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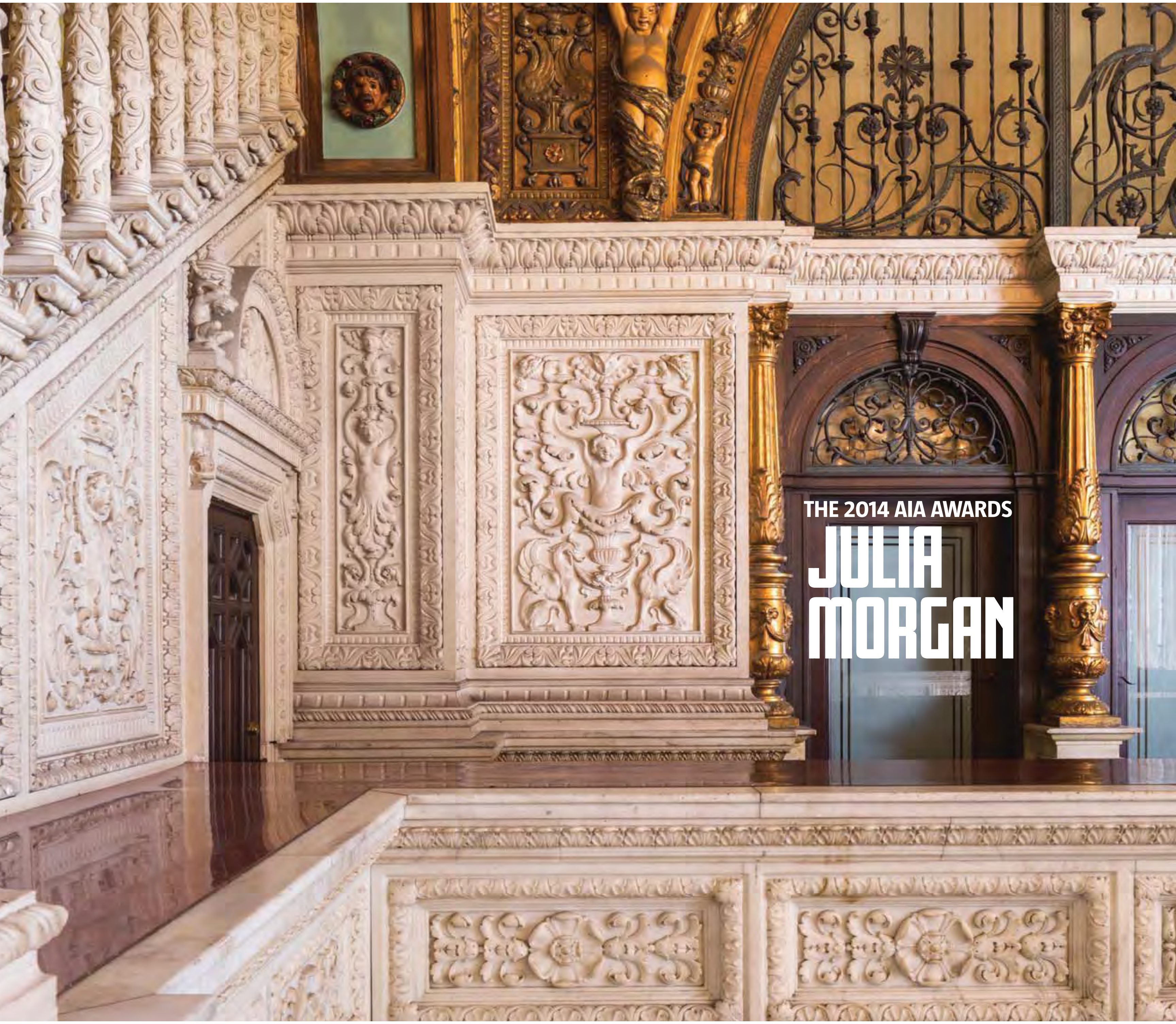


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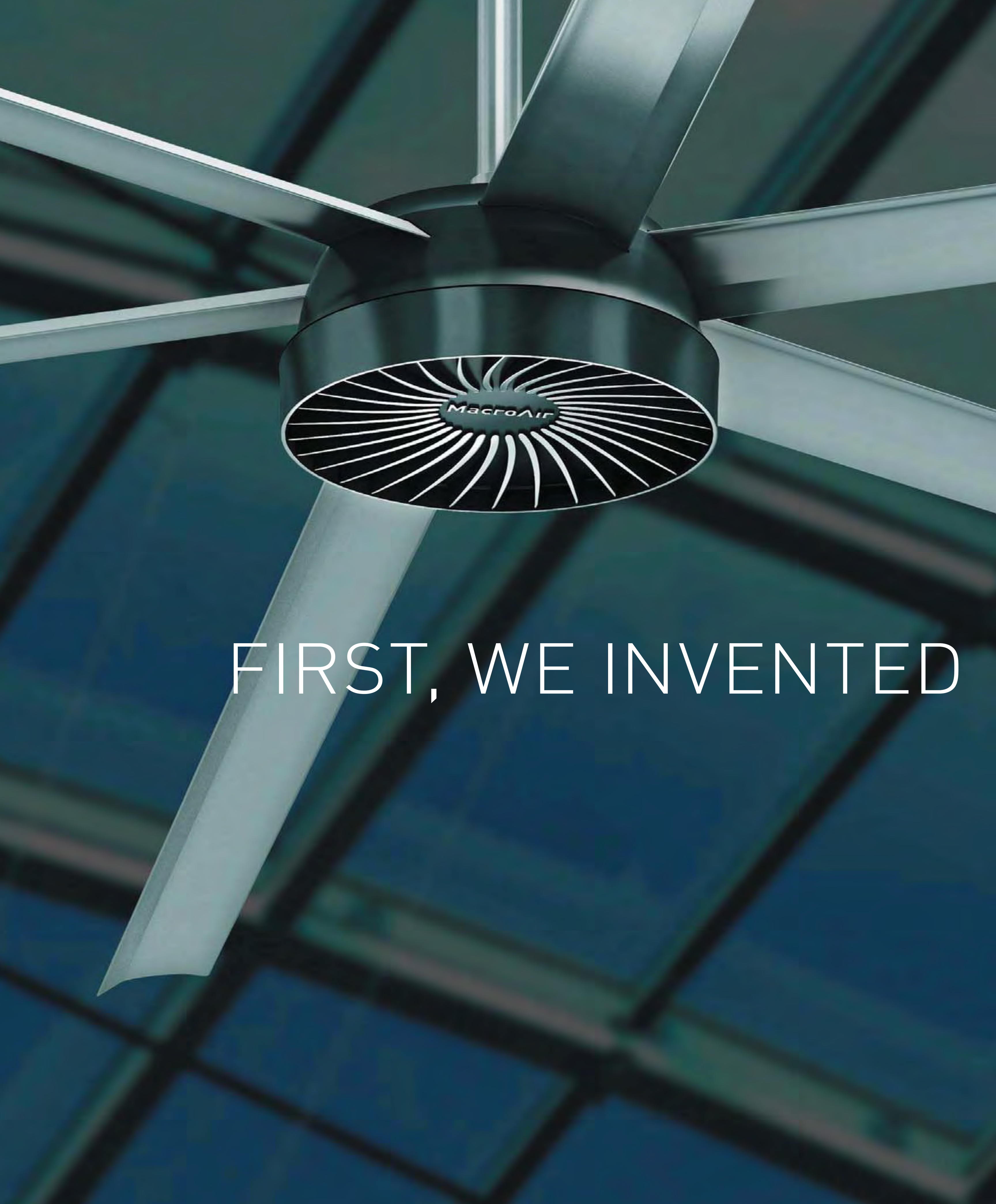

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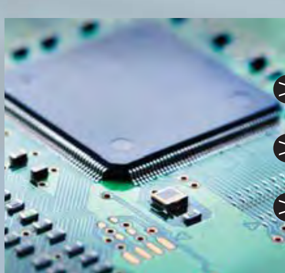

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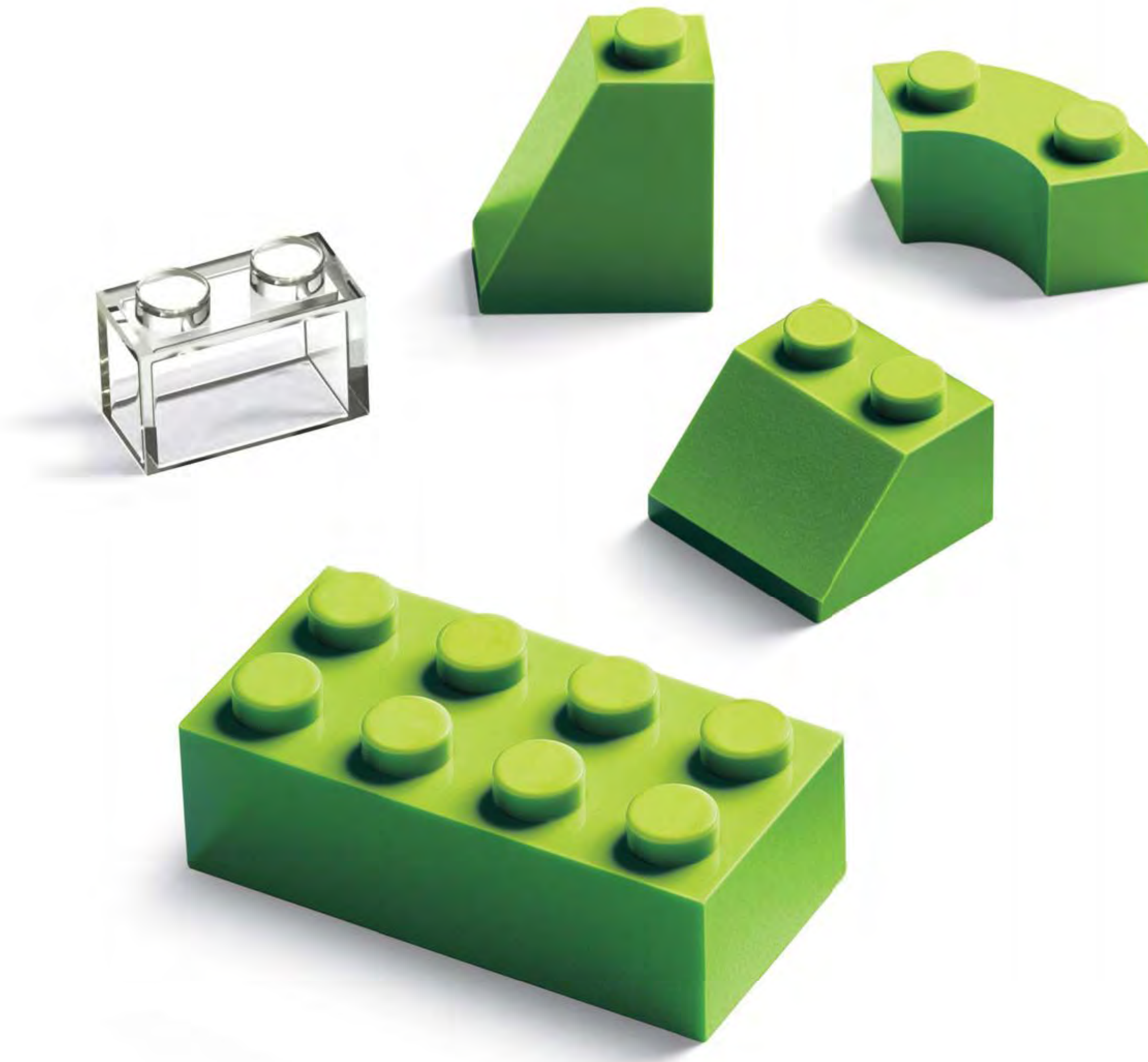

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D.C. Metro, designed by Harry Weese

STEPHEN VOSS

2014 AIA AWARDS

The American Institute of Architects' Gold Medal, Architecture Firm Award, Twenty-Five Year Award, and Institute Honor Awards are among the architecture profession's most prestigious honors. The Young Architects Award recognizes promising individuals who are rising up through the ranks. And each year, the AIA recognizes leaders—inside and outside the profession—in the areas of education, equal rights, and public architecture.

06.14

Above: Jellyfish House; This image: Old Market Square Stage

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ON THE COVER

Herald Examiner Building in Los Angeles, designed by Julia Morgan. Photo by Lawrence Anderson.

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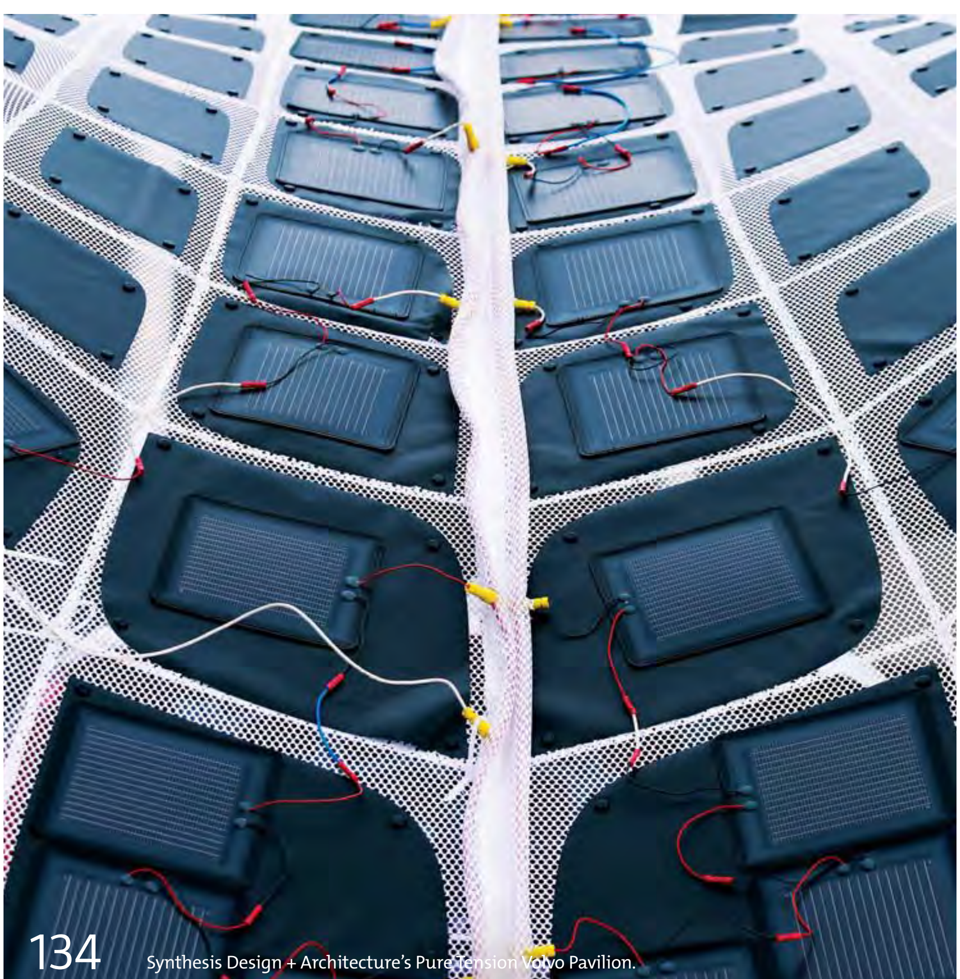
41 A new breed of custom panel will clad Snøhetta's SFMOMA expansion.



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TOP: COURTESY MIR AND SNØHETTA; BOTTOM: COURTESY SYNTHESIS DESIGN + ARCHITECTURE


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MANY MILLENNIALS—NOT ALL, CERTAINLY, BUT TOO MANY TO IGNORE—MUST SEE INTERNSHIP, THE EXAM, AND EVEN LICENSURE AS IRRELEVANT TO THEIR PERSONAL GOALS.

CHANGE YOU CAN BELIEVE IN

THE NATIONAL COUNCIL OF ARCHITECTURAL REGISTRATION BOARDS HAS ENDORSED A POTENTIALLY TRANSFORMATIVE NEW PATH TO LICENSURE.

INSTITUTIONS CHANGE or they die. And nowadays they seem to be dropping like flies: Newspapers. Unions. Shopping malls. Pessimists say architecture belongs on the list. While that's a matter of opinion, it is a matter of fact that the profession is getting older and struggling to retain younger members.

The numbers don't lie. According to the AIA's 2012 annual report, "Members of the baby boom generation are currently peaking, resulting in an organization in which members in the 60–69 age bracket increased and the percentage of architects under 50 decreased steadily over the same period."

It didn't help that junior staffers were usually the first to lose their jobs during the Great Recession, and many of them never came back. But the problem isn't just demographic and economic. It's also structural. School, graduation, internship, exam, licensure—the current career-development path is torturous and increasingly disconnected from the realities of practice, the demands of the market, and the aspirations of the next generation.

Architecture schools' curricula are often so removed from day-to-day office work that that first job after graduation causes serious culture shock. The Intern Development Program takes too long to complete (8.5 years on average); the term "intern" is just plain insulting; and I've yet to meet a fan of the Architect Registration Examination (ARE).

No wonder more than half of architecture school graduates end up leaving the profession. Many Millennials—not all, certainly, but too many to ignore—must see internship, the exam, and even licensure as irrelevant to their personal goals. They are voting with their feet.

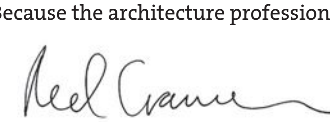
Fortunately, the powers that be have begun to respond. Emerging professionals are a centerpiece of the Institute's Repositioning the AIA initiative. A group of them met this January and crafted a 12-point plan for education, licensure, career development, and firm culture, alongside leaders of the AIA, Association of Collegiate Schools of Architecture, American Institute of Architecture Students, National Architectural Accrediting Board, and National Council of Architectural Registration Boards (NCARB). Stay tuned for more.

At NCARB—the historically unloved, seemingly inflexible body that regulates internship and licensure—fresh, reform-minded leadership has taken charge. A new version of the exam, ARE 5.0, is scheduled for release in 2016. And, joy of joys, last month NCARB announced its endorsement of what it calls "licensure upon graduation." While the mechanics are yet to be determined, the basic idea, according to a statement from the organization, is to "integrate the rigorous internship and examination requirements that aspiring architects must fulfill into the years spent completing a professional degree in architecture."

If that doesn't seem like a big deal, read it again and remember, since time out of mind the term "young architect" has been an oxymoron. The legal profession, by comparison, has it right. You take the exam shortly after graduation, and if you pass you are admitted to the bar. Your boss and the marketplace dictate whether you have enough experience to tackle a particular assignment.

In law, as in architecture, young people have changes of heart and decide to pursue other fields. But in law, those who do (and who maintain their accreditation) can still rightly call themselves lawyers, and the title retains much of its value in other contexts. Interns who leave architecture have had comparatively little to show for their efforts, and the profession has lost a host of potential allies and ambassadors to other fields.

Next year, NCARB will invite schools to submit proposals for the venture. So while much work remains to be done to make licensure upon graduation into a reality, I pray the response is overwhelmingly positive. Because the architecture profession must grow.



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Shaunacy Ferro is a freelance writer whose work has appeared in *Fast Company*, *Popular Science*, and *Time Out Chicago*.

She covers architecture and urban design for *Fast Company*'s Co.Design, exploring how good design can impact the way we live and work. She previously wrote about psychology, neuroscience, and the robot overlords of the future at *Popular Science*. She's fascinated by the way the built environment shapes behavior and by what makes cities tick.

A native of southern California, Ferro has forsaken her sunny suburban homeland for the urban wilds of Brooklyn, N.Y., where she spends her days elbowing aside fellow Millennials at coffee shops.

Read Ferro's story about a new class of robots that are poised to infiltrate jobsites on page 140.


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LAWRENCE BIEMILLER

Lawrence Biemiller is a longtime senior writer for *The Chronicle of Higher Education* who has covered campus architecture and many other topics. He is also a volunteer for the East Broad Top Railroad and Coal Co., in Rockhill Furnace, Pa., for which he learned how to operate small rail vehicles; and for the Washington, D.C., chapter of the National Railway Historical Society, for which he is learning to prepare meals in the 1934 kitchen of the Pullman car "Dover Harbor." A graduate of Franklin & Marshall College, in Lancaster, Pa., he lives in a Washington neighborhood where potholes regularly reveal the paved-over tracks of the streetcar system that preceded Metrorail.

Read Biemiller's story on the D.C. Metro, this year's winner of the AIA Twenty-Five Year Award, on page 188.

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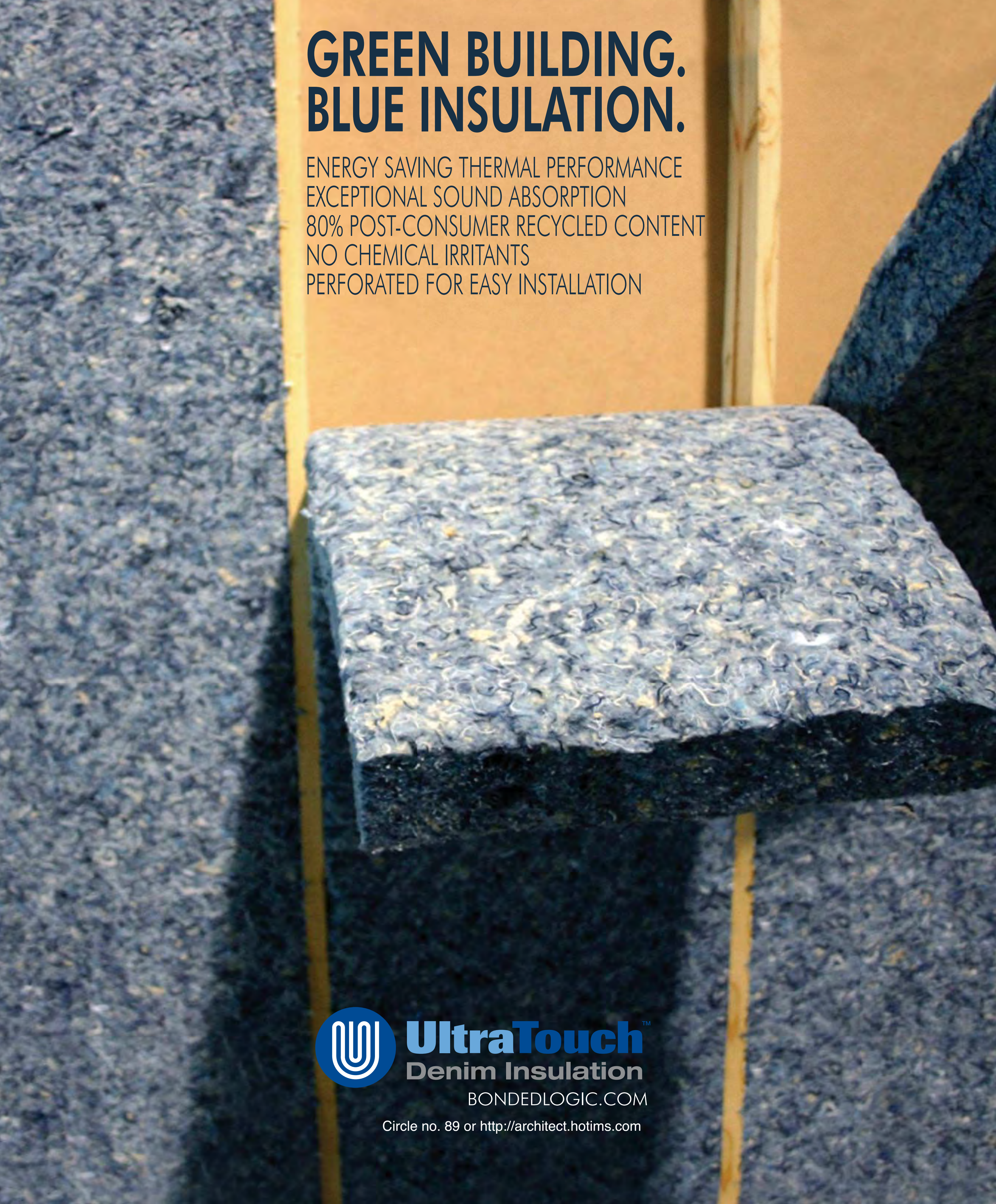
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FRONT

NOW YOU SEE IT

Philip Johnson's Glass House turns 65 this year, and to mark the occasion, director and chief curator Henry Urbach invited Japanese artist Fujiko Nakaya to create an outdoor installation on the New Canaan, Conn., property. For 10 minutes each hour, 600 nozzles mask the iconic residence in a fine mist. Ergo the title of the work: Veil. Through Nov. 30.

APRIL GREER

Q+A: SHERRY-LEA BLOODWORTH BOTOP

THE NEW EXECUTIVE DIRECTOR OF THE AIA'S PHILANTHROPIC ARM TALKS ABOUT RESILIENCY AND THE IMPORTANCE OF ARCHITECTS IN REBUILDING EFFORTS.

For the full Q+A, visit *architectmagazine.com*

$11 million

THE APPROXIMATE COST OF LAUNCHING AND RUNNING THE REGIONAL RESILIENT DESIGN STUDIOS FOR FOUR TO FIVE YEARS.

IN FEBRUARY, Sherry-Lea Bloodworth Botop was named executive director of the American Institute of Architects Foundation (AIAF), the philanthropic arm of the AIA that focuses on architecture and design advocacy and education. Prior to this position, Bloodworth Botop was a senior adviser and director of strategic development for Architecture for Humanity.

AIAF is launching the first of five Regional Resilient Design Studios. The first one will be in the New York metro area. These studios, developed in partnership with Architecture for Humanity, the Rockefeller Foundation's 100 Resilient Cities program, and the Clinton Global Initiative, will work on resiliency projects in places selected based on factors such as threat level and the availability of university partners. ARCHITECT spoke with Bloodworth Botop at the AIA headquarters in Washington, D.C.

So what exactly does the foundation do?
We have a mission statement, but I would say more broadly that the mission is to educate the public about the value of architecture in the world and how it impacts your life, your day-to-day life.

Resiliency seems to be a buzzword right now.
We address it from the built environment perspective. You have people like [the Garrison Institute's] Diana Rose, who is working on cognitive resilience—you have the whole emotional piece of it too. There are other parts of resilience—it's not all about property being destroyed, but that is the piece that we're focused on and it's a big part of it.

What does a typical day look like for you?
Lots of travel, lots of engagement. I feel like it's Christmas every day here for me. Every day I find out about some expertise—like deep knowledge that AIA has housed in their partnerships, relationships, staff, components—that people don't know about, and has never been really catalyzed and used to drive a national strategy to impact something like resilience. I grab things every day from people, and I find out about this deep expertise and put it all together to broaden the impact of the programs.

What accomplishments are you particularly proud of?
I'm proud of developing a network of studios on the Gulf Coast to come together and propose to be the recipients of millions of dollars from [the U.S. Department of Housing and Urban Development] so that architects could plan and stamp the housing that was being built. You have a lot of volunteer organizations coming in and building things, and that's great, but I struggle with those that are not working with architects and engineers in their rebuilding process.

Your long-term goals?
For me, the biggest long-term goal is helping the general public understand the value of architecture, so it's not something that's reserved for skyscrapers or the elite; it's something that should be accessible to everyone, it's something we all should know about and have access to, period. So that is a long-term goal. How does that happen, how do we do that? It's educating the public, building things, and showing people the value of what architects do.
SARA JOHNSON

BILL TIMMERMAN

2014 AIA COTE TOP 10

ARIZONA STATE UNIVERSITY STUDENT HEALTH SERVICES BUILDING
Tempe, Ariz., Lake|Flato Architects and Orcutt|Winslow

BUD CLARK COMMONS
Portland, Ore., Holst Architecture

BUSHWICK INLET PARK
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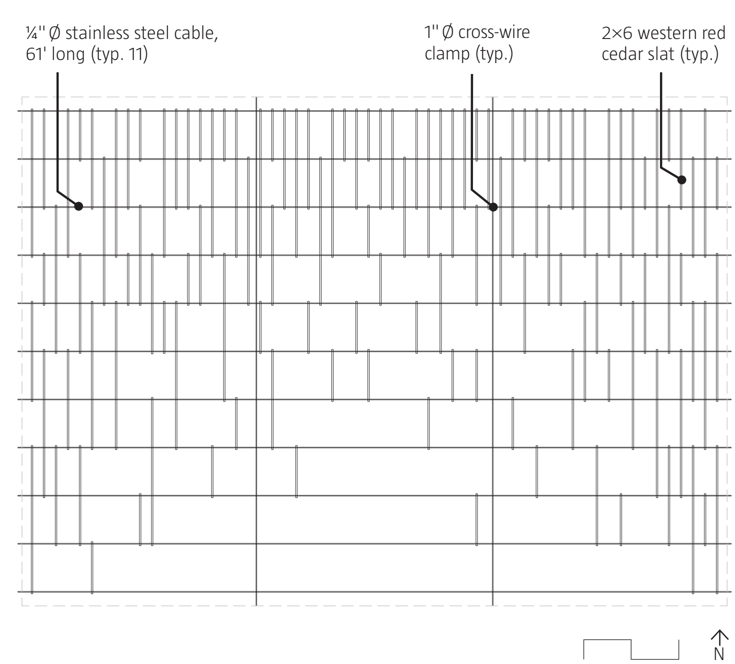
GSA OFFICE BUILDING

FOR AN INTERIOR COURTYARD surrounded by the double-height, floor-to-ceiling glazing of the General Services Administration Office Building in Albuquerque, N.M., Page Southerland Page senior principal Larry Speck, FAIA, and his team designed a suspended system of transverse wooden slats that serves the building's site-specific shading needs, while allowing natural light inside.

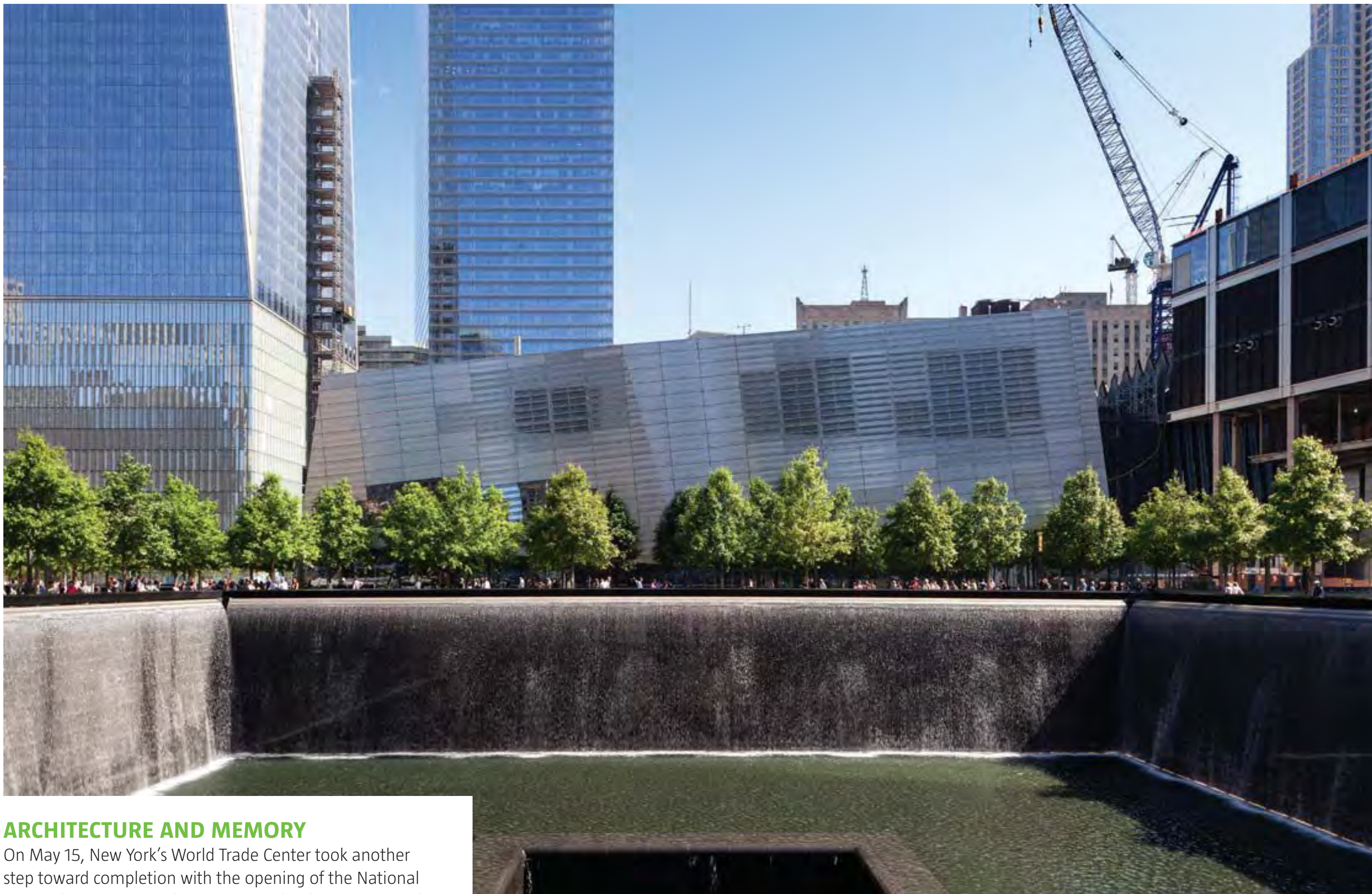
Speck variably spaced his 2x6 western red cedar slats, which come in lengths of 5, 10, and 15 feet. In order to place the boards in the most effective and economical layout, the designers superimposed sun-tracking data onto its 3D building models in Autodesk Revit. By looping simulations of the sun's movement throughout the day and year, the designers added slats accordingly and omitted them in locations where the building self-shades the courtyard. The resulting pattern is intended to look randomized for aesthetic reasons, but is in fact quite purposeful. LOGAN WARD

Shading System Plan View



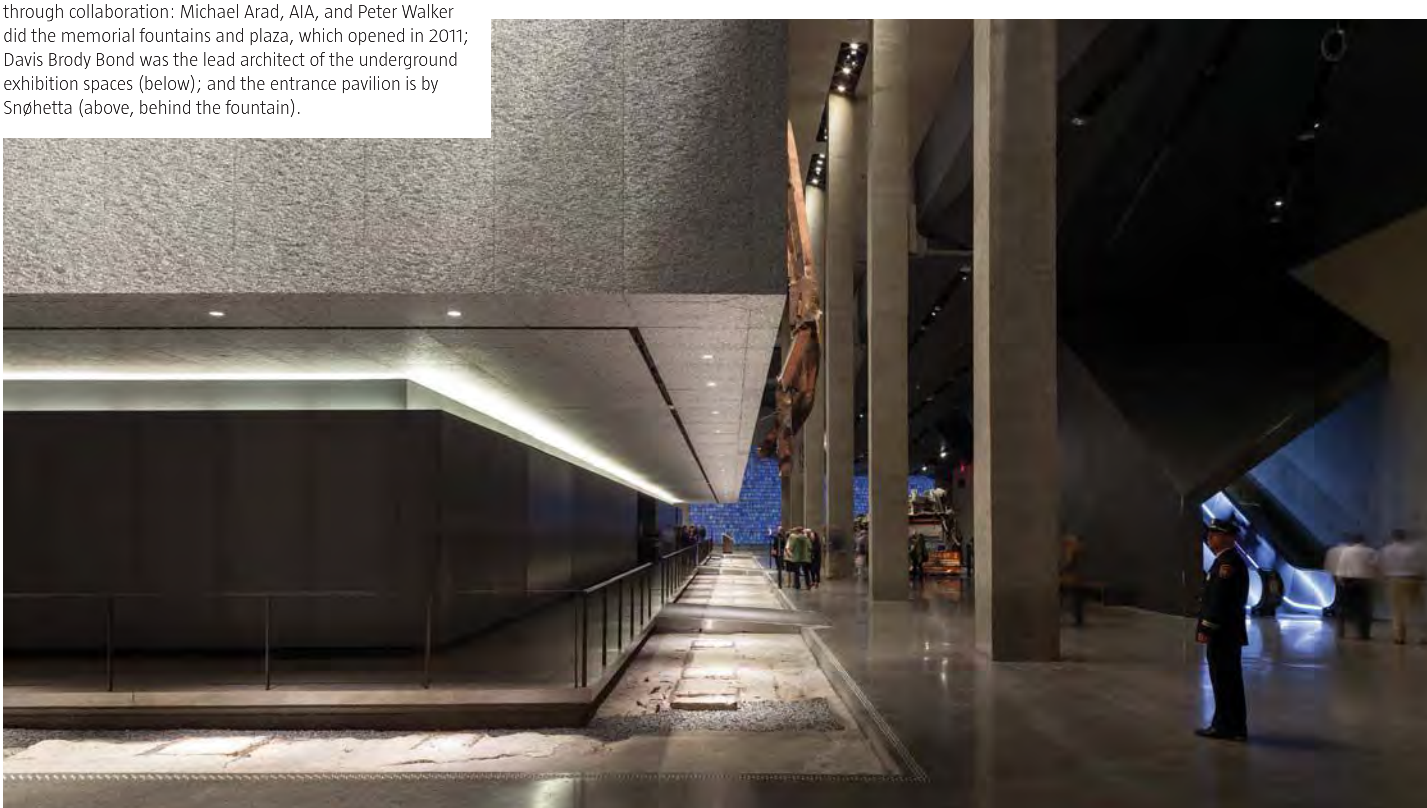
PATRICK COULIE

➔ Learn more about Page Southerland Page's design for this Albuquerque building's cable-suspended shading system at *architectmagazine.com*.
The Detail series of innovative material-assembly solutions is proudly supported by reThink Wood.



ARCHITECTURE AND MEMORY

On May 15, New York's World Trade Center took another step toward completion with the opening of the National September 11 Memorial & Museum. The design emerged through collaboration: Michael Arad, AIA, and Peter Walker did the memorial fountains and plaza, which opened in 2011; Davis Brody Bond was the lead architect of the underground exhibition spaces (below); and the entrance pavilion is by Snøhetta (above, behind the fountain).



FRAN PARENTE


ECHO_01
ECHO_02
ECHO_03
ECHO_04
DELTA_01
01
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06
CALLOUT 2
CALLOUT 3
CALLOUT 4
CALLOUT 1


HOW DOES
GOETTSCH
DESIGN BETTER?
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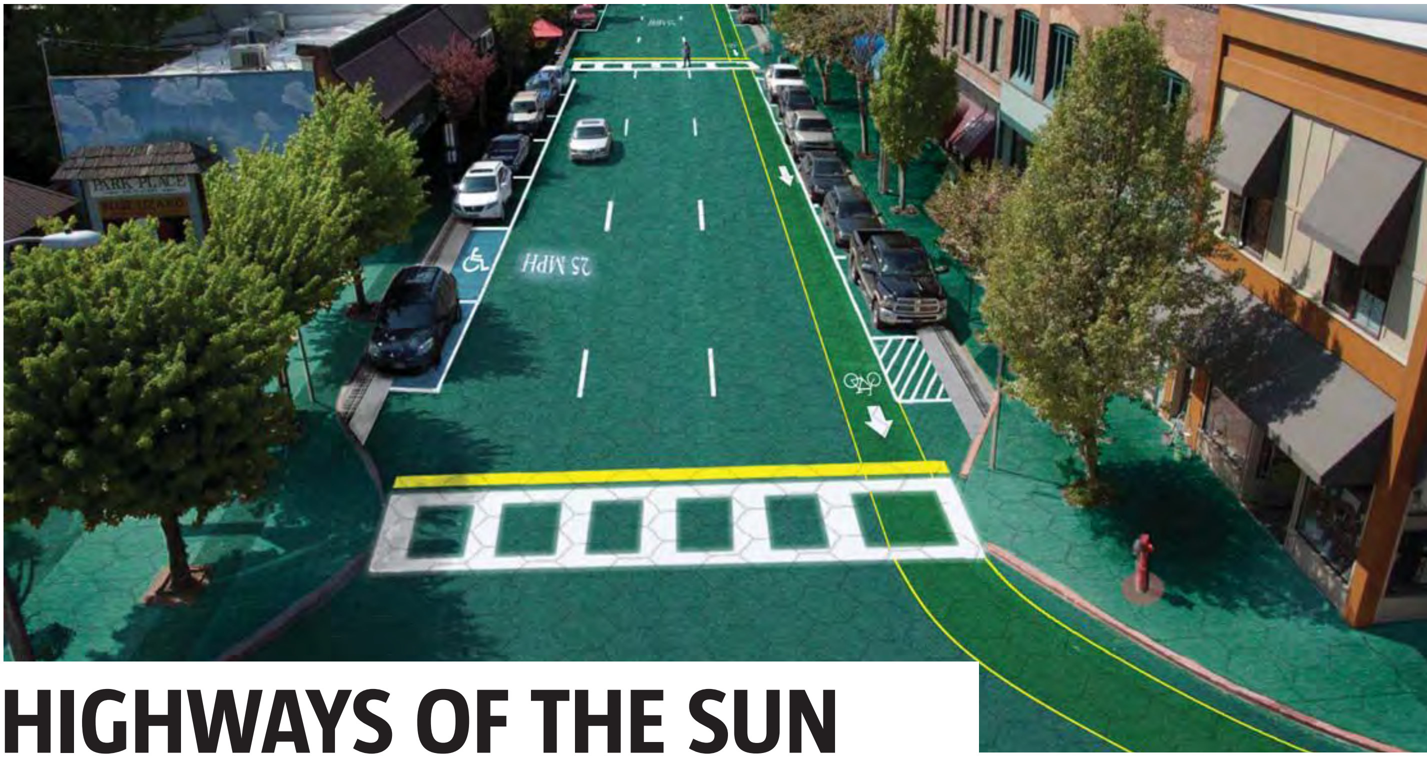


HIGHWAYS OF THE SUN

WITH FUNDING FROM BOTH THE U.S. GOVERNMENT AND MEMBERS OF THE PUBLIC, THESE PAVERS MAY SOON POWER OUR CITIES AND CARS.

SOLAR POWER HAS a math problem. Unlike fossil fuels, which pack a lot of energy into a small volume, solar power relies on each unit of photovoltaic area contributing a relatively small quantity of energy. In terms of building-integrated photovoltaics, groundscrapers—low-slung structures with sprawling roofs—have the advantage. Compact structures fall short on surface area while vertical tower façades contend with incident sun angles.

Given these limitations, Idaho entrepreneurs Julie and Scott Brusaw tapped another built component to harvest solar energy: pavement. To utilize the U.S.'s approximately 27,800 square miles of concrete and asphalt paving, the Brusaws invented Solar Roadways, a multifunctional paving surface that they say can harness up to three times the current U.S. energy demand if used in roadbeds and parking lots.

With funding from the U.S. Federal Highway Administration, the Brusaws have developed two prototypes. The latest iteration consists of interlocking hexagonal pavers made of high-strength, textured glass embedded with photovoltaics, LEDs, and sensors. The infrastructure-integrated photovoltaics can power neighboring homes and businesses while directing some energy to programmable LED lights for lane markers and signage, and to heat for melting snow and ice.

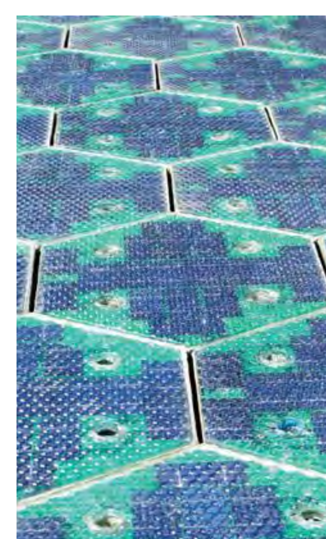
Though the pavers lack batteries to store energy, their nocturnal power demand is offset by their diurnal energy supply to the grid. The Brusaws hope that Solar Roadways will even power electric vehicles via parking lot–based charging stations or direct induction through the road surface.

The next step is full-scale production. In April, the Brusaws launched a crowdfunding campaign on Indiegogo with the goal of raising $1 million to help grow their team and streamline production. As of press time, the project was at $1.5 million and counting.

