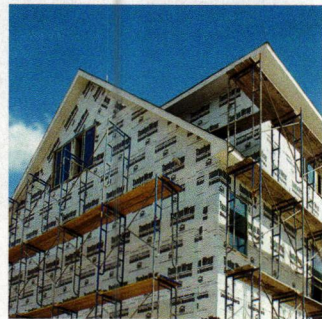
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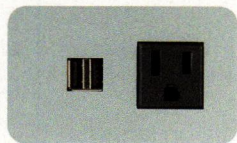
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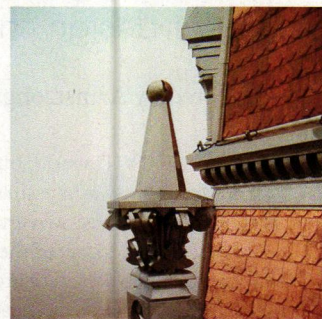
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Upcoming Exhibitions

ADOLF LOOS: Private Houses

Vienna

December 8, 2020–March 14, 2021

The Museum of Applied Arts in Vienna is mounting an exhibition to mark the 150th birthday of Adolf Loos, a pioneer of Modernism. The exhibition will focus on his private residential buildings. As a contrast to such structures, the present selection of 100 design sketches, plans, photographs, and models from the Albertina Museum's Adolf Loos Archive also includes important social projects designed by the architect. More information at MAK.at/en.

Engineer, Agitator, Constructor: The Artist Reinvented

New York

December 13, 2020–April 10, 2021

This exhibition at MoMA looks at the reinvention of the role of the artist and the functions of art that took place in tandem with historical shifts in industry, technology, and labor amid the impact of World War I, the Russian Revolution, the collapse of the Austro-Hungarian Empire, and the rise of fascism. Highlighting figures such as Aleksandr Rodchenko, Lyubov Popova, John Heartfield, and Fré Cohen, this exhibition demonstrates the ways in which artists reimagined their roles to create a dynamic art for a new world. More at moma.org.

Sigurd Lewerentz: Architect of Death and Life

Stockholm

From April 2021

Sigurd Lewerentz, the 20th-century Swedish architect, is the subject of a new exhibition at ArkDes, the Swedish national center for architecture and design. The exhibition will show a range of Lewerentz's works, including the Woodland Cemetery, St. Mark's Church, and St. Peter's Church in Scandinavia. The opening will coincide with the publishing of a monograph about the architect, due out in the spring. More at arkdes.se/en/.

Ongoing Exhibitions

Francesca Lalanne: In This Time

Los Angeles

Through December 26, 2020

Haiti-raised artist Francesca Lalanne's latest works, which comprise figurative engravings on oxidized steel that evoke burial rituals, are on display at Galerie Lakaye. Inspired by

ancient carvings, these steel-sheet impressions include architectural and geometric shapes that represent mental and spatial dispositions. See more at galerielakaye.com.

Jaume Plensa: Nocturne

Chicago

Through January 9, 2021

This solo exhibition of new sculpture by Jaume Plensa debuts nine of the artist's latest works in stone, glass, steel, and bronze at Gray Warehouse in Chicago. Limited number allowed in the gallery at any one time; reservations necessary. For more information, go to richardgraygallery.com.

Spaces of No Control

New York

Through January 10, 2021

Curated by Austrian artist and curator Walter Seidl, the exhibition explores the notion of the modern city and urban dystopias of the 20th and 21st centuries, with works by American and Austrian artists that examine the histories of specific places and create narratives about them. The core of the show lies in examinations of cities, and their social strata, using photographs then transformed into other media. The exhibition analyzes city planning—initially intended to optimize rather than reorganize society—and the results of its complex history. Learn more at acfny.org.

The Long Dream

Chicago

Through January 17, 2021

This new exhibition at the Museum of Contemporary Art is inspired by the current moment, giving shape to issues heightened by the pandemic and social unrest. It features over 70 Chicago artists, ranging from the visual arts to performance and public practice, selected by museum curators and programmers with different backgrounds and specialties. Named after a novel by renowned author Richard Wright, *The Long Dream* is part reflection on the state of the world after the arrival of Covid-19 and part celebration of Chicago artists and creative denizens. The goal of the exhibition is to advocate for artists' voices and artwork in a city grappling with anxiety, and to empower artists to make an impact during a time of social change. See more at mcchicago.org.