Mass production will allow the Brusaws to address logistical questions, such as how a system of hexagonal units will conform to curvilinear road geometries; how to stomach the high initial cost and embodied energy of glass paving; and how to maintain safety lighting in the event of an electrical malfunction.

But the Brusaws have thought through many details, including a strategy for incremental implementation. "We'll start off with low-speed, lightweight vehicle applications such as driveways, sidewalks, parking lots, and bike paths," Julie Brusaw says. "Then, we'll move out onto residential roads … . Our final goal will be the fast lane of the highway."

BLAINE BROWNELL, AIA



Top: A rendering of the Solar Roadways pavers installed in Sandpoint, Idaho. **Above:** Detail view of the interlocking glass pavers, which are embedded with photovoltaics.

TOP: SAM CORNETT; BOTTOM: COURTESY SOLAR ROADWAYS

UP AND RUNNING:
DRAFTING YOUR FIRM'S BUSINESS PLAN

$10,000 AND A LAPTOP. That was Katherine Darnstadt, AIA's accidental business plan. Newly licensed, newly pregnant, and newly laid-off at the height of the recession, she found herself with few options but to start her own architecture firm. The circumstances, she admits, were less than ideal.

"When everyone talks about: What was your marketing plan? How much did you have? What was your strategy? There was no strategy," she says. "It was really a Plan B."

Now, four years later, Darnstadt's Plan B has become the four-person Chicago-based firm Latent Design. She is also one of six finalists in the first Architecture Business Plan Competition, which is inspiring firms to think more strategically about their businesses. First prize is $10,000, and the winning firm will be announced at AIA Convention 2014.

For Darnstadt, the competition is less about the prize than the process. "It was a prod and a catalyst to actually make the business plan that I thought we should have had since day one," she says.

And that's the point, according to Matt Ostanik, AIA, the competition's founder. A registered architect who transitioned to developing software for the industry, he's seen firsthand the benefits of having a clear business strategy. After winning a few business plan competitions with his technology company, Ostanik realized that architects were really in need of a plan. "Architects need to be as thoughtful about designing their own business as they are about designing a building," he says. "And yet in a lot of cases how they build their firm is they stumble into it and it just kind of happens without that thoughtful design process."

Though business plan competitions are fairly common in other fields, Ostanik had never seen one for architecture. He ended up getting 134 entries. Winners will be announced June 26. In the meantime, check out these four tips from Ostanik and other industry professionals about drafting a plan of your own. NATE BERG

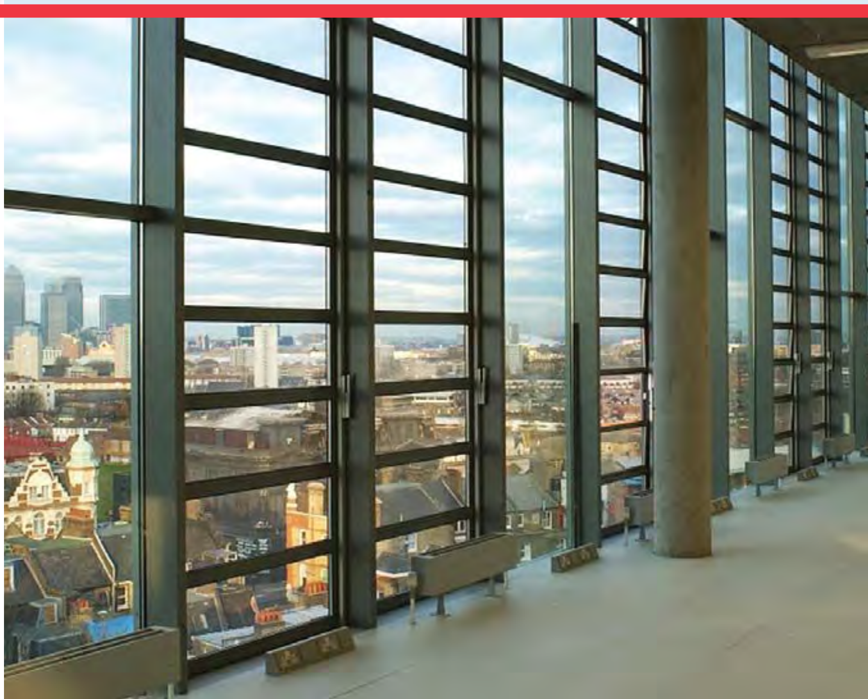
TIP 1: Rena M. Klein, FAIA, an architecture business adviser and principal of RM Klein Consulting, says more architects should be taking the time to write business plans, even very basic ones: "You don't necessarily need a big document that sits in a drawer, but you should be thinking and planning strategically." She says a business plan should be "a vehicle for self-reflection." It can help architects appraise how their firms perform and where they're going.

TIP 2: The best business plans are comprised of just a few simple elements, according Mark R. LePage, AIA, who runs the architecture business advice website Entrepreneur Architect. "The first business plan that I completed was a one-page business plan," he says. "It basically had my vision, my mission, it had goals, and it had actions in order to accomplish those goals. The goals have deadlines and the actions have specifics." He says the one-page approach will help make the process less intimidating, and help set a framework for adding more detail as the business evolves. Today his business plan is about 12 pages.

TIP 3: Ostanik says that a good business plan should cover marketing, acquiring customers, delivering services, financing, targeting a market, and creating a vision for the firm's future. "You have to have a vision for what you want to create and what's driving you to do it, but you also have to have the nuts-and-bolts stuff, to some extent – where to find income and how you're going to execute is very important," Ostanik says. "A good business plan starts with stuff that's in your head, but then it's got to add in those nuts and bolts."

TIP 4: It's a process that shouldn't stop. Ostanik argues that a business plan is out of date as soon as it's written, and should be updated regularly to reflect changes in the market, in the practice, and in the firm's aspirations. It will never be an exact document, but rather a guidebook for how the firm should operate and where it's going. With a good plan, architects can step out into the wilderness of the business world with at least a little confidence. The business plan can be your navigator through unknown territories, even if all you have is a handful of cash and a laptop.

For more Up and Running, a new monthly series on starting your own firm, visit *architectmagazine.com*.

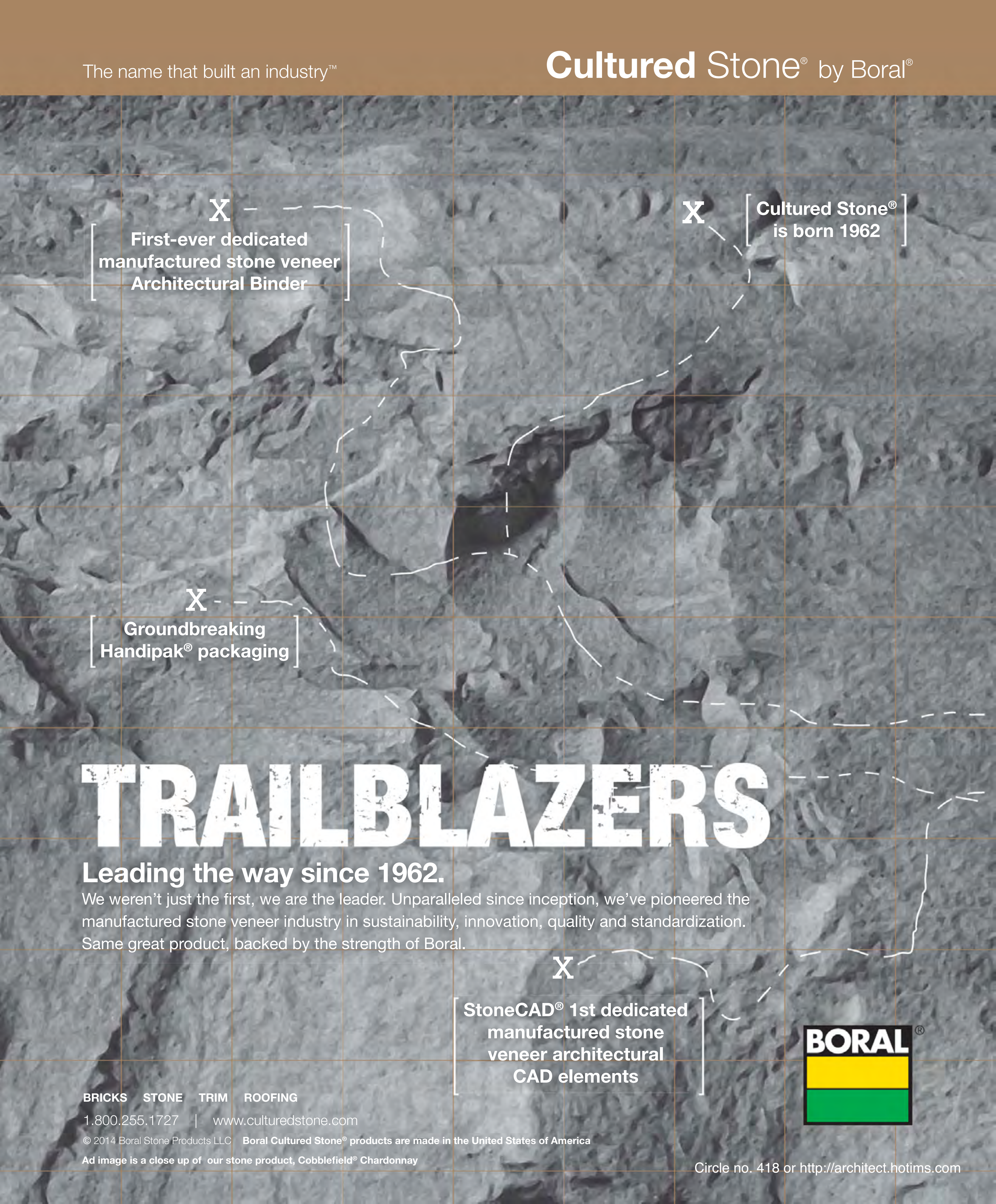


PORTFOLIO:
BRININSTOOL + LYNCH

Office: Chicago
Principals: Brad Lynch, David Brininstool, AIA
No. of Employees: 24
Founded: 1989
Awards: 25 AIA Chicago Design Excellence Awards, four *Residential Architect* Design Awards, two American Architecture Awards
On The Boards: Silo, which adaptively reuses a group of waterfront silos as the base for a 300-unit residential tower in Toronto. The inside of the silos will be retrofitted to include automated, stacked parking, while the landmarked façades remain intact. Estimated completion is 2016.
Notable Work: Claremont House, Chicago (top, completed 2007); R+D 659, Chicago (right, completed 2009); Basecamp, Chicago (below, completed 2010).

Every month we dedicate this space to work that architects have uploaded to our online Project Gallery. Publish yourself at *architectmagazine.com/projects.*

TOP AND BOTTOM LEFT: DARRIS LEE HARRIS; BOTTOM RIGHT: CHRISTOPHER BERRETT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TRIAL BY FIRE

CUSTOM FABRICATION SHOP KREYSLER & ASSOCIATES HAS CREATED AN ULTRA-LIGHTWEIGHT COMPOSITE PANEL THAT CAN WITHSTAND THE HEAT.

DIGITAL FABRICATION has made bespoke finishes a more attainable—and affordable—reality for architects and their clients. Entering the arena of custom cladding options is Fireshield 285, a fiber-reinforced polymer (FRP) panel system developed by Kreysler & Associates, in American Canyon, Calif. As its name suggests, the façade system is fire resistant, passing the rigorous National Fire Protection Association's 285 standard, which tests a wall assembly's fire propagation characteristics by burning it for 30 minutes.

Made from a blend of synthetic resins and natural aggregate, Fireshield 285 enables architects to take the geometric, organic, one-off, or repetitive surfaces that they've lovingly 3D modeled into a producible building component. Kreysler can also manufacture the panels to butt together and create seamless contours and patterns.

The panels will make their public debut at the San Francisco Museum of Modern Art expansion, which is anticipated to open in early 2016. Designed by New York– and Oslo, Norway–based Snøhetta in collaboration with San Francisco's EHDD, the 235,000-square-foot project will feature a 10-story wall of white Fireshield 285 panels curved to emulate the ripples of the San Francisco Bay.

With a 3/16-inch-thick skin, the 700 panels average 5 pounds per square foot and come as large as 5 feet 6 inches by 30 feet. A panel of that magnitude clocks in at 825 pounds, which is still light enough to fasten to a unitized wall system without an intermediate support frame, saving tons of steel. WANDA LAU

STOP BY BOOTH 1907 AT THE AIA 2014 EXPO, IN CHICAGO, WHERE KREYSLER & ASSOCIATES WILL DISPLAY A 3-FOOT-BY-30-FOOT FIRESHIELD 285 PANEL.

A worker at Kreysler & Associate's shop, in the San Francisco Bay Area, finishes a Fireshield 285 panel, which will be installed at the San Francisco Museum of Modern Art.

JUSTIN FANTL

April 2014

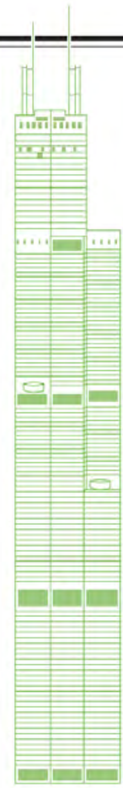
Architecture Billings Index
49.6
↑ 0.8 pt

Institutional
47.1
↓ 1.2 pts

Mixed Practice
50.7
↑ 1.8 pts

Commercial
50.2
↓ 0.3 pt

Multifamily Residential
52.6
↓ 0.1 pt



SKYFALL

Last month, glaziers had to replace a protective layer on one of the see-through platforms at Chicago's Willis Tower after it cracked. The four glass Ledge platforms, designed by Skidmore, Owings & Merrill (SOM) and completed in 2009, extend 4.3 feet off the 103rd floor of the tower, which was also designed by SOM more than 40 years earlier. The Ledge was designed to hold upwards of 10,000 pounds, but isn't a monolithic construction. It incorporates something that engineer Terry McDonnell told *Fast Company* is called "a sacrificial piece of quarter inch glass," and is designed to be replaced when it gets too dinged up.

CONTINUING EDUCATION

HOT UNITS

BREAKTHROUGH DECKING: LATEST DEVELOPMENTS IN WOOD-ALTERNATIVES

This Trex-sponsored course walks through the history of natural and manmade decking materials. *(1 AIA)*

THE FUTURE OF DESIGNING (WITH) WATER

Tackle our aging water infrastructure with sound practices in this Bluworld and Bradley course. *(1 AIA/HSW)*

LASER SCANNING APPLICATIONS FOR ARCHITECTURE

Document non-rectilinear and historic buildings with digital technology in this Faro-sponsored course. *(1 AIA)*

ADP NATIONAL JOB GROWTH IN THOUSANDS

STEP UP

Brooke Hodge
Deputy director
Smithsonian's Cooper-Hewitt, National Design Museum

Hodge comes to New York from Los Angeles, where she most recently was the director of exhibitions and publications at the Hammer Museum. She is currently organizing an exhibition on the work of Thomas Heatherwick.

David Hart, AIA
President
Steinberg

Jeff Saad, AIA
Associate principal and senior project architect
Perkins+Will, Chicago

Ann Dilcher, AIA
Principal
Quinn Evans Architects

Rodolphe el-Khoury
Dean, School of Architecture
University of Miami

Elizabeth Meyer
Dean, School of Architecture
University of Virginia

Anita Makwana
Director, interior architecture and design
Ware Malcomb

Jennifer Stone, AIA, and Chen-Huan Liao, AIA
Associate partners
Robert A.M. Stern Architects

Now Open: Summer Sightseeing for Architects

Rockford, Ill.
Laurent House, Frank Lloyd Wright

Chicago
Emil Bach House, Frank Lloyd Wright

Jasper National Park, Alberta
Glacier Skywalk, Sturgess Architecture

Healdsburg, Calif.
Shed store and café, Jensen Architects

New York
National September 11 Memorial Museum and Pavilion, Snøhetta and Davis Brody Bond

Glen Jean, W.Va.
Sustainability Treehouse, Mithun and BNIM

Yellowstone National Park, Wyo.
Old Faithful Haynes Photo Shop, CTA Architects Engineers

Mexico City
Cineteca Nacional Siglo XXI, Rojkind Arquitectos

STEP DOWN

Mona Lemoine
Vice president, education and events
International Living Future Institute

Don Gatzke, AIA
Dean, School of Architecture
University of Texas at Arlington

Geoff Manaugh
Editor in chief
Gizmodo

Nine months after joining the tech site, Manaugh is out. Gawker Media Group editorial director Joel Johnson said that Manaugh "did not integrate well" with the company. Manaugh is moving on to a book and continuing work on his popular BLDGBLOG.

April Jobs Report

New construction jobs reported by the U.S. Department of Labor's Bureau of Labor Statistics

13,100 Residential Construction + 10,500 Heavy and Civil Engineering + 8,100 Nonresidential Construction + 3,800 Architectural and Engineering Services = **35,500** Total Construction Jobs Added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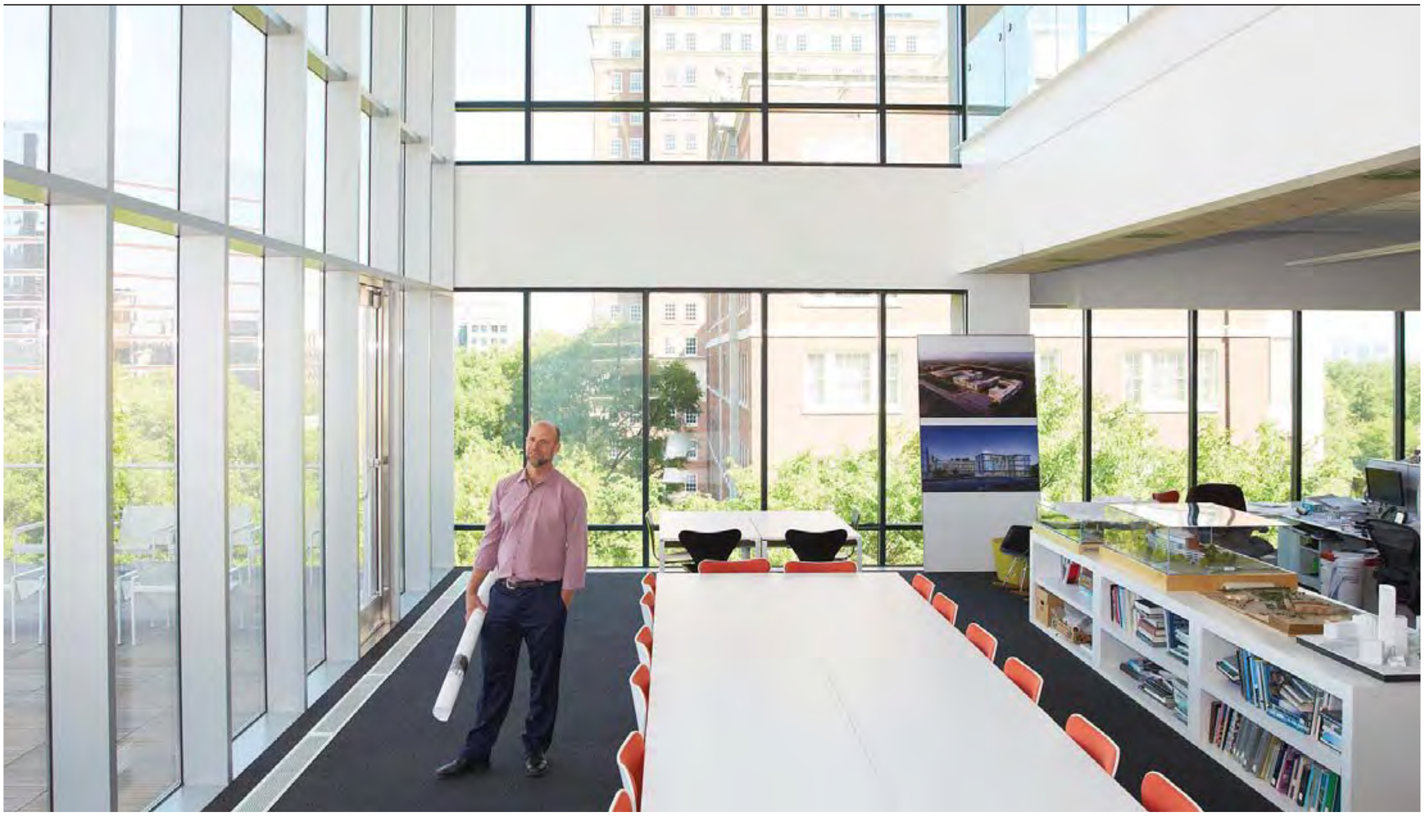


PHOTO: DANA HOFF

AIAVOICES

THE TECHNOLOGIST | APPLIED RESEARCH AND DESIGN OUTREACH

In January, Perkins+Will named John Haymaker, AIA, as firmwide director of research, overseeing the firm's Innovation Incubator and practice-based research centers for 24 offices worldwide. Haymaker also oversees Perkins+Will's nonprofit AREA Research, which draws together data and researchers in topics like health, energy, process, and resiliency that impact the design and operation of the education, workplace, healthcare, and urban built environments. A self-described technologist, Haymaker is also an assistant professor at the Georgia Institute of Technology and holds a Ph.D. in civil and environmental engineering from Stanford University.

I'M A TOOL BUILDER IN THE INTERDISCIPLINARY SPACE OF architecture, engineering, and computation, and I see research and design as information-processing activities. I also see we are at a point in history where, if we are to build smartly and sustainably, we need to gather the right information and process it in the right way to get the right results. This may sound simplistic, but it's actually incredibly hard. Architects are known for coming up with great ideas, synthesizing information, and devising wonderful solutions. But they're not always very good at doing that in a systematic and repeatable way, so that learning can be shared and best practices disseminated.

Design research is a multi-threaded and cyclical process. It's about generating data and tools that help you do your job better. There's also a social aspect to adopting new processes, and to figuring out how they might change practice. My students are particularly valuable to my work because they are closer to the forces of new technology. I'm fortunate that what I do at Perkins+Will informs my teaching at Georgia Tech and vice versa: My students teach me new things all the time that I can apply in my industry work, as I prepare them to do this work.

The principals at Perkins+Will have established the company's research focus to define and solve our emerging problems. There's a business side to this emphasis, too: We're not the only firm to realize that our product is applied knowledge. Yet there's a social imperative side as well: to make the world a better place. This is why we all became architects. Applied research in the built environment is imperative if we are to resiliently face the impacts of climate, social, and technical change.

I call myself a technologist because I believe new tools, methods, and approaches can improve the way we communicate. For me, technology can equal progress and architecture is undergoing a big shift these days.

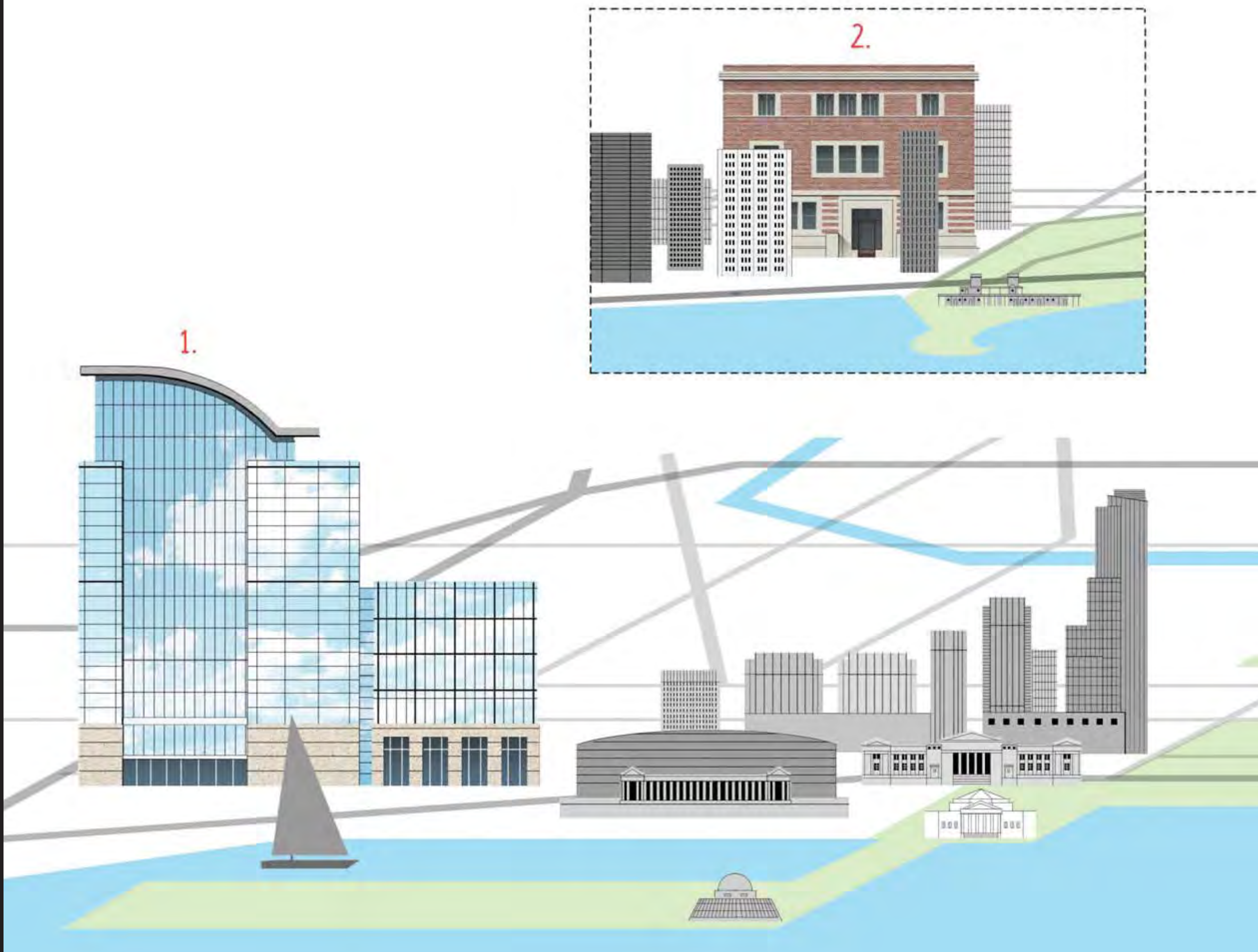
People might assume, given my background and interests, that I want to do away with the aesthetics of architecture. No, I just want to shift the identity of the architect from being a master builder to a master organizer of systems. Massive organization—and reorganization—is what the architecture field needs today.

—As told to William Richards AIA

AIANOW

ACROSS CHICAGO

By William Richards
Illustration by Michael Kirkham



1 *For AIA Conventioneers.* McCormick Place is the largest convention center in North America. It's also one of the most epic sagas in convention history. Chicago's Alfred Shaw designed the first McCormick Place, completed in 1960 but conceived as early as the 1920s. Seven years later, it was a smoldering husk, ignited by some flammable expo swag (even in spite of its so-called fireproof steel-and-concrete shell). Chicago's Gene Summers (a former Mies employee) designed its replacement in 1971. The North Building (1986) and the South Building (1997) more than doubled McCormick Place's footprint—and propelled it past New York City's Javits Center for largest in the nation. Finally, tvsdesign's 2007 West Building boosted it to its final size. And, you thought this was just another convention center.

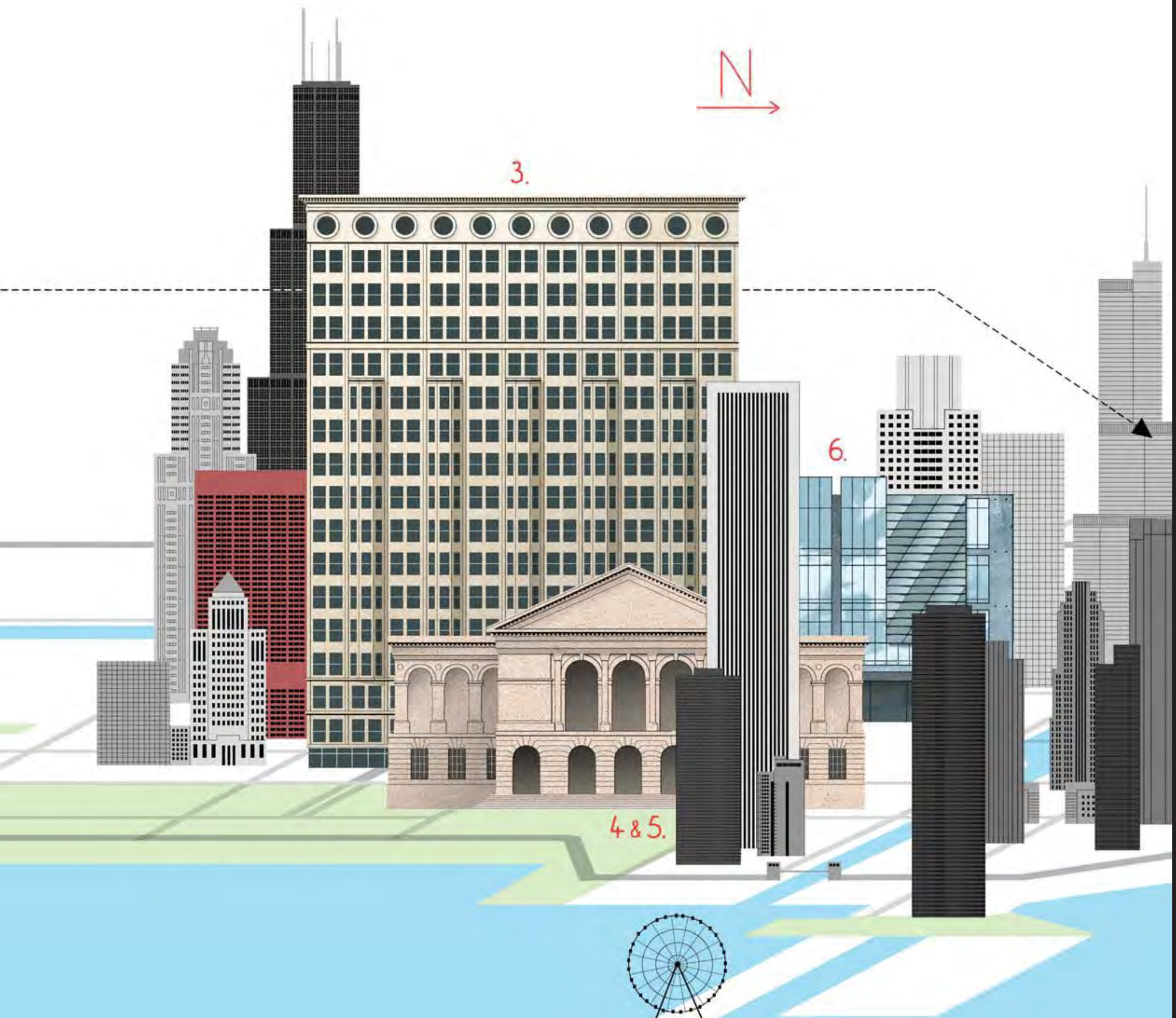
↗ Learn more at *convention.aia.org.*

2 *Loose Change.* In 1992, about when computer-aided design changed the way architects talked about architecture, Sylvia Lavin published *Quatremère de Quincy and the Invention of a Modern Language of Architecture* (MIT Press). For some, it begged the question "Quatremère who?" For others, Lavin's timing seemed shrewd: Antoine-Chrysostome Quatremère de Quincy chronicled the French Revolution's republican ideals and changed the way architects understood Classical forms—not as a fixed design language but as an adaptable framework imbued with what Lavin called a "social contract." Lavin's most recent project, "Everything Loose Will Land" (at the Graham Foundation May 1–July 26), looks at another language shift in 1970s Los Angeles, blurring boundaries between art and architecture.

↗ Learn more at *grahamfoundation.org.*

3 *In the Loop.* In a Jan. 12, 1974, memo regarding a possible coalition, Chicago architect Gertrude Lempp Kerbis, FAIA, invited other area women to her office to "come and meet other female architects." Out of that evening, Kerbis and seven others founded Chicago Women in Architecture (CWA), a nonprofit dedicated to raising the visibility of and advocating on behalf of women in design—through scholarships, a job network, events, and opportunities. CWA celebrates 40 years with an exhibit opening this month at the Chicago Architecture Foundation at 224 S. Michigan Ave.

↗ Learn more at *architecture.org* and *cwarch.org.*



4 ***Chicagoisms.*** Suffix-addicts who are fond of dropping *–ism* like hot Chicago pierogi are really trying to help the rest of us. When describing a style or an attitude or a design movement like Classicism, Modernism, or (pitiably) Parametricism, invoking *–ism* simplifies things. Architectural theorist Alexander Eisenschmidt, art historian Jonathan Mekinda, and designer Matt Wizinsky have a new one for you: Chicagoisms. An exhibition of the same name at the Art Institute of Chicago outlines five key principles that define the city, its evolution, and where it may be headed. "Chicagoisms," April 5–Jan. 4, 2015, features custom architectural models by MVRDV, Dogma, and UrbanLab.

↗ Learn more at *artic.edu.*

5 ***Scalables.*** The Art Institute of Chicago's exhibition "Architecture To Scale" juxtaposes the work of two groundbreaking architects—scale models by Stanley Tigerman, FAIA, and a series of films called "XYT: Detroit Streets," by Andrew Zago. You may see the preciousness of models against the backdrop of an 80-foot video wall as a synecdoche for the urban experience—perfect little buildings that stand in for the idea of the city. Or you may see the moving images from Detroit and static models from Chicago as the perfect art-world juxtaposition that confounds and engages. Either way, when you walk back out onto Michigan Avenue, you'll see the city a little differently.

↗ Learn more at *artic.edu.*

6 ***Pop Smarts.*** From livestock or grain arriving at Union Stock Yards to the deep dish pizza arriving at your table, Chicago has always been a nexus for food. It's no surprise, then, that the eight-fold resurgence of American farmers markets over the last decade has been strongly felt in the Chicago metro area. It's also no surprise that the AIA Small Project Practitioners (SPP) would launch an ideas competition to design and build a better farmers market pop-up canopy. Entrants took up lightness, portability, durability, and appeal in their proposals, and winners are on display at the SPP Pop-Up Space at 29 W. Randolph St., June 23–30.

↗ Learn more at *aia.org/spp.*

Center of Gravity

EMERGING ARCHITECTS IN CHICAGO

ON THE DAY IN 2008 THAT SHARON SAMUELS, AIA, WAS LAID OFF from her big-firm job in Chicago, she wasn't sure what her next step would be. Firms were making staff cuts all over town. The bad news came on a Monday, and Samuels dutifully sent out the standard message to all of her contacts, with all of the usual transition details.

Five days later, that message paid off in an unexpected way: A contact had passed her name along to somebody who was embarking on a small retail build-out, and by the end of Friday Samuels had launched her own firm, SolQuest Design Unlimited, to handle that project and the succession of jobs that followed.

Almost six years later, Samuels's workload has been steady with design projects and LEED certification consulting. None of it has been gift-wrapped—she's worked hard, plied connections, and promoted SolQuest on a daily basis—but Samuels says Chicago has been a receptive, supportive market to be in during the down years.

"In entertainment, if you can make it in New York you can make it anywhere," Samuels recently told several groups of young architects. "And in architecture, if you can make it in Chicago you can make it anywhere."

LEFT TO RIGHT: SHARON SAMUELS, AIA, MATTHEW DUMICH, AIA, AND JINHWA PARADOWICZ, AIA.

Last In, First Out—But Where?

With nationwide economic recovery sputtering along, making it in Chicago is becoming a little easier. In mid-2008, there were about 9,800 architects in the 13-county metro region, according to *Crain's Chicago Business*, and—like Samuels—some of them were out of work by year's end. Three years later, the number of architects in Chicago reached a post-crash low of about 6,600. That figure has improved since 2011, if slightly, and there are now almost 7,200 architects employed there.

Crain's is also reporting that construction firms signed $8.5 billion in development deals in the Chicago area, an increase of more than 16.5 percent from the prior year's $7.09 billion tallied by McGraw-Hill Construction—making it the third year of growth in a row.

JinHwa "Gina" Paradowicz, AIA, welcomes the news of expanding hiring as a sign that younger architects will again see Chicago as the place of opportunity that it was for her a decade ago. The downturn, she says, "put a lot of burden on young architects."

Paradowicz, a senior associate at Perkins Eastman, points to the last-in/first-out effect when times are lean. Senior architects dug in and held on, forcing a lot of younger architects to the curb, back to school, or into other creative fields for what she calls "the dark years."

Another effect? Many aspiring architects—on the cusp of graduation—extended their stay in school, either by re-enrolling in a higher degree program or teaching studio courses. "Opportunities are opening up again," says Matthew Dumich, AIA, a senior architect and project manager at Adrian Smith + Gordon Gill Architecture, the Chicago firm that designed the Kingdom Tower—which will be the world's tallest building, now under construction in Jeddah, Saudi Arabia—and has an outsized portfolio of other projects going up around the world.

"In the last six months, you've seen quite a lot of people make moves who had been stuck in a situation for five years," Dumich says. "There was nowhere to go for a long time, but now there's competition for really good, experienced people."

Dumich, who worked for a few years in Milwaukee before moving to the Chicago firm DeStefano and Partners in 2004 and joining Valerio Dewalt Train in 2006, believes that in Chicago sharp young architects don't only find work, they find challenging and substantive work. His own experience bears out that trajectory: Adrian Smith + Gordon Gill has him traveling regularly to Kazakhstan, where the firm is designing the vast Astana Expo 2017, a world's fair themed on"Future Energy." That's three more years of billable hours for Adrian Smith + Gordon Gill and three more years of rewarding work for Dumich.

"It's an incredible project, with very ambitious sustainability goals, and it meant a career jump for me and we're having fun," says Dumich. But he's quick to point out that he's not the only young Chicago architect experiencing this level of excitement: "This community of architects is very accessible," he says. Recently, an architect who's just starting out told Dumich in a mentoring session that she was given a major piece of a project to design and resolve on her own.

LOCATION: SPERTUS INSTITUTE FOR JEWISH LEARNING AND LEADERSHIP. © CARL BOWER.

"It's truly collaborative at our firm, with more of a studio culture than any firm I know. Everyone contributes to the conversation, not just the guys whose names are on the door," says Dumich, who sees opportunities for himself and his younger colleagues to connect, particularly through AIA Chicago's Young Architects Forum and Bridge, a leadership and mentorship program he co-founded in 2009. During the down years, he jokes, the Young Architects Forum became "a place to commiserate," but now news of job opportunities percolates through its events again.

Samuels suggests that the global economic recovery will provide a specific kind of relief to younger and smaller Chicago firms like hers. For several years, she says, the competition for relatively modest local projects sometimes took on a David-vs.-Goliath nature because the giant firms whose international work had slowed down were showing up to present for jobs in town that they would have ignored during the boom years.

"Firms that you never would have thought before cared about projects like a small school in Chicago were turning out full-force," she says. As their major-project work revs up, she believes, those firms will step out of the smaller ring again, easing up the competitive pressure that smaller practices felt.

On a practical level, Chicago supports young architects simply by being a more affordable place to live than other U.S. architecture centers such as New York and San Francisco, where salaries are a bit higher than other parts of the country but the cost of living is a lot more. "Living here, you feel like you can actually have a balance of life because of the cost of living," Paradowicz says. Dumich agrees. He and his wife, who is also a designer, can afford to live in one of the city's most desirable neighborhoods without being stretched financially.

Economics aside, the culture of Chicago is highly supportive of architects and the work that they do—it's practically part of the city's DNA. Many Chicagoans who aren't related to the profession will happily tell visitors that the city is an "open-air museum of American architecture." Because of Chicago's rich history of design innovation in the 19th and early 20th centuries, plus its deep inventory of mid-20th century modern buildings, the average citizen there seems to have a greater awareness of architecture as a profession, according to both Paradowicz and Dumich.

They add that taxi drivers identifying landmarks by the names of their architects makes it feel like an industry town. "People feel a strong connection to the architectural heritage," Paradowicz says. "The city respects it, and people are proud of what architects like Ludwig Mies van der Rohe and Daniel Burnham did here."

Speaking in his office in Chicago's downtown Loop, Dumich observes that "there are, like, 2,000 architects sitting within a half a mile of me. There's a great synergy that makes you feel lucky to be an architect in Chicago." *—Dennis Rodkin* AIA

Dennis Rodkin is a writer and former editor of Chicago Architect, *published by AIA Chicago.*

AIAKNOWLEDGE

WHAT'S PAST IS PROLOGUE | CHICAGO'S FIRST TIME AT THE FAIR

PHOTO: LIBRARY OF CONGRESS PRINTS AND PHOTOGRAPHS DIVISION (LC-USZ62-128873)

WORLD'S FAIRS WERE BIG BUSINESS IN THE U.S. FROM THE late 19th century into the 20th century. They offered the host city prestige, an influx of commercial activity over an extended period of time, and some lasting pieces of architecture, landscape architecture, and infrastructure.

The World's Columbian Exposition (aka Chicago World's Fair) transformed Chicago's lakefront for six months in 1893 and welcomed 27 million Americans and foreign nationals—the equivalent of a quarter of the U.S. population at the time. Some political scientists have pointed to this moment as the birth of American Exceptionalism. Some popular historians, no more modestly, have called it the birth of the "the American century."

Architectural historians generally accept those arguments in their narrative of fin de siècle America. Within their purview, the Chicago World's Fair codified Beaux-Arts Neo-Classical architecture and city planning for at least three generations of architects. The so-called City Beautiful Movement evolved in other cities, certainly, but its most famous expression centers on Chicago's rebirth after the Great Fire of 1871.

On the surface, the fair celebrated Christopher Columbus's arrival in North America in 1492. Across 600 acres, the buildings and sculptures of the White City—in some cases, only nominally—referenced the Genoese explorer. Like other nationalist expressions, however, the past was referenced as prologue. The European "discovery" of a new world served as a pretext to this far better, fully modern one. Burnham and Root principal Daniel Burnham (of "Make no little plans" fame) organized a cadre of architects to design exhibit houses under the umbrella of science, industry, and art—that perfect Gilded Age triad that drew together new taxonomies, steely mechanization, and everyday craft-ways and culture.

Fairgoers reveled in performances by a young Scott Joplin and live electricity demonstrations by Nikola Tesla. They also perceived Burnham's overall architectural logic for the fair, which unified the messy and seemingly random demonstrations of science, industry, and art: Classical proportions for all the major fair buildings, sheathed in plaster of Paris and painted chalk white.

And it truly appeared as a White City: Richard Morris Hunt's central Administration Building; McKim, Mead & White's

Above: View of the 1893 World's Columbian Exposition looking south along Lake Michigan in what's now Chicago's Jackson Park. Twenty-seven million people visited the fair, a number equivalent to one quarter of the U.S. population at the time.

Agriculture Building; Van Brunt & Howe's Electricity Building; Henry Ives Cobb's Fisheries Building; Peabody & Stearns's Machinery Hall; Solon Beman's Mines and Mining Building—all conformed to the fair's stylistic palette, as did sculptures by Augustus Saint-Gaudens, Frederick MacMonnies, and Daniel Chester French.

But it wasn't all aesthetic jingoism.

Among the big architect-driven buildings within the main fairgrounds, Adler & Sullivan's infamous Transportation Building broke from its neighbors with brown, coral, emerald, and maroon tones in a form that was part Moorish souk and part industrial shed. The World's Columbian Exposition also hosted 46 nations, and fairgoers visited a full-scale Ho-o-Den Temple replica constructed by Japanese craftsmen, a 22,000-pound "monster cheese" shipped by barge from Canada, and what Louis Sullivan called an "Egyptoid" cigarette booth set up by a Cairo merchant. Fairgoers found an even greater contrast to the sanctioned sectors of culture and industry in the Midway Plaisance, with woolly and exotic sights like belly dancers, fire-breathers, and the original Ferris wheel.

Physically, the fair lives on as a pair of ghost footprints in Frederick Law Olmsted and Burnham's master plans for both Jackson Park and the Midway. Symbolically, the fair lives on as one of the four stars of the Chicago municipal flag (the other three symbolizing the Great Fire of 1871, Fort Dearborn, and the 1933–34 Century of Progress Exposition).

Architecturally, on the other hand, not much survives besides Charles Atwood's Palace of Fine Arts and Shepley, Rutan and Coolidge's World's Congress Auxiliary Building (now the Art Institute of Chicago).

Then again, not much was supposed to have survived—plaster and stucco fairs like that were meant to come and go. Instead, organizers in the early 1890s had other goals in mind: Give 27 million attendees an experience and move Chicago out onto a world stage—where it remains today when 30,000 AIA National Convention attendees converge on the Windy City. —*William Richards*

AIAPERSPECTIVE

CONTRIBUTING STRUCTURES

PHOTO: WILLIAM STEWART

THERE ARE MANY REASONS TO ATTEND THE 2014 AIA NATIONAL Convention—and I could go on for a while, based on my own attendance history, about inspiring keynote speakers, world-class educational opportunities, and meeting those on the cutting edge of building materials and products.

Of course, I always learn a lot about the host city itself—and in the case of Chicago, there's always something new to discover.

"Talking amongst ourselves brings oxygen to the blood of our work, but finding opportunities to talk to others outside of architecture gives our work purpose and context."

Above all, though, the core value of the convention is the opportunity for fellowship with my colleagues. Chance encounters in the hall, tea with a long-time friend, serving on a panel with other small-business owners, or even sharing the main stage with remarkable architects—communion and communication matter more to me than any other aspects of a convention.

Here's the hinge of my argument, though:

Talking amongst ourselves brings oxygen to the blood of our work, but finding opportunities to talk to others outside of architecture gives our work purpose and context.

To be truly useful, communication must be more than what we want to say (or give) in terms of expertise and experience; there must be an eagerness to receive. We must listen. And, not only listen to members of the public already actively interested in architecture, but to seldom-served constituencies who must have a voice in shaping their own environments: residents of low-income housing, individuals who are in prison, patients in hospitals, the elderly in nursing homes, and children in school.

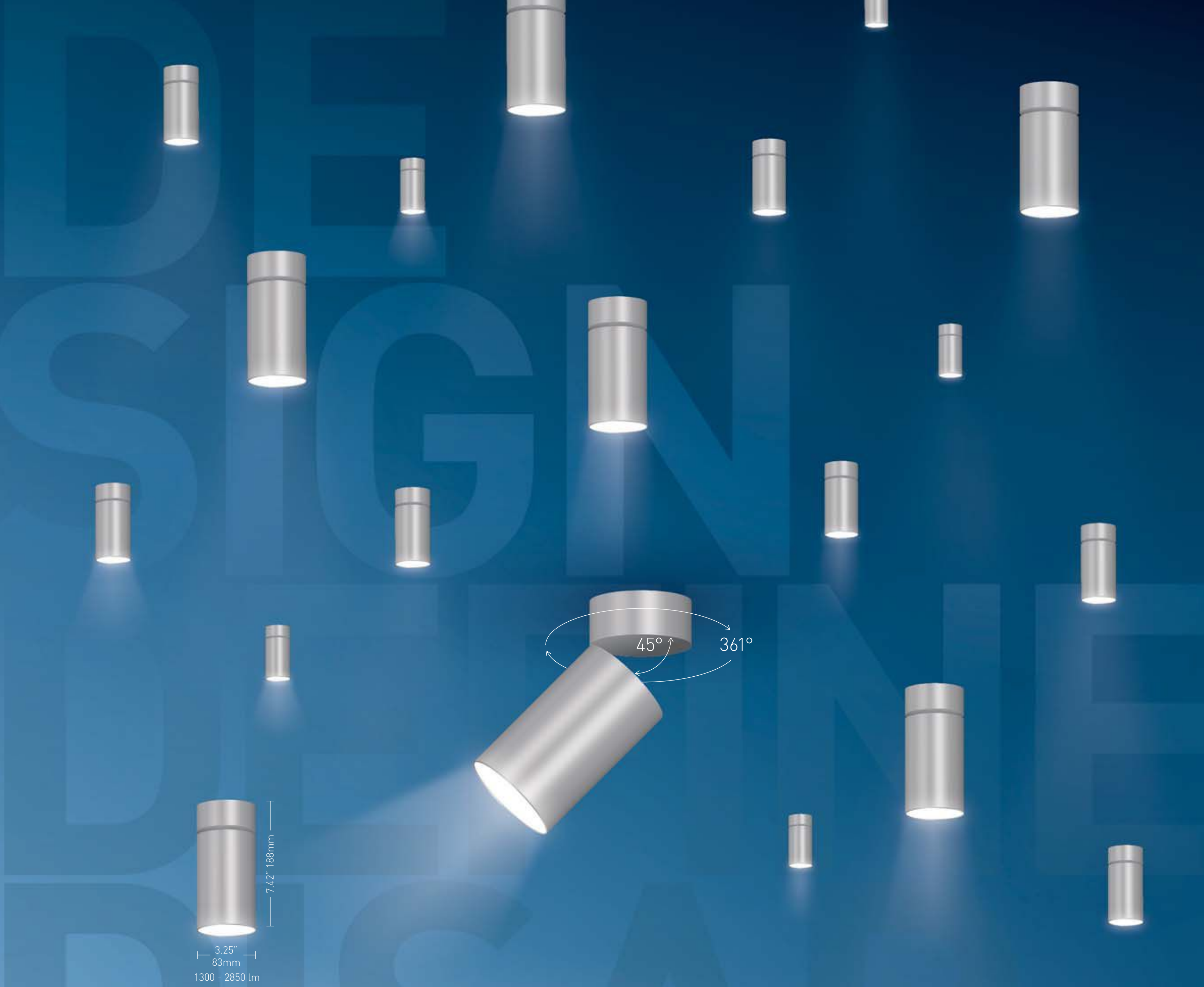
People will engage when they believe they have something to contribute that others will find meaningful. Instead of initiating a conversation with the implicit assumption that we architects have all the answers, imagine the possibilities when all the parties touched by architecture (and that means everyone!) are open to developing a shared agenda, one that's long-term in its possibilities and implications.

Such engagement marks a healthy partnership.

Far different from the speed-dating approach of many so-called "outreach" initiatives, these partnerships are like a marriage: They are evidence of a long-term commitment in which the parties are, in a fundamental sense, considered equal and are respected for the unique assets each brings to the relationship.

Developing an understanding of the power of architecture to transform lives is too big of a challenge and too important to leave to media celebrities and a few notable experts. It's a joint endeavor in which architects and the public connect in a constructive conversation that grows more vibrant over time. AIA

Helene Combs Dreiling, FAIA
2014 President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Intense Lighting Presents:

CHALLENGES WITH LED CONTROLLABILITY AND CHANGING ENERGY CODES

LEDs are used in a wide range of applications, from residential to hospitality, retail, healthcare, theater, churches, and museums.
Photo Credit: Peter Lik Gallery

LEARNING OBJECTIVES

After reading this article you will be able to:

1. Describe the various types and functions of LED lighting in architectural spaces.
2. Discuss challenges of dimming of LEDs, as well as compatibility issues that may arise.
3. Identify the types of lighting controls that can be used in conjunction with LED products.
4. Explain current regulations and compliance issues that apply to LED lighting.

CONTINUING EDUCATION

CREDIT: 1 LU

COURSE NUMBER: ARjune2014.1

Use the learning objectives above to focus your study as you read this article.

Visit http://go.hw.net/AR1013Course1 to read more and complete the quiz for credit.

By Paige Lozier

Learning Objective One—Describe the various types and functions of LED lighting in architectural spaces.

INTRODUCTION TO LEDS AND CONTROLS

An LED, or light emitting diode, is a type of solid-state lighting (SSL) that uses a semiconductor device to convert electrical energy directly into light when an electrical current passes through it. LEDs can have either constant current or constant voltage drivers. Also, there are different ways to dim LEDs which is dependent on the LED driver. These drivers can utilize a variety of dimming methods including forward phase dimming, 0–10V dimming, the DALI protocol and others.

ADVANTAGES OF LEDS

From residential to hospitality, retail, health-care, theater and churches, LEDs are used in a wide range of applications. Their unique characteristics include compact size, ease of maintenance, and highly directional light output, which results in much less wasted light trapped in the fixture.

Other advantages of LEDs are their high efficacy, as the fixtures can achieve up to 100 lumens per watt, as compared to incandescent lamps that only output 10 to 17 lumens per watt. And, their efficacy is not affected by the shape and size of the lamps, unlike fluorescent bulbs or tubes. They also have greater longevity with a useful life of 25,000 to over 100, 000 hours, as opposed to incandescent lamps that have a useful life between 750 and 2,500 hours and fluorescent tubes which are typically rated at about 10,000 to 15,000 hours. LEDs are ideal for uses subject to frequent on-off cycling, unlike fluorescent lamps that fail faster when cycled often, or HID lamps that require a long time before restarting. Finally, LEDs are resistant to breakage, unlike fragile fluorescent and incandescent bulbs.

LEDs are also environmentally friendly, as they contain no hazardous materials such as the mercury vapor used in CFLs. Today's LED bulbs can be six to seven times more energy efficient than conventional incandescent lights and cut energy use by more than 80 percent. In 2012, approximately 49 million LEDs were installed in the U.S., saving about $675 million in annual energy costs.

Switching entirely to LED lights over the next two decades could save the U.S. $250 billion in energy costs, reduce electricity consumption for lighting by nearly 50 percent and avoid 1,800 million metric tons of carbon emissions.

LEDs have highly directional light output, which results in much less wasted light trapped in the fixture. Photo Credit: Intense Lighting

CHALLENGES OF LEDS

LED lighting is certainly gaining in popularity but there are still some limitations of LEDs, including their higher cost, limited applications and controls compatibility. LEDs for general illumination are high brightness if not properly shielded and are relatively expensive compared to other lighting options. Also, they require electronic drivers to convert AC to discrete DC, which also increases the cost. LEDs have limited application because no style is universally accepted and LED fixtures are not available for every application. Finally, there can be controls compatibility issues because not all fixtures are dimmable and the ones that are may have limited performance. Most of these issues can be easily overcome by qualified manufacturers, but part of the problem is that there are few who truly know the issues at play.

The benefits of dimming are enhanced ambience, improved safety, space flexibility and increased productivity due to increased visual task performance and task tuning. Photo Credit: Natural History Museum, Los Angeles

This controls and dimming issue is important because dimming LEDs saves energy. At 50% dimming there is a 50% energy savings, which is an added savings to an already efficient source. Also, dimming lowers the operating temperatures, which extends the life of components such as the electronics and phosphor. This can provide double or triple lumen maintenance, which is the luminous flux at a given time in the life of an LED. It is the only technology that has the potential to become more efficient as it is dimmed.

The general benefits of dimming are enhanced ambience, improved safety, space flexibility and increased productivity due to increased visual task performance and task tuning. We will delve into dimming more deeply in a bit.

WHAT ARE THEIR TYPES?

There are two different types of LED products; LED retrofit lamps and LED fixtures. LED lamps are designed to replace standard incandescent, linear fluorescent, or screw-in CFL lamps and have Edison base sockets. They have integral drivers, which determine dimming performance, if the lamp is dimmable. This often causes issues with glare and in-rush current. In-rush current is a very brief current spike in an LED lamp that happens twice per cycle. This brief spike in current will affect the recommended lamp load on each transformer or dimmer. The current surge can cause component damage and/or failure within the equipment itself, blown fuses, and tripped circuit breakers.

LED fixtures are variable in purpose, such as cove lights, down lights and track lights. Photo Credit: Intense Lighting

LED fixtures are variable in purpose, such as cove lights, down lights, and track lights. They usually have an external driver, which has many advantages such as customized performance, color turning, dimming and sunset dimming. Some fixtures have multiple driver options to support different control technologies and applications such as dim vs. non-dim or 0–10V vs. DALI.

Fixtures with integrated LED modules are always recommended over those with retrofit type lamps for architectural applications.

Learning Objective Two—Discuss challenges of dimming of LEDs, as well as compatibility issues that may arise.

Switching entirely to LED lights over the next two decades could save the U.S. $250 billion in energy costs, reduce electricity consumption for lighting by nearly 50 percent and avoid 1,800 million metric tons of carbon emissions.

Because LED systems work differently from traditional fixtures dimming is often a challenge, as most existing buildings have traditional phase control dimmers. If this is the case LED drivers must be designed to be compatible with phase control dimmers.

WHY DIM?

What is the importance of dimming in the first place? Dimmable means the ability to lower a light level to the lowest specified level, such as 1%. Different applications require different dimming capabilities. For example, in a lobby or atrium it may be acceptable to dim to a 20% light level, while a restaurant may need 1% dimming capability to increase ambience. The dimming range of fixtures varies greatly. Some may dim only to 50%, others to 1%, such as incandescent lamps.

Dimmable means the ability to lower a light level to the lowest specified level. Photo Credit: WOODLANDS GRILL

Dimming is aesthetically useful because it creates the desired mood, makes the room more interesting by composing contrasting light and dark areas, and draws attention to objects. Dimmers are available in a wide variety of styles and finishes that can add to the finished look of a building and they give the user a greater degree of control over the space. Energy savings and space flexibility are two additional benefits, as spaces can be dimmed to different levels to achieve the desired effect.

DIMMING CHALLENGES AND COMPATIBILITY PROBLEMS

Understanding the limitations of LEDs and dimming is essential. New luminaire manufacturers are continually entering the market, offering a multitude of control types that may or may not be based on standards. Performance issues can be a problem, as can driver-related issues such as the quality of the DC output, remote driver mounting, or a driver that is not designed for the same lifetime as the LED.

Let's discuss some of the performance issues that may generally occur when dimming. The goal is smooth and continuous dimming, but if the wrong fixture, lamp, or control is chosen, you can get dropout, pop-on, flicker, shimmer, dead travel and audible noise. These issues are functions of the lamp itself and not any manufacturers' controls, but these kinds of compatibility problems could pose LED dimming issues.

Dropout occurs when the voltage at which a light source stops operating is higher than the lowest setting on the dimmer. With drop-out the light turns off before the slider or knob on the dimmer reaches the minimum setting. The light should only turn off when the switch is turned off; this can be achieved by setting the low end trim on dimmers and dimming modules.

Pop-on happens when the dimmer is turned on at or near the low-end (from off) and the lights do not turn on. As the slider or knob moves toward the maximum setting the lights suddenly "pop-on." This occurs when the voltage at which a light source begins operation is higher than the voltage of the dimmer's lowest setting.

Flicker is an unexpected modulation of light level that is visible to the human eye. It is easy to perceive at <100Hz. It can be caused by line noise, circuit noise, component tolerance, and circuit design. Flicker is present in all commercial electric light sources and is typically periodic; it is a property of the light source. This should not be confused with electrical flicker, which is noise on the AC distribution line that directly creates additional light modulation on incandescent loads. Electrical flicker is not a property of the light source.

Shimmer is small changes in light intensity that is noticed at low light levels. Shimmer occurs at a frequency of 30 to 60Hz. Any LED system without energy storage is susceptible. It can be caused by asymmetrical output of an incandescent dimmer, a transformer that is starting to saturate, or different LEDs operating in each half cycle.

With dead travel the control is adjusted and the corresponding light level does not match.

Audible noise is a buzzing from the lamp or from the dimmer due to the lamp.

If any of these issues arise it does not mean the LED or the control is bad, but rather that there is a compatibility issue. Lighting designers and anyone responsible for human performance in the built environment should be aware of the issues dimming can pose. Certain populations are more susceptible to various lighting conditions, which can have severe implications on health and well-being.

Learning Objective Three—Identify the types of lighting controls that can be used in conjunction with LED products.

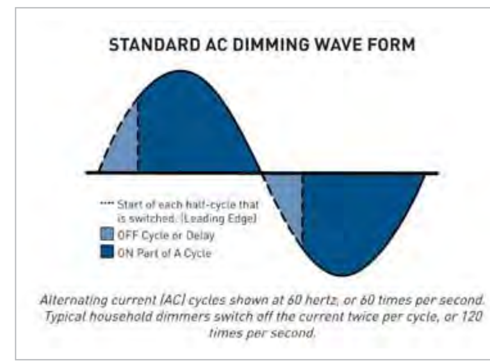
Now we will discuss the different types of lighting controls and which ones are ideal for LED lamps and fixtures. Control type refers to the signal and wiring between the wall control and fixture or lamp.

LIGHTING CONTROL OPTIONS

There are a few standard control options when considering luminaire dimming. First, there is phase control dimming, of which there are two types. Forward phase control is used with incandescent and magnetic low voltage (MLV) fixtures, and reverse phase control is used with electronic low voltage (ELV) fixtures. Other control options we will discuss here are 0–10V, DALI, and DMX.

Phase control dimming is typically found in residential applications, while 0–10 volt is commonly found in commercial applications due to flexibility, dimming performance, and compatibility with new technologies, such as wireless and building energy management systems.

The "phase" in "phase control" just means the shape of the frequency of electricity. When a light is dimmed, it is being turned on and off rapidly, 120 times per second. That means that for 50% of a phase cycle, the light is on. "Forward phase control" means it is on for the first half of the cycle, and "reverse phase control" means it is on for the second half. So if the dimmer switch has forward phase control, a compatible driver with the same phase is needed.



Phase control dimming is typically found in residential applications.
Photo Credit: Intense Lighting

Forward phase control, also called leading edge, is the most common dimming method (150 million dimmers in use) but was not originally intended for use with LEDs and it can cause performance issues. As we said, it is typically used for incandescent and magnetic low voltage. Most are two-wire construction, meaning that the loads have an impact on the dimming performance. They work well when the load is resistive (incandescent), but when the load becomes complex it affects the dimmer.

TRIAC

Phase control is also known as TRIAC dimming because at the heart of the dimmer device is an electronic component called a triac that gives the device the ability to turn the AC power on and off, thus controlling the phase. In general lighting situations, especially where LEDs are replacing incandescent bulbs, the use of TRIAC controls should be permitted. The TRIAC dimmer supplies time-sliced sections of sinusoidal AC voltage to the LED driver. The driver must then translate this chopped AC power into something the LED can use. TRIAC is mainly found in residential applications with standard slide type controls.

Electronic Low Voltage Dimming & Reverse Phase Control

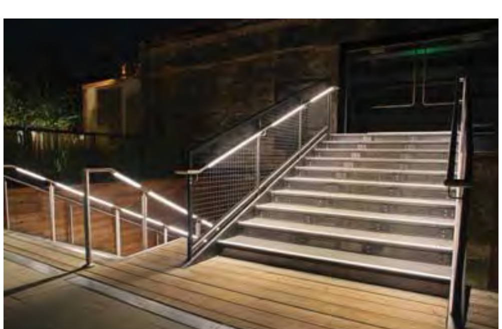
Reverse phase control, referred to as trailing edge, is typically used for electronic low voltage loads and typically performs better with LEDs.

An ELV dimmer is a phase control dimmer like an incandescent dimmer, but instead of controlling the front part of the phase it controls the back part of the phase, which is why it is known as reverse phase control. ELV dimmers were originally designed to improve the performance of low-voltage halogen lamps operating on electronic transformers. Electronic transformers also step down 120VAC line voltage to 12VAC or 24VAC. But, this is done with electronic circuitry which is capacitive by nature (capacitance is the ability of a device to store energy in the form of an electric field).

This style of control is electrically gentler on what it controls as it allows the device to gently turn on by riding the phase wave as it increases in voltage, then cutting power to shorten the phase and cause the light to dim.

0–10V

Now we will talk about zero-to-ten volt (0–10V) dimming, the standard protocol for commercial lighting. While many LED manufacturers use 0–10V dimming technology to control their LED fixtures, 0–10V is an older analog technology originally used to control dimmable fluorescent fixtures. There are 2 power wires and 2 control wires and a driver is the current source. In this system, the 0–10V control device receives a signal between 0V (off) and 10V (full on) from the dimmer and scales the output accordingly to the light fixture. For example, at 10 Volts, a fixture is 100% on. At 6 Volts a fixture is dimmed to 60% and at 3 Volts a fixture is dimmed to 30%. This type of dimming provides uniformity but there is ambiguity about what is the low end (off or at minimum light level).



0–10V dimming is the standard protocol for commercial lighting.
Photo Credit: Packing House, Anaheim, CA

Visit http://go.hw.net/AR1013Course1 to read more and complete the quiz for credit.

QUIZ

1. Which of the following is a benefit of LEDs over other light sources?
   - a. Greater longevity
   - b. Large size
   - c. High efficacy
   - d. Light spread
   - e. Both A and C
   - f. All of the above

2. True or False: LEDs are the only technology that has the potential to become more efficient as it is dimmed.

3. True or False: LED fixtures typically have an internal driver, as opposed to LED lamps, which typically have an external driver.

4. Which of the following is a benefit of dimming?
   - a. Greater control over space
   - b. Energy savings
   - c. Draws attention to objects
   - d. Creates a desired mood
   - e. All of the above

5. Which of the following is an unexpected modulation of light level that is visible to the human eye?
   - a. Pop-on
   - b. Dropout
   - c. Shimmer
   - d. Flicker

6. True or False: Phase control dimming is typically found in residential applications, while 0–10 volt is commonly found in commercial applications.

7. Which of the following is primarily used for stage lighting?
   - a. DALI
   - b. Zigbee
   - c. DMX
   - d. 0-1V

8. What are the two primary types of drivers on the market?
   - a. Intermittent current
   - b. Constant current
   - c. Constant voltage
   - d. Variable voltage

9. Which wireless protocol is a low-cost, low-power, wireless mesh network standard?
   - a. ZigBee
   - b. Z-Wave
   - c. EnOcean

10. Which of the following is a model energy code that covers lighting in addition to other energy-using building systems?
    - a. California Title 24
    - b. IECC

ABOUT INTENSE LIGHTING

Intense Lighting, Inc. is widely recognized as a solutions-based manufacturer of award-winning, sustainable lighting products. Innovative and energy efficient, our luminaires offer a wide variety of specification grade lighting solutions for the commercial, hospitality, supermarket, retail and residential markets. Customers can select from several broad-based product lines of LED downlights, tracklights, and recessed multiples. In addition to interior lighting, Intense Lighting offers a complete product line of outdoor luminaries including bollards, landscape, step lights, wall cylinders, wall sconces, in-ground luminaires and our popular V-Rail, an LED illuminated rail system.

Established in 2001 and headquartered in Anaheim, CA, Intense Lighting has quickly become an industry leader by continuing to deliver quality products backed by outstanding customer service. We pride ourselves on the ability to deliver products with the shortest lead times in the industry. Today, with a growing team of product engineers, Intense Lighting is on the cutting-edge of research and development in LED lighting solutions backed by the company's impressive 10-year product warranty.

SUSTAINABLE CHOICES IN LUXURY FENESTRATIONS

Presented by:

Loewen

Windows create a unique opportunity for the architect to create a luxury living space that is both comfortable and energy efficient.

LEARNING OBJECTIVES

After reading this article you will be able to:

1. Discuss the main attributes and relevance of windows in sustainable (green) building design
2. List the critical aesthetic and functional roles of fenestration in the design of luxury residential projects
3. Evaluate windows according to the key performance criteria such as base material, cladding, and hardware
4. Select a superior window for luxury home projects that will be long lasting, durable, and aesthetically pleasing

CONTINUING EDUCATION

CREDIT: 1 HSW/LU

COURSE NUMBER: ARjune2014.2

Use the learning objectives above to focus your study as you read this article.

Visit http://go.hw.net/AR614Course2 to read more and complete the quiz for credit.

By Andrew Hunt

Luxury homes offer the architect, builder and buyer a unique opportunity to create dwellings that are distinctive, comfortable and aesthetically pleasing. Increasingly, sustainable design is becoming more important to luxury home owners. Opulence does not need to be wasteful of natural resources. Even large floor plans can prove to be conservation-minded if the architect, builder and homeowner decide to pursue a "green" route.

Designing a luxury home that is environmentally responsible must take into account many aspects of the building process including design, construction practices, air sealing and insulation, and material selection. Windows sit at the crossroads of sustainable material selection and luxury design. The right window can reduce energy use, contribute to green building goals and also provide the touch of quality and beauty a luxury home requires.

WINDOWS AND GREEN BUILDING

Concerns about climate change, rising energy costs, and a general trend towards environmental responsibility have created a homebuilding market where sustainable goals are increasingly important to both buyer and builder.

A report from the U.S. Department of Energy (DOE) shows that residential buildings consume 22 percent of all the energy used in the United States annually. In addition to this, according to the USGBC (United States Green Building Council) buildings in the United States account for 39 percent of total carbon dioxide emissions. Beyond energy conservation, sustainable design can also increase comfort, save material costs, create a more healthful living space and produce a more durable building. The positive qualities of sustainable or green building make it especially attractive in the luxury home market where homes are often built in unique and environmentally attractive or sensitive areas.

Sustainability and green building design are not new concepts in the practice of architecture. The principles have existed for decades. There have always been designs that take advantage of natural systems, from tepees to the Capitol Building, but the materials and forms were not technically advanced. Today, construction materials and building science technologies have evolved enough that they can support sustainable building goals, and windows are no exception.

GREEN BUILDING AND BEYOND

Green building programs can support and architect's goal of creating a sustainable design while also satisfying the aesthetic needs of the project.

Green building is a very popular trend today but goes beyond simply improving insulation and recycling construction waste. Today green building also takes into account many other more subtle metrics. Here are a few of the important ones to consider:

Embodied Energy (EE): the quantity of energy required to manufacture and supply (to the point of use), a product, material, or service.

Life Cycle Assessment (LCA): the total environmental impact of a material or product through every step of its life—from the raw material extraction, to transport, manufacturing, assembly, installation, use in a building, and finally through its disassembly, deconstruction and/or decomposition. This term is also known as a cradle-to-grave analysis.

Windows have evolved from single-pane light sources to the high tech fenestrations now recognized as an integral part of the green built environment. Modern windows have the ability to lower energy bills by reducing, or allowing, solar gain, depending on the climate zone. Understanding the main attributes of windows and how these characteristics apply to green or sustainable building goals is an important first step in matching the right window with a luxury home.

As popular as green building is, it remains subjective. Identifying processes and products that are green is an extremely difficult task. It is not always scientific and there may not be a definite yes or no answer. The answer is often relative. However, there are a number of programs and organizations available to assist with assessments. When it comes to windows, being able to identify a high-quality product that will satisfy sustainability, comfort, and luxury aesthetic goals is critical. The following are some of the more common programs and organizations that help define green or sustainable building products and practices.

Energy Star

Energy Star is a joint program of the U.S. Environmental Protection Agency (EPA) DOE designed to help save money and protect the environment through energy efficient products and practices.

Energy Star qualified windows have met a series of energy efficiency guidelines set by the EPA and the DOE. It does not measure/evaluate materials or their sources.

National Fenestration Rating Council (NFRC)

As a non-profit organization, the NFRC administers a uniform, independent rating and labelling system for the energy performance of windows, doors, skylights, and attachment products. Their goal is to provide fair, accurate, and reliable energy performance ratings so that architects, builders, code officials, contractors and homeowners can compare different products and make informed product choices.

Ratings provided by the NFRC also help building officials, state government employees, and others involved in code development and enforcement to determine if products meet local codes. The NFRC is also one of the industry standard rating organizations that help manufacturers have a fair and level playing field to compare products and an accurate method of showing the energy benefits of new designs or technology.

American Architectural Manufacturers Association (AAMA)

The AAMA is a material-neutral organization, comprised of members from window, door, and skylight manufacturers, component and supply manufacturers, and service and consulting companies. Established in 1936, AAMA represents all sizes of companies, from all across the USA and internationally. Addressing issues of critical importance to its members, it provides a forum for sharing experiences and knowledge, while participating in efforts to shape the future for its members.

AAMA is a primary source for performance standards, product certification and educational programs for the window, door and skylight industry. AAMA proactively and effectively influences codes, construction and specification issues.

Window and Door Manufacturers Association (WDMA)

WDMA is a trade association for the window, door and skylight industry with members in Canada and the USA. The organization offers a Hallmark Certification program to ensure that fenestration products are manufactured in accordance to their standards. In addition, they develop industry standards and test methods, certify products to industry standards.

As a trade organization WDMA represents the industry before building code and regulatory bodies, conducts research and collects data on the fenestration industry, provides educational programs and training for members, and serves as an information clearinghouse for specifies, architects, builders, contractors and consumers.

The Sustainable Forestry Initiative

Founded by the American Forest & Paper Association in 1994, the Sustainable Forestry Initiative (SFI) was originally designed as a code of conduct for the forest products industry in the United States, the SFI program has become one of the world's largest sustainable forestry and certification programs.

In 2007, a new, fully independent organization, the Sustainable Forestry Initiative, Inc. was created to direct all elements of the SFI program. They developed a comprehensive third-party certification procedure for participants to document and communicate their compliance with the SFI Standard.

To be certified, an applicant must undergo a review of its operations by an audit firm accredited by an independent body, such as the American National Standards Institute (ANSI) or the Standards Council of Canada. Auditors must meet educational and professional criteria established by SFI, Inc.

Forest Stewardship Council (FSC)

The FSC is an international not-for-profit membership-based organization that accredits certification organizations (such as Rainforest Alliance–SmartWood) in order to guarantee the authenticity of their claims. Their goal is to promote environmentally responsible, socially beneficial, and economically viable management of the world's forests by establishing a worldwide standard of recognized and respected Principles of Forest Stewardship.

Founded in the early 1990s, FSC was created to change the dialogue about the practice of sustainable forestry worldwide. The FSC standards represent the world's strongest system for guiding forest management toward sustainable outcomes.

In addition to these specific product certification programs, there are several green building programs that can validate the overall design and construction of the building. These programs can be especially helpful when selecting windows as they can suggest attributes or certifications a window must have to be considered part of an overall sustainable design package.

The following are a few of the more recognized green building programs available today for sustainable design for residential homes.

NAHB's Model Green Home Building Guidelines

The National Association of Home Builders designed the program as a tool kit for individual builders looking to engage in green building practices. It also aims to assist homebuilder associations looking to launch their own local green building programs.

The Model Green Home Building Guidelines are for the mainstream homebuilder and is designed to systematize green design and the construction process. The program highlights the methods a mainstream homebuilder can effectively include to introduce environmental solutions into new homes.

Leadership in Energy and Environmental Design (LEED)

LEED Green Building Rating System is the nationally accepted benchmark for the design, construction, and operation of high-performance green buildings. LEED provides building owners and operators with the tools they need to have an immediate and measurable impact on their buildings' performance. It promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality.

In the United States, LEED is administered by the U.S. Green Building Council; in Canada, it is operated by the Canada Green Building Council.

While these certifications and programs can help point the architect toward a window that can satisfy sustainable design goals, it is important to understand the basic criteria that these programs use to evaluate windows. There are two general areas to be familiar with when evaluating the sustainable aspects of a window, energy efficiency and what the materials used to produce the window.

While some green building programs focus strictly on commercial buildings, more opportunities are being created for residential sustainable project.

HOW WINDOWS CAN BE ENERGY EFFICIENT

Windows impact the energy efficiency of the house by reducing the heat transfer from the outside environment to the inside of the home. To determine how well a window operates at reducing heat transfer, there are three factors that can be evaluated: direct heat transfer, solar gain, and air tightness.

To evaluate the direct heat transfer of a window is to determine how well a window blocks heat from directly conducting through the unit. To measure this, windows are given a U-factor. U-factor is the rate at which a window, door, or skylight conducts non-solar heat flow. It is usually expressed in units of BTU/hr-ft^2-oF. For windows, skylights, and glass doors, a U-factor may refer to just the glass or glazing alone. NFRC U-factor ratings, however, represent the entire window performance, including frame and spacer material. The lower the U-factor, the more energy-efficient the window, door, or skylight.

The second evaluation of energy efficiency for windows is how well the product performs at blocking solar radiation, or sunshine, from passing through the glazing. This rating is called the solar heat gain coefficient (SHGC). The SHGCis the amount of solar radiation admitted through a window, door, or skylight—either transmitted directly and/or absorbed, and subsequently released as heat inside a home. The lower a product's SHGC, the less solar heat it transmits and the greater its shading ability. A product with a high SHGC rating is more effective at collecting solar heat during the winter. A product with a low SHGC rating is more effective at reducing cooling loads during the summer by blocking heat gain from the sun.

The third rating to consider when evaluating a window for energy efficiency is the air leakage rating. This is the rate of air movement around a window, door, or skylight in the presence of a specific pressure difference across it. It is expressed in units of cubic feet per minute per square foot of frame area (cfm/ft^2). A product with a low air leakage rating is tighter than one with a high air leakage rating.

These three primary energy efficiency ratings can be found on the NFRC label attached to the window, although the reference to the air leakage is optional in many regions. For windows, Energy Star bases its qualification only on U-factor and solar heat gain coefficient ratings.

Historically, single pane windows did very little to reduce the amount of energy that passed between the outside environment and the inside of the home. Glass by itself is highly conductive, so to improve energy efficiency a second and then third pane of glass was added to the window frame. The spaces between the panes greatly reduce heat transfer and are filled with argon or a similar inert gas with a low heat transfer property. The gas works to both reduce heat transfer and also eliminate fogging from humidity between the panes.

The other aspect of energy efficiency in windows is the coating put on the glass panes. Low-emissivity (low-e) coatings on glazing or glass control heat transfer through windows with insulated glazing. A low-e coating is a microscopically thin, virtually invisible metal or metallic oxide layer deposited directly onto the surface of one or more of the panes of glass. The low-e coating lowers the U-factor of the window. Different types of low-e coatings have been designed to allow for high solar gain, moderate solar gain, or low solar gain.

Windows manufactured with low-e coatings typically cost about 10% to 15% more than regular windows, but they may reduce energy loss by as much as 30% to 50%. This significant reduction in energy loss can be especially advantageous for luxury homes, which are generally larger and have more windows than traditional homes.

A final consideration when evaluating low-e windows for luxury homes is the UV, or ultraviolet, protection the window coatings offer. Blocking UV light is important because it can protect furniture, art, carpet and décor from the fading effects of UV exposure. Low-e windows can block over 70 percent of the UV light coming into the house through the window.

Visit http://go.hw.net/AR614Course2 to read more and complete the quiz for credit.

QUIZ

1. Which of the following is not a benefit of sustainable design in luxury home building?
   a. Improved energy efficiency
   b. A more healthful living environment
   c. Improved home security
   d. Increased durability

2. What does the U-factor rating of a window measure?
   a. The number of panes in the window (singe, double, or triple)
   b. How well the unit blocks the flow of thermal energy or non-solar heat flow
   c. How well the window reflects visible light
   d. The amount of noise the window allows to pass through

3. What does SHGC stand for?
   a. Society of Heating, Glass, and Countertops
   b. Sustainable and Healthy Guidelines Council
   c. Sustainable Home Governance Committee
   d. Solar Heat Gain Coefficient

4. Why is blocking UV (ultraviolet) light an important aspect of luxury home design?
   a. UV rays increase heat within the building, driving up energy bills
   b. Excessive UV rays can lead to house fires
   c. UV rays can fade furniture, carpets, and art
   d. You should not try to block UV light

5. Which of the following should be considered as part of the life cycle analysis of a window?
   a. Initial cost of the product
   b. How easy the product can be recycled at the end of its functional lifespan
   c. Weight and shipping costs
   d. The value, in dollars, of the potential energy savings

6. What are some of the primary benefits of daylighting as an architectural design element?
   a. Improved mood for the occupants
   b. Increased resell value
   c. Reduce energy use through temperature regulation and artificial light use
   d. Improved line of sight for occupants

7. What is the base material of a window?
   a. The glass or glazing type
   b. The type of primer paint used
   c. The exterior of the bottom sill
   d. The material the frame is made from

8. What are some of the attributes of a high quality window base material?
   a. Moisture resistant and dense grain
   b. Sustainable forest certified
   c. Natural smell and pleasing grain tone or color
   d. Low VOC

9. From a quality standpoint, which of the following describe the benefits of extruded aluminum when compared to roll-formed aluminum?
   a. Extruded aluminum can withstand greater impact without sustaining damage
   b. Extruded aluminum can be shaped for more intricate profile details
   c. Provides a more uniform base for high quality paint finish
   d. All of the above

10. True or false. Copper and bronze, as a window cladding material are superior products because they will retain factory finish for the entire life of the window
    a. True
    b. False

BUILDING RETROFITS: GETTING THE WHOLE PICTURE ON WINDOW REPLACEMENT

MOVING BEYOND WINDOW RATINGS TO IMPROVE ENERGY-EFFICIENCY IN COMMERCIAL RETROFIT PROJECTS

Provided by:

COMMERCIAL SOLUTIONS

LEARNING OBJECTIVES

After reading this article you will be able to:

1. Describe the historic evolution of fenestration design and the opportunity for traditional energy retrofit projects in the U.S. Market.
2. Explain the value of including occupant comfort and air infiltration in whole building analysis projects related to windows.
3. Quantify financial payback of window replacement considering both direct energy savings and indirect energy savings via occupant comfort.
4. Discuss the importance of selecting a building analysis team that includes a focus on whole-building simulation modeling with comfort and air sealing included.

CONTINUING EDUCATION

CREDIT: 1 HSW/LU

COURSE NUMBER: ARjune2014.3

Use the learning objectives above to focus your study as you read this article.

Visit http://go.hw.net/AR614Course3 to read more and complete the quiz for credit.

The Wrigley Building in Chicago recently went through a significant energy retrofit that focused on energy efficiency, comfort and air infiltration. Besides lowering heating and cooling costs, maintaining the aesthetics of this iconic building were also an important consideration.

By Andrew Hunt

When undertaking a significant energy retrofit project, architects employ various tools to help them successfully identify potential areas for improvement. Some of the most valuable assets in an architect's toolbox are companies that provide building analysis. A building analysis service team that can completely test, measure, and document the gaps and opportunities for energy savings in a building will provide the architect with a wealth of information and resources needed to successfully complete the project. However, when it comes to windows, traditional building analysis services often fail to deliver a complete evaluation of the building, and miss several of the key components that can impact energy use. Besides the energy efficiency rating of the window - other considerations like occupant comfort and air tightness should be included when designing a window replacement strategy during a retrofit project. Architects who choose a building analysis service that provides a complete evaluation of the windows and fenestration in the building will have better information, more options, and a greater chance of creating a successful energy-efficient design that provides a faster return-on-investment for property owners.

HISTORIC EVOLUTION OF FENESTRATION DESIGN

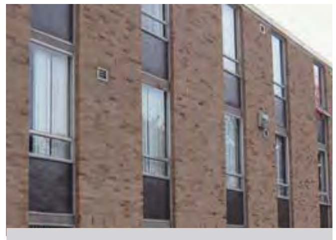
Today in the United States there is a glut of existing commercial buildings that could benefit from an energy efficiency retrofit. According to the U.S. Department of Energy (DOE), on average 30 percent of the energy used in commercial buildings is wasted. Commercial buildings account for 36 percent of all U.S. electricity consumption and cost more than $190 billion in energy every year. To put this energy use into perspective, commercial buildings consume more than 18 percent, or 18 quads, of U.S. primary energy—more than all of Canada's energy consumption. This massive use and waste of energy means that during a retrofit project, even a modest improvement in the energy performance of the building could result in exponential savings for building owners.

However, despite the need for energy consumption improvements, only a small fraction, less than two percent, of the standing commercial building stock are renovated each year. This leaves a vast majority of the buildings operating below current energy codes and in need of repair.

GENERATION 1
(1900s–1960s)

- Single Pane
- Aluminum, Steel, Wood
- Poor Thermal Properties
- Variable Installation Quality

50% of Commercial Bldgs Using Generation 1



GENERATION 2
(1960s–PRESENT)

- Single & Double Pane
- Glass Coatings & Sealed Double-Pane Insulated Glazing (prone to failure)
- Poor Thermal Properties
- Variable Installation Quality

40% of Commercial Bldgs Using Generation 2

GENERATION 3
(PRESENT)

- Double & Triple Pane
- Advanced Thermal Frames
- Scientifically Tested Install
- Air Infiltration Management
- Dynamic Shading, Venting

Less than 10% of Commercial Buildings Using Generation 3

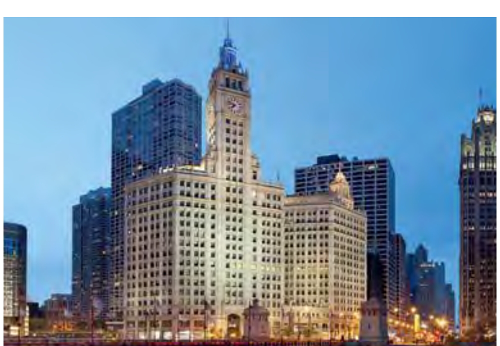
When an architect does have the opportunity to perform an energy efficient retrofit, one of the main areas of interest are windows. Windows in aging commercial buildings can provide one of the easiest avenues to upgrading energy efficiency, largely due to the fact that historically, window replacement has been considered either too expensive or impractical. To better understand why many existing commercial buildings have such poorly performing windows, there are a few different facts to consider.

A bulk of the existing commercial fenestration in the U.S. dates back to the early 1900s, when single-pane windows were the only type of window available. In terms of the history of fenestration in the U.S., these types of windows were the first generation of mass-produced products. These first generation windows were mostly wood framed, and later in the century aluminum and steel frames were introduced. Installation of windows was very inconsistent, with little regard for air sealing. The result was a legacy of many large commercial buildings, schools, and public institutions that rely on overpowered heating and cooling system to provide reasonable comfort for occupants. Today, half of all commercial buildings still have these first generation windows installed.

Beginning in the 1960s, tinted and reflective glass and even double-pane windows were introduced. This was the second generation of windows used in commercial applications. At the time, the newer fenestration technology seemed like a huge improvement over the traditional single-pane windows. However, much of the thermal advantage relied on new technologies to create a sealed double-pane insulated glazing system, and some of those new technologies were prone to failure. Also, although window technology seemed to be advancing, little research was done on installation techniques, proper air sealing, and the overall impact that windows play in the energy efficiency of the building. Currently, almost 40 percent of the existing commercial building stock still has these second generation windows.

During the 1970s, when energy costs started to impact the bottom line of commercial buildings, more research and development was conducted on improving the overall energy performance of buildings. The concept of a building envelope and measuring individual components of that shell started to make headway in the industry, with

CASE STUDY—THE WRIGLEY BUILDING, CHICAGO



In 2011 the new owners of the iconic Wrigley Building in Chicago initiated an extensive retrofit project of the 1920's landmark. The goal was to return to the original architectural design intent, while at the same time improving the performance and usability of the space, all of which to attract new tenants.

The first stage of the project was to evaluate the existing condition of the building and identify where the greatest improvements could be made to reduce energy use, increase comfort, and control air infiltration. The analysis found that 41 percent of the building energy use and 32 percent of the building energy cost comes from the building envelope. Replacing the windows and air sealing the building envelope would:

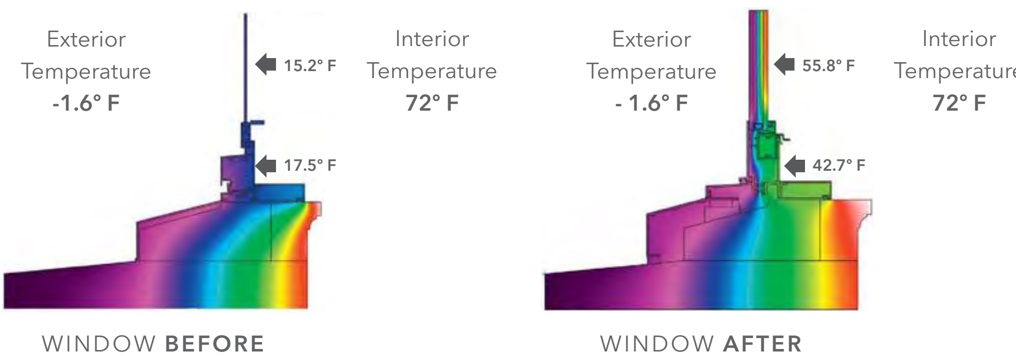
- Save $276,000 per year in energy costs (27 percent savings)
- Reduce carbon emissions by 1,730 tons per year (22 percent reduction)
- Reduce the building's energy use intensity by 41 kbtu/sf (37 percent reduction)
- Payback in 15 years or better (lower payback possible using only incremental costs, via rebates/incentives, or via potential HVAC downsizing)

There were several benefits specifically identified with replacing the windows. The projected fast payback and decreased energy costs were achieved because the building had approximately 2,000 single-pane windows installed that were over 20 years old. By replacing the current windows with new windows that had a higher thermal resistance, the improvement would bring the interior surface temperature of the glass nearer to room temperature. This approach included comfort as a variable for increasing energy efficiency. The analysis found potential to relax the thermostat set points by up to 5°F, delivering significant savings.