Yves Klein: Elements and Colors

Massignac, France

Through January 29, 2021

Taking place at Domaine des Etangs' art space, La Laiterie, the exhibit showcases 60 works by Yves Klein, the French artist best known for his signature color, Klein Blue. The documents and films on display—which include *Air Architecture*, his utopian vision of building cities with the elements of fire, air, and water—explore his spiritual connections to both nature and the cosmos. Learn more at yvesklein.com.

China Goes Urban. The City to Come

Turin, Italy

Through February 14, 2021

Curated by the Polytechnic University of Turin, Prospekt Photographers, and Tsinghua University in Beijing, this exhibition at Museo d'Arte Orientale connects the cultures of China with the transformations of contemporary Chinese urban centers. Starting with the exploration of new Chinese cities and the contradictions triggered by urbanization, the exhibition aims to invite reflection on the phenomenon. More at chinagoesurban.com.

Marking Time: Art in the Age of Mass Incarceration

New York

Through April 4, 2021

As its first exhibition upon reopening to the public since the Covid lockdown, MoMA PS1 highlights the centrality of incarceration to contemporary art and culture. Featuring art made by people in prisons and work by non-incarcerated artists concerned with state repression, erasure, and imprisonment, this exhibition includes more than 35 artists, including Tameca Cole, Russell Craig, James "Yaya" Hough, Jesse Krimes, Mark Loughney, Gilberto Rivera, and Sable Elyse Smith. The exhibition has been updated to reflect the growing Covid-19 crisis in U.S. prisons, featuring new works by artists made in response to this ongoing emergency. More information at moma.org.

Howardena Pindell: Rope/Fire/Water

New York

Through April 11, 2021

For her solo exhibition at the Shed, Howardena Pindell will present her first video in 25 years—a project unrealized since the 1970s that the Shed commissioned her to complete. In *Rope/Fire/Water*, Pindell recounts personal anecdotes and anthropological and historical data related to lynchings and racist attacks in the United States, using voiceover with archival photos of lynchings and the May 1963 Birmingham, Alabama,

DATES & Events

Children's Crusade, a series of nonviolent protests carried out by young people. Learn more at theshed.org.

Competitions

IE Architecture +Prize

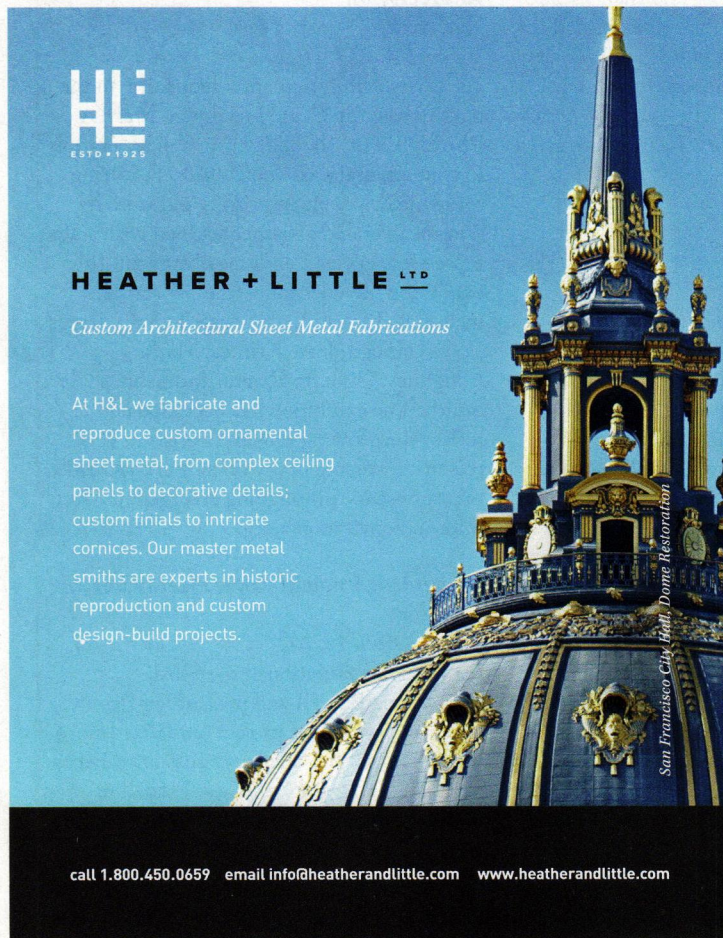
Deadline: December 11, 2020

This competition, sponsored by IE School of Architecture and Design, is for students and young architects who graduated between 2010 and 2020 and who were ranked in the top 25 percent of their class. Participants submit one architecture or design project realized during their last year of study. Winners will receive admission to the IE Master in Business for Architecture and Design program for the 2021–22 academic year and a scholarship. More at arquideas.net/competition.