The second benefit of replacing the windows was eliminating drafts from leaky window units. Replacing the windows in this facility with new windows reduced drafts from the windows by 51 percent.

New windows shown in the bottom row.

To satisfy the aesthetic goals of the project, only energy efficient windows and doors that could match the original design were considered. Choosing high quality windows that were also attractive provided the new owners with an enhanced image of the building that retained the historical feel. The concern for aesthetics as well as comfort allowed for a potential higher property value, higher rental and lease income while reducing the maintenance costs and upkeep burden.



Improvements in thermal properties. This image shows how first generation single pane windows (left) would have an interior glazing temperature much closer to the relative exterior air temperature. Additional panes and improved design have greatly reduced the amount of heat transfer, reducing energy use and improving comfort for occupants.

insulation improvements and air sealing becoming more common during new construction projects. It was during this time that the third generation of window technology started to be introduced into the commercial building market. Building scientists soon began finding ways to measure and evaluate windows using a wide range of criteria. Window rating systems from the National Fenestration Rating Council (NFRC) became the industry standard by the late 1980s.

Having evolved from simple single-pane pieces of glass bound in wood, the third generation of windows now features double- and triple-panes mounted in advanced frame designs with exotic sounding inert gasses such as krypton and argon employed to arrest heat transfer. Low-e coatings can be custom ordered to either encourage or halt solar gain depending on the climate zones and situational needs of the building. Air infiltration within the window unit combined with advancements in materials and installation training have helped greatly reduce heat loss around window penetrations.

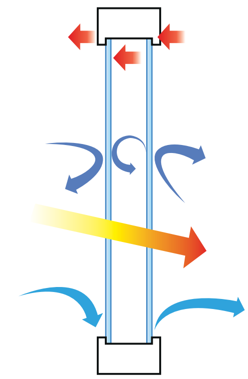
But even with the fantastic advances in window technologies, less than 10 percent of the commercial building stock has third generation windows installed. This means that architects have a tremendous opportunity to reduce energy loss in commercial buildings during a retrofit project. To maximize the potential savings, the key is to understand how commercial buildings operate and then select the tools and resources to best accomplish energy efficient design goals.

THE VALUE OF RECOGNIZING COMFORT AND AIR INFILTRATION

Building analysis service providers for commercial building projects typically focus on environmental factors within the building. These "low hanging fruit" are easy to identify and generally require less investment. Common areas of improvement include lighting design and energy saving fixtures, environmental controls such as programmable thermostats, and an upgrade of the central heating and cooling system. Making these recommendations requires very little consideration of the actual project. In fact, this sort of inside-to-outside approach can be done without ever visiting the project site or understanding the local climate and environmental conditions that impact energy use. While these improvements will reduce energy use, they may not improve the comfort for all the occupants and do not address energy loss through the building envelope.

Drafts from uncontrolled air infiltration and poorly performing windows create uncomfortable and costly work environments for occupants. If the occupants don't feel comfortable, they are going to change the environment to make it comfortable. During cooler months, occupants may pile on sweaters and use electric space heaters to stay warm. During summer months, personal fans, temporary sun shades, and open windows are common methods of managing the temperature. If the occupants are relying on additional devices to manage the building's temperature, these devices are costing the building in terms of energy use.

Modern testing and building analysis teams utilize sophisticated instruments and comprehensive software to accurately measure the existing condition of the building and predict how improvements will improve energy efficiency, and comfort.



Windows and doors contribute to energy loss through conduction, convection, radiation and infiltration.

But the more common energy loss issue with uncontrolled air infiltration around windows and doors within the building envelope is the impact on the heating and cooling system. A poorly sealed building envelope will require the heating and cooling system to work overtime to maintain a reasonable temperature. The excessive use of the system will lead to larger energy bills, more maintenance, and ultimately the pre-mature replacement of the heating or cooling unit.

To thoroughly evaluate air infiltration in a building, there are several aspects to consider including stack effect, current testing methodologies, and local climate.

Multi-story commercial buildings often create variables in internal air pressure due to the warming of the air inside through solar gain, mechanical equipment, lighting, and people. Warm air is less dense than relatively cooler air, so it will rise and displace cooler air above it. This flow of air is called the stack effect. The stack effect can significantly impact air infiltration and exfiltration in the building.

During the course of the day, the stack effect will create a low pressure zone in the lower part of building. The negative pressure within the building envelope will draw air in from the outside around any improperly sealed penetration, or directly through first generation windows. At the same time, the upper parts of the building will be over pressurized, forcing air out of the space. The result is that the lower parts may feel cold to the occupants while the upper parts feel too warm.

While this internal flow of air may make the occupants uncomfortable, the stack effect can also create moisture issues within the building. As warm air is forced through the walls and penetrations in the upper part of the building, it is likely to deposit moisture. When water vapor comes in contact with a relatively cooler surface, it will condense to liquid form and can lead to mold, rot, and structural damage.

The stack effect inside the building can impact the structure much like a consistent wind outside. Wind outside the building can create variable air pressure areas within the building as the side of the building receiving the brunt of the wind is having air forced in similar to a low pressure zone, and on the lee side of the building a vacuum is created drawing air out (internal high pressure).

Stack effect in a two-story building can create the equivalent air pressure differences of a 10 mile per hour wind at all times.

During the building analysis process, if the local area is considered a "low wind" region, the implications of the stack effect are often ignored. However, a two story building can create the equivalent air pressure differences of a 10 mile per hour wind at all times. The taller the building, the more the stack effect takes place.

Software and measuring tools used to evaluate building performance can be adjusted to account for the additional impact of the stack effect in both low wind and high wind areas. The standard American Society for Testing and Materials (ASTM) tests on windows need to be adjusted to include both stack effect and local air speed in order to accurately show the actual condition of the building.

Visit http://go.hw.net/AR614Course3 to read more and complete the quiz for credit.

QUIZ

1. Which of the following is not a characteristic of a first generation window?
   a. Single-pane
   b. Wood or metal framed
   c. Poor air sealing
   d. Tinted or coated

2. How are some of the ways that occupants overcome uncomfortable temperatures due to drafty windows?
   a. Adjust the interior temperature controls
   b. Personal heaters or fans
   c. Hang temporary shades on the windows
   d. All of the above

3. How does the stack affect impact occupants?
   a. Creates unbalanced air pressure in the building which can lead to headaches
   b. Forces warm air into the upper parts of the building and draws cooler air into the lower parts impacting comfort
   c. Forces warm air into the lower parts of the building and draws cooler air into the upper parts impacting comfort
   d. Generates internal air pressures that can blow paper and decrease productivity

4. What is the primary contributor to stack affect?
   a. Poor air sealing in the building envelope
   b. Local winds of constant speeds
   c. Oversized heating and cooling equipment
   d. Excessively "tight" or well-sealed building envelope

5. What are the three evaluations a building analysis team should consider in order for the architect to calculate the payback of windows during an energy efficient retrofit?
   a. Initial cost of the product, rental rates, aesthetics
   b. Thermal performance, comfort, air infiltration
   c. Project scope, design, solar gain
   d. Location, comparable properties, occupancy rates

6. What does SHGC stand for?
   a. Society of Heating, Glass, and Countertops
   b. Sustainable and Healthy Guidelines Council
   c. Sustainable Home Governance Committee
   d. Solar Heat Gain Coefficient

7. True or False. Comfort can be quantified when evaluating the value of window replacement?
   a. True
   b. False

8. Based on the case studies provided in the article, what was the impact of including comfort and air infiltration in terms of potential energy savings for retrofit projects?
   a. Little to no impact in any case study
   b. The greatest impact in all cases studies
   c. Variable impact in most of the case studies
   d. Comfort and air infiltration were not considered in the case studies

9. What is an inside-to-outside approach to an energy efficient building retrofit?
   a. Improving the building envelope first and then updating lighting and environmental controls
   b. Focusing on environmental controls and lighting first and then improving the envelope
   c. Updating interior walls first and then focusing on roofs and exterior walls
   d. Concentrating on insulation inside the walls before evaluating air sealing needs

10. Why is an inside-to-outside approach not the best approach to an energy efficient retrofit design?
    a. This approach may evaluate each component of the building separately
    b. This approach will not consider some of the greatest impacts on comfort and air sealing
    c. This approach will provide insufficient data when calculating payback periods on improvements like windows and mechanical equipment
    d. All of the above

HIGH PERFORMANCE COATINGS FOR CLEANER, FRESHER SCHOOLS

A FEW SIMPLE LESSONS CAN MAKE THE DIFFERENCE BETWEEN A COATING THAT PASSES WITH FLYING COLORS OR FAILS TO MAKE THE GRADE.

Scuffs, abrasion, stains and constant cleaning are common aspects of any school environment. Coatings specified for these applications must be able to handle a lot of abuse and still look great, year after year. Photo Courtesy of Sherwin-Williams

LEARNING OBJECTIVES

After reading this article you will be able to:

1. Name the four basic ingredients of a paint formula and understand their impact on coatings specified for educational facilities
2. Identify suitable applications for high performance acrylic, urethane, and epoxy coatings in school environments.
3. Calculate the value of a coating based on its expected service life.
4. Explain the effect of carbon dioxide on concrete that is left uncoated
5. Describe the correlation between asthma-related illnesses in children and indoor air pollutants

Provided by: SHERWIN WILLIAMS.

CONTINUING EDUCATION

CREDIT: 1 LU

COURSE NUMBER: ARjune2014.4

Use the learning objectives above to focus your study as you read this article.

Visit http://go.hw.net/AR614Course4 to read more and complete the quiz for credit.

By Cathy Brugett, in collabotation with Joe Kujawski, Director of Wholesale Marketing–Sherwin-Williams

Although the educational sector has been relatively flat in terms of construction spending for the past five years, a number of economic analysts anticipate an upswing in this market in the year ahead. The very fact that building activity has been lackluster for so long creates pent-up demand for facility upgrades or expansion, and precipitates the need for new schools in districts that haven't kept up with the demands of local populations. According to a recent report published by the Center for Education Statistics, over half of American schools are in need of repairs or renovation, with a projected price tag of $200 billion! Another contributing factor to the anticipated increase in new school construction is the double-digit increase in housing starts, which helps increase tax revenue for some school districts. Robert Murray, chief economist for McGraw Hill Construction, predicts that "Starts for educational buildings will swing from a negative 3.4% in 2013 to a positive 3.0% in 2014." Whatever is driving the increase in school spending, it's good news for the economy as a whole, and will certainly generate renewed focus on construction and finishing materials that offer the best performance for the public's tax dollars. Often overlooked, but critically important to the ultimate appearance, maintenance, and preservation of any school construction project are the coating systems specified for each area of the facility.

Without question, school environments take a lot of abuse. A standard architectural coating isn't formulated to withstand the inevitable scuffs and abrasion that occur in hallways where hundreds of kids pass through every hour five days a week. Metal lockers that get stuffed with books, bags, and sports gear require hard, durable coatings that are tough enough to resist chipping or peeling. Showers and restrooms where damp conditions are the norm need paints formulated with mildewcides to resist the formation of mildew on the surface of the paint film and help maintain a fresh environment. School kitchens and cafeterias are exposed to constant cleaning to maintain proper sanitation standards, so the coatings specified for these areas have to be tough enough to resist harsh cleaning chemicals and detergents. In short, no single coating suits every application, and just as an educational curriculum is designed to meet the needs of students, the coatings you specify must address diverse conditions to perform successfully over time.

Michael Rantilla, AIA, LEED AP BD+C, Associate Principal at Perkins + Will in North Carolina confirms that, "When it comes to specifying a high performance coating, we look at the performance of the product, and by that I mean things like durability, color options, vapor

What goes in the can makes all the difference. High quality ingredients are necessary to deliver high quality performance. Photo Courtesy of Sherwin-Williams

proofing, and of course, compatibility with the substrate and the other products that are part of the overall system.

QUALITY INGREDIENTS = QUALITY PERFORMANCE

To develop a better understanding of how to choose the best paint for any area in a modern K-12 school, a brief review of the four basic components of any paint is useful, because what goes in the can has a direct impact on how the coating will perform on the substrate.

At the most basic level, all paints are comprised of pigments, binders, liquids, and additives.

Pigments are finely ground particles that give a coating its color and hide, although many low grade paints also include 'extender' pigments that add bulk but provide no benefits. Because high quality paints contain more prime pigments, they will deliver better hide and longer lasting color retention. Of course, paint with better hide requires fewer coats to get good coverage, and lasting color retention also cuts down on the frequency of repaints in the future.

As their name implies, binders are essential because they literally bind the paint to the substrate. Binders also have unique properties that enable the coating to perform well according to its intended purpose. For example, binders used in the manufacture of coatings designed for exterior use have very different characteristics than the binders used in formulating an interior paint. Binders used in a high quality exterior paint, for example, have greater flexibility, so the coating is less likely to crack, peel, or blister when exposed to extreme weather conditions.

Binders for exterior coatings are also engineered to give the coating better resistance to UV, helping to maintain color and gloss levels despite years of exposure to weathering. And because moisture in the form of rain, snow, or excessive humidity is likely, high quality exterior coatings incorporate binders that resist the transfer of moisture from the paint film to the building's substrate. Conversely, interior coatings contain binders that give the paint a harder film surface—so it has the durability to withstand abrasion and burnishing, resist stains, and withstand frequent scrubbing or cleaning—conditions that are less likely to be an issue for an exterior application.

The next key ingredient of a coating's composition is the liquid, which is simply the 'carrier' that gets the paint from the can to the surface being painted. The liquid can be water, or an organic solvent such as mineral spirits. Either way, the liquid used influences how the coating 'flows' onto the surface being painted, how quickly it dries, and its VOC level. That's because, as the liquid evaporate, it releases volatile organic compounds into the atmosphere. If the 'liquid' is primarily water, the paint is classified as waterborne, or water based, and it will usually be lower in VOCs than a coating that is formulated with an organic solvent. The best paints have a greater ratio of the right solids, that is, binders and pigments, to liquids. Cheaper paints are watered down or contain solids that are simply fillers, which can result in spattering, drips, and time-consuming clean-up on the job site, as well as durability.

Finally, coatings contain various types of additives, which are special-purpose ingredients engineered with specific attributes that enhance performance. Common additives in higher-quality paints include mildewcides to resist the formation of mold or mildew on the paint surface, or rheology modifiers that impact the viscosity of the paint film. Additives like corrosion inhibitors retard corrosion on the surface of steel, while freeze/thaw stabilizers enable a coating to maintain its appearance and resilience despite weather extremes.

Recent developments in coatings for interior applications also include highly sophisticated features that have many benefits for your client. There's nothing new, for example, that water-based coatings are lower odor than solvent-based coatings. This is a distinct asset if the painting must be done during the school year and rooms are occupied, but some state of the art coatings are engineered to continually eliminate ambient room odors of organic origin—making them ideal for school gymnasiums, cafeterias, and other areas in the school where odor control is desirable. The odor-reducing capacity of this type of product is linked to the concentration of the odors, the frequency of exposure, and the amount of painted surface area.

In sum, a first quality paint is like a first quality building. The quality of the ingredients that go into the coating have a direct bearing on how well the coating will perform in the long run.

HEALTHY ENVIRONMENTS ENHANCE LEARNING

One of the most important aspects of modern school design is to create a healthy learning environment for young students, with growing emphasis on protecting children by preserving indoor air quality. In fact, a recent study by the National Academies' Institute of Medicine found that "poor indoor environmental quality is creating health problems today and impairs the ability of occupants to work and learn." Equally compelling were the conclusions formulated by a gathering of national experts

Studies show that improving and preserving indoor air quality is an essential aspect of creating a healthy learning environment for students and can reduce asthma-related absenteeism. Photo Courtesy of Sherwin-Williams

and local leaders who attended the 2010 Greening of America's Schools Summit sponsored by the AIA, ICLEI-USA Local Governments for Sustainability, the Redford Center, and the U.S. Green Building Council. Estimating that American students miss approximately 14 million school days per year due to asthma, the Summit's research indicated that controlling exposure to indoor air pollutants would prevent more than 65% of asthma cases among elementary school age children. Key among the group's findings was that by eliminating toxic chemicals "often found in flooring and furniture," schools could radically decrease eye, nose, and throat irritations as well as asthma-related illness.

The industry is taking these findings seriously, and in its Toward Healthy Schools 2015 publication, the Healthy Schools Network reports that nearly half the states in the U.S. have "high performance and/or green school design protocols in place."

Fortunately, recent advances in technology enable many high performance coatings to deliver hard working performance in formulas that meet or exceed the strictest environmental regulations. Some are GREENGUARD® Indoor Air Quality Certified for low chemical emissions into indoor air during product usage, or meet the more stringent criteria for GREENGUARD Gold certification, which is cited by The Collaborative for High Performance Schools (CHPS) and the Leadership in Energy and Environmental Design (LEED) Building Rating System. Increasingly, school administrators are interested in products that comply with the Green Building Initiative's Green Globes certification. This cost-effective, web-based program offers design guidelines for creating healthy school environments that meet third-party criteria for environmental performance and sustainability.

Monica Green, FAIA, CSI, CCS, LEED AP, and senior specifications writer for the Cleveland based firm of Westlake, Reed, Leskosky, reports that "Our clients are very aware of indoor air quality, and many of them, especially government agencies, set the standards they want their design professionals to follow, so we tend to direct them toward GREENGUARD products," Clients are also aware of the rating systems and they know that VOC levels are a factor in these rating systems".

In addition to coatings that contain minimal, or no volatile organic compounds, coating technology has advanced to the stage where some coatings actually reduce airborne VOC levels in the space being painted, specifically aldehyde and fermaldehyde VOCs. This type of coating is particularly useful in new construction, where carpeting, fabrics, even cabinets, contribute to elevated levels of fermaldehydes and aldehydes. The larger the area painted, the more effectively these coatings reduce potentially hazardous compounds.

While attention to indoor air quality is essential in all facets of the educational setting, it is equally important that coatings applied in school facilities deliver a more rigorous level of performance than standard architectural paints can provide. Fortunately, the new generation of high performance coatings offer greater durability while maintaining the highest standards of environmental compliance.

THE RIGHT COATING FOR THE JOB EARNS TOP GRADES

With so many advanced formulas available, it may seem difficult to choose the high performance coating that best suits your client's needs. Generally speaking, coatings recommended for K-12 educational facilities are divided into three primary categories—acrylics, epoxies, and urethanes, and a basic understanding of their individual features is useful.

With a tough, flexible finish, high performance acrylics are formulated to withstand scuffs, abrasion, and impact.

Thanks to their abrasion resistance and attractive finish, acrylics are a good choice for school hallways and stairwells. High quality acrylics are also formulated to withstand harsh cleaning chemicals and detergents, so they're equally suited to cafeterias and restrooms where strict standards of hygiene require frequent scrubbing. Because they're water based, most acrylics have lower odor than solvent-based coatings, which is a significant advantage when

The tough, flexible finish of high performance acrylics makes them a good choice for high-traffic areas like school hallways and stairwells, where they can withstand abrasion while maintaining an attractive finish. Photo Courtesy of Sherwin-Williams the painting must be completed while school is in session. Their fast-drying formula even makes it possible for contractors to paint over a week-end and have the school ready to return to service on Monday.

Another advantage to high-performance acrylics is ease of application. They can be applied with conventional equipment, and school maintenance crews need no special skills to get a sleek, smooth finish that rivals the appeal of a premium architectural coating, combined with the durability of a heavier-duty commercial product.

Like any paint product, most high performance acrylics need thorough surface preparation to ensure good adhesion, but in some areas, like school shops or store rooms, a comprehensive cleaning isn't always possible. For those areas where surface prep is less than ideal, surface-tolerant acrylics are also available. These coatings are typically self-priming and provide good hide and stain blocking in a single coat. This not only saves labor costs, it reduces time on the job for in-house crews that must divide their day among many duties.

A new generation of water-based epoxies delivers maximum performance with minimal impact on indoor air quality.

If you've avoided specifying solvent based epoxy coatings for schools in the past due to their high VOC levels and strong odor, the new generation of water based high performance epoxies may change your mind. With lower odor and VOC levels than traditional solvent based epoxies, these new water based epoxies have enhanced benefits that make them well suited for challenging applications.

Visit http://www.attachmore.com/118645127 to read more and complete the quiz for credit.

QUIZ

1. Name the four essential ingredients of virtually any paint.
   a. Pigments, binders, liquid, and additives
   b. Pigments, binders, water, and additives
   c. Binders, mineral spirits, additives, and VOCs
   d. Binders, mineral spirits, pigments and UV inhibitors

2. Identify a fundamental difference between the role of a binder in an exterior coating versus an interior coating.
   a. There is essentially little difference between the two. In both cases, binders are formulated to provide strong resistance to peeling and chalking.
   b. Exterior applications require binders that are hard and abrasion resistant, whereas interior coatings contain binders that provide better adherence to the substrate.
   c. Interior coatings are formulated with binders that accept a wider range of colors than binders used for exterior coatings.
   d. Binders in an exterior coating must defend against UV and promote gloss and color retention, while binders for interior applications have high scuff and abrasion resistance.

3. Which of the following is a true description of the qualities of a high performance acrylic coating?
   a. A high performance acrylic coating has the highest degree of UV resistance, and retains its color and gloss level better than most other types of exterior coatings.
   b. A high performance acrylic coating has an abrasion resistant, attractive finish that makes it a good choice for school halls and stairwells.
   c. Although a high performance acrylic coating has a sleek, attractive finish, its odor and high VOC levels make it unsuitable for sensitive environments.
   d. The best advantage of an acrylic coating is that it is self-priming.

4. For demanding school settings that must tolerate a high degree of moisture, cleaning chemicals, and potential for corrosion, such as laboratories or shower rooms, which of the following coatings would be the best choice?
   a. A high performance, water-based urethane.
   b. Two coats of a premium quality architectural latex paint.
   c. A high performance, water-based epoxy.
   d. Any coating that is suitable for use in a USDA inspected facility.

5. What are the primary benefits of a dry fall coating?
   a. It has superior early block resistance, so facilities return to service faster.
   b. When applied by airless sprayer, paint particles are instantly atomized and overspray is eliminated.
   c. It has excellent spatter resistance, so clean up is minimized.
   d. Allowing a height of at least 10', overspray from an airless sprayer dries to a harmless dust before falling on furnishings or equipment.

6. For superior aesthetics and long lasting color and gloss, which type of high performance coating is recommended?
   a. A high performance water based urethane
   b. A premium quality exterior latex topcoated with a clear sealer
   c. A solvent-based epoxy
   d. A water-based epoxy

7. Why is it so important that fresh concrete be allowed to cure properly before applying a masonry coating?
   a. A coating applied too soon may discolor.
   b. Fresh concrete is porous and will absorb the coating, requiring additional coats to achieve sufficient coverage.
   c. New concrete requires time to level out in order to achieve a smooth, even surface prior to coating.
   d. Applying the coating prematurely will interrupt the natural process of outgassing, which can lead to blistering.

8. What are the advantages of a high performance pre-catalyzed epoxy coating?
   a. It has zero VOCs.
   b. It is lower odor than traditional solvent-based epoxies.
   c. It requires no measuring or mixing site.
   d. It can be applied using an airless on sprayer.

9. What is the formula for determining the actual cost of a coating over its service life?
   a. Add the initial cost of the paint and materials and multiply it by the number of repaints required during its expected service life.
   b. Add the initial cost of the paint, labor, and materials and divide it by the number of expected years of service life.
   c. Add the initial cost of the paint and materials and subtract the labor costs.
   d. Add the initial cost of the paint, labor, and materials and divide it by the square footage of the area being painted.

10. Acrylic epoxies are a hybrid formula that combines what features to benefit which of these possible applications?
    a. Acrylic epoxies combine low odor and low VOCs with excellent UV resistance, making them ideal for sports facilities or glossy school logos painted on tanks.
    b. Acrylic epoxies combine the fade resistance of an epoxy with the mildew resistance of an acrylic, so they're great for cafeterias or school kitchens.
    c. Acrylic epoxies combine low odor and low VOCs with the hard, sleek finish of an epoxy, making them ideal for school lockers, handrails, or restroom stalls.
    d. Acrylic epoxies are recommended for shop floors or equipment storage areas, thanks to their combined attributes of self priming efficiency and resistance to corrosive environments.

FLOODPROOFING NON-RESIDENTIAL BUILDINGS

SAFETY, COST AND LIABILITY IN FLOOD HAZARD AREAS

Sponsored by: SMART VENT Foundation Flood Vents

At the new James E. Clyburn Research Center, Charleston, South Carolina, foundation flood vents meet functional as well as aesthetic requirements. Photo by Smart Vent Products, Inc.

LEARNING OBJECTIVES

After reading this article you will be able to:

1. Identify FEMA regulations, National Flood Insurance Program requirements and ICC building codes as they relate to sustaining non-residential foundations in flood hazard areas.
2. Describe the effects of hydrostatic pressure on building sustainability.
3. Analyze the differences between active and passive floodproofing measures in non-residential buildings and their impact on optimizing health, durability and maintenance.
4. Explain the features and benefits of ICC-ES certified engineered automatic flood vents in terms of cost, code requirements, performance in floods, and reduced liability for design professionals.

CONTINUING EDUCATION

CREDIT: 1 LU/HSW

COURSE NUMBER: ARjune2014.6

Use the learning objectives above to focus your study as you read this article.

Visit http://go.hw.net/AR614Course6 to read more and complete the quiz for credit.

By Layne Evans

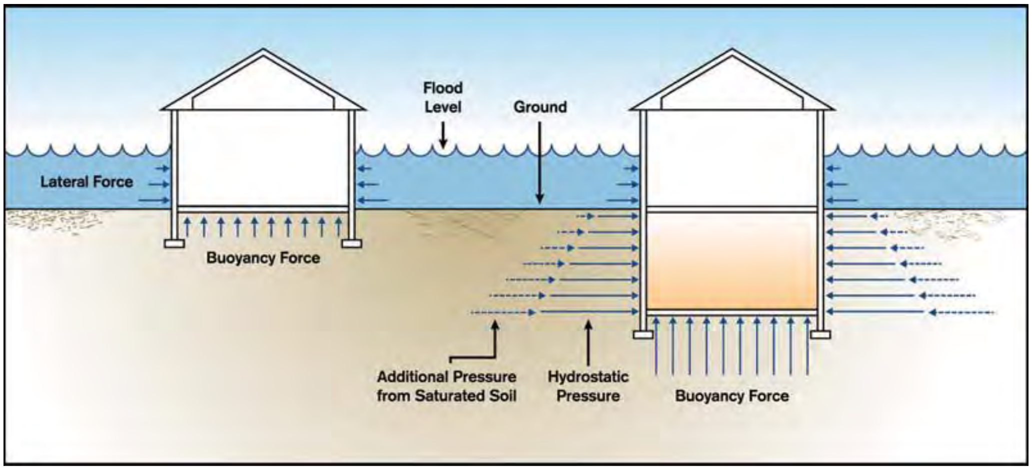
Almost everyone lives in a potential flood zone. In addition to the hurricanes and catastrophic floods that make national headlines, a damaging flood is happening somewhere in the U.S. every day, even in desert regions, caused by local heavy rainfall, dam failures, land development runoff, drainage problems, inland remnants of tropical storms and many other conditions. Nationwide, flooding is the leading cause of deaths related to severe weather, and it wipes out businesses, too. According to the National Flood Insurance Program (NFIP), almost 40 percent of small businesses never reopen their doors after a flood disaster, because just a few inches of water can cause tens of thousands of dollars in damage.

In an increasing number of areas around the country, the risk of flood is even more acute. Over 178 million acres have been designated as floodplains by FEMA. These areas are growing steadily, and more people are finding themselves within a floodplain as flood maps are redrawn. The new maps reflect changes in conditions and new development, and also improvements in scanning technology, additional years of climate, flood and topographic data, and more advanced prediction models.

Building in floodplains, or Special Flood Hazard Areas (SFHA) designated by FEMA, is strictly regulated by the NFIP, the International Building Code, ASCE national reference standards, and by local community codes, all of which are discussed in this course. Deciding on a non-residential building's floodproofing strategy will have a direct connection to the project's cost, to the safety of the building's occupants and the survivability of the building itself, and to the risk of liability for the designer and builder in case of flood damage.

NATIONAL FLOOD INSURANCE PROGRAM

Standard insurance policies do not cover floods. The NFIP was created to provide flood insurance, but also to prevent flood damage in the first place by encouraging effective management and use of floodplains. Community participation in NFIP is voluntary, but flood insurance and many types of disaster assistance are only available in communities that participate by adopting and enforcing floodplain management and construction ordinances that meet or exceed NFIP guidelines. Over 20,000 communities participate in the NFIP, in an effort to avoid the skyrocketing costs of disaster assistance, repair and rebuilding.



Unless hydrostatic pressure acting on structures during floods is equalized or relieved, walls can be damaged or even fail.
Photo by Smart Vent Products, Inc.

NFIP insurance is available to anyone within the participating community, and FEMA encourages homeowners, business owners and renters even in low-risk areas to purchase flood insurance, since at least 25 percent of flood insurance claims every year come from low- and moderate-risk flood areas. In designated Special Flood Hazard Areas, however, flood insurance is mandatory. Premiums are based on the specific measures taken in the building, and can vary widely depending on what floodproofing options are used.

With luck, most of the buildings built to NFIP standards will never face a catastrophic flood, but effective floodproofing measures also result in more durable structures that require less maintenance and suffer an estimated 80 percent less damage every year. If the worst case does occur, the right floodproofing option will increase a building's "sustainability" in a fundamental way, often determining whether or not the building will survive at all.

SPECIAL FLOOD HAZARD AREAS

Special Flood Hazard Areas are designated on Flood Insurance Rate Maps prepared by the NFIP. These are areas subject to flooding during what is called the base flood: a flood that has a 1-percent chance or greater of being equaled or exceeded in any given year.

The base flood is also commonly referred to as a "100-year" flood, but it's important to note that this is not a flood event that is expected to happen only once every 100 years. The base flood has a 1-percent chance of happening every year. This translates to a 26-percent chance of happening once over a 30-year mortgage. In fact, in some areas 100-year floods have happened in consecutive years.

The Special Flood Hazard Areas are divided into zones beginning with the letter A or the letter V. There are also numerous subdivisions, such as AO, AE, VE, etc., based on varying types of risk for the exact topography and other characteristics of the area. "V" zones are in coastal floodplains where high velocity wave action could occur during the base flood, so building designs have to take hydrodynamic forces into account. "A" zones can be on coastal floodplains, but they can also be in inland areas. High-velocity waves are not expected in "A" zones, so most damage results from hydrostatic forces, as will be discussed in more detail below.

Codes and regulations specify floodproofing measures in relation to the "base flood elevation" (BFE), the water surface elevation associated with the 100-year flood. The BFE is the basic standard for floodplain development, used to determine the required elevation of the lowest floor of any new or substantially improved structure.

In "A" zones, a non-residential structure is allowed to have an enclosed space below the BFE provided that the building has been designed, constructed and certified to be floodproofed and to meet established criteria, as explained in this course. In "V" zones, construction or substantial improvement of buildings with lowest floor elevations below the BFE is not allowed, regardless of floodproofing techniques.

Purchase of flood insurance is mandatory in both "A" and "V" areas.

FLOODPROOFING BASICS

As mentioned above, local communities adopt and enforce their own ordinances, and many exceed the minimum standards discussed here, as the NFIP encourages them to do. But a number of basic concepts apply to all floodplain building ordinances, and they are important to understand when planning a new non-residential building in a Special Flood Hazard Area.

Wet vs Dry Floodproofing

NFIP regulations require flood openings in all enclosures below the BFE of buildings in flood hazard zones. This is referred to as "wet floodproofing," where water is expected to move in and out of the lower, uninhabited portions of the building. It is required in all residential buildings, but in non-residential buildings an exception is allowed for what is referred to as "dry" floodproofing, essentially attempting to make the building watertight. This course will analyze the costs and benefits of each approach.

Elevation Certificate

The FEMA Elevation Certificate (EC) or FEMA Form 81-31 is the official form the community uses to document compliance with the community's floodplain management ordinance. (www.fema.gov/library/viewRecord.do?id=1383)

Insurance agents also typically use the information from the EC to determine flood insurance eligibility and rates. The current EC form includes a check-box if the project is using pre-certified engineered flood vents. With certain types of other measures, additional documentation will be required. For instance, if using dry

Flood vents provide wet floodproofing, automatically equalizing the hydrostatic pressure acting upon the structure.
Photo by Smart Vent Products, Inc.

floodproofing methods, the design professional on the project is required to certify that the structure is floodproofed to a certain elevation (the BFE plus 1 foot, and higher in many communities). Certification methods are described in detail in the online version of this article.

Enclosure Types

Some of the types of enclosed areas under elevated buildings that will require flood openings or other floodproofing measures include:

- Parking areas or attached garages
- Building access areas such as stairwells, foyers, elevators
- Storage (for low-value items)
- Under-floor spaces like crawlspaces providing access to utilities

Freeboard

The term for extended floodproofed space above the BFE, added for additional safety, functional reasons and often to decrease insurance premiums. (See sidebar "Design Solution: Add Freeboard".)

Active vs Passive Floodproofing

"Active" floodproofing measures require human intervention, such as opening and closing flood gates, etc. "Passive" floodproofing measures are built into the building and operate automatically without any human activity necessary. In residential buildings, wet floodproofing must operate automatically, without any human intervention. However, in non-residential buildings, many dry floodproofing systems require human intervention in order to function effectively. Again, these are subject to strict rules and must be individually certified by the design professional in charge of the project.

"DRY" FLOODPROOFING

The only exception to the requirement for flood openings is for non-residential buildings that are designed and engineered to be floodproofed by meeting stringent requirements to be watertight.

Using dry floodproofing essentially means making the building, and all its utility systems, completely watertight and impermeable to the passage of water below the BFE. (Dry floodproofing is not permitted in V zones, where breakaway walls are required below the BFE.)

Dry floodproofing can include passive measures such as waterproof sealants and coatings on

For commercial, industrial and other non-residential applications, pre-tested and certified engineered flood vents are available in large frame sizes and custom configurations. Photo by Smart Vent Products, Inc.

walls and floors, water barriers, and automatic backflow prevention valves and sump pumps. But it also may include active measures, for instance, flood gates, shields or doors, which must be manually activated when high water is expected. The design has to take into account important planning considerations such as how much warning time is likely to be available, how people will enter and exit the building, what the flood frequency in the area is, and what floodwater velocities, flood depths and debris impact can be expected.

Examples of features of dry floodproofing systems include the following (and additional examples of system design are given in the Cost Analysis PDF in the online version of this course):

- Sealants, coatings and membranes to reduce seepage of floodwater through walls and wall penetrations
- Installation of watertight closures for doors and windows
- Reinforcement of walls to withstand floodwater and floating debris
- Anchoring of the building to resist flotation, collapse and lateral movement
- Installation of pumps to control interior water levels
- Installation of check valves to prevent the entrance of floodwater or sewage flows through utilities
- Location of electrical, mechanical, utility and other valuable damageable equipment and contents above the expected flood level

The choice to use dry floodproofing triggers a requirement for a floodproofing certification: Floodproofing Certificate for Non-Residential Structures (FEMA Form 81-65). Among other requirements, the certificate must state: 1) the elevation to which the building has been dry-floodproofed, 2) that the building, together with utilities and sanitary facilities, is watertight to the floodproofed elevation, with walls that are substantially impermeable to the passage of water, and 3) that the structure is capable of resisting hydrostatic, hydrodynamic and debris impact forces, including the effects of buoyancy.

Every building floodproofed in this way within the Special Flood Hazard Area must also be certified by a design professional, as stipulated in NFIP regulations: "Provide that where a non-residential structure is intended to be made watertight below the base flood level, a registered professional engineer or architect shall develop and/or review structural design, specifications, and plans for the construction, and shall certify that the design and methods of construction are in accordance with the accepted standards of practice for meeting the applicable provisions of… this section." Note: Detailed information on dry floodproofing is found in FEMA's Technical Bulletin 3, Non-Residential Floodproofing – Requirements and Certification.

"WET" FLOODPROOFING

As mentioned above, NFIP regulations require wet floodproofing in residential buildings, and it is also an option in non-residential buildings. Costs are lower (see the Cost Analysis PDF in the online portion of this course for more detailed cost and design discussion), and human activity is not needed, a definite plus under emergency conditions where warning is short and travel is difficult or impossible. In addition, in the case of engineered automatic flood vents which have been pre-certified under the International Code Council Evaluation Service (ICC-ES), the certification process is substantially streamlined, and liability for the performance of the product during a flood is the responsibility of the product manufacturer rather than the certifying design professional.

Wet floodproofing measures allow water to flow in and out of the lower, uninhabited portions of the building such as parking garages, building access areas and crawlspaces. Installation of flood openings—most commonly flood vents—in the walls allows for the automatic equalization of flood levels on both sides of the walls, preventing the catastrophic damage that can be caused by unbalanced hydrostatic forces created during floods.

When flood water rises against the building enclosure and is unable to flow into the space, or recedes much more quickly than it entered, unequal pressure is created on opposite sides of the walls. The magnitude of hydrostatic pressure increases linearly with water depth. Unless the pressure is equalized or relieved, walls can be damaged or even fail (see figure at top of page XXX). If they are load bearing walls the building will collapse. Lateral pressure pushes against exterior walls, while vertical force can shift and separate the foundation or walls, and even in some cases literally lift the structure. When significant floodwaters are present, forces of buoyancy can float the entire structure away.

Visit http://go.hw.net/AR614Course6 to read more and complete the quiz for credit.

SPONSOR INFORMATION

SMART VENT®
Foundation Flood Vents

Smart Vent Products, Inc. is the worldwide leading manufacturer of foundation flood venting systems and takes pride in having a FEMA-accepted and ICC-ES certified flood vent. The company staff consists of certified floodplain managers and technical field representatives eager to assist you with any part of your floodplain project. www.smartvent.com

QUIZ

1. Which of the following statements best describes areas in the U.S. designated by FEMA as floodplains?
   a. Floodplain areas have been decreasing over the past decade as more levees are built.
   b. Over 178 million acres have been designated to date, and the area is growing steadily as maps are redrawn.
   c. Floodplain areas do not change over time, since the course of rivers and streams stays basically the same.
   d. Floodplains are narrow areas directly adjacent to major rivers.

2. In designated Special Flood Hazard Areas, which of the following is true?
   a. Flood insurance is mandatory.
   b. Insurance premiums vary according to specific floodproofing measures.
   c. National Flood Insurance Program (NFIP) regulations apply.
   d. Local ordinances which may exceed national standards apply.
   e. All of the above.

3. True or False: A "base flood" is also called a 100 year flood because weather records indicate they happen less than once every 100 years.

4. The base flood elevation (BFE) is the water surface associated with a 100 year flood. Which of the following statements is true of the BFE?
   a. The BFE is used to determine the required elevation of the lowest floor of any new or substantially improved structure.
   b. Regulations require that structures must be floodproofed to the BFE, and in many communities, higher.
   c. The BFE is a technical term used only for developing flood maps.
   d. Both a and b are true, but not c.
   e. Both b and c are true, but not a.

5. The term for extended floodproofed space above the BFE, added for safety, function and decreased insurance premiums, is:
   a. Floodboard
   b. Dryboard
   c. Freeboard
   d. Safetyboard

6. "Passive" floodproofing measures are:
   a. Natural features of the site that aren't changed by construction of the building.
   b. Features that operate automatically during a flood without any human activity necessary.
   c. A plan set in place to leave ample time for emergency sand bagging.
   d. Features that are easy to operate by flipping a switch or closing a door.

7. All of the following types of floodproofing a non-residential building require signature and certification by the design professional involved except which one:
   a. Dry floodproofing, certifying that the structure is watertight to a certain elevation.
   b. Non-engineered flood openings, certified to provide one square inch of net open area per square foot of enclosed area.
   c. Engineered flood openings uniquely designed for a specific project
   d. Pre-approved engineered flood vents certified through the ICC-ES so that the manufacturer is responsible for performance.

8. Automatic flood vents are designed to prevent damage caused by which of the following forces during a flood?
   a. Hydrodynamic forces caused by high waves crashing into a wall.
   b. Hydrostatic pressure building up unequally on walls from rising or receding flood water.
   c. Buoyancy pressure which can lift a building off its foundation and possibly float it away.
   d. Both a and b but not c.
   e. Both b and c but not a.

9. Dry floodproofing requires that areas of a building that are below BFE be made completely waterproof. Which of the following are common dry floodproofing measures?
   a. Sealants, coatings and membranes
   b. Manually operated watertight closures for doors and windows
   c. Anchoring and reinforcement of building to resists flotation, collapse, lateral movement.
   d. Installation of pumps and check valves
   e. All of the above.

10. The ASCE 24 standard requiring that a 3-inch sphere must be able to pass through a flood opening is referenced in the regulations to:
    a. Ensure that water can flow freely at 3 inches per hour.
    b. Eliminate the need to have flood vents on two different walls.
    c. Ensure that grills and louvers don't interfere with the passage of debris, or become so blocked that they are ineffective.
    d. Reduce the maximum flood vent height placement requirement of 1 foot.

Wilsonart Presents:

LEARNING CAN HAPPEN ANYWHERE

EXPLORING TWO CASE STUDIES OF EDUCATION ARCHITECTURE IN THE SEATTLE REGION

LEARNING OBJECTIVES

After reading this article you will be able to:

1. Identify how education architecture can enhance sustainability, ecological design, and innovation through space planning and site design.
2. Examine the process followed to design a state-of-the-art educational environment, and the resulting architectural features.
3. Describe how designers took advantage of a school's natural surroundings to create an innovative learning environment.
4. Discuss how the theme of Learning Can Happen Anywhere was embraced through space design and integration of natural site features.

CONTINUING EDUCATION

CREDIT: 1 LU

COURSE NUMBER: ARjune2014.7

Use the learning objectives above to focus your study as you read this article.

Visit http://go.hw.net/AR614Course7 to read more and complete the quiz for credit.

By Paige Lozier

Learning Objective One—Identify how education architecture can enhance sustainability, ecological design, and innovation through space planning and site design.

A STORY OF SUSTAINABILITY, ECOLOGICAL DESIGN AND INNOVATION

We will explore two case studies of replacement schools in the Pacific Northwest—Cherry Crest Elementary and Riverview Elementary. The design of both schools embodies the concept of 21st Century Learning and the idea that learning can happen anywhere. Together, these projects tell a story of sustainability, ecological design and innovation in education architecture.

The architecture firm on both projects was the Seattle office of NAC|Architecture. As a leading designer of educational facilities for more than 30 years, NAC|Architecture has completed over 160 major PK-12 school projects for 60-plus school districts. The total value of that construction exceeds $1 billion.

Embodying the experiential quality of architecture, both schools are designed to make one feel not so much "in the building" as "on the site." The buildings are woven into the landscape in patterns that people discover as they move through the spaces. This integrated experiential environment is intended to enhance the curriculum and stimulate student engagement. The schools offer a variety of unique learning spaces, both formal and informal, which encourages the overlap of academic and social interaction. Transparency and visual connectedness foster shared learning, self-instruction and teacher collaboration.

The space planning and interior design are enhanced with furnishings that enable breakout learning zones and provide ready opportunities for individual or small-group activities. Movable walls and doors between classrooms allow flexible educational arrangements and accommodate team-teaching for groups of various sizes, depending on the learning task.

The schools—both highly energy-efficient buildings on small sites—also were designed to serve as community gathering places. From the fields and playgrounds to the gyms and libraries, these schools are truly neighborhood destinations that have enriched their communities and local education.

CHERRY CREST ELEMENTARY SCHOOL

Cherry Crest is a school in the Bellevue School District of Washington. The City of Bellevue lies across Lake Washington from Seattle. Bellevue includes thriving retail, commercial and residential areas on the developing east side of Puget Sound; it's a part of Seattle's larger metropolitan area. A substantial taxpayer-approved bond measure has enabled the Bellevue School District to replace all its existing elementary schools with new ones that are intended to serve the community for the next 50 years. Cherry Crest students began classes in the new building in September 2012 after spending the two-year construction period in an interim school.

A BUILDING INTERCONNECTED WITH NATURE

A defining factor in the design of Cherry Crest was its heavily wooded site adjacent to a public park. The school district has a joint-use agreement with the City of Bellevue for the neighboring park, which students use for physical education and recess. Initially, district officials considered swapping land, but ultimately they decided to keep the property and the school was built on the existing site.

When the school was constructed, great care was taken to preserve the surrounding trees and the wonderful character of the woodlands so that students, teachers and visitors could fully experience life and learning in the middle of a mature forest. To that end, careful planning went into siting the new building to allow the forest environment to be a visible part of the school experience. This central theme required an understanding of how to site the building to preserve the trees and forest around it while simultaneously trying to accommodate a new school roughly twice the size of the old school. This challenge was met by breaking the new building into smaller pavilions and keeping the forest close to the school's edges wherever possible.

A central theme of Cherry Crest's design was the preservation of surrounding woodlands while remaining innovative in developing the site. Photo Credit: Benjamin Benschneider/OTTO

With the district's strong support, the architectural team decided to use photovoltaics (PVs) on the project. Thus, the building's southern orientation takes best advantage of direct sunlight. Even in rainy Bellevue, the architects felt that using photovoltaics to provide part of the school's power was feasible on this building. Construction crews installed 434 rooftop solar panels, which offset approximately 10 percent of the building's total annual energy use.

Another state-of-the-art step was the use of a ground-source heat-pump system. Ground-source exchange wells were sunk under a sand playfield on the adjacent park property. They allow fluid exchange with the building's mechanical system to either cool or heat the building, reducing long-term operating costs. The wells were placed under a sand playfield on the adjacent city park property; they provide all heating and cooling, as well as hot water. The system eliminates the need to burn fossil fuels on-site.

The architects wanted the theme of green space and a school sited in a wonderful natural setting to continue onto the building itself. Rooftop gardens and outdoor courtyards are living classrooms - and also provide storm water management. Meanwhile, large garden tubs on the first floor rooftop are accessible from the second floor. The flora is far more than attractive: students help care for the plants, use them to conduct experiments and track their growth. It's a very pleasant place to be and also serves an educational function.

The courtyards around the school offer students convenient and abundant spaces where they can observe the abounding outdoor flora and fauna. The courtyards also provide quiet spaces for individual study as well as meeting places for large groups. Groups often use the space to hear speakers deliver presentations.

FOSTERING 21ST CENTURY SKILLS

Now we move on to the building itself, which was conceived to allow views and access to the magnificent natural surroundings. A wealth of windows and window-walls provide outdoor vistas. Even when they are deep within the building, students and staff can see outside as though there were no wall and can look directly into the forest. The opportunity to view the outdoors occurs in many areas of the school, including classrooms and walkways where students and teachers circulate from space to space. Students and staff experience the connection with nature.

The school was conceived to allow views and access to the magnificent natural surroundings. Photo Credit: Benjamin Benschneider/OTTO

The building is composed of learning clusters; each comprises four classrooms that surround a shared flex space. The idea is that the four-teacher teams are working with a smaller group of students, approximately 100, and are able to use both their classroom space and the shared space in the middle to conduct activities. This arrangement accommodates the development of 21st Century Skills.

The principle behind 21st Century Skills is that successful students must do more than simply retain facts. Students need to learn creativity, collaboration, communication and critical thinking—the 4Cs. Educators are finding that to teach these additional competencies, lecture cannot be the exclusive method by which teaching occurs.

Learning by doing is the essential principle behind the 4Cs. Students work on projects in small groups or individually, which allows lessons to "stick" much better than by simply memorizing subject matter. Students are actually performing tasks or creating things that are relevant to their learning. The shared flex spaces provide "hubs" for project-based learning to occur. These areas also allow access to the outdoors, expanding the learning space and experience outside the building.

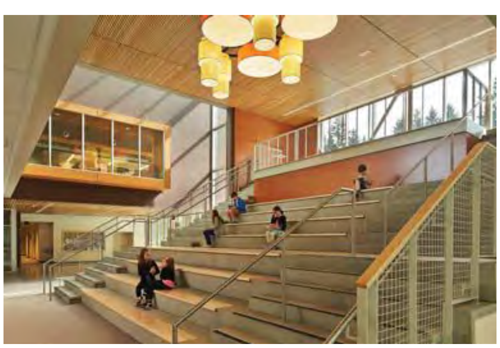
Inside, the classrooms are technology rich. Electronic whiteboards used by students and teachers allow large-scale computer-based instruction. In addition, classrooms contain many typical surfaces for displaying projects, artwork and class materials. There is a variety of built-in casework surfaced with laminate. Laminate was chosen for its durability, which is very important in a high-traffic school environment, and it also adds significant color appropriate to the theme of the building. The floor finishes vary between hard surfaces and carpets to provide a variety of environments for students to use.

THE LEARNING STAIR

The central design feature in the school is what the architects call the "learning stair." As you enter the building, there is a 30-foot wide central stairway leading from the first floor to the second floor, surrounded by a balcony above. The area resembles an amphitheater. The stairs do more than help people ascend to the second floor; they offer a place for spontaneous gatherings and organized activities for teachers and guests.

The learning stair is an assembly spot for administrators, teachers and guest speakers to address large groups of students. Parents often congregate there to socialize while waiting for their students at the end of the school day.

More importantly, the learning stair is a welcoming place for multiple classes of students to meet and collaborate (though not the entire student body at once). Small groups also gather on the stairs to work together. If students have free time between bells, they can lounge on the stairs amid the natural light streaming in from surrounding windows. Students like to congregate in the space that connects with the outdoors and reinforces the theme of Cherry Crest.



The Learning Stair is a main feature of the school and a central assembly space. Photo Credit: Benjamin Benschneider/OTTO

In traditional elementary schools, classrooms or specialized spaces such as the library are meant for learning while corridors are reserved for travel. The architect's approach to these two schools, however, was utilizing the entire school and environment as potential learning areas. The architects created spaces they liken to an eddy in a river: as a river flows there are pools to the side where canoe paddlers often pull off. Similarly, there are multiple places throughout Cherry Crest where students can pull off to the side, where a small group can congregate or an aide can take them to work. These eddies are always visible to a teacher who can supervise.

The learning stair is one such eddy, but there are also smaller spaces throughout the building. School administrators have found that the children like both sizes of eddy, depending on the situation, such as when they prefer a smaller and more enclosed space to think or do a quiet activity. Essentially, the spaces are as flexible as possible so they can respond to the changing demands of educational environments. The goal is to be able to respond to that change by providing an adaptable environment that can be honed.

Learning Objective Two—Examine the process followed to design a state-of-the-art educational environment, and the resulting architectural features.

EXAMINING THE EXTERIOR

Now let's return to the building's exterior. The site is so heavily wooded that the building is difficult to see from off-site. Still, the architects arranged ample parking, drop-off space, bus lanes and other ingress/egress necessities. These transportation zones were precisely plotted to maintain smooth function and convenience while minimizing disruption to the forest.

Given the region's rainy climate, the architectural team designed a large covered area at the front entrance to shelter students, staff and visitors. It is a welcoming entry with a comfortable scale.

The architects worked hard to diminish the scale of the building where it faces the parking lot, which is the view most people see upon arrival. And even though all interior spaces are connected, the building appears to be a series of smaller entities or pavilions that fit neatly within the landscape.

The site is so heavily wooded that it is difficult to see the building from off-site. Photo Credit: Benjamin Benschneider/OTTO

Horizontal siding was used for a residential connotation, but the material is for commercial purposes. Even though the building is quite modern and nobody would think of it as traditionally residential, by using the textured horizontal siding and a variety of other sidings the architects were able to create an interesting composition that breaks down the scale of the large, 77,000 square foot single building. Trees are visible behind and around the building so that even though it's brand new, it is very nestled into the forest setting.

The colors used on Cherry Crest feature a deep red, selected to complement the evergreen site characteristics, that allows the building to feel that it has been there for a long time.

Cherry Crest was designed prior to the campus tragedies that have made recent national news headlines. Nevertheless, the school uses principles from Crime Prevention Through Environmental Design (CPTED) to create a secure campus. The number of doors is limited in order to control access, the main entrance requires people to go past the front office in a controlled manner so administrators can know who is entering, and of course all visitors must sign in. The school becomes much easier to control because of this configuration.

LANDSCAPING A LEARNING ENVIRONMENT

Low-maintenance landscaping is a must for school districts that want to save on operational costs due to limited maintenance or custodial budget. That's why the landscape design at Cherry Crest called for new low-ground cover and taller hardy species that all are native. This means they can survive and thrive in the area's wet and dry seasons. The native plantings also enhance and reinforce the site's old-forest character.

Another important landscape feature is its contribution to local water quality. Run-off requirements are strict in the Puget Sound region. Even a site where a previous building stood must be restored to pre-Columbian condition as part of any redevelopment. The goal is to prevent runoff and fertilizers from polluting Puget Sound, a vital ecosystem for salmon in the Pacific Northwest. Puget Sound's near-shore region is composed of shallow saltwater, nearby wetlands, estuaries, beaches and bluffs. These areas are critical zones for juvenile salmon as they make the transition from rivers to the ocean.

At Cherry Crest, plantings in the parking lot and other areas of the site act as biofiltration swales or rain gardens. Rain and fluids from other sources flow from hard outdoor surfaces into these planted areas. The roots and other vegetation naturally filter the water, helping separate contaminants that come from vehicles and other sources. The cleaner water is collected, detained and finally allowed off-site.

THE DESIGN PROCESS

To guide the design of its redeveloped schools, the Bellevue School District uses a model educational specification. This specification describes the educational program at the school, the required spaces, their sizes, their planned uses, etc. Additionally, the school district applies an individual process for each school to specify modifications that represent the unique design aspects of that particular building. The district's goal is to satisfy the needs and wants of the community served by each new school while incorporating important innovations used by faculty across the district.

The design process was conducted with a planning and design team composed primarily of teachers, along with some parents and community representatives. This user group helped design the school and provided a better understanding of existing problems and site challenges. The architects initially worked with the group using blocks representing different areas of the school. The group discussed their wants, needs, and perceived issues, and then they tried to arrange the blocks on the site to solve their issues. In so doing, they achieve an understanding of what the challenges are in arranging spaces in a certain way.

Visit http://go.hw.net/AR614Course7 to read more and complete the quiz for credit.

QUIZ

1. Which elementary school is located on a heavily wooded site?
   a. Cherry Crest Elementary
   b. Riverview Elementary

2. True or False: No fossil fuels are burned on-site at Cherry Crest Elementary.

3. What is the term used in education to describe a style of deeper learning that develops the natural curiosity, creativity, and interest of students?
   a. Memorization
   b. 21^{st} Century Skills
   c. Montessori
   d. Parochial

4. What architectural feature was incorporated into Cherry Crest Elementary to serve as a central assembly space?
   a. The Learning Stair
   b. The I.D.E.A Lab
   c. Elevated walkways above the wetland

5. True or False: The design process at both schools mirrors the experiential project-based learning that the schools themselves are using.

6. Which elementary school is located adjacent to a wetland?
   a. Cherry Crest Elementary
   b. Riverview Elementary

7. What is the special classroom at Riverview Elementary called that is located close to the front of the school and can be used for art and science purposes and also by the community?
   a. The I.D.E.A. Lab
   b. The Library
   c. The Courtyard
   d. The Learning Stair

8. True or False: At Riverview Elementary most of the materials from the demolished school were re-used onsite.

9. Which energy-saving measure was used at Riverview Elementary?
   a. Photovoltaics
   b. Ground source heat pump system
   c. Daylighting
   d. Triple-glazed windows
   e. Super-insulated walls
   f. All of the above

10. What material was used in the community meeting spaces at Riverview Elementary to create a level of sophistication?
   a. Concrete block
   b. Horizontal siding
   c. Ochre colored cementitious panels
   d. Woodgrain laminate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CENTER

A worker controls a Trimble UX5 drone, which can capture high-resolution survey data that can be turned into a 3D model of a construction site. For more on the UX5 and other jobsite robots, turn to page 140.

RESIDENTIAL

MADE (MOSTLY) IN AMERICA

KAREN LANTZ WANTED TO DESIGN HER HOUSE USING ONLY U.S.-MANUFACTURED PRODUCTS. MINUS THE SOLAR PANELS (AND A FEW OTHER THINGS), HER PROJECT IS A BLUEPRINT FOR LOCAL SOURCING.

LANTZ FULL CIRCLE

The landscaping at Karen Lantz's Houston house is irrigated using a below-ground water collection tank manufactured by Norwesco in St. Bonifacius, Minn.

Text by **Karrie Jacobs**

CRUISING SLOWLY UP BANKS, a narrow residential street in Houston's Museum District, I'm trying to guess which house belongs to architect Karen Lantz, AIA. Along the way I find the typical Houston mix: postwar ranch houses and their lot-filling replacements, mostly McMansions loosely modeled on Versailles. I'm momentarily fooled by a big white modernist house, but it's too cool, too formulaic. I know I'm looking for something more particular. Finally, I spot a precise assemblage of boxy volumes that looks—and this is a good thing—like it was put together from a Kenner Building Set. The exterior is marked by a xeriscape garden instead of a lawn, a length of white vinyl fence framed like a work of minimalist art, a solar water heater astride the roof that resembles a high-tech gable, and a light sculpture—a bright cluster of LED bulbs—above the entrance.

Lantz, 40, designed the house—built from the ground up and completed early last year—for herself; her husband, a dentist named Andrew Farkas; and their dog, Willa

Wonka, a labradoodle. Her first project of note, it is as packed with ideas as an ambitious debut novel. In this case, the ideas are mostly about the economic and ecological impact of materials and products, where they're made and how they're sourced. Like many creative professionals lately, Lantz thinks it's economically and culturally significant to support local manufacturers, much in the way we now support local food producers. More than just follow the LEED for Homes Checklist, Lantz attempted (and largely succeeded) in building and furnishing the house with materials and products manufactured in the United States—no mean feat. And unlike many concept-driven projects, hers is a testament to the fact that you can be highly conscientious without sacrificing the visual side of design.

ON A TOUR OF THE HOUSE, Lantz was quick to tell me that she didn't grow up with a lot of money. She was raised in Pasadena, Texas, a working-class suburb of Houston, and married her high school sweetheart. "His dad worked at NASA and my dad worked at Armco steel [now AK Steel] . We both went to junior college and I went on to architecture school at the University of Houston."

Fourteen years ago, the couple bought the 1950s ranch house that originally sat on the property and rented it out. They also bought a second house by the Texas Medical Center and lived in it. Both properties increased dramatically in value and helped them finance the new 3,600-square-foot house that Lantz estimates cost roughly $250 a square foot.

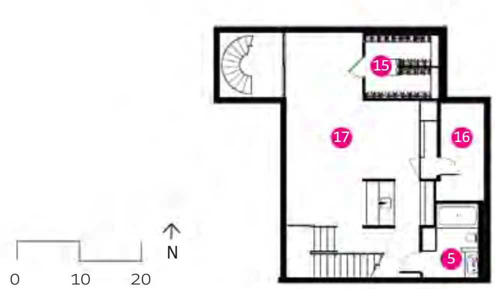
Originally, Lantz's plan was simply to design a house good enough to liberate her from a professional holding pattern she refers to as "renovation hell." But in 2009, as she demolished the old house that sat on the lot (diligently finding new users for the materials), she found herself preoccupied by the recession. "My friends were losing their jobs. I felt like there's something very wrong with that. Why are those factories closing?" At appliance showrooms, salesmen offered her discounts for German-made appliances. Lantz was appreciative: "I was calling in every discount I could get." But she began to resent the fact that she was "being directed toward products that weren't manufactured here."

LEED's system (Lantz anticipates that the house will be certified LEED Platinum) awards points for sourcing goods from within a 500-mile radius, but no major appliances are manufactured that close to Houston. Lantz decided that, beyond the carbon generated by transporting goods, there was another important issue: American manufacturing. She eventually found an attractive, European-

Second-Level Plan

Ground-Level Plan

Basement-Level Plan



1. Roof terrace
2. Bedroom
3. Study
4. Closet
5. Bathroom
6. Carport
7. Kitchen
8. Dining room
9. Living room
10. Entry
11. Porch
12. Pool
13. North garden
14. Courtyard
15. Wine cellar
16. Mechanical
17. Media room

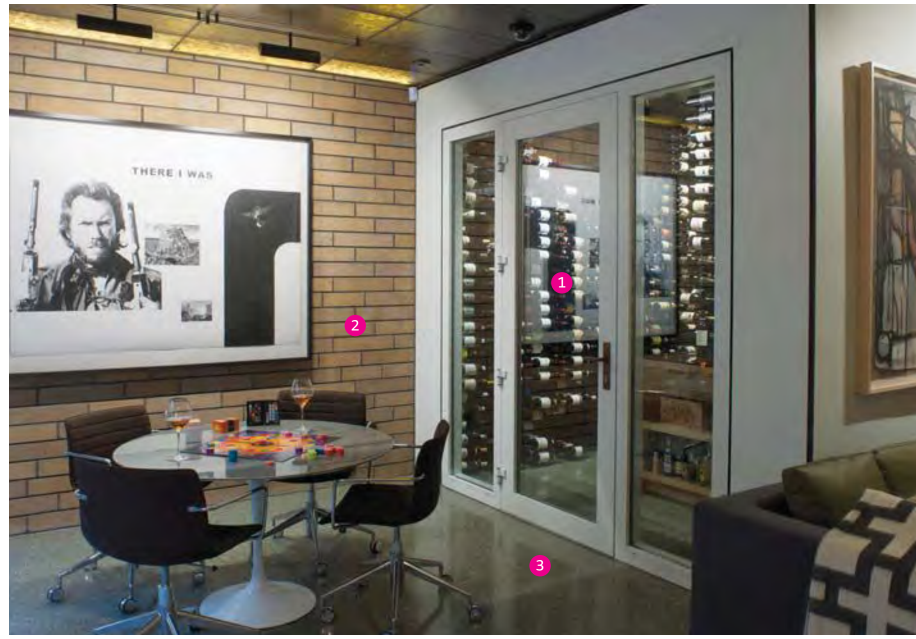
inspired line from Sub-Zero. "I was so excited that we were producing them in Madison, Wis.," she says. And suddenly, Lantz's design process had a focus: "It became a mission about finding the best-looking American products."

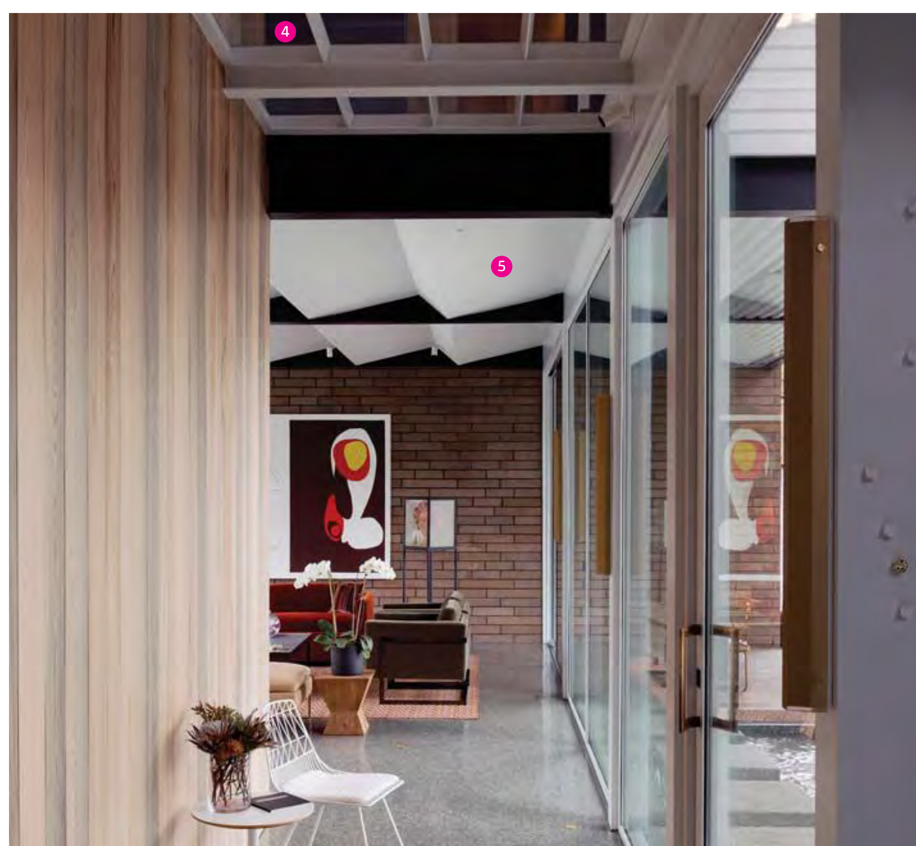
Lantz began an extended scavenger hunt that turned up Corian, the once-ubiquitous white surfacing material, which DuPont makes in Buffalo, N.Y. She found kitchen accessories fabricated by Waterstone Faucets in Murrieta, Calif., and Uplift medicine cabinets with doors that slide vertically from Bristol, Pa., manufacturer Robern. From her home state, she sourced metal roofing material from San Antonio, soy-foam insulation from Arlington, and coated glass from Waxahachie. Houston companies yielded a steam therapy shower for the master bathroom, insulated windows, and terrazzo flooring. Bob Bertin of American Marble Mosaic Co., a third-generation terrazzo man, was especially supportive of her mission. "I said, 'Bob, I really want to know where everything comes from.'" He obligingly handwrote a sourcing list for every last bit of gravel.

For some things, Lantz simply couldn't find U.S. producers. While her decision to use an Italian-made sink in the powder room was a stylistic whim, the fact that she felt compelled to install a German-made solar hot-water heater and a thin-film solar array produced in China suggests that we're behind the curve on these crucial technologies: "There are American companies making solar panels, just not the beautiful thin-film ones I was looking for," says Lantz. "There are domestic solar hot-water systems, but the sources I found were not to the standards of the European companies."

It isn't just the sourcing of the materials that's significant. Everything in the house invites the eye and the hand. For the most part, Lantz says "the materials dictated the aesthetic," although she was clearly influenced by midcentury modern design. Indeed, her living room exudes Case Study House, with reupholstered vintage club chairs and sofa against a warm backdrop of Texas limestone. A round hanging lamp that could be a Noguchi is actually a piece by California artist Russell Crotty. And then there's a zigzag ceiling, an innovation intended to modulate the room's acoustics, which Lantz borrowed from a Madrid restaurant designed by Spanish architect Francisco Mangado, Hon. FAIA.

One of the more unconventional material decisions Lantz made is only visible in key spots—for instance, where the staircase to the second floor rests on one of the steel beams (milled in the U.S., of course) that supports the house. "My dad made steel," Lantz says. "His company sent steel to New York for the [original] World Trade towers. I had the feeling





1. Wine cellar by USA Cellar Systems (made outside the U.S. but assembled in Long Beach, Calif.).
2. Texas limestone from Aguado Stone in Georgetown, Texas.
3. Terrazzo flooring by American Marble Mosaic Co. in Houston.
4. Second-story glass floor by Innovative Building Products in Denton, Texas.
5. Green glass fiberglass-faced gypsum board for zig-zag ceiling by Temple-Inland in McQueeney, Texas.

TOP: HESTER + HARDAWAY; BOTTOM: JACK THOMPSON

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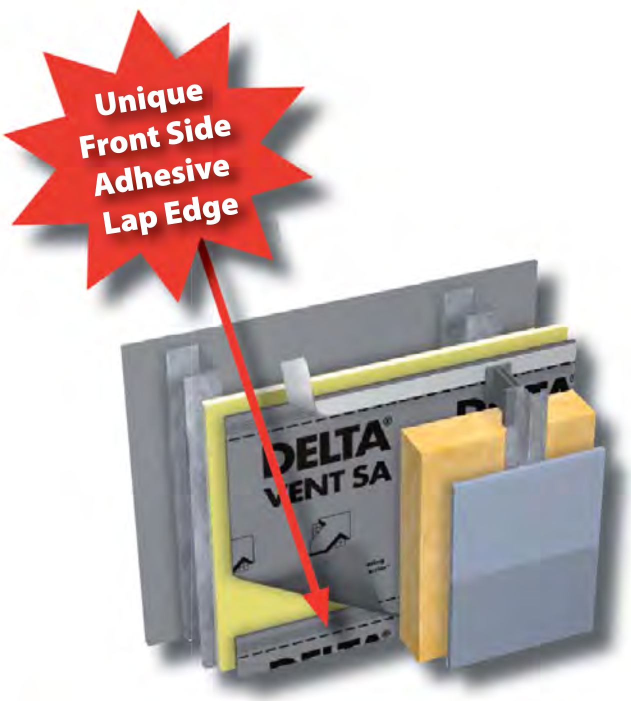

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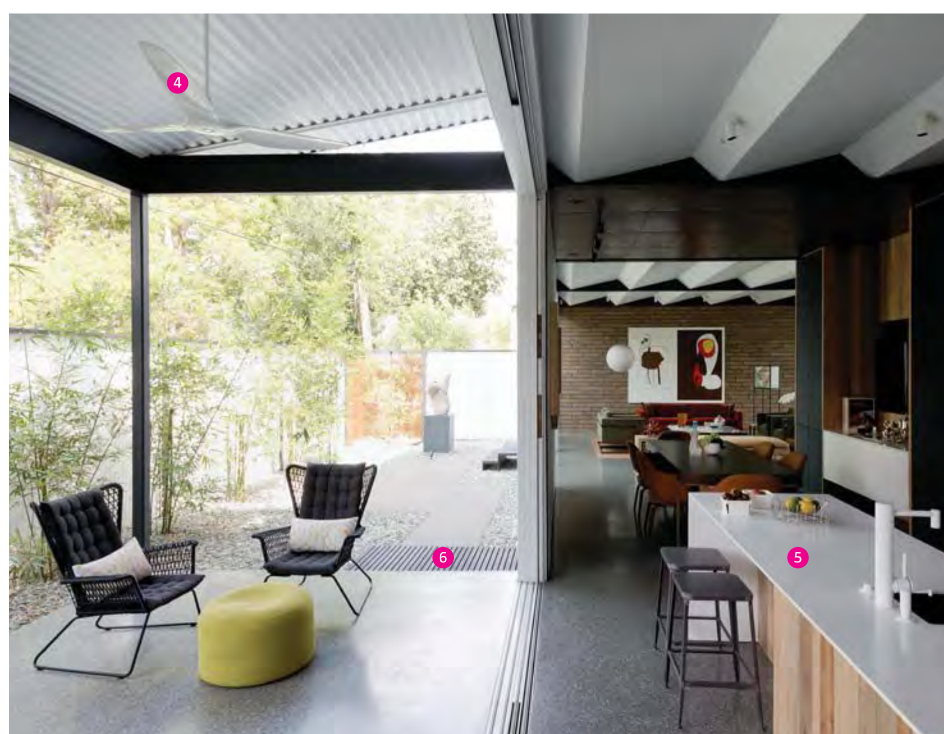

1. Hunley faucet by Waterstone Faucets in Murrieta, Calif.
2. E Series built-in double ovens and framed induction/gas multifunction cooktop by Wolf in Fitchburg and Madison, Wis.
3. Aluminum doors by Fleetwood in Corona, Calif.
4. Haiku ceiling fan by Big Ass Fans in Lexington, Ky.
5. Countertops by DuPont Corian in Buffalo, N.Y.
6. Duradek fiberglass grating by Strongwell in Chatfield, Minn.

JACK THOMPSON


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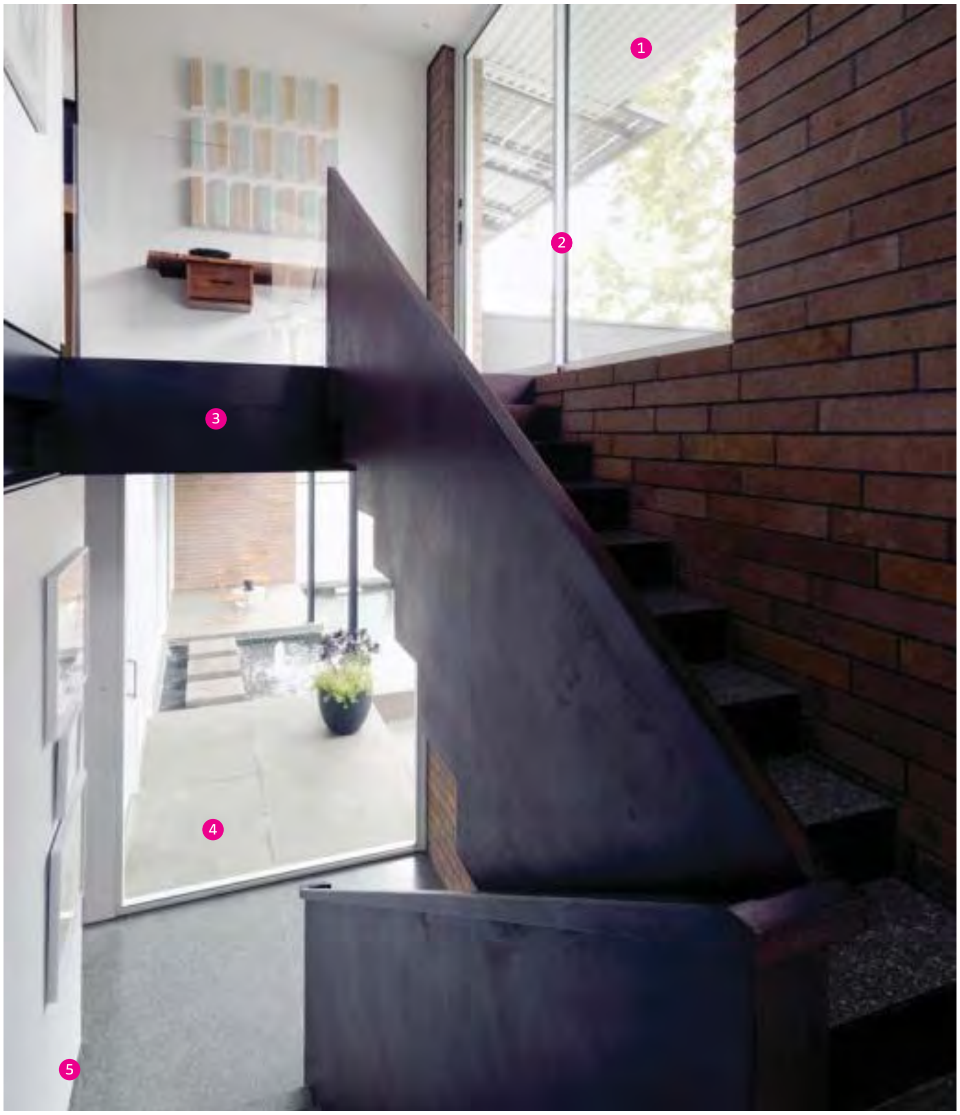
1. Texas limestone from Aguado Stone in Georgetown, Texas.
2. Grout for Texas limestone by Spectrum Cement in Alvin, Texas.
3. Shower-door glass by Cristacurva in Houston.
4. Teak shower seat by MTI Baths in Sugar Hill, Ga.

JACK THOMPSON

that if I used steel he would love that." Her father, she adds, didn't live to see the house completed.

IN SOME WAYS, Lantz's first house is a typical career move: "As an architect," she says, designing your own home is "the moment to make your statement." But the statement she's making is not just about her own abilities. It's more about how the architectural profession could help boost the manufacturing sector.

Industrial employment in the U.S., which bottomed out in early 2010 after decades of decline, has started to creep up again, according to the U.S. Bureau of Labor Statistics. Similarly, the Institute for Supply Management shows a consistent uptick over the last year in manufacturing activity. But economic experts disagree about whether the indicators demonstrate that industry is simply recovering from the recession or whether "reshoring"—the return of manufacturing jobs to the U.S.—is



1. Metal roof by Berridge in Houston and San Antonio, Texas.
2. Coated neat glass Cardinal in Waxahatchie, Texas.
3. Steel beam by New York Steel USA.
4. Washed terrazzo by American Marble Mosaic Co. in Houston.
5. Aluminum metal baseboards and reveals by Fry Reglet in Santa Fe Springs, Calif., and Alpharetta, Ga.

actually happening. For her part, Lantz says, "I wish that I could influence architects that do big buildings to use the principles of this tiny project. I would like it to be cool to say, 'I got my material locally.'"

What's more, she hopes her project helps change the architectural character of her hometown. "Houston is such a conservative city architecturally. We're always making houses that seem like they're from someplace else. I hope that this house seems like it's from *here*."

JACK THOMPSON

BEST PRACTICES

BUILDING NEW BUSINESS

EVEN AS THE ECONOMY RECOVERS, THE COMPETITION FOR BRICK-AND-MORTAR PROJECTS REMAINS FIERCE. ARCHITECTS WOULD BE WISE TO EXPAND THEIR PRACTICES AND EMBRACE THESE FOUR EMERGING FIELDS.

Text by **Thomas Fisher, Assoc. AIA**
Illustration by **Tang Yau Hoong**

WHILE MOST ARCHITECTS have gotten busier since the recession officially ended, there do remain challenges—lagging employment, depressed fees, increased competition—that result from so many firms chasing the same projects. Meanwhile, the profession has never had more opportunities to use our knowledge and skills in an era of rampant climate change, rapid population growth, and dramatic economic transformation. How might we resolve the paradox of having too few jobs to pursue and so much work to do?

One answer: We should take a more expansive view of architectural practice. The four fields on the next page, which have emerged in response to the pressing needs of our current age, represent inventive combinations of existing disciplines. These fields are among the most visible examples of the entrepreneurial revolution happening in our midst.

1. GEODESIGN has emerged in the midst of climate change because of our need to know the environmental impacts of design decisions. Using geographic information systems (GIS), this new discipline not only helps us visualize complex data and map them to particular places, it also enables us to see the consequences of our design work on the ecosystem.

Initially embraced by landscape architects and planners, geodesign has also proven useful at the scale of individual buildings and interiors. Programs have started in schools like Pennsylvania State University and Philadelphia University, and firms like Skidmore, Owings & Merrill have embraced it. And with the Obama administration providing Esri's ArcGIS Online to every K–12 school in the nation, geodesign will soon become a core skill of every educated American, and something that every designer needs to know—and use.

2. SERVICE DESIGN focuses on invisible phenomena—processes and procedures, systems and infrastructures. Driven so far by major health providers like the Mayo Clinic and Kaiser Permanente, service design has increasingly benefited private, public, and nonprofit organizations. They use design thinking and prototyping methods to improve outcomes, increasing productivity, creating faster delivery, and reducing errors.

While graphic- and industrial-design firms like IDEO have led this work and major business schools have embraced it, the architectural profession has been slower to come around, perhaps because such commissions only sometimes lead to conventional building projects. But with pressures on every sector of our economy to reduce costs, increase efficiency, and speed up innovation, service design will soon become an essential offering.

3. EXPERIENCE DESIGN places more emphasis on human behavior than on the design of abstract systems. Long embraced by the hospitality, retail, and entertainment industries, experience design can be applied to almost every type of activity and environment, from the physical to the virtual.

The rethinking of the workspace, for example, which balances the value of mobile digital technology with that of face-to-face interaction, represents one of many experience-design efforts underway. It reflects a shift toward a more integrated, holistic approach to design. The rise of interdisciplinary education programs, and of transdisciplinary design firms like Pentagram and Frog, show how the built environment has become part of a much larger orchestration of user experience.

4. PUBLIC INTEREST DESIGN responds to the fact that, globally, roughly 1 billion people live in slums, 1.1 billion don't have access to clean water, and 2.6 billion lack basic sanitation. It remains an area of strong interest among many architecture students and recent graduates, with classes or programs offered in several schools, including the University of Minnesota, where I'm dean of the College of Design. Both large firms, such as Perkins+Will, and small ones, such as Public Architecture and MASS Design Group, have robust public interest design practices; some are run as nonprofits in partnership with Architecture for Humanity or Partners in Health. This field might eventually grow larger than traditional architectural practice, given the much greater demand.

How should you position your firm for the future?

Although these four fields do not yet rival the established design disciplines, they may someday trump more conventional practice simply because of the extent of the markets and the magnitude of the demands they serve. And at least this much seems clear: Architects need to diversify their practices and broaden their self-definition, or they risk getting left behind in a world of rapidly changing design needs.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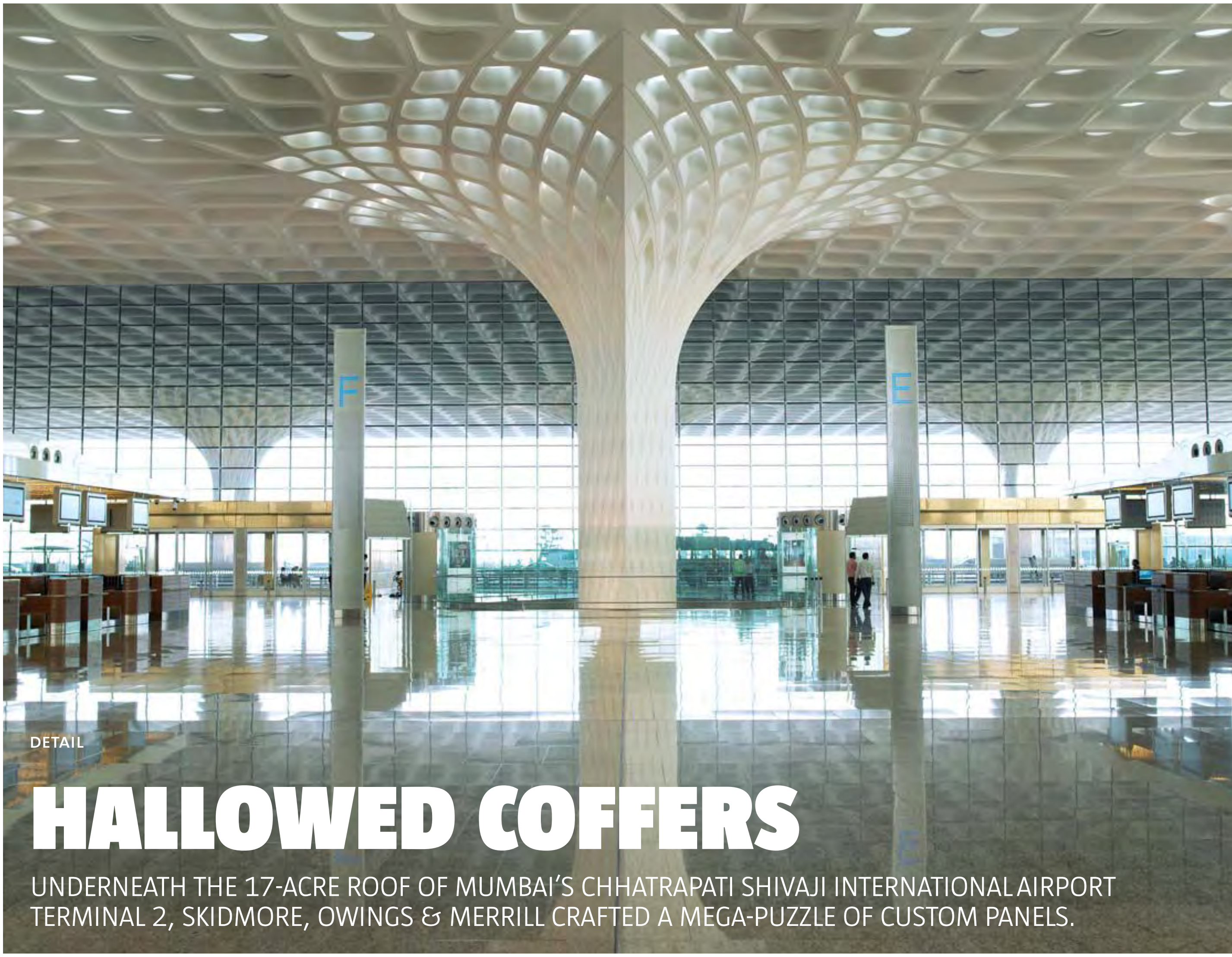


DETAIL

HALLOWED COFFERS

UNDERNEATH THE 17-ACRE ROOF OF MUMBAI'S CHHATRAPATI SHIVAJI INTERNATIONAL AIRPORT TERMINAL 2, SKIDMORE, OWINGS & MERRILL CRAFTED A MEGA-PUZZLE OF CUSTOM PANELS.

Text by **Logan Ward**
Photos by **Robert Polidori**

THE GRID OF COLUMNS and ceiling coffers at the Chhatrapati Shivaji International Airport Terminal 2 in Mumbai, India, recalls the intricately carved stone *mandapas*, or pavilions, of ancient Hindu temples. But everything else about this 4.4-million-square-foot transportation hub, designed by Skidmore, Owings & Merrill (SOM) to serve 40 million travelers per year, is thoroughly modern.

Thirty massive concrete-encased steel columns structurally bear the terminal's 1,150-foot-by-900-foot roof, with 111- and 210-foot clear spans between supports. The columns also create a powerful aesthetic that helped fulfill the client's goal for more than just a sleek international airport. "They wanted it to feel like it belonged in India," says Roger Duffy, FAIA, the project's design partner. For design inspiration, he met with historians, studied traditional choreography, visited archeological sites, and collaborated with Indian designers Abu Jani and Sandeep Khosla.

Upon learning that the peacock, India's national bird, is a symbol of life, Duffy and his colleagues chose the iridescent, teardrop-shaped eye of the tailfeather as the inspiration and motif for the molded coffered panels that clad the terminal's ceiling and columns.

The 131-foot-tall columns rise the full height of the terminal, passing through openings in each of the four floors, and culminating with a 111-foot-wide capital that mushrooms into the 17-acre ceiling. To design the coffered panels, Duffy says the SOM team "essentially made a 3D map of the ceiling [and capitals], and then segmented it into a taxonomy of pieces." Each piece is a molded coffered panel measuring approximately 9 feet 2 inches by 8 feet 9 inches; panels at the capital are slightly smaller. With their teardrop shapes, all panels reflect the peacock eye motif.

For the 4.4-million-square-foot Terminal 2 at Chhatrapati Shivaji International Airport, in Mumbai, India, Skidmore, Owings & Merrill designed a moment-resisting steel-truss frame that is softened by thousands of precision-made glass-fiber-reinforced concrete panels and gypsum panels.

The airport's long-span steel structure is supported by a grid of composite mega-columns that comprise a 2.3-meter-square cruciform steel structure encased in a 2.7-meter-diameter concrete casing. The panels attach to the structure with a system of aircraft wire and steel hooks molded into the glass-fiber-reinforced gypsum and concrete.

The interior panels are molded glass-fiber reinforced gypsum (GFRG) while their exterior counterparts, in areas such as the arrivals forecourt, are made from glass-fiber reinforced concrete (GFRC) to withstand weather.