What Is Sustainable Architecture? Essay Competition

Deadline: December 14, 2020

Bee Breeders, in partnership with ARCHHIVE BOOKS, is calling for essay submissions, from those in any field, for their next print publication, planned for spring 2021, *What is Sustainable Architecture?* Selected winners will receive monetary awards along with publication in the volume. More at sustainablearchitectureessay.beebreeders.com.



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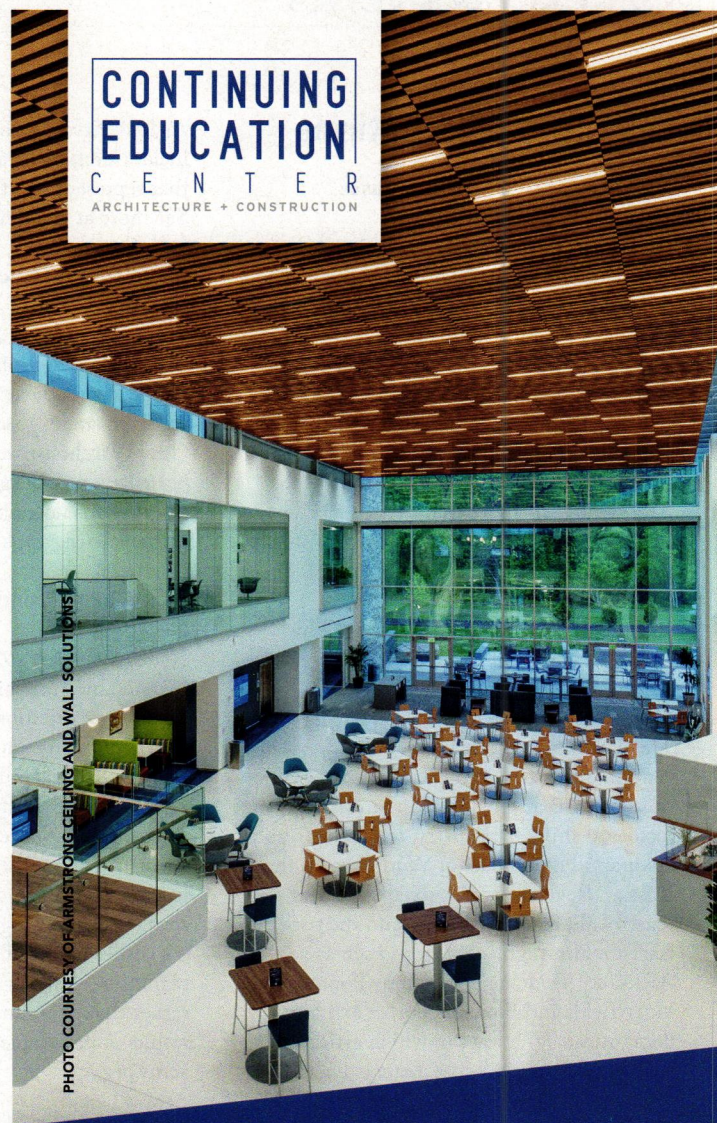


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DATES & Events

AIA COTE Top 10 for Students Competition

Deadline: January 13, 2021

The 2021 edition of this competition is open to students of an Association of Collegiate Schools of Architecture (ACSA) school with a faculty sponsor. Submissions should demonstrate design moving toward carbon-neutral operation, considering daylighting, passive heating and cooling, materials, water, energy-generation, or other sustainable systems. More at acsa-arch.org.

Architects Foundation Diversity Advancement Scholarship

Deadline: January 15, 2021

This multiyear scholarship supports high school and undergraduate minority students who are entering, enrolled in, or transferring into an NAAB-accredited undergraduate architecture program. Scholarships may be renewed every year until the degree is completed, for up to five years (\$20,000 total

award). Applications must include an essay, professional résumé, two letters of recommendation, and a portfolio of three to five creative works. More at architectsfoundation.org.