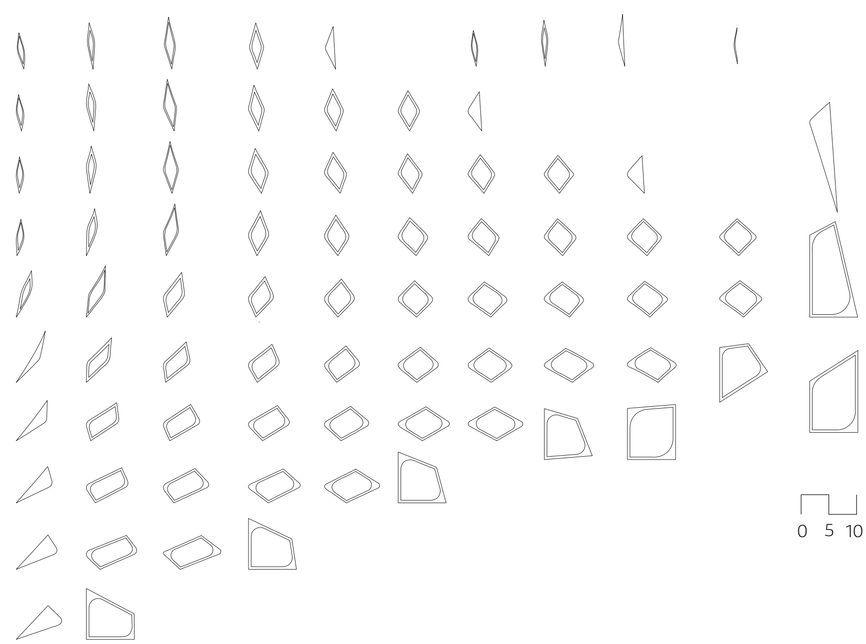
To meet the tremendous scope and scale of the panels, the designers partnered with Formglas Products, a Toronto-based molded architectural products company. Formglas brought SOM's digital models into the 3D CAD software CATIA to make the molds. "That allowed us to detail everything [including overlaps and joints] to nth degree," says Formglas senior vice president Richard Samson.

Five-axis CNC machines cut each shape from molded medium-density fiberboard (MDF). Formglas then layered fiber-reinforced plastic (FRP) over those shapes and took a "negative," which became the mold. In all, Formglas's manufacturing plants in Toronto and Mexicali, Mexico, built more than 500 different molds and produced more than 15,500 different components for the roof, capitals, and columns.

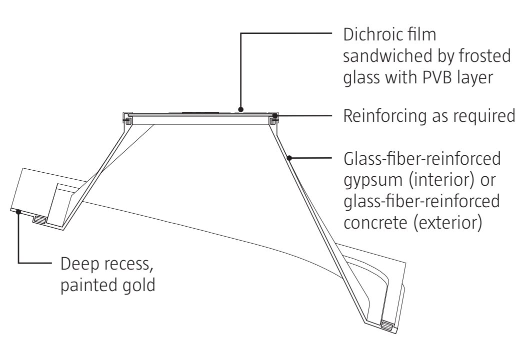
What makes the design special, Duffy says, is the precision with which each panel was fabricated. "You can barely see the joints, making the columns and ceiling look as if they were carved from a single piece of stone," he says. To produce such a fine surface, Samson explains, each FRP mold was thoroughly sanded and buffed. "The quality of the panels is only as good as the quality of the surface of the molds."

At the center of each of the 8,500 coffered panels is a 2- to 3-foot-diameter aperture for natural and electric light to pass. In each aperture is a laminated lens with a disc of dichroic film that produces two colors, depending on the angle at which light strikes it. SOM positioned the film to create a geometric pattern of color on the ceiling itself and the floor below. "When the light is right, the whole airport looks like a Rajasthan palace filled with colored glass," Duffy says.

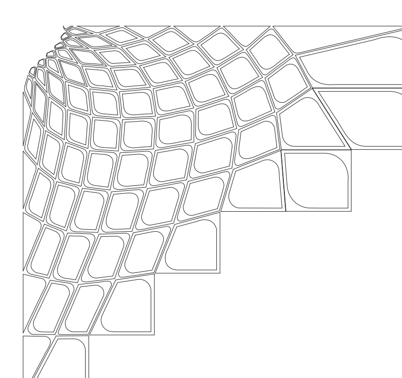
Column Panels Unrolled Plans



Column Coffer Panel Section



Column Panel Index



PRODUCTS

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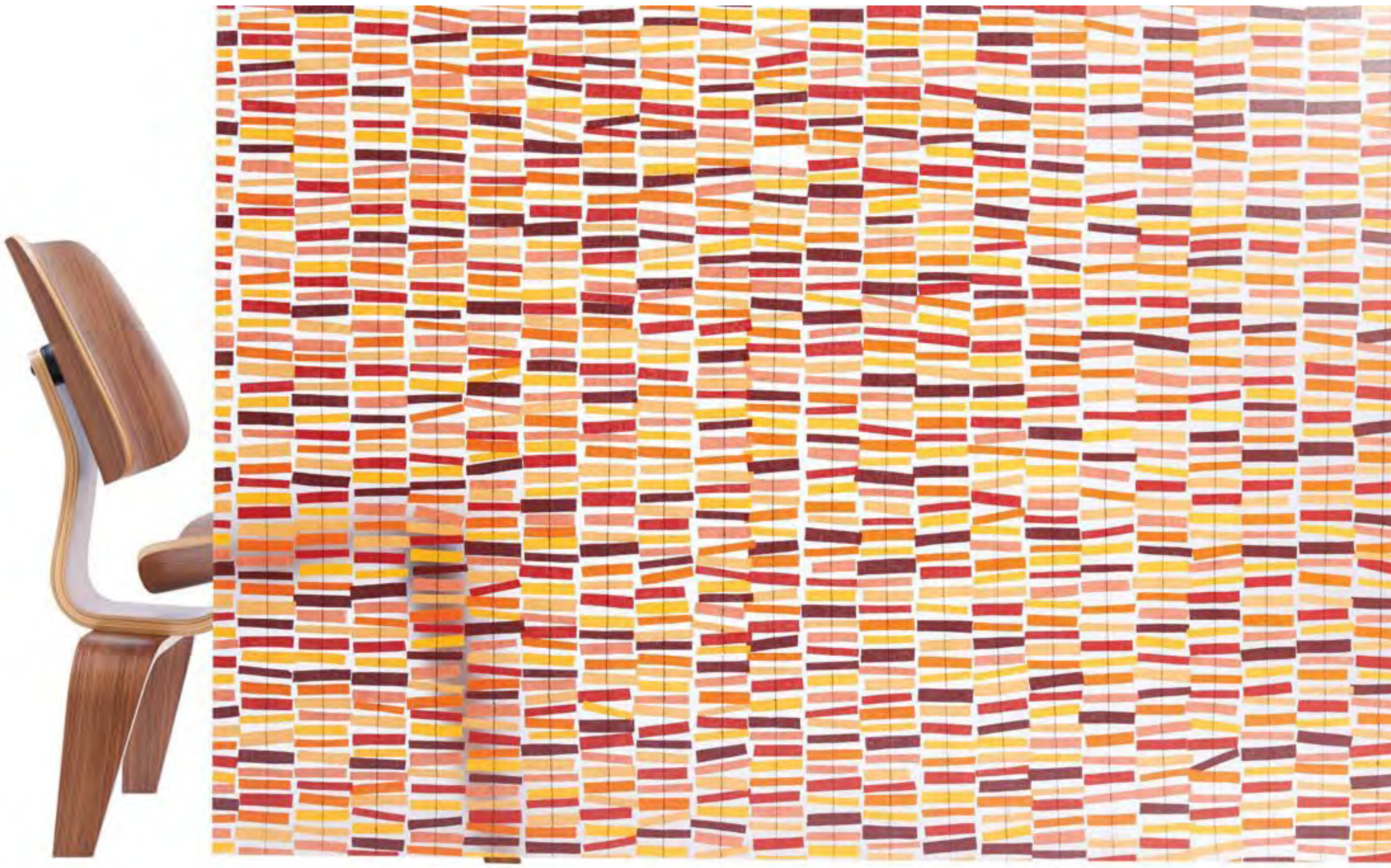
Text by **Hallie Busta**

HONEYCOR ESP, NOBLE ENVIRONMENTAL TECHNOLOGIES
To create a sustainable alternative to wood and composite panels, Noble Environmental Technologies mixed post-consumer recycled and bio-based cellulose fibers with water, turned up the heat, and compressed the material into rigid, structural forms. Among its line of Environmental Structural Panels (ESPs) is HoneyCor (shown), which has honeycomb-shaped ESPs between single ESP plys. Offered in ½" to 2" thicknesses. *ecorusa.com* Circle 100

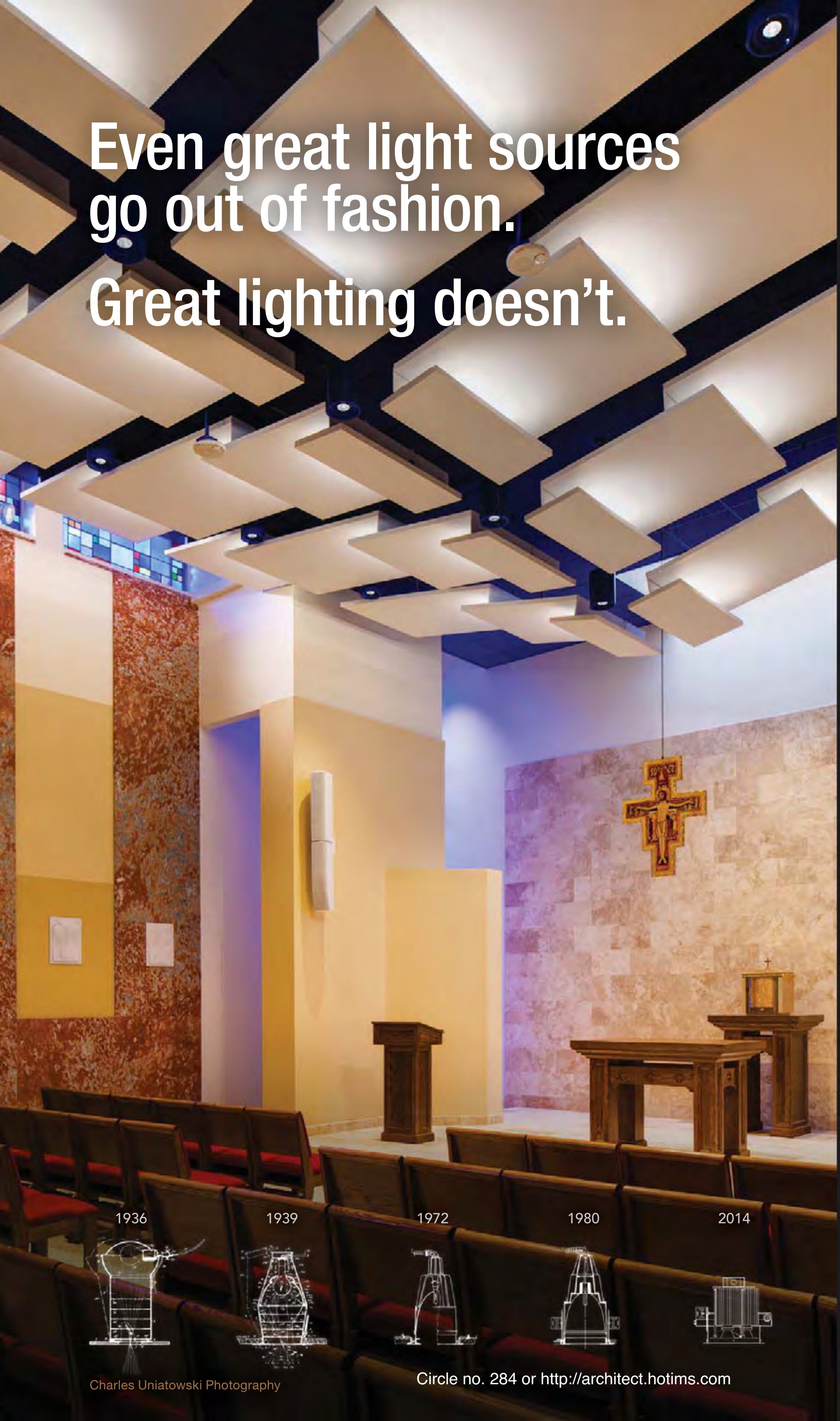


FULL CIRCLE, 3FORM

Architectural surfaces maker 3Form is growing its Full Circle series, which was borne from partnerships with artisans worldwide to provide skilled jobs while sourcing eco-friendly materials to insert between sheets of the company's translucent Varia Ecoresin, which contains 40% pre-consumer recycled content. The two new lines are produced by craft workers in Ndem, Senegal, and include Tribe (shown), which evolves 3Form's Ensign product with horizontally stitched fabric chains in warm and cool color palettes. *3-form.com* Circle 101

SKINNY PLANKS, INTERFACE

With a legacy of combining healthy materials and high-design, the sustainability-minded carpet manufacturer Interface is adding a new dimension to its collection of modular flooring. The 23cm-wide-by-1m-long plank-style carpet tiles help designers integrate features such as wayfinding and work area demarcations within a floor plan. Skinny Planks join the company's existing line of modular tiles, which include 50cm-wide-by-1m-long planks, 1m squares, and 50cm squares. *interface.com* Circle 102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Great lighting doesn't.
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1939
1972
1980
2014
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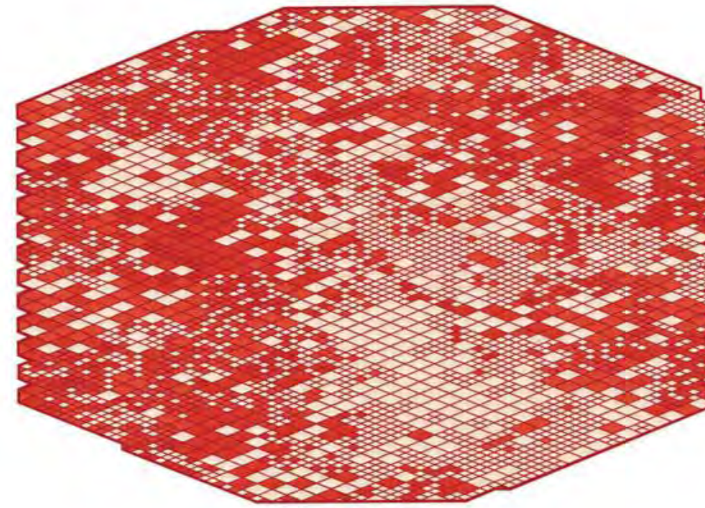


BIOMASON

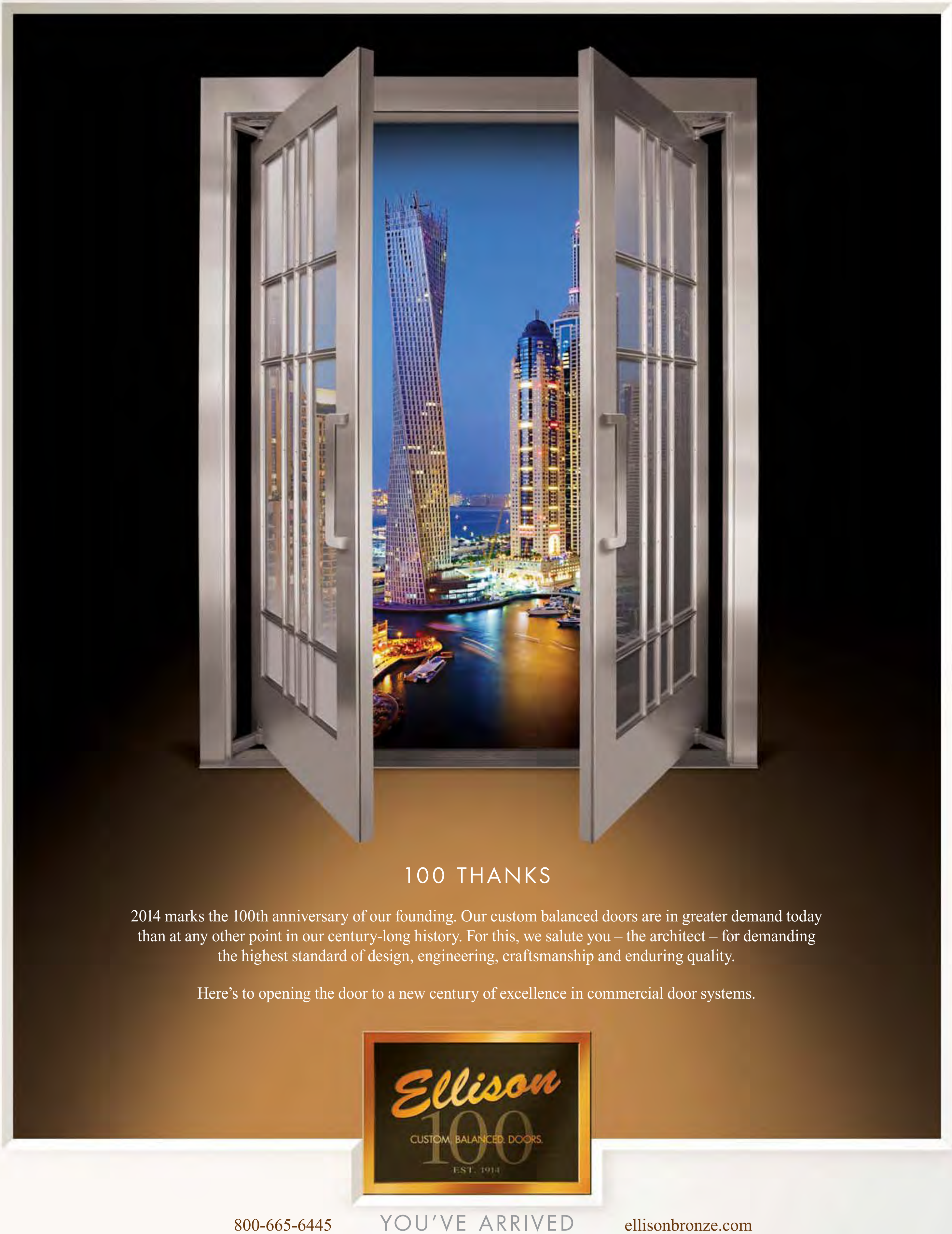
The fabrication of Portland cement–based masonry units is notorious for its CO_2 emissions, spurring the development of products and processes that emit fewer air pollutants and VOCs. One of these, BioMason, uses bacteria grown from yeast extract to do the binding work of cement when mixed with an aggregate. The result is a durable masonry unit that hardens in fewer than five days. The product won the inaugural Cradle to Cradle Product Innovation Challenge in 2013. *biomason.com* Circle 103

LOSANGES III, NANIMARQUINA

The Spanish carpet maker collaborated with French designers Erwan and Ronan Bouroullec on Losanges, a trio of area rugs. The latest addition to the series, Losanges III, repeats a rhombus shape to form a geometric lattice in red and white colorways. The rug is hand-woven from hand-spun wool by craftsmen in northern Pakistan using a process emulating that of traditional kilims and resulting in slight variations in color and arrangement with each iteration. *nanimarquina.com* Circle 104

MODULAR SYSTEM DIY BOOKCASE KIT, RX MADE

Chicago salvage operation Rebuilding Exchange offers job training to disadvantaged groups via its RX Made shop. Workers use locally sourced materials to craft furnishings such as a modular bookshelf (shown) whose kit of parts includes a powdercoated steel base and risers. *rxmade.org* Circle 105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PAPER VASE COVER, PEPE HEYKOOP

A project by Dutch designer Pepe Heykoop, with the goal of providing skilled jobs and socioeconomic mobility to members of an impoverished community in India by 2020, Paper Vase Covers are made of coated paper that can be rolled up or down to cover a variety of vessel types and sizes. Available in white, black, green, silver, and blue colorways. *pepeheykoop.nl* Circle 106

ARROW LAMP, ROSE & FITZGERALD

Crafted by artisans in Uganda from locally sourced mugavu and teak, the Arrow Lamp from Rose & Fitzgerald is a product of an enterprise that aims to foster sustainable sourcing and manufacturing while fueling local industry. The luminaire's base measures 6" wide and 12" tall. A drum shade, offered in black linen and cotton, measures 15" wide and 8" tall. *roseandfitzgerald.com* Circle 107

LOLLYGAGGER, LOLL DESIGNS

Loll Designs crafted its Lollygagger collection of outdoor furniture from composite boards that include post-consumer recycled plastic milk jugs, a UV stabilizer, and a colored pigment. The Duluth, Minn.–based outdoor furniture maker was founded in 2003 by a skate park design/build contractor to reuse leftover materials. The series includes a chaise lounge (shown) and tables. *lolldesigns.com* Circle 108

NEXT PROGRESSIVES

THE DNA OF DIGITAL CRAFT

ALVIN HUANG'S MULTILAYERED, COMPUTER-GENERATED DESIGNS ARE MERGING APPLIED RESEARCH FROM HIS ACADEMIC STUDIO WITH THE REAL-WORLD PROBLEM-SOLVING OF HIS LOS ANGELES FIRM.

Alvin Huang in front of "The Groove" at CentralWorld, a 129,167-square-foot entertainment and retail venue his firm completed late last year in Bangkok.

Text by **Deane Madsen**
Portrait by **Lek Kiatsirikajorn/MoST Artists**

FOR ALVIN HUANG, AIA, the founder of Synthesis Design + Architecture (SDA), his firm's name aptly defines his approach to practice. An assistant professor at the University of Southern California's School of Architecture, Huang finds a significant overlap between his teaching and research at the school and the various explorations undertaken in his firm's Los Angeles office. In his studios, Huang pushes students to research the ways in which technology informs the architectural process. At SDA, similar investigations are constrained by budgets and the limitations of materials. By repeatedly collapsing the boundary between applied research and exploratory practice, Huang has developed a symbiotic feedback loop between the two.

Huang spent his formative years in England. He attended the Architectural Association School of Architecture (AA)—and will co-direct an L.A.-based visiting school program through the AA for 10 days in June—and worked at the London offices of Zaha Hadid Architects, Future Systems, and Amanda Levete Architects (which Levete founded after the death of her partner at Future Systems, Jan Kaplický). Huang embraced the international diversity of those practices and sought to create a similarly varied team after striking out on his own in 2011. Not only does SDA's staff of five hail from Portugal, Taiwan, Canada, Jordan, and the U.S., but all of the firm's built work has been abroad.

A NATURAL CHOICE

The three-story addition to the **Johnston County, Iowa campus of ChildServe,** a not-for-profit organization serving children with special health care needs, doubles their current space for outpatient therapy, administrative offices, and future growth.

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Josh Ridgely, AIA, LEED® AP
Architect
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That will change, however, with SDA's commission to design an exterior pedestrian footbridge over a freeway as part of a public art project at the Slauson metro station in L.A. "We took the [need for a] big stair as an opportunity to do a decorative rainscreen cladding that creates a sort of vector-field condition," Huang says. Apertures at various points along the walkway will frame highlighted views, like the nearby Watts Towers, providing "a visual experience moving up and down the stairs that encourages you to make that journey."

As Huang tells it, the Slauson project—scheduled to be completed in early 2015—reflects his interest in how overlapping, slightly non-parallel viewpoints and materials can generate provocative ideas in architecture. For CentralPlaza Lampang, a shopping center in Thailand, SDA designed a lattice-like façade that embraces the moiré effect. Comprised of folded metal sheets over extruded aluminum sill profiles, the façade relies on associative geometries for variation. "When we started the design, it was something like 2,000 to 3,000 unique parts," Huang says. "Using associative geometries, we could make the same effect with just five different pre-fabricated panels flipped and rotated. For close to the same cost of producing just one type of panel, we were able to produce an exponentially more interesting result."

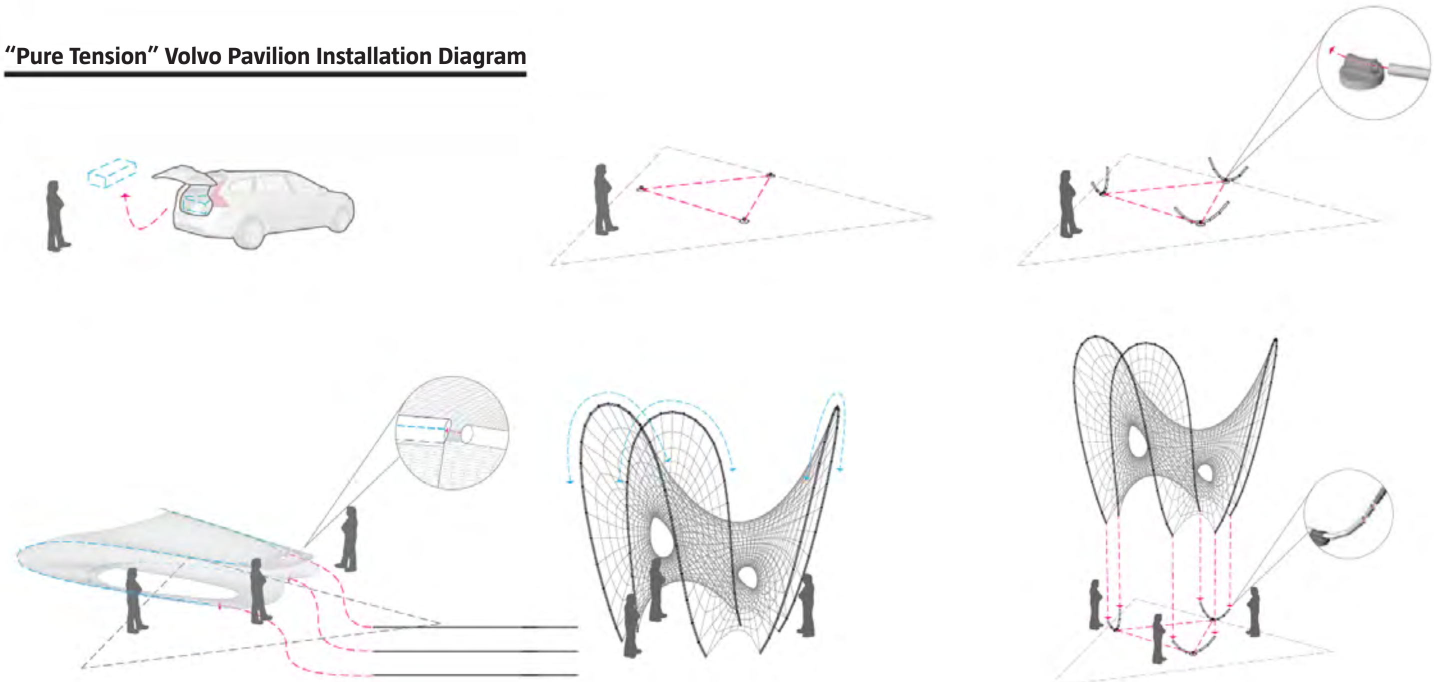
With subtle shifts in the orientation of a façade element, Huang was able to reveal either views beyond the scrim or the substructure behind it. "The power of associative geometry is something that is inherently there in every architectural project I've ever done, even when I was drawing by hand with a Mayline," he says. "But I think now, with the computer, you're able to take it to a different dimension and use it in ways that you couldn't previously."

Just don't call it parametric design. Huang insists that his office avoid the term, despite the fact that his former teacher (at the AA) and boss (at Zaha Hadid Architects), Patrik Schumacher, wrote the proverbial book on parametricism with his 2008 manifesto that celebrates it as the next great style after Modernism. "I don't think that parametricism or associative geometry has to produce a formal result," Huang says. He finds the stylistic or formal elements of parametricism less interesting than its potential as an adaptable set of tools: "With associative geometries, it's about geometric relationships and building hierarchies, and how you can adjust them."

FOR THE FUZHOU Cross-Strait Cultural Art Center in China, SDA designed systems that wrap simple programmatic volumes with tensile membrane roof systems and skins of perforated fiber-reinforced concrete. Digital

SDA's Shanghai Wuzhou International Plaza in Shanghai, a 1,937,00-square-foot development of offices, hotel, and retail, has a circulatory "canyon" that weaves between the two building volumes.

"Pure Tension" Volvo Pavilion Installation Diagram

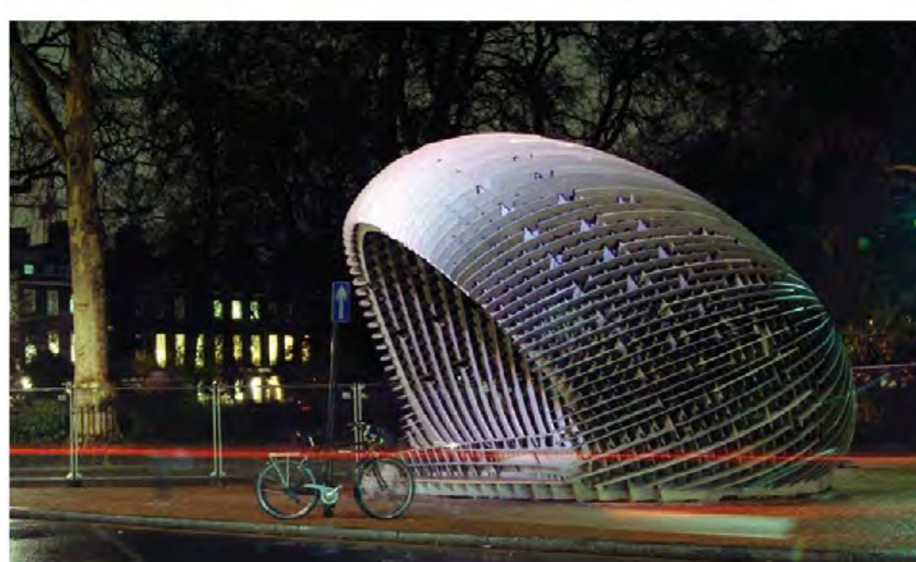


triangulations on the skin produced a network of lines and nodes, allowing SDA to produce the visual effect of a porous tree canopy by strategically cutting out voids in this network.

On a smaller scale, an early project like Chelsea Workspace—a 7-square-meter (75-square-foot) home office—merges geometric logic with digital craft. For Huang, this interior fit-out made with CNC-milled birch plywood ribs was only possible through intense collaboration with the fabricator. "I still believe very firmly in the notion of craft," Huang says.

Taking a 3D model, reproducing it in 2D drawings, and then translating those drawings into 3D forms is no simple task. Sometimes there's more fidelity in skipping the middle step; Huang found it easier to exchange digital 3D files that doubled as fabrication documents. But then, as Huang says, "the way of making the 3D file has to have a level of digital craft" that's every bit as good as the builder's handiwork.

With current commissions ranging from a temporary tensile pavilion in Calgary, Alberta, to the 861,000-square-foot cultural art center in Fuzhou, Huang and SDA are tackling new project types as varied as their geographic locations. "We are not a practice that is bound by expertise to a specific typology," Huang says. "The main thing for us is trying to find different design problems that are willing to consider things from a different perspective and let us explore. Design really does span all scales; we're just as interested in furniture as we are in towers. For us, it's really about a way to find how design research and practice overlap and inform one another."



Opposite top and middle: SDA collaborated with engineering firm Buro Happold and Fabric Images, based in Elgin, Ill., on the "Pure Tension" Volvo Pavilion, a tensile membrane structure with integrated PV panels, designed to house—and charge—the new Volvo V60 hybrid car. "Our original free-form design ... had something like 300 different radii," Huang says. "We asked ourselves, 'Why is the cost so high?' And we spent a little bit of time to reconfigure the geometry to produce five different radii. Visually, you couldn't tell the difference, but it saved us exponentially in terms of price." **Opposite bottom:** Huang worked with Alan Dempsey, founding director of London-based NEX, on [C]Space Pavilion, which won the AADRL10 competition in 2008. The shell structure comprises CNC-cut sheets of FibreC concrete and rubber gaskets, developed in digital and physical models in collaboration with Austrian manufacturer Rieder. **Top:** A 75-square-foot home office in London digitally designed and fabricated by SDA. **Bottom:** SDA designed the façade and interiors for the CentralPlaza Lampang, a retail center in Thailand. Breaking up the façade into distinct zones allowed the firm to minimize costs on the steel diagrid lattice while maximizing the moiré effect seen from the adjacent highway.

Termes, a prototype from Harvard University's Self-Organizing Systems Research Group.

TECHNOLOGY

BATTLE OF THE 'BOTS

THE MACHINES ARE COMING. THOUGH CONSTRUCTION ROBOTS ARE LIMITED TO WORKING IN CONTROLLED ENVIRONMENTS, DEVELOPERS OF THE FOLLOWING FOUR 'BOTS ARE PREPPING FOR A FUTURE IN WHICH AUTOMATION RULES ON EVEN THE MOST UNWIELDY JOBSITES.

Text by **Shaunacy Ferro**
Photos by **Ian Allen**

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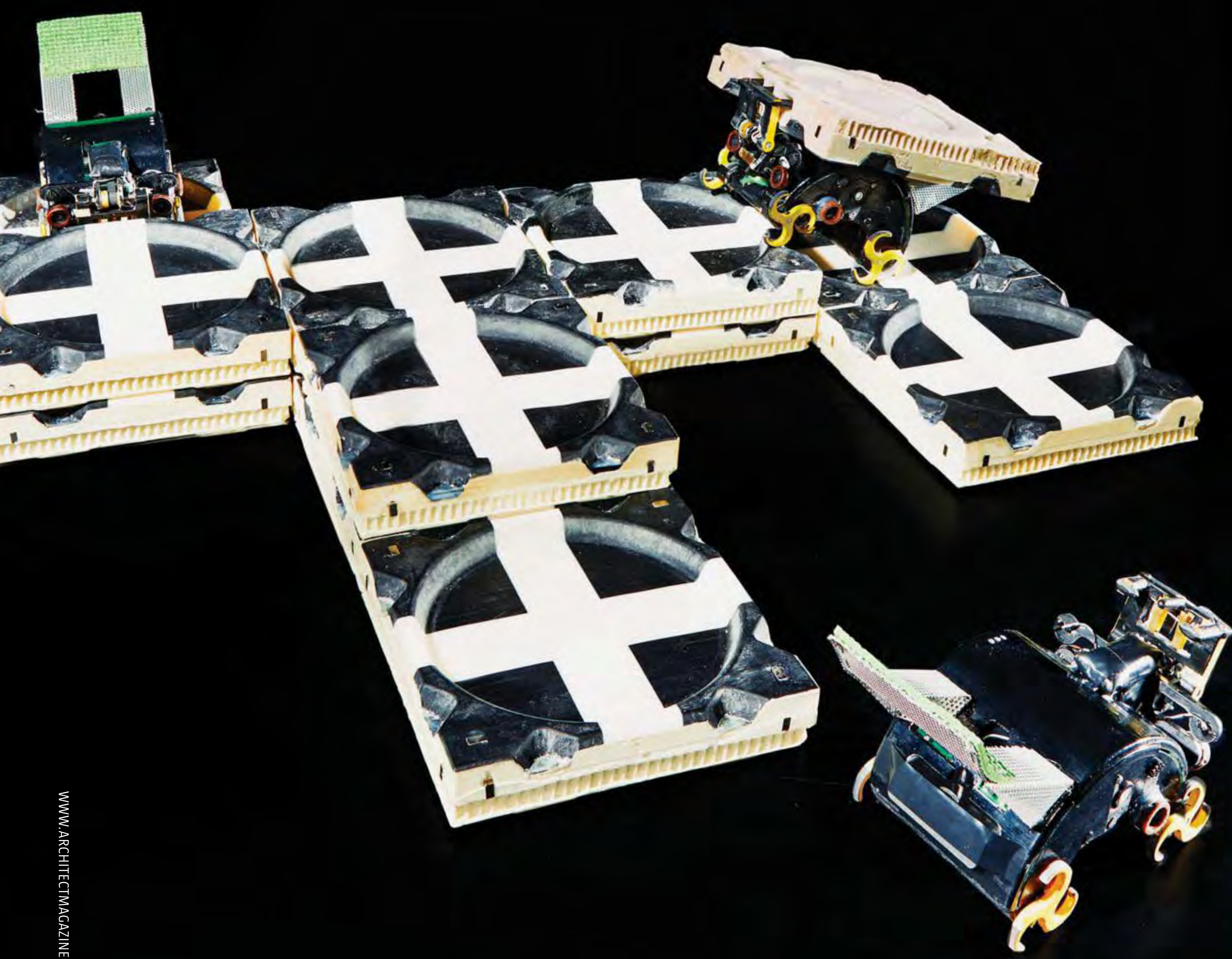
TERMES

Self-Organizing Systems Research Group, Harvard University
Year created: 2011

Named for the mound-building termite genus *Macrotermes*, the Termes prototype works independently among a swarm of its peers to build complex structures. The 6-inch-long, 4-inch-wide robots are programmed with an algorithm that issues traffic rules specific to assembling a structure, while integrated sensors help each detect when and where to place the next foam block. In action, they click around on spiky, climb-ready wheels and transport the blocks on their backs. The concept is suited for hazardous jobsites—even if a handful of the ’bots break, the rest can continue without missing a beat. The research group hopes that one day, a project team could program in drawings, supply materials, and watch the robo-colony go to work.

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M-BLOCKS

Computer Science and Artificial Intelligence Laboratory, MIT
Year created: 2013

MIT researchers are building an army of modular, robotic cubes that can self-assemble into almost any rectilinear shape to form load-bearing objects such as a chair or even scaffolding. Controlled by radio signals, M-Blocks hop around in gravity-defying jerks sans any external moving parts. Rather, each cube is propelled by the momentum of an internal spinning flywheel. When the wheel brakes, its conserved momentum catapults the robot into the air, allowing M-Blocks to jump, roll, and climb over each other, assembling into new configurations. Magnets on the cubes' faces and corners allow them to snap together and to scale metal surfaces, such as a network of pipes or a tall building. And because each block works independently, if one falls or is lost, the rest can soldier on.

GEOWEAVER
California College of the Arts, Future Cities Lab
Year created: 2013

The Geoweaver's glue gun–like 3D printer extrudes fiber-reinforced concrete as it navigates terrain on six legs. A building plan transmitted through radio signals guides the machine's activity via open-source software, cross-weaving lines of concrete to knit the fibers together. Its developers see the 'bot as a foreman of the future, with integrated sensors and GPS to perform site analysis and record soil data and topography. Future printing materials include algae, clay, and recycled plastic.


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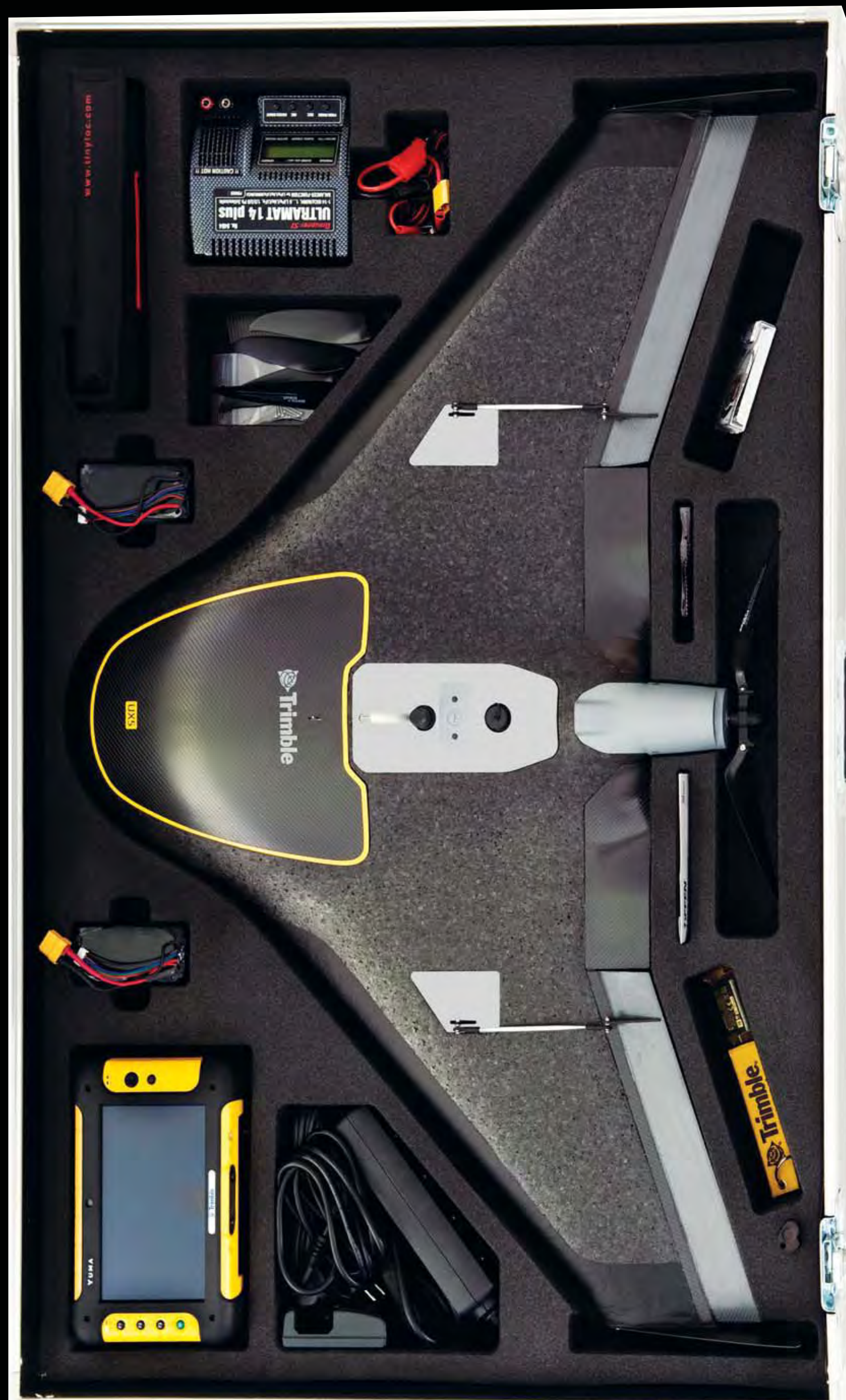


COURTESY TRIMBLE

UX5
Trimble
Year created: 2013

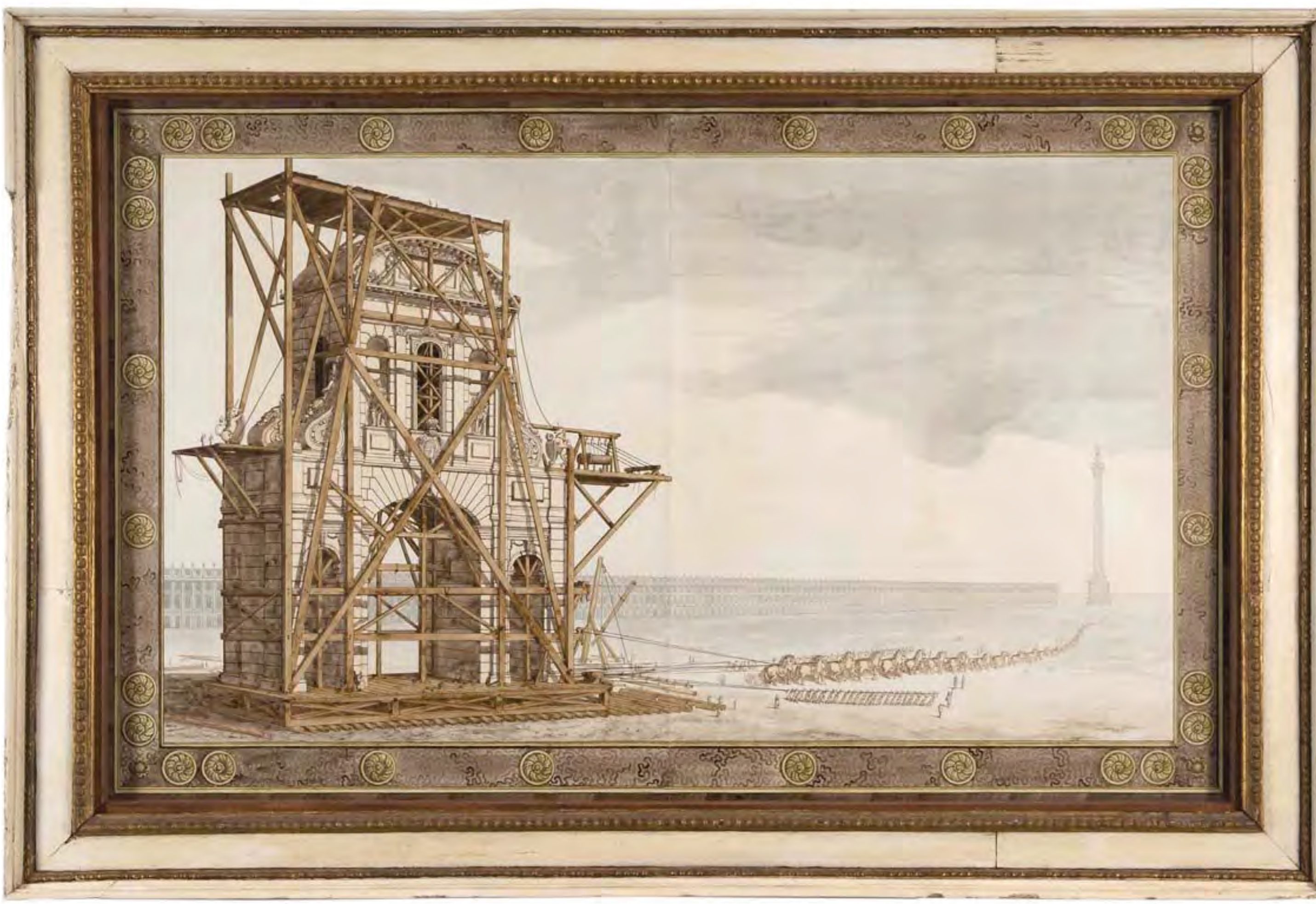
Designed to cover the same ground in one flight that a human in an all-terrain vehicle might in four or five days, the Trimble UX5 can fly up to 2,460 feet above the ground and stay airborne for up to 50 minutes. That makes it a fit for charting hard-to-reach or rugged terrain. A hawk-eyed camera scans the ground at a 2.4-centimeter resolution—a much denser level of detail than can be ascertained from surveying on foot. Released to the market last summer, the battery-powered unmanned aerial vehicle follows a pre-programmed flight plan uploaded through Trimble software. Once it lands at a preset location, users can upload the flight data and get a 3D model of the surveyed area before construction, to map out the land, and during, to survey the progress of a job.

ARCHITECT THE AIA MAGAZINE JUNE 2014

CRITIQUE

AN ARTFUL FAÇADE

FOR ARTIST PABLO BRONSTEIN, THE AVANT-GARDE HAS BECOME SO INSTITUTIONALIZED THAT HISTORY SEEMS RADICAL.



Pablo Bronstein's "Relocation of Temple Bar," a reimagining of Christopher Wren's London landmark.

COURTESY HERALD ST, LONDON AND FRANCO NOERO, TURIN

Text by **Amanda Kolson Hurley**

SEVERAL YEARS AGO, the artist Pablo Bronstein published a new edition of Horace Walpole's novel *The Castle of Otranto*, with a cover he had drawn by hand. Walpole, an 18th-century English aristocrat, is perhaps best known for his country estate Strawberry Hill, which is credited with beginning the Gothic Revival. In the main reception room, visitors admired elaborate fan vaulting, copied from Henry VII's Chapel at Westminster Abbey—only at Strawberry Hill, it was made of papier-mâché. It was the kind of stagecraft that undoubtedly attracted Bronstein to Walpole. Just like his subject, Bronstein prizes artifice, and the meaning it can bring to his work.

Bronstein was born in Buenos Aires, Argentina, in 1977 and moved with his family to suburban London at the age of four. When he finished high school, he enrolled in an architecture program—and lasted three weeks. "Having to take courses in structural loads, and be in the same class as a bunch of competitive straight men with Rotrings [technical pens] and books on Kahn, made me jump ship to art school pretty quickly," he says now.

Bronstein earned degrees at the Slade School of Fine Art and then Goldsmiths, University of London, but he never relinquished his interest in architecture. By the mid-2000s, he was staging performance works and improving his draftsmanship through

assiduous practice. It paid off, as his 2008 book, *A Guide to Postmodern Architecture in London*, makes clear. The Romantic drawings in that book conjure London icons of the go-go Thatcher years—Cesar Pelli's Canary Wharf, James Stirling's Clore Gallery at the Tate Britain—transplanted into alien settings and crumbling into Piranesian decay. *Postmodern Architecture* revealed Bronstein's extremely well-stocked historical imagination and complicated mix of fantasy and irony.

IRONY CAN BE bought cheaply, through obvious juxtaposition. What Bronstein pulls off is trickier: He dares us to find where irony ends and sincerity begins. The drawing "Relocation of Temple Bar" (2009) imagines a mock-heroic history for the London landmark designed by Christopher Wren. A team of horses attempts to pull the massive stone gate, clad in suspiciously elaborate scaffolding, across a desert.

The original gate was, in fact, dismantled in the 1870s, rebuilt outside of London, and then dismantled, moved and rebuilt again at a different city site—the newly redeveloped Paternoster Square—in 2003. Presenting the Temple Bar like an Egyptian obelisk being hauled away by a conquering army, Bronstein questions both its authenticity and the power of those who would lay claim to it. But he invites us all the same to admire its proportions, its scale (which he exaggerates), and even the prettified scaffolding around it.

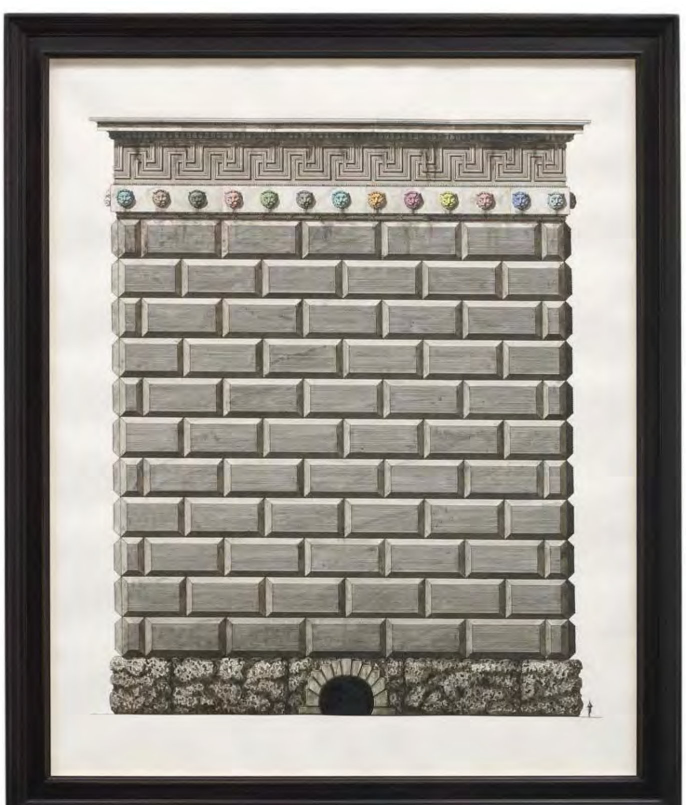
Likewise, "Tiepolo's Triumph of Marius Entering the Metropolitan Museum of Art" depicts a gigantic pulley moving an absurdly large Old Master painting into the Met, a crowd of Lilliputians at its base. The technical brilliance of the drawing suggests a deep engagement with the subject that lurks behind—or beneath—its playful critique of the museum's cultural authority. "There is a role-playing element to the drawings, in which I draw as if I were an architect talking to a king, or a developer, or as if the building were already in existence and needed to be depicted either ruined, or new," Bronstein tells me.

Even if he were to inhabit the role of an architect designing a tyrant's palace, Bronstein adds, he wouldn't be able to take a clear-cut moral stance. "I [would] take pleasure in designing the palace, and part of the value of the artwork to the viewer is the technical qualities of the drawing." Making us complicit in that pleasure is what Bronstein does, whatever questions about history, power, and taste that his work may pose.

Notions of taste may seem to have died out with chintz drawing rooms, but Bronstein reminds us that the contemporary art world is ruled by its own norms of white walls and

Top: "Tiepolo's Triumph of Marius Entering the Metropolitan Museum of Art" (2013). **Bottom:** Six of the nine parts from "Designs for the Ornamentation of Middle Class Houses" (2011).

COURTESY HERALD ST, LONDON AND FRANCO NOERO, TURIN



Clockwise from top left: "Plaza Monument" (2006); "Pair of Houses a la Grecque" (2011); and "Triumphal Arch in Honour of Transport for London" (2013).

clean lines—and they are no less strict for being considered avant-garde. In contrast, Bronstein's love of the Baroque, his joy in decorative profusion, starts to seem downright radical. He has published one book of designs for ornamental doorways and another of gilded keyholes. If ornament is crime, then Bronstein is an outlaw.

"I think that the art and architecture audiences that want something to look 'contemporary' are very often the most conservative and most superficial," Bronstein says. "They are usually audiences that cannot judge something other than by a very quick visual reading." That said, there are advantages to going against the grain. "I have been lucky that my aesthetic ... [is] a different aesthetic to the mainstream, and so has perhaps more recognizability than other works."

BRONSTEIN'S PERFORMANCE PIECES have a dislocating effect similar to that of his drawings. What seems more contemporary than performance art? And yet his mannered works evoke the early ballet and opera. In his recent show at REDCAT in Los Angeles, "Enlightenment Discourse on the Origins of Architecture," a performer manipulated oversized Georgian-style furniture, turning a cabinet, dressers, and chairs into a stylized cityscape.

For 2011's "Tragic Stage," part of the exhibition "Sketches for Regency Living" at the Institute of Contemporary Arts in London, Bronstein put dancers in front of a canvas of a Regency mega-terrace, its stark, identical bays marching across the wall. Wearing costumes rich in color and architectural ornament, the

COURTESY HERALD ST, LONDON AND FRANCO NOERO, TURIN

COURTESY HERALD ST, LONDON AND FRANCO NOERO, TURIN

dancers animated the façade while drawing viewers' attention to its blank regularity.

Sometimes, Bronstein combines performance and architecture in three dimensions. Teatro Alessandro Scarlatti, built on the grounds of a museum near Zurich, is the world's smallest opera house, seating five. It offers "a metaphor for how a building such as an opera house subdivides and categorizes its users," Bronstein says. "Even in its minute scale, [it] had an entrance, designated level, and observation point for each type of participant within the spectacle—the musicians, the public, the singer. There is also the opportunity of listening to a piece of music in an isolated and very close way, which I find fascinating."

The tiny opera house might be called a folly, but Bronstein is ambivalent about that word, because "very few follies become significant or serious." Like Walpole, who used his "little play-thing house" to challenge the dominance of Palladianism, Bronstein affects levity with purpose.

Opposite: “Windowless Prison in Reinforced Concrete” (2013). **Top:** Teatro Alessandro Scarlatti, the world’s smallest opera house, which Bronstein staged as an exhibit near Zurich. **Bottom:** An elevation of the opera house.

ARCHITECT THE AIA MAGAZINE JUNE 2014

RESILIENT DESIGN

DAMAGE CONTROL

DESIGNING ABOVE AND BEYOND SEISMIC BUILDING CODES CAN HELP TO SAVE LIVES AND RECOVERY COSTS BY ENSURING THAT STRUCTURES REMAIN BOTH UPRIGHT AND FUNCTIONAL AFTER AN EARTHQUAKE.

Text by **Jenny Jones**
Illustration by **Bryan Christie Design**

ON JAN. 17, 1994, residents of the Los Angeles neighborhood of Northridge were jolted awake by the intense vibrations of a 6.7-magnitude earthquake. Scores of buildings and highways collapsed in the area, and after just 10 seconds, the trembler caused at least 57 deaths and up to $26 billion in damage—making it one of the costliest natural disasters in the history of the United States.

Since Northridge, which was the last major earthquake—in terms of damage, costs, and lives lost—to strike our country, significant advances have been made in seismic design and construction, from building materials and methods to research and technology. But as scientists grow increasingly wary of the next big one, the question arises about whether those advances are enough not only to protect lives during an earthquake, but also to keep buildings operational in the immediate aftermath.

All 50 states experience some level of seismic activity, but the western U.S. shoulders much of the brunt. A 2007 study led by the Southern California Earthquake Center found that San Francisco alone has a 63 percent chance of experiencing an earthquake of 6.7 magnitude or greater within the next 30 years. If a 7.2-magnitude earthquake hits the

The Federal Emergency Management Agency estimates that the long-term value of earthquake losses to the general building stock in the U.S. is $5.3 billion per year. This value, known as the Annualized Earthquake Loss, is conservative because it does not include damages to lifeline infrastructure or indirect, long-term economic losses.

99.7%

THE PROBABILITY THAT CALIFORNIA WILL EXPERIENCE AN EARTHQUAKE OF 6.7 MAGNITUDE OR GREATER BY 2027.

SOURCE: 2007 WORKING GROUP ON CALIFORNIA EARTHQUAKE PROBABILITIES

city, roughly 17 percent of its buildings will be unsafe to occupy and at least 2 percent will be unsalvageable, according to a 2010 report from the Applied Technology Council, a Redwood City, Calif.–based nonprofit corporation that advocates for the application of engineering resources to mitigate natural hazards. "The next major earthquake that strikes San Francisco will change the city and its people," the report states.

Part of the concern stems from the fact that modern building codes outline only minimum life-safety requirements to prevent building collapse and give people time to egress during a design-level earthquake—that is, one that represents the maximum amount of ground movement that a structure is intended to sustain.

DEVELOPED AND ADOPTED by localities, building codes prescribe the minimum standard for buildings and infrastructure. In reality, however, the codes often end up as the standard to which structures are designed. They generally do not address the continued operations of nonessential structures—buildings that aren't hospitals and fire stations. Buildings that become inoperable can lead to unsafe conditions and displacement, as well as lost income and tax revenue.

At the forefront of an outreach effort is Ibrahim Almufti, a San Francisco–based associate and structural engineer in Arup's Advanced Technology + Research group. Almufti helped develop the firm's Resilience-Based Earthquake Design Initiative (REDi) Rating System, a tiered checklist for architects, engineers, and owners to design buildings beyond life safety. REDi outlines criteria for designing new buildings to meet silver, gold, and platinum levels of earthquake resiliency, in a manner similar to the U.S. Green Building Council's LEED rating system for sustainable design.

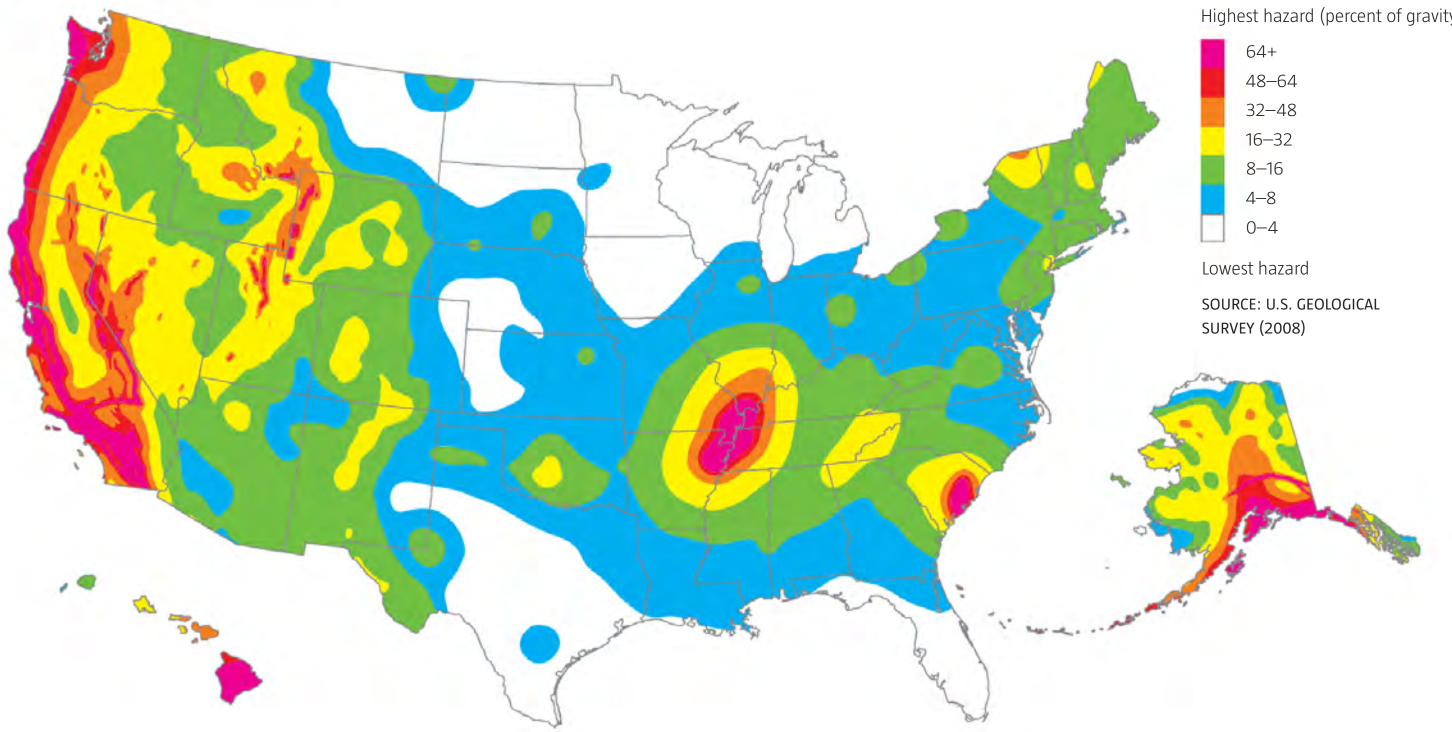
The system, Almufti says, aims to prevent significant damage to structures, architectural components and façades, building contents, and mechanical, electrical, and plumbing systems. "My objective is ... to provide quality of life after a big earthquake," he says. "We shouldn't have to spend years and decades recovering from a 500-year earthquake."

Almufti cites Christchurch, New Zealand, as an example. The city is still rebuilding three years after a 6.3-magnitude seismic event destroyed the city center in 2011 and caused upwards of $40 billion in damage. And with comparable building codes to New Zealand's, the U.S. might find itself in a similar situation someday, Almufti says. "For code-designed buildings, the average amount that you need to spend to repair the building is about 25 percent of the total building value. If you have that much damage, [you] would probably end up demolishing the building"—a fate that befell many Christchurch buildings.

BUT CHRISTCHURCH may not be the definitive barometer. Sissy Nikolaou, a senior associate and director of the geo-seismic department at Mueser Rutledge Consulting Engineers, in New York, points out that Christchurch had experienced several large earthquakes in a short period prior to the 2011 event. The resulting repetitive soil liquefaction—or the loss of considerable strength of water-saturated soil due to an applied stress—contributed significantly to the damage, she says. "It's not a typical case study of an earthquake."

Nikolaou contends that whether buildings in the U.S. should be designed beyond the code

National Seismic Hazard Map

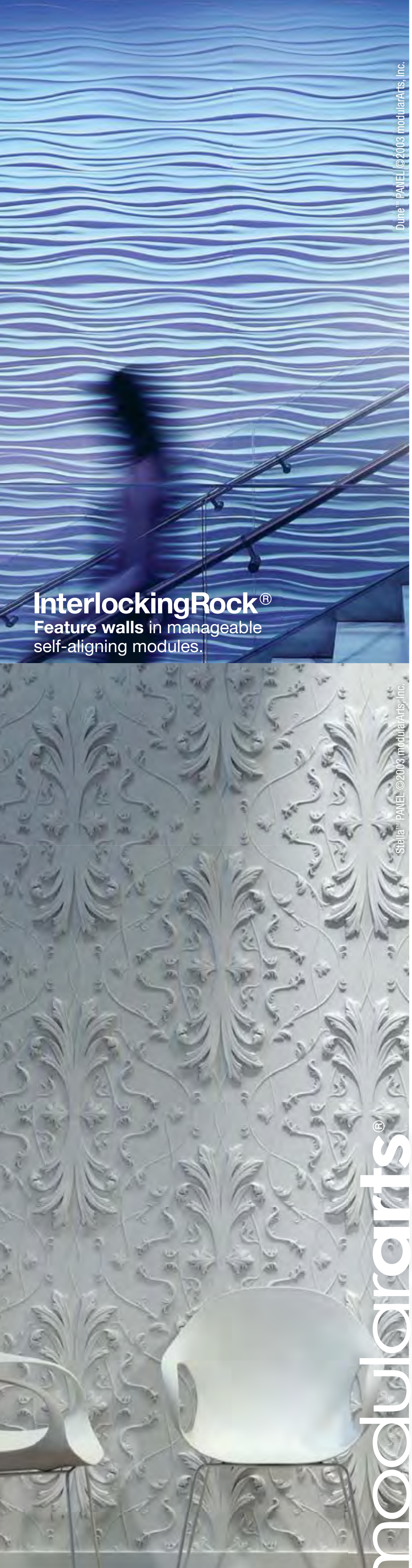


is a discussion that designers must have with their clients. "That process involves educating the client, owner, or agency about their local hazard exposure and associated risk exposure, and understanding their specific needs and goals for seismic protection beyond code," she says.

THESE DAYS, few building owners and developers are interested in exceeding code. Reasons include limited finances, time, and interest. However, Almufti says a building can be designed to be earthquake resilient for less than 5 percent of a project's construction cost.

While a building designed to code will likely sustain significant structural damage during a design-level event, an earthquake-resilient building will, in theory, experience only cosmetic damage and remain operational. Achieving this resiliency, Almufti says, is a matter of integrating advanced seismic technologies, such as base isolation and viscous dampers, and detailing architectural components for movement. Other design necessities: a façade that remains air- and watertight; elevators that stay operational; and interior partitions capable of handling significant displacement.

Some of the most earthquake-resilient buildings in the country are base-isolated hospitals in California, Almufti says. But though building codes for hospitals and other essential



CENTER

PERRETTI & PARK

Designed by Fong & Chan Architects with Arup as its engineer, the new nine-story, 500,000-square-foot San Francisco General Hospital and Trauma Center incorporates a base-isolated foundation to ensure that the building—the only trauma center in the city—will remain operational after a seismic event.

buildings are more stringent than those for nonessential structures, the current code does not even require base isolation for hospitals.

The forthcoming San Francisco General Hospital and Trauma Center building, designed by local firm Fong & Chan Architects with Arup as its engineer, will be base isolated and its structural elements will behave elastically in a design-level earthquake. Those features, coupled with the strict code requirements for the design of architectural and M/E/P systems, give the hospital a good chance of enduring significantly less damage than other hospitals that were built simply to code, and infinitely less damage than other code-designed buildings, Almufti says.

While San Francisco and other seismically aware cities are effectively designing buildings for peril, other communities, such as those near the New Madrid Seismic Zone in the Midwest, haven't been as proactive, says Tim Smail, senior vice president of engineering and technical programs at the Federal Alliance for Safe Homes. "There are lots of places throughout the country where communities are downplaying their risk." Consequently, he says, "they are not taking advantage of those opportunities to build stronger against earthquakes."

Smail attributes the inaction to a perceived low return on investment. "For low-probability events that are high-risk in nature, people have a very hard time wrapping their heads around what those mean," he says. Spending "money now to mitigate or prepare for those events is just not in the forefront of people's minds."

Seismic resilience involves more than the stability of a single building, however.

> "A NON-COLLAPSED STRUCTURE THAT'S DEPRIVED OF ITS ESSENTIAL SERVICES IS NO LONGER SAFE FOR ITS OCCUPANTS. IN EFFECT, IT'S ABSOLUTELY USELESS WHEN IT'S NEEDED MOST."
>
> —EFFIE BOURAS, CO-CURATOR OF "CONSIDERING THE QUAKE"

Associated infrastructure is also a factor. Effie Bouras, co-curator of "Considering the Quake: Seismic Design on the Edge," an exhibition that recently appeared at the Center for Architecture in New York, notes that essential services such as water and electricity must also be maintained for buildings to be truly resilient and safe. "A non-collapsed structure that's deprived of its essential services is no longer safe for its occupants," Bouras says. "In effect, it's absolutely useless when it's needed most. This is something that still needs to be functionally addressed [in most communities]."

Utility continuity is also critical for fighting post-disaster fires, says Stephen Szoke, senior director of codes and standards at the Portland Cement Association. "Such fires can cause as much or more damage as the initial events," Szoke says, particularly because water supplies are often limited. "There have been lots of papers written on the topic, but it's not really been something that has been integrated into the design codes and the design standards."

ABOUT 800 INFERNOS blazed in Northridge and its surrounding areas following the 1994 earthquake, including at least one from a burst gas main that spread to nearby homes. Fire also spread rapidly in the San Francisco Bay Area after the Loma Prieta earthquake in 1989.

Szoke says the most important thing designers can do is help people "consider what they're adopting as their building codes." He urges architects and engineers to spread the message about seismic risks to government officials and the public.

Designers can also talk to project owners about the value of resilient design. Lance Jay Brown, FAIA, president of the AIA New York Chapter (AIANY) and founding co-chair of AIANY's Design for Risk and Reconstruction Committee, says that owners need to know that spending extra money up-front for advanced seismic design will save them money over time. Like many long-term capital investments, the challenge lies in convincing people to plan for an event that could be decades or centuries away. When it comes to desired return on investment, "we live on a very short schedule," says Brown, who's also an architecture professor at the City College of the City University of New York.

While it is impossible to know exactly when the next major earthquake will come, designing buildings that can stand and function in the aftermath will help protect lives, limit damages, and expedite recovery. Going from building collapse to life-safety codes in the past half-century has been a huge achievement for the earthquake engineering community, Almufti says. "But we should be doing way better than that."

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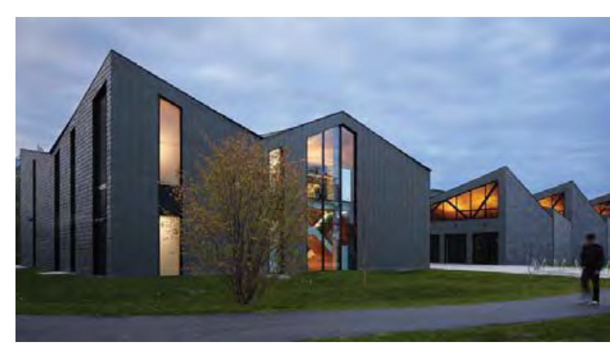

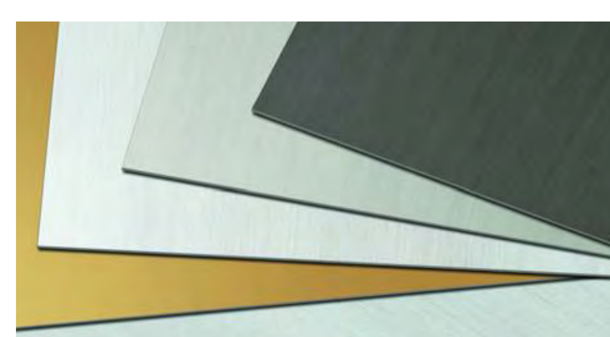

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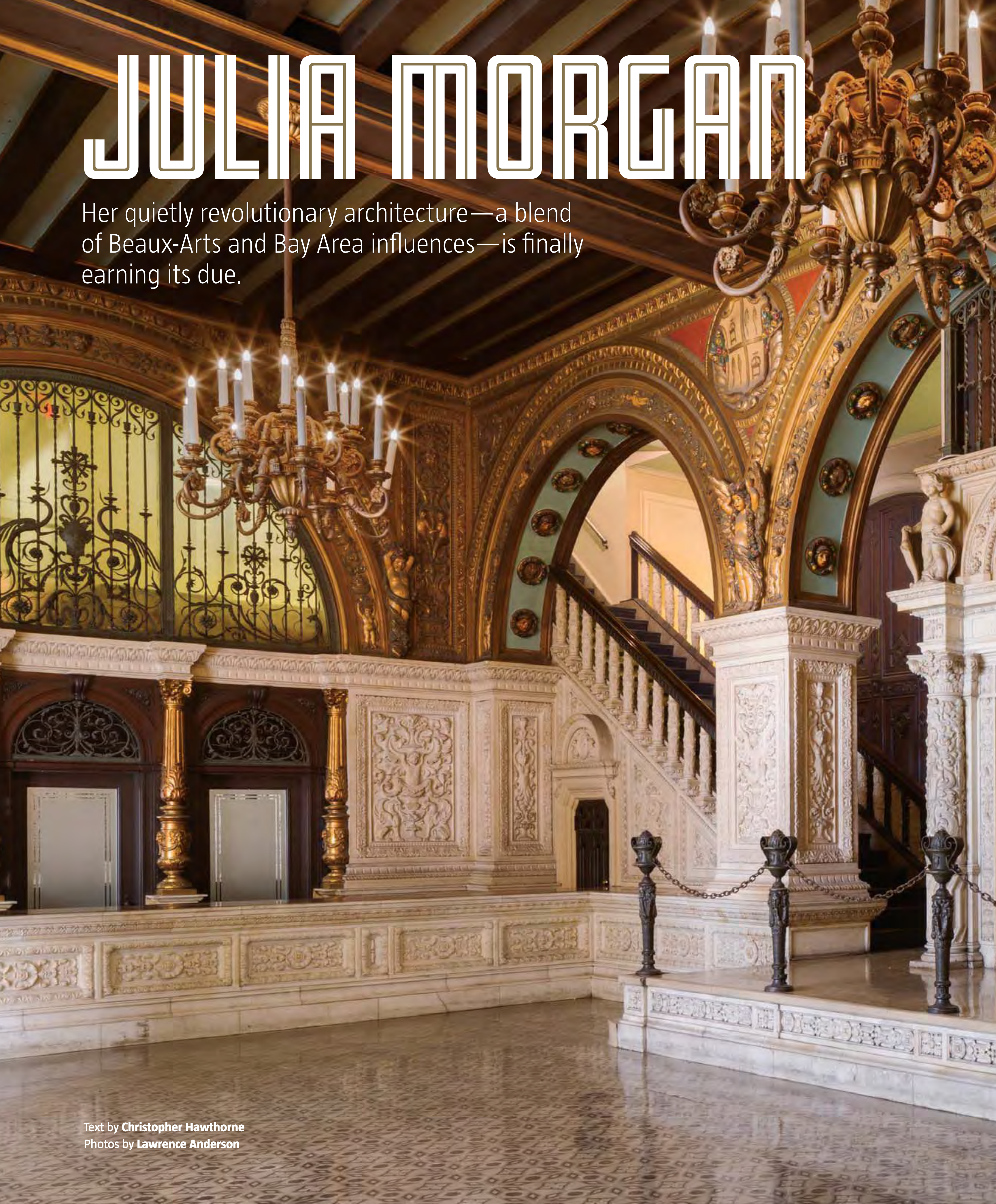
2014

AIA HONOR AWARDS

JULIA MORGAN

Her quietly revolutionary architecture—a blend of Beaux-Arts and Bay Area influences—is finally earning its due.



Text by **Christopher Hawthorne**
Photos by **Lawrence Anderson**

GOLD MEDAL

Seven California architects have been honored with the Gold Medal from the American Institute of Architects since the award was established in 1907. Bernard Maybeck, in 1951, was followed by William Wurster in 1969 and Richard Neutra (posthumously) in 1977. Then came Charles Moore (a nomad, born in Michigan, who was more Californian than anything else) in 1991, Frank Gehry, FAIA, (a Canadian who moved to Los Angeles at age 18) in 1999, and Thom Mayne, FAIA, in 2013.

This year's winner, Julia Morgan, is another posthumous honoree: She was born in San Francisco in 1872 and died there in 1957. Aside from a childhood year in New York and an important six-year stint in Paris, during which she became the first female student to earn a degree from the architecture division of the École des Beaux-Arts, she spent her entire life in Oakland, Berkeley, and San Francisco. Though she designed a YWCA in Honolulu in 1920 and sent sketches by mail for a house to be built in Auckland, New Zealand, in 1928, nearly all of her commissions were in her home state.

And a staggering number of commissions there were: Morgan, the first female architect to be licensed by the state of California, oversaw more than 700 built projects during her career, or an average of 15 per year between the time she founded her San Francisco office in 1904 and her decision to close it in 1951, when she was 79. (By contrast, Maybeck, her friend and mentor, completed an average of roughly two buildings per year.) Geographically, the California projects ranged from the Herald Examiner Building in downtown Los Angeles, a combination of Moorish and Mission Revival styles, all the way north to Wyntoon, the estate near Mount Shasta and the Oregon border where she designed several buildings between 1924 and 1943 for the newspaper's owner, William Randolph Hearst. Along with his mother, Phoebe Apperson Hearst, he was Morgan's most consistent and supportive client, commissioning her to design the extravagant group of buildings in San Simeon, Calif., known collectively as Hearst Castle.

Morgan's specialties included private houses as well as YWCAs and other women's clubs in several California cities. (A loose group of well-connected women around the state gave her support and work throughout her career.) The biggest collection of her work at one site is

Previous spread: **The** Herald Examiner Building in Los Angeles (1914). **This page:** The Berkeley City Club in Berkeley, Calif. (1930).

This page: The Chinatown YMCA in San Francisco (1930), now home to the Chinese Historical Society of America. **Opposite, from top to bottom:** Morgan's École des Beaux-Arts I.D.; the interior of the Chinese Historical Society; a 1930 residence that Morgan designed for working-class women around the corner from the Chinatown YMCA (today it serves as an apartment building for lower-income seniors).

the Asilomar Conference Grounds, on the Monterey Peninsula, where she designed a total of 16 buildings for the YWCA between 1913 and 1929.

That prolific output is one reason it has taken so long for Morgan's work to win the sort of national notice symbolized by the AIA Gold Medal, which has never before gone to a woman. There was something supremely methodical, even metronomic, about her practice. ("She ran as efficient an office as I've ever been in," one of her employees said.) Typically we consider that sort of steadiness as being at odds with singular genius, which the clichés have led us to believe comes in bursts of unpredictable inspiration.

Morgan was hardly the kind of architect to madly sketch plans that had suddenly come to her on the back of a napkin. (I'm not sure any architect is, really, but she never came close to filling that stereotype.) Her muse was the grindstone. During her most prolific years, her office juggled two or three dozen projects at the same time. She often worked 18-hour days. She never married.

Morgan produced no manifestos, and she shunned the press. As Sara Holmes Boutelle, Morgan's biographer, put it, "She steadfastly refused to enter competitions, write articles, submit photographs to architectural magazines, or serve on committees, dismissing such activities as fit only for 'talking architects.'" Morgan had a similarly dim view of prepping her archive for posterity. When she retired, she had all her blueprints and other materials destroyed. She figured the only people who might have any use for them were her clients. And they had their own copies.

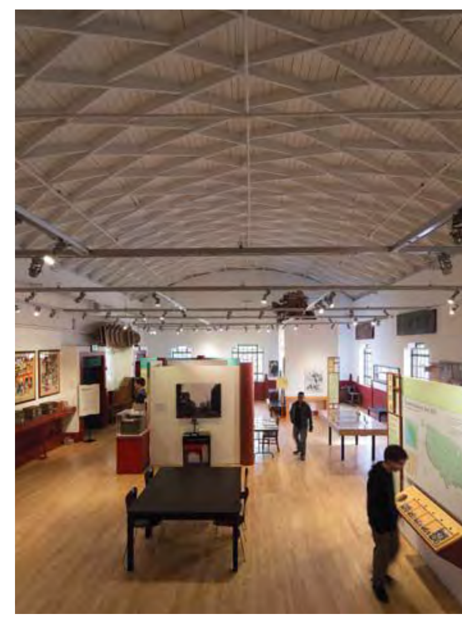
Morgan never hitched her architecture—or her career—to any theory or school. In this, she resembled another overlooked Californian, Irving Gill, who by 1915 was producing houses that were as radically spare and stripped of ornament as anything designed by Adolf Loos in Europe, but stayed largely unknown because he lacked Loos's interest in polemics. Morgan built a following that was restricted to her own professional circles and, largely, to the San Francisco Bay Area. But, like Gill, she understood structure and the behavior of materials deeply enough to make her architecture a vehicle for experiments in engineering, especially in her early embrace of concrete.

CERTAINLY OPERATING AS A WOMAN in a profession dominated by men had much to do with the way she carried herself. Morgan disdained publicity for reasons that were at least partly strategic. She had many clients who accepted the idea of an architecture practice headed by a woman but would not have been thrilled to see Morgan sticking her neck out for any cause, let alone a feminist one. Some have argued that this suited Morgan's temperament, since her priority was always to safeguard her ability to do her work.

Yet there's no doubt that she acutely felt the pressures that came with pushing her way into architecture's all-male world. In her first year as an undergraduate at the University of California, Berkeley—she would go on to become one of the first female students in the UC system to earn a degree in civil engineering, in 1894—she had to rely on her younger brother Avery to chaperone her by horse-drawn streetcar between the university and the family home in Oakland. (As a sophomore, she moved into a sorority house on campus.) In a letter from Paris, she wrote with some frustration that one of her École instructors "always seemed astonished if I do anything that shows the least intelligence."

Yet, in the end, those qualities—her consistency, her distaste for self-promotion, the obstacles she faced as a female architect—don't fully explain why her work was admired rather than celebrated for so long.

Another major factor has been the limited, even stunted, definition of innovation prevailing in architecture, and among critics and prize juries, since the beginning of the modern movement in the early years of the 20th century. That view has tended to lionize only those architects



who break new formal ground or dramatically cut stylistic ties from their predecessors.

Morgan's work, by contrast, was anchored in synthesis. It took the Academic Classicism still dominant when she was studying at the École and mixed it with elements of the Bay Region style established around the turn of the century by Maybeck and others. The result was Beaux-Arts & Crafts, to coin a phrase: the emphasis on symmetry and decorum of the classical European approach combined with the connection to region and landscape fundamental to Bay Region architecture. Some of her work was plainly neoclassical, some more fully craftsman. But nearly all of it exists somewhere on that continuum.

When prompted by a client like Hearst, her architecture could be theatrical, whimsical, even extravagant. The buildings at San Simeon and Wyntoon were all three. In Southern California she adopted the Spanish Colonial Revival. Through the years, many critics and architectural historians have read these buildings against the backdrop of Modernism and dismissed her architecture as fussy or eclectic, which for many of them were synonyms for undisciplined. If there is one thing Morgan's work is not, it is undisciplined.

The projects over which she had more creative control were subtler, and often let material richness speak more loudly than form or revivalist style. St. John's Presbyterian Church in Berkeley, Calif., finished in 1910, is a blend of Romanesque, Gothic, Tudor, and Arts & Crafts elements that come masterfully together in a redwood interior that is complex and harmonious at the same time. A chapel and auditorium at Asilomar, from 1915 and 1928, respectively, apply the same approach. In these projects, the influence of the earliest Bay Region architects is evident; but Morgan added what their work lacked—or maybe sought, in the romantic spirit of John Ruskin, to avoid—namely a layer of urbane sophistication. There is William Morris in her architecture, but the Parisian years are clear to see, too. She took the rustic character of Maybeck's architecture, its bracing roughness, and smoothed it out, creating something more easily salable, sure, but also, in terms of technical skill and poise, often more impressive.

Most impressive of all were the buildings that brought together regional, historical, and cultural references all at once. Morgan's YWCA for San Francisco's Chinatown, finished in 1932, is among the best examples, a masonry building in a hilly urban setting with three towers topped with Chinese tile.

THERE IS SOMETHING of a chicken-and-egg quality to the question of Morgan's relationship to style. Was it the wide range of clients that inspired her diverse architectural output? Or was it more the case that she sought work from a wide range of clients so that she could satisfy her own native interest in stretching her talents? Many of her admirers have written that what made her work stand out is its absolute commitment to the desires of her clients, many of whom kept coming back to her; but I think this misses the point. Throughout her career she was arranging tests for herself, and, more often than not, passing them.

All the same, by virtue of personality and in service of her reputation, she exhibited a noticeable distaste for experimental form. In a 2005 book about Morgan and Asilomar, Russell L. Quacchia tells the story of a young architect in her office who sketched an inventive, fanciful set of stairs that struck his boss as unbuildable. "Well, young man," she told him dismissively, "I can't deal with fiction writers."

Still, you would have to have a pretty blinkered view of how architecture (or American culture) operated during Morgan's life not to see her as a remarkably, even astonishingly, groundbreaking figure. Her practice itself was the polemic. Her professional success and longevity were the radical statements of purpose.

Think about what it took to forge her career. She sailed to Paris after college because she'd heard that the École *might* soon open its entrance examinations to women. She learned French and worked as the only female architect in a series of Parisian ateliers. The École's exam was taxing, with written and oral sections; in a typical year, between 90 and 95 percent of the applicants failed. On her first try in 1897, competing in a foreign language against mostly native speakers, she placed 42nd of 376, which was not high enough: Only the top 30 were admitted. She failed a second time the following spring. In the fall of 1898, she tried a third time and succeeded, with the 13th highest score.

She took some solace in the fact that nearly all the French applicants

Opposite page: Hearst Castle in San Simeon, Calif. (construction began in 1919). **This page:** A bedroom in the castle.

who'd passed had also failed the first two times. She explained her determination to keep trying in a letter to friends: "A mixture of dislike of giving up something attempted and the sense of its being a sort of test in a small way, of work itself overcoming its natural disadvantages," she wrote, "made it seem a thing that really had to be won."

I GREW UP in a house designed by Julia Morgan. Built in 1920 for a couple named Lucy and Wallace Macgregor and their family—it was Lucy Macgregor who sought out Morgan—it sits on a wide, shallow parcel of land in the Berkeley Hills that slopes down toward San Francisco Bay. In the Morgan office, it was numbered Job 520. My parents bought it in 1972, the year I turned two. They still live there. The house was part of a new North Berkeley subdivision called Thousand Oaks: early photographs show it sitting nearly alone on its hillside. Lightly decorated with restrained, nearly abstracted Tudor half-timbering, it is symmetrical as it faces away from the bay and toward the street, with gables on either end and a wide dormer, with window boxes, above a substantial redwood front door.

Inside, the house continues briefly with this charade, that it is set in a flat English garden rather than the Berkeley Hills, facing a damp meadow beyond instead of the Golden Gate Bridge and San Francisco and the Pacific Ocean. But very quickly you realize that the architecture is, more than anything, a machine designed very efficiently to deliver visitors to the view it offers due west.

When you come through the door, you face the side of the staircase and a choice: to go either left or right. But either way you will reach one of a pair of large picture windows, one in the living room, near the southern end of the house, the other in the dining room, toward the north. In each room there is a fireplace set into a windowless wall to the east directly opposite the picture window to the west: the hearth in one direction and the world in the other.

There is a remarkable 2001 project by the photographer Richard Misrach, the "Golden Gate" series, showing the view from his house high in the Berkeley Hills (even higher than my parents' house) toward the bay, not as an iconic postcard perspective but as something shifting and unpredictable, the colors and tones changing by the week and the season. I remember something similar from my childhood: taking in that view every morning and every evening, over breakfast and dinner, and each day seeing a different effect, a slate gray monochrome in winter and pinkish-orange in summer , when the sun set way north over Marin County.

My bedroom was on the northeast corner of the second floor. It was designed for the daughter of the owners, an artist, so she'd have northern light. With redwood walls tucked beneath a sloping roof, it was a charming room with only one drawback: It was located on what was very clearly, even to a child, the wrong side of the house, away from the view, facing the street instead of the bay, overlooking people walking their dogs instead of sailboat races. But the room itself almost seemed to sense this, and off the main room was an extra space, too modest to be called a sitting room, that turned toward the west. One small window, maybe 18 inches square, offered an oblique view of the Golden Gate, although it wasn't until I was nearly a teenager that I became tall enough to see the bridge through it. The room is shaped roughly like the letter L, and, like the rest of the house, what counts is the pull exerted by the part of the L that bends west, toward the view.

The house is a pretty good shorthand for Morgan and her approach. It is a California house in the same rather complex way she was a California architect. Its equilibrium and handsome redwood interior mask the careful rigor of its plan. In opening itself up to its setting in the strategic, generous way it does, it combines materials and landscape to create something far more striking than the sum of its well-ordered parts. It is a beautiful house willing to concede that the views it frames are more beautiful still.

Above: Job 520, a house Morgan designed for Lucy and Wallace Macgregor (1920), and that the author grew up in. **Right:** An interior from the Asilomar Conference Grounds in Pacific Grove, Calif. (1913–1929).

THE ARCHITECTURE IS, MORE THAN ANYTHING, A MACHINE DESIGNED VERY EFFICIENTLY TO DELIVER VISITORS TO THE VIEW IT OFFERS DUE WEST.