Re-Use Italy

Deadline: March 12, 2021

The third edition of this international architecture competition promotes the reuse of a forgotten church in southern Italy, facing the issue of the abandonment of small towns in the nation. The competition, open to architects, engineers, and students, asks the participants to transform the ruin into a concert hall. Submissions will be displayed in April 2021 in Grottole, Italy, and the winners will receive a cash prize of €4000 and be invited to explain their project to the townspeople. More at reuseitaly.com.

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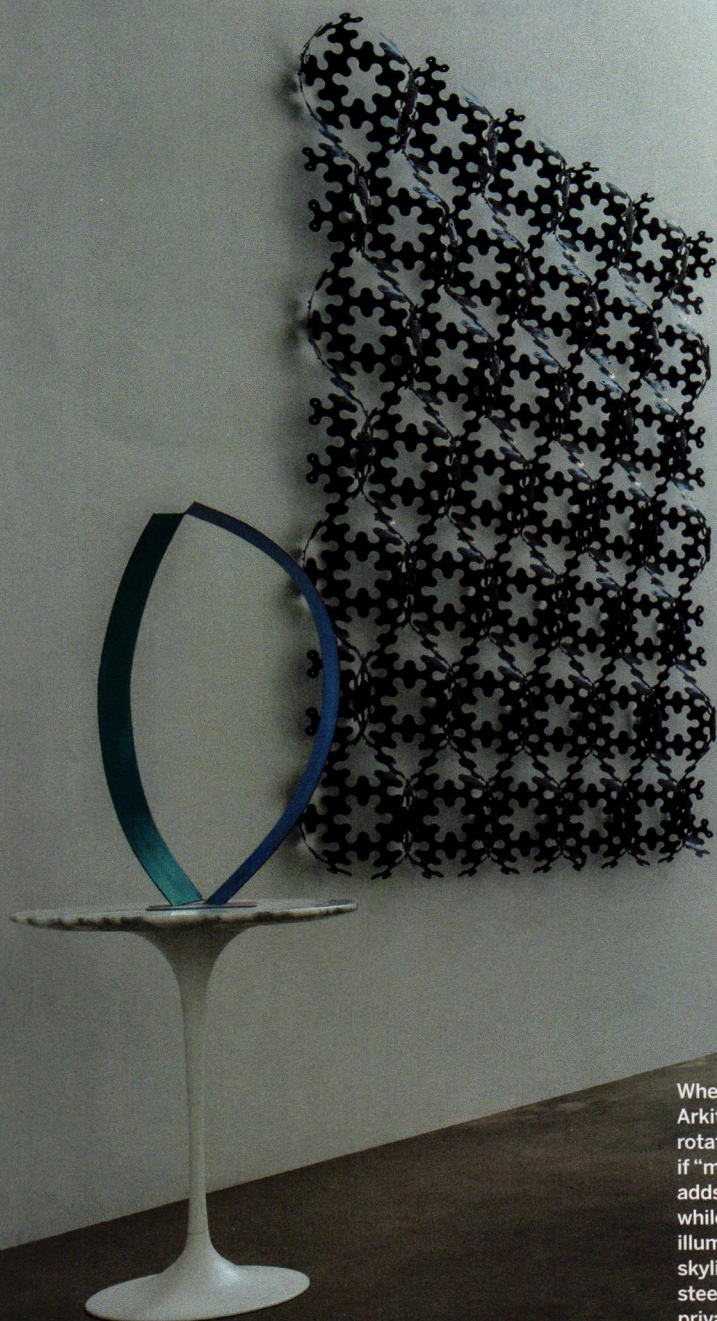
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 Regional AD

SNAPSHOT



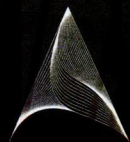
When a couple in the suburbs of Gothenberg, Sweden, contacted locally based STEG Arkitekter to design a freestanding 270-square-foot gallery in their garden to display rotating exhibits of their extensive art collection, the architects approached the project as if “modeling a sculpture,” says firm cofounder Karolina Hegen. Her partner, Jenny Stening, adds that it was a challenge to tuck a building into the tight, awkwardly shaped site while meeting zoning regulations. The need to maximize wall space for artwork and still illuminate the interior with northern light led the architects to insert a scalene triangular skylight in a corner of the cross-laminated timber structure, which is clad in blackened steel. Juxtaposed with the couple’s white-painted traditional wood house, the unusual private gallery—occasionally opened to the public for events—is like “jewelry” for the garden, Hegen says. *Kara Mavros*

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