ESKEW+ DUMEZ+ RIPPLE

With a diverse body of work defined by a keen sensitivity to place, EDR has helped New Orleans rebuild from Katrina.

Text by **Elizabeth Evitts Dickinson**
Photos by **Daymon Gardner**

ARCHITECTURE FIRM AWARD

To understand the architectural philosophy underpinning the work of Eskew+Dumez+Ripple (EDR), it helps to consider the humble parking space. In New Orleans, where the firm is based, city code requires a 20-foot length for a car, but why use pavement for the entire span, particularly in a waterfront city prone to flooding? "The car can extend beyond a green space just as well," says Mark Ripple, AIA, partner and director of operations at EDR. "So you use the final 2 feet of a parking space on each end, carve out 2 feet in the middle, plant native vegetation that doesn't require maintenance, and you have a 6-foot bioswale."

In a heavy storm, that parking spot becomes a small containment area minimizing water running into the main storm drain system. It's a common-sense redesign that works for a water-clogged place like New Orleans. Yet even with a simple idea such as this, Ripple says, "the challenge isn't figuring out the technology or the design, the challenge is questioning the existing idea of how we design and solve problems."

Since its founding in 1989 by the late Allen Eskew, and particularly in the nine years since Hurricane Katrina, EDR has challenged conventional notions of typology. The firm has infused historic New Orleans with contemporary design, as it did with the 930 Poydras Residential Tower project, which reinterprets the low-level courtyard design of the French Quarter in a 21-story high-rise. EDR transformed a ubiquitous and seemingly lifeless 1970s suburban office building into an energy-efficient hub of creative activity for the client, Lamar Advertising. And, perhaps most dynamically, the firm has redefined civic and community buildings for a post-Katrina world. In a renovation plan for New Orleans East Hospital, for example, EDR raised the emergency room and the building's critical infrastructure to the second floor, ensuring that the building can function after a serious flood.

"One of the lessons learned from Katrina is that the on-ramps of highways make great boat launches," says Ripple, whose own home

Previous spread: Mark Ripple, partner and director of operations (left) and Steve Dumez, director of design (right). **This image:** Allen Eskew, the late founder and principal of EDR.

This page:

Z Smith, AIA, principal and director of sustainability and performance

Opposite page, clockwise from top left:

Vanessa Smith-Torres, architectural intern

Caleb Sears, architectural intern

Tiffany Bergeron, director of business development

Matthew Kymes, senior designer

flooded in the storm. "What we have at New Orleans East is an elevated second floor emergency department, with a ramp for the ambulance to drive up. But in the event of another Katrina, it could serve as a way to get people there by boat."

"We believe," adds partner Steve Dumez, FAIA, the firm's director of design, "that all buildings can have value if thought of creatively."

Which may account for the diversity of building types in EDR's portfolio, ranging from historic restorations to contemporary high-rises, from small community libraries to multimillion-dollar hospital campuses, from private residences to cultural centers. And all of this doesn't even touch on projects at the urban scale, such as the Reinventing the Crescent Development Plan, a post-Katrina proposal for turning a 6-mile swath of land along the East Bank of the Mississippi River into an active greenway connecting New Orleans to its industrial waterfront.

Every EDR project considers how the design will be experienced. "There are a lot of lessons to be learned from the place where you are building," Dumez says. "Those lessons are often about the way in which we live in a place. It's not just about style; it's about experience. It's not that we don't care about how our projects look. It's that we consider how a building feels, how it operates, how it works for people. That's the harder question in design. And that's intrinsic to our approach."

For the $48-million LEED-Gold New Orleans Bioinnovation Center, which opened downtown in 2011, EDR was asked to develop the city's first commercial wet lab and life sciences incubator. Aaron Miscenich, the center's president, says that the trustees believed the firm was best equipped to create the unique experience that they hoped to offer the building's users. "This is a novel project, a business incubator meant to bring life sciences entrepreneurs together as a community and help them to interact informally," Miscenich says. A retail food service area connecting to Canal Street and an interior atrium facing an outdoor courtyard are some of the amenities that now entice individuals out of their work areas and into sociable public space. "EDR helped create an environment that would draw people out of their labs."

LaToya Cantrell is now a city councilmember for New Orleans, but when Katrina flooded her Broadmoor neighborhood, she was a community activist who helped lead the rebuilding efforts there. EDR assisted the community with its redevelopment plan, which included the rebuilding of the local library. The EDR-designed, award-winning Rosa F. Keller Library and Community Center is the result. "They clearly

understood how we wanted to bring back the library in a way that wasn't just about books," Cantrell says. "It was about empowering people."

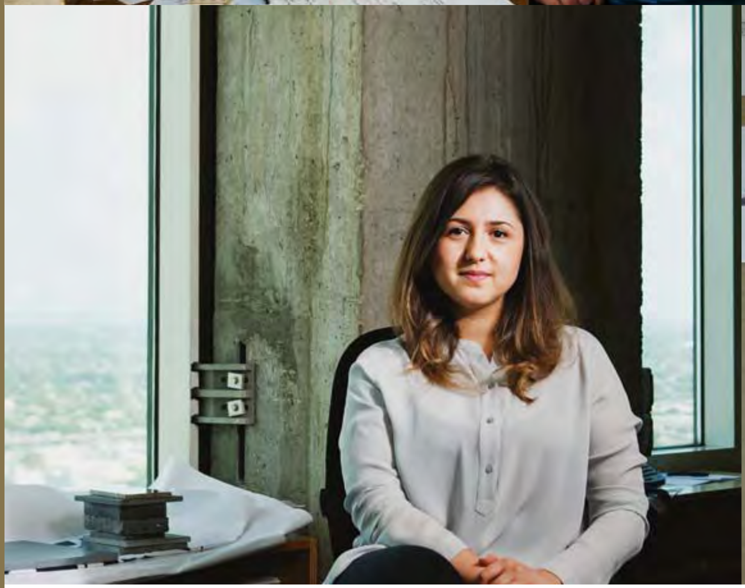
ON A RECENT SPRING AFTERNOON, just days before Jazz Fest was to take over the city, Dumez and Ripple sat at a table in the EDR office to reflect on the firm's past and to consider its future. Here, 52 employees work in an open-plan office that embodies the collaborative environment fostered in the studio. In one corner, a Voodoo-inspired altar reminds visitors that while this office may be located in a contemporary tower 31 stories above the city, it's still very much a part of the New Orleans culture below. Wall-to-wall windows command a nearly 360-degree view of the city that EDR has helped to rebuild. In the distance, you can see the recently opened Crescent Park, a 1.4-mile greenway hugging the river's edge near the Bywater neighborhood, which was part of the Reinventing the Crescent Development Plan.

Notably absent from the table is firm founder and principal, Allen Eskew. In December of last year, just days before EDR learned of its Architecture Firm Award honor, Eskew unexpectedly passed away at the age of 65. Eskew was a force in both New Orleans and the architecture community, and was known for his collaboration and civic engagement. "With Crescent Park, the thing that Allen liked to say—and this epitomizes Allen's personality—is that 'For any project of consequence, it requires a cheerleader, and sometimes that's you,'" Ripple says.

Eskew was a mentor, not only to the clients and community but to the firm's young architects. "He had an incredible humanity and would share openly both information and opportunity," Dumez says. "That's something that Mark and I and the other leaders who have grown this firm with him will miss the most. It's a legacy that we hope to build on."

That spirit of community engagement—and an architectural ethos rooted in place, research, sustainability, and design excellence—is what draws many of the young associates to EDR. Tom Gibbons is an architectural intern who recently joined the firm. He first became acquainted with EDR during a 2009 internship with Brad Pitt's Make It Right Foundation. "I really liked EDR's approach to that project," Gibbons says of the house that the firm designed for the rebuilding efforts.

Equally important, Gibbons says, is what EDR fosters outside of the studio. "The firm fully embraces the city's culture and believes: Why be a bystander when you can participate?" This goes for volunteerism and professional development, as well as imbibing in the infamous New Orleans party festivities.



Marissa Campos is another young designer who was attracted to EDR for its engagement of broader ideas. A recent University of Cincinnati graduate, she relocated to New Orleans for a year to work as a research fellow at the firm. The fellows program, which Eskew launched in 2012, tackles a different topic with each fellow class and invites talented designers to contribute to the firm's evidence-based approach to building. "There's a real desire to learn here at EDR, a curiosity about what else is out there, and apply it to practice," Campos says.

This year, the theme for the fellowship is resiliency. "The word 'resiliency' is so prevalent in architecture right now, and we've been attacking what that word truly means, and how it relates to buildings and community," Campos says.

Resiliency is also a word that could apply to the firm itself. Eskew, Dumez, and Ripple had a set of complementary skills and worked in tandem to build the firm's legacy. Now, in the wake of Eskew's passing, EDR is faced with its own rebuilding of sorts. Eskew was in the early stages of a retirement plan, according to the partners, but his loss is deeply felt throughout the firm, and the city. His passing also happens to coincide with the final phases of many FEMA-funded, post-Katrina projects. After nearly a decade of focusing on New Orleans, EDR is again looking to grow.

AFTER NEARLY A DECADE OF FOCUSING ON NEW ORLEANS, EDR IS AGAIN LOOKING TO GROW.

Opposite page, clockwise from top left:

James Hollister, marketing and public relations manager

Shawn Préau, AIA, associate

Jose Alvarez, AIA, principal

Mary Grace Verges, architectural intern

Right:

Collette Creppell, AIA, principal and director of urban strategies

"We were a practice that was working around the country before Katrina," Dumez says. "While we are known as a firm that is invested in place, and that place is New Orleans, our approach to design is a research-based one that strives to understand culture, place, and climate, and that allows us to travel and look with open eyes at any locale. We're now pursuing more of that work." EDR now has projects in places like São Paulo and Greenwich, Conn.

BACK IN NEW ORLEANS, down on the river's edge at Crescent Park, it's already hot and muggy, even though it's only mid-April. James Hollister, EDR's young marketing and public relations manager, is giving me a tour of the recently opened park. The project reclaimed a brownfield site with beautiful landscaping that includes walking paths and a dog run, but also remnants of the old Piety Wharf building. It's a reminder of the site's industrial legacy. The centerpiece of the park is the David Adjaye, Hon. FAIA–designed Piety Street Bridge, a high arching pedestrian walkway that rises above active railroad tracks to connect the river's edge, for the first time, with the adjacent Bywater community. Locals have taken to calling the bridge, which is fabricated from oxidizing steel, the "rusty rainbow."

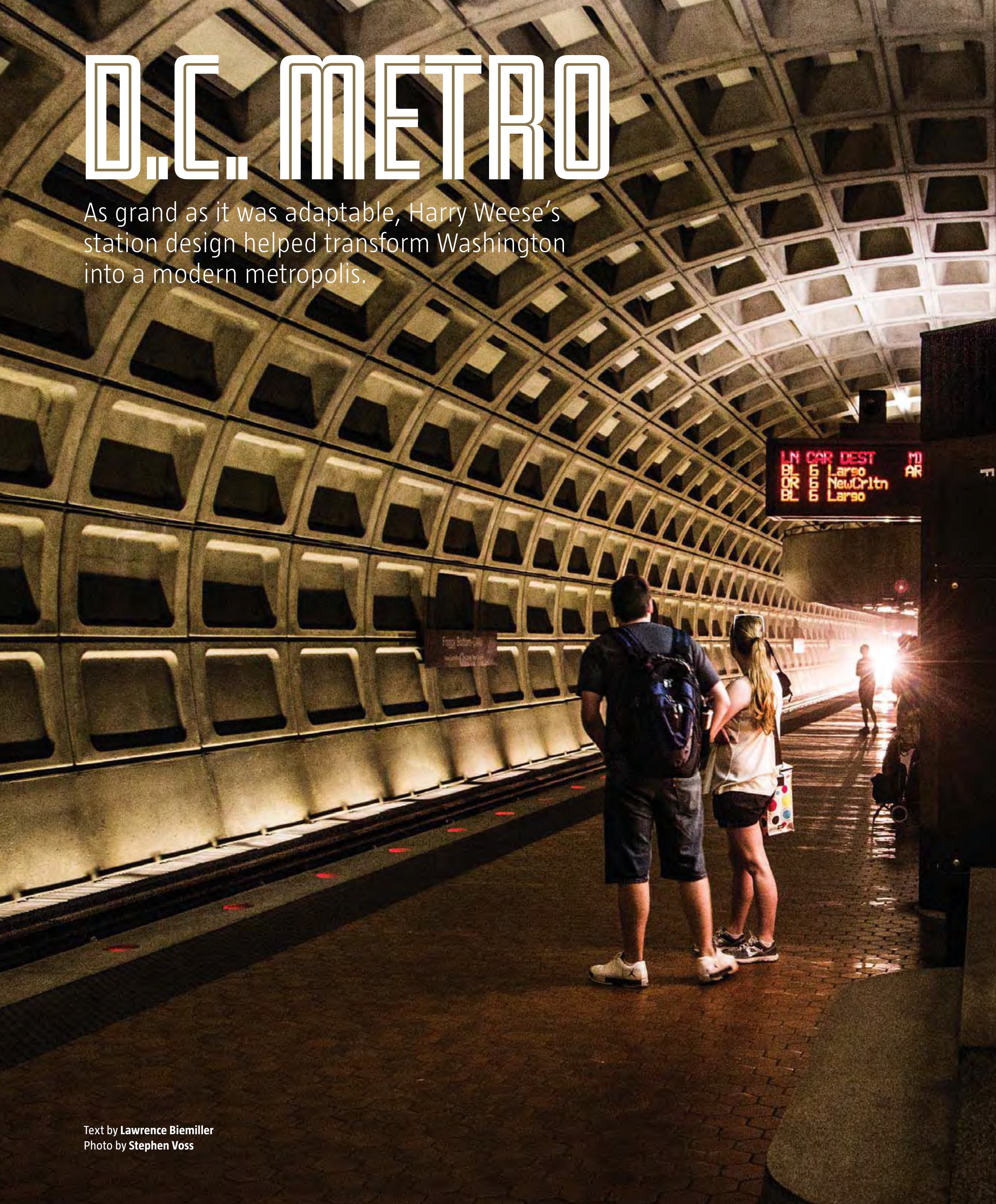
There is a moment, after climbing the steep steps of the Piety Street Bridge and reaching the middle of the structure, when the sides rise well above your head and you lose your peripheral view, your sense of where you're going. Here Hollister hoists himself up the sidewall of the bridge and perches his feet on a handrail. He offers a hand. "Climb up," he says, "you won't believe the view."

Rising above the rusted sidewall, a cooling breeze comes off the water. A barge blasts its baritone horn. And there is the city, splayed out in all its glory. There, too, is the river that defines the city. Here, in the center of the bridge, perched above the railroad tracks, with the water to our left, and the city to our right, we are momentarily suspended amid these variant worlds.

What does the future hold for EDR—post-Katrina, post-Eskew—as the firm seeks to work again outside the region? Wherever EDR goes next, you can bet that the lessons learned at home, in Louisiana, will carry them forward. "We live in a unique place," Ripple says. "It's too hot, too humid, too close to water, and it's sinking at a measurable rate. It underscores the truth that we all have to build in a different way; we all have to live differently now. I think more people realize that, particularly after Sandy. There's no such thing as a static condition, and our architecture will need to deal with those changes."

D.C. METRO

As grand as it was adaptable, Harry Weese's station design helped transform Washington into a modern metropolis.



Text by **Lawrence Biemiller**
Photo by **Stephen Voss**

TWENTY-FIVE YEAR AWARD

Wreckers came this spring for two of my favorite modernist buildings here in Washington, D.C.—the Third Church of Christ, Scientist, by I. M. Pei & Partners, and a handsome companion office building for *The Christian Science Monitor*. I'd read how the 1970 church, an octagonal concrete drum two blocks from the White House, had long been disliked by its congregation, but Washington doesn't have many modernist landmarks, so losing these two hurt—especially since they'll be replaced by yet another office building.

It took the American Institute of Architects (AIA) to restore my faith, reminding me that one of Modernism's biggest, best, and busiest successes is literally right beneath my feet: the 106-mile, 86-station Metrorail system. The Twenty-Five Year Award honors Chicago-based Harry Weese & Associates, the subway system's architects, for a "striking" prototype station design that the AIA said "revolutionized public perceptions of mass transit in the mid-to-late 20th century"—and that has helped the system grow to a 2013 average of 725,770 weekday trips.

Still, as a longtime Metro rider—I moved to Washington in 1980, when the system was only four years old and 34 miles long—I realized I've been taking its design for granted. While waiting for trains I typically spend more time reading email on my phone than admiring the lighting (the original design was by William Lam Associates) or appreciating how smoothly the mezzanines accommodate throngs of commuters. I resolved to have a fresh look around.

A good place to start is Union Station, Daniel Burnham's magnificent 1908 fix for the worst of the city's 19th-century transportation woes. What was designed as the main waiting room is arguably Washington's grandest secular interior, a barrel-vaulted re-creation of Roman-scale splendor with a coffered ceiling and smaller arches opening off the main axis. I find the station as crowded as Burnham anticipated. Tides of Amtrak passengers and commuters on trains to Maryland and Virginia meet rivers of bus riders and floods of tourists.

I head down the escalators to what is Metrorail's single busiest stop. Like the system's other downtown stations, it is every bit as

Previous spread: The Foggy Bottom station.
This page: The Gallery Place–Chinatown station.

The Anacostia station

impressive as the Burnham building. Soaring above the tracks and a center platform tiled in Metro's signature red hexagons is an elliptical concrete vault with bold rectangular coffers. Lighting recessed between the tracks and the sides of the vault creates vivid shadows, particularly in the coffers, and the space—Metro calls it a train room—comes off as a sleek and powerfully simple modernist reinterpretation of Burnham's classical splendor. It's the perfect design for Washington, splitting the difference between Caracalla and Louis Kahn.

Two stops west is Gallery Place–Chinatown, a station that is one of the system's showpieces. Here the Red Line crosses above the Yellow and Green Lines, and at the intersection of the two enormous vaults their coffers elongate into elegant facing points. On the Yellow and Green Line level, the platform is again between the tracks, but on the level above, the Red Line platforms are on either side of the rails, and the two tracks are separated by a narrow band of lights. More lights are hidden between the sides of the vault and a waist-high concrete wall that marks the back edge of the platform. Even on the raised mezzanines on which riders enter the train room and cross above the Red Line, the vault is always far enough away that I can't touch it.

The coffered vault is easily the most memorable aspect of Metrorail's station-design template, which came together in 1966 and 1967. Weese's firm had been given co-equal status with a Chicago engineering firm, De Leuw, Cather & Co., that had a fair amount of experience with subway systems; Weese did not, so he and several others toured systems in Europe to get ideas. The architect's preliminary designs—which included pointed-arch vaults for deep stations and boxier plans for shallow cut-and-fill stations—won approval from the the local National Capital Transportation Agency, the predecessor to the current Washington Metropolitan Area Transit Authority, but faced a rough reception at the federal government's Commission of Fine Arts, whose members included the architects John Carl Warnecke and Gordon Bunshaft.

You can read all about the evolution of the design—and the egos and clashes involved—in Zachary M. Schrag's detailed 2006 book *The Great Society Subway*, published by Johns Hopkins University Press. Suffice it to say that commission members pushed Weese to make all the stations look as much alike as possible—hence the template—and that the design that the Twenty-Five Year Award honors is in fact the cumulative work of many people. The coffers I like so much, in fact, were a late design refinement at a Saturday meeting of Weese's staff in Chicago not long before the Commission of Fine Arts gave its final—and finally warm—approval.

THE COFFERS ARE just one of the design elements that work their way into your mind and make the system instantly recognizable, no matter where you are in it. Just as important are the gentle curves of the concrete mezzanines, the red floor tiles, the deep bronze of the escalators, and the dark brown of the station kiosks, sign pylons, elevators, and farecard readers. (A companion shade of orange that was common in earlier years is now hard to find.) Where the tracks emerge from tunnels to run above ground, the design template offered station shelters with paired concrete roofs curving out above the rails like the wings of great birds.

Such a robust design template gave Metrorail plenty of flexibility in planning stations for a wide variety of locations. A station may have a single entrance or multiple entrances on different levels and at different angles, and riders may enter on stairs, escalators, elevators,

The Metro Center station

The Woodley Park station

The Ronald Reagan Washington National Airport station

or through shopping concourses or parking garages—all deftly handled by mezzanines that funnel the throngs toward the fare gates. The Fort Totten station is partly in a tunnel and partly outside of it, while at the Pentagon station, the tracks run parallel but on two different levels—and in the same train room. The Silver Spring station in Maryland bridges busy Colesville Road, while the Arlington Cemetery station is bridged by the avenue approaching the Virginia cemetery. In the Anacostia station, where space constraints made a single long vault impossible, a series of smaller crosswise vaults are used instead. The design template easily accommodates them all.

And while other subway systems have always had a variety of station types, it's worth thinking back to 1976, when Metro's first stations opened. Imagine how spacious, how modern, how majestic they looked at a time when riders were mostly familiar with the cramped, warrenlike stations of systems in New York, Philadelphia, and Boston. It's true that New York's splendid City Hall station has Guastavino-tiled vaults, but it was closed to passengers in 1945. And while Moscow's subway has a number of vast, vaulted stations, they're as fancifully ornamented as Fabergé eggs. Metrorail's modernist design is on an altogether different—and thoroughly distinctive—level.

But the farther I go from the original downtown stations, built before construction costs became such a big issue, the more often I encounter stations that rely on the less expensive design elements. Early on, the system's designers began cutting costs by using less detailed vaults, so that in many underground stations acoustical panels imitate the pattern that would have been made by the absent concrete coffers. Some above-ground stations dispense with the system's signature curves altogether. When I get off the train at the King Street–Old Town station in Virginia, its angular roof looks more like an overgrown garden shed than like anything connected with the original design template. Only the red tiles and the brown kiosks signal that I am, indeed, on the Metro.

As you might expect, not all of the system's original design choices have stood the test of time. Outdoor escalators proved to be such a maintenance headache that Metrorail eventually gave in and sponsored a design competition for glass shelters to protect many of them. While the shelters compromise the granite-and-brown-kiosk simplicity of the original station entrances, almost no one is eager to praise great architecture while trudging three stories or more up a stalled escalator. Worse, poor engineering choices made decades ago have resulted in continuing water leaks in some Red Line tunnels. The repairs could require closing the busy line for months.

And while Metro administrators have, for the most part, stuck as closely to the design template as money has allowed, clutter has wormed its way into the system in various ways. Arriving-train displays are popular with riders—I look at them as much as anyone—but anything that intrudes on the original spare look of the platforms is unwelcome from a design perspective. At the elevated Ronald Reagan Washington National Airport station in Virginia, I note that the area of the platform that's under cover has been extended, but with a new roof that doesn't match the paired-wing original and disrupts its clean lines.

LESS CLEAR IS WHAT the future holds. In April of last year, Metro officials announced in a video uploaded to YouTube that they planned to test "several new design concepts" at the Bethesda station in Maryland. Among the possibilities are new lights to create "a brighter, more welcoming atmosphere," metal mezzanine wall panels, and replacing

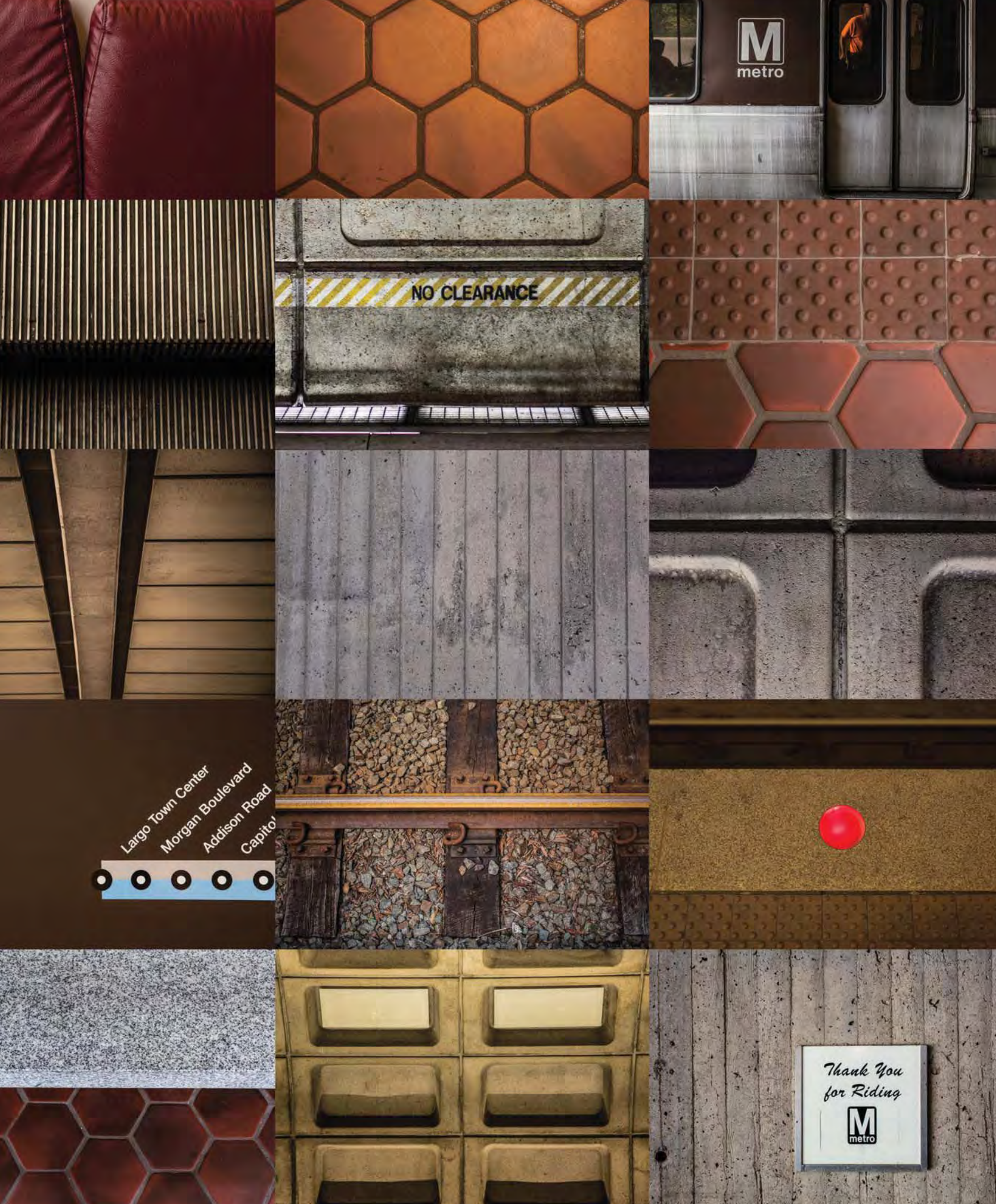
The Red Line (top) and Green and Yellow Lines (bottom) at the Gallery Place–Chinatown station

The Dupont Circle station

Metrorail's signature brown with stainless steel and light gray. Also possible: lighting suspended from the vault in the train room, new and bigger information pylons on the platforms, and replacing some of the curving concrete mezzanine walls with glass—all changes that seem to me as welcome as the wreckers at Pei & Partners' church.

Meanwhile, the much-delayed opening of the first phase of new Silver Line is expected later this year, which will eventually take Metrorail out to another modernist landmark, Eero Saarinen's 1962 Washington Dulles International Airport terminal in Virginia. Since the opening date hasn't been set yet, it's hard to know what elements of the original design template have survived, if any. From a distance, the new stations appear to emphasize angles rather than re-create the Weese template's curves.

But maybe that's just as well. I wrap up my tour at the Dupont Circle station. It has one of the original all-coffered train rooms—which deserve to be spared cheap imitation as well as disfigurement—and I stop to enjoy the shadows that race along the coffers as the departing train plunges into the tunnel. Then, a final pleasure: The three long, bronze-trimmed escalators of the Q Street NW entrance emerge on a broad plane that bisects a granite-rimmed drum set into the earth beside Connecticut Avenue NW. The escalator I'm on is crowded with chattering tourists and preoccupied locals, but as we ascend into the drum, the burst of daylight and the scale and boldness of the geometry delight, even awe. Moments later, the escalator deposits me back in the busy everyday city, at the intersection of two of the streets that Pierre Charles L'Enfant drew on a plan of Washington way back in 1791. It's as fine a subway station, as wonderful an experience, as any modernist could hope for.


metro
NO CLEARANCE
Largo Town Center
Morgan Boulevard
Addison Road
Thank You
for Riding
metro

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AIA HONOR AWARDS

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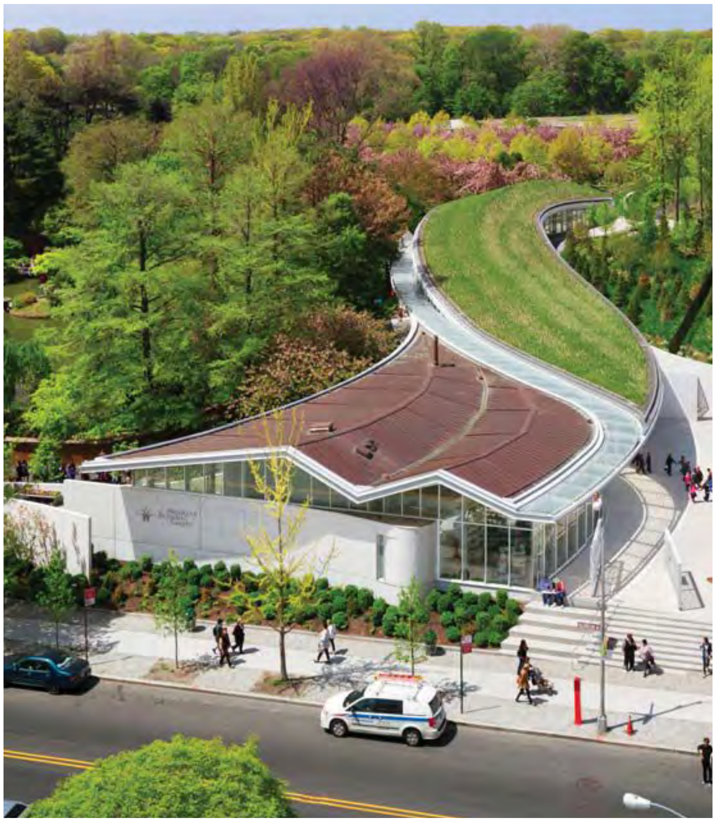
ARCHITECTURE

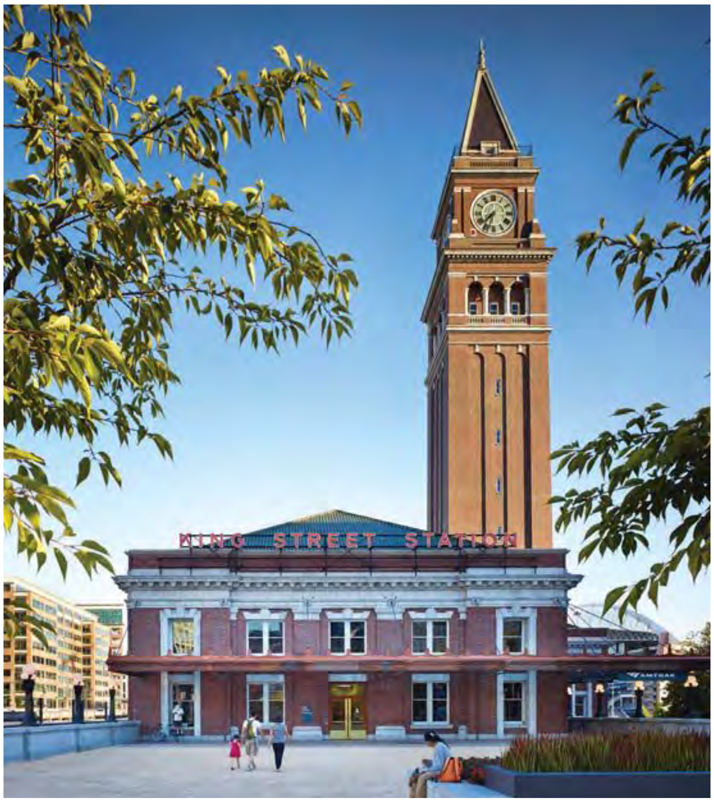


BROOKLYN BOTANIC GARDEN VISITOR CENTER, BROOKLYN, N.Y.

WEISS/MANFREDI ARCHITECTURE/LANDSCAPE/URBANISM, NEW YORK

CLIENT: "We wanted a brilliant, transformative new structure with dynamic design and outstanding functionality seamlessly integrated into our complicated, century-old 52-acre site." —Scot Medbury, president, Brooklyn Botanic Garden.

JURY: "It is a ribbon of building, integrating roof, pedestrian experience, and city context."



KING STREET STATION, SEATTLE

ZGF ARCHITECTS, PORTLAND, ORE.

CLIENT: "We simultaneously wanted to restore the station's historic features while modernizing its systems so that the building reflects its past but is also well-positioned for the future." —Ethan Melone, major projects division, Seattle Department of Transportation

JURY: "An incredible transformation of an important civic landmark, and one that reinforces Seattle's commitment to sustainable design and to preserving our historical and cultural heritage."

TOP: ALBERT VEČERKA/ESTO; BOTTOM: BENJAMIN BENSCHNEIDER


MADE IN AMERICA
This Steel Fabricator Has a New Assistant
Used to be you had to move paper. Lots of it. A change here, a change there. Run out to the plant, make sure everyone's on the same page. Reprint the drawings. Distribute them. Heck, the paper cost could put you at a loss. And the time involved!
Jake Thomas suddenly found himself the owner of Thomas Steel. So when this third generation was called into action to lead his team, he quickly found out he needed some changes. The process was inefficient.
Brought in new assistants. Jake equipped his entire 55,000 sq. ft. plant with 44 iPads. And he taught everyone in the plant how to use them. "They thought I was crazy," he says. "Until the results started to happen almost instantly."
Like saving money – around six figures. Like saving time – thousands of hours. And Jake says it's just the beginning. "What iPads do more than anything else is expedite networking," he says. "It puts us all on the same page. And that's a competitive advantage in any business."
In the digital age, to be competitive, you have to move fast – faster than the competition. It's no longer ready-aim-fire. It's aim-fire-aim-and fire again. And again. With his new assistants, Jake Thomas is always ready. And putting himself in a very competitive position. All the time.
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ARCHITECTURE

CENTRE FOR INTERNATIONAL GOVERNANCE INNOVATION (CIGI) CAMPUS, WATERLOO, ONTARIO
KPMB ARCHITECTS, TORONTO

ARCHITECT: "The design, inspired by universities in the Oxbridge style, is based on a vision for a 'vibrant sanctuary' in the form of an academic courtyard building, enclosed by a glazed cloister, with a bell tower. By including a variety of lounge, study, and breakout areas throughout the campus, the concept encourages a high level of interaction and collaboration between faculty and students." —Fred Kuntz, vice president of public affairs, CIGI

JURY: "The building feels humble, yet sophisticated. It reinvents ways of using light; it uses the reflection off of the white masonry walls to illuminate the space. The sustainable program and design are well integrated."

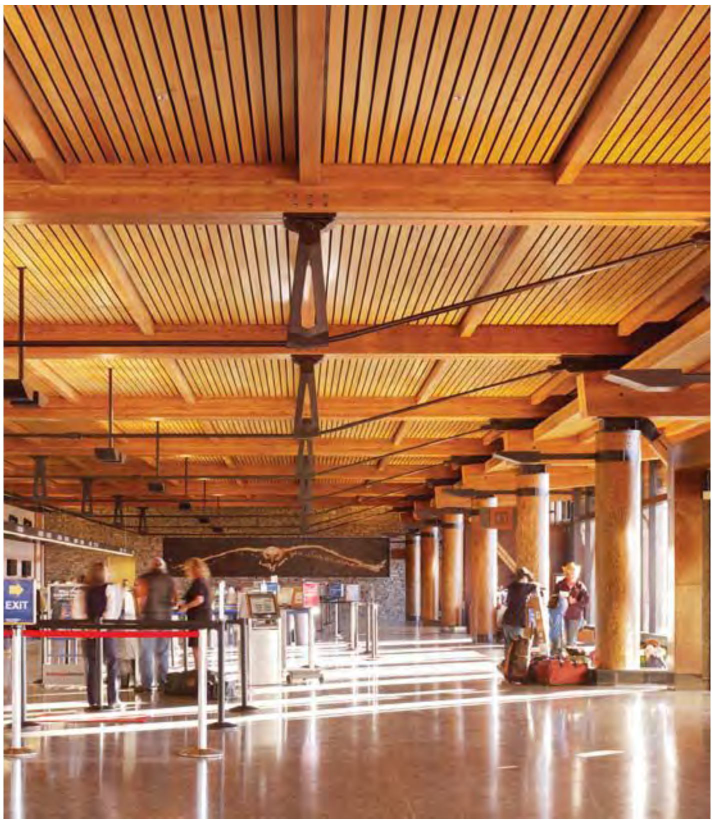
HARRY PARKER BOATHOUSE, BRIGHTON, MASS.
ANMAHIAN WINTON ARCHITECTS, CAMBRIDGE, MASS.

CLIENT: "We wanted the building to communicate openness and accessibility to the public, so we wanted long, airplane hanger–style doors, parallel to the water, so the boats would be fully visible, and a pathway connecting the boathouse to a larger public park system." —Bruce Smith, president, Community Rowing

JURY: "The design purpose is clearly conveyed by borrowing from the nomenclature of oars and regattas."

TOP: MARIS MEZULIS; BOTTOM: PETER VANDERWARKER

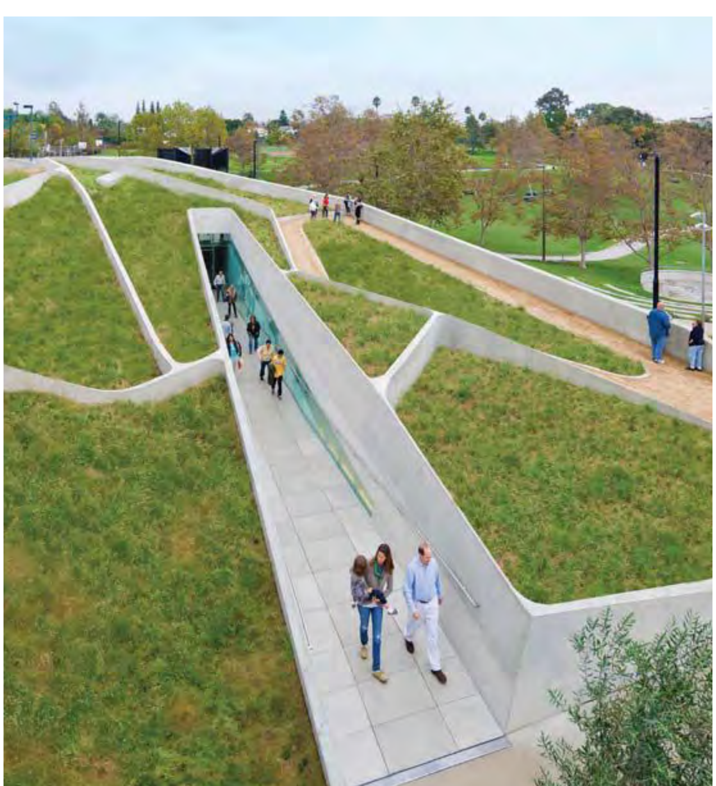
ARCHITECTURE



JACKSON HOLE AIRPORT, JACKSON, WYO.
GENSLER, SAN FRANCISCO

ARCHITECT: "Our concept considered the building as a simple, understated foreground within the beautiful landscape. We wanted a rich dialogue between the interior and exterior—the terminal needed expansive views to both the east and west. And we aimed to distinguish the Jackson Hole Airport from typical airport aesthetics through its regional design, materials, and intimate scale."—Brent Mather, AIA, design director and senior associate, Gensler

JURY: "The rusted steel, wood, and stone are great material choices that produced a regionally inspired solution."



LOS ANGELES MUSEUM OF THE HOLOCAUST, LOS ANGELES
BELZBERG ARCHITECTS, SANTA MONICA, CALIF.

CLIENT: "We wanted a vessel for memory and a dynamic home for Holocaust education at the heart of the Los Angeles Jewish émigré community, in a public greenspace where Holocaust survivors have long gathered to share their stories. To honor them, we needed a dignified, contemplative exterior—one respectful of the park it's nestled in, the lives it honors, and the sorrowful history it was built to teach." —Samara Hutman, executive director, Los Angeles Museum of the Holocaust

JURY: "The concrete work is beautiful. Although the project is curvilinear in form, the more basic structure is a very rigid grid. Given the nature of this museum's mission, the experience of it should be unusual, and this design makes it so: The amorphous geometry reinforces the unsettling journey through the museum."

TOP: MATTHEW MILLMAN; BOTTOM: IWAN BANN

ARCHITECTURE

THE PIERRE, SAN JUAN ISLANDS, WASH.
OLSON KUNDIG ARCHITECTS, SEATTLE

ARCHITECT: "We wanted the architecture to be embedded into the landscape. It was one of those rare moments as an architect when you're allowed to explore the intersection between the landscape and a building's interior. Our aim was to make the two seamless." —Tom Kundig, FAIA, principal and owner, Olson Kundig Architects

JURY: "This project is a beautiful design response to a beautiful setting. It has a fascinating medieval-modern feel; exquisitely crafted."

ST. LOUIS PUBLIC LIBRARY, CENTRAL LIBRARY, ST. LOUIS, MO.
CANNONDESIGN, ST. LOUIS, MO.

CLIENT: "The St. Louis Public Library treasured its magnificent building and wanted the matchless façades and monumental spaces thoughtfully restored. But we needed more than a beautiful, historic museum of architecture. Cass Gilbert's great Renaissance palace had to be reborn as a state-of-the-art library of our time, with all the complex systems and diverse services a modern library requires. It had to be efficient and effective. It had to be brilliant. Above all it had to reflect our own time and open itself up to the St. Louis of today." —Waller McGuire, executive director, St. Louis Public Library

JURY: "The restored building is lovely, bright, and it maintains the Cass Gilbert glory. It is well detailed, restrained, and bold all at once."

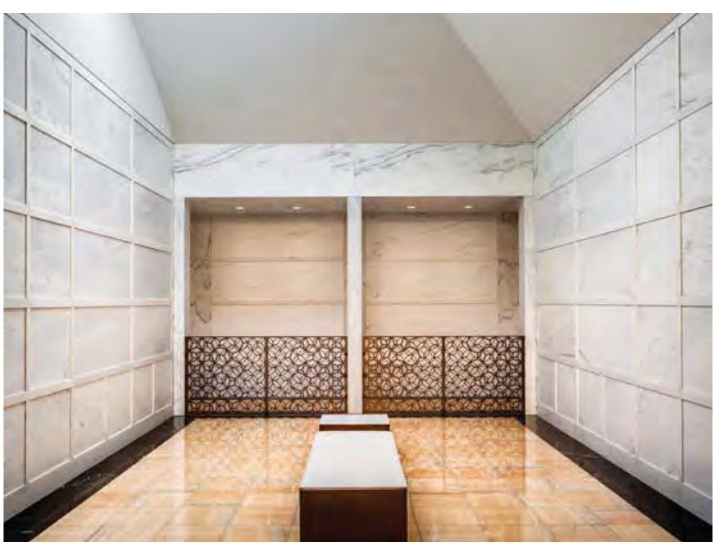
TOP: DWIGHT ESCHLIMAN; BOTTOM: TIM HURSLEY

ARCHITECTURE

QUAKER MEETING HOUSE AND ARTS CENTER, SIDWELL FRIENDS SCHOOL, WASHINGTON, D.C.
KIERANTIMBERLAKE, PHILADELPHIA

CLIENT: "We wanted to transform our Eisenhower-era gymnasium into a timeless Quaker meeting house and arts complex—a space that would be both the physical and spiritual center of campus life." —Ellis Turner, associate head of school, Sidwell Friends School

JURY: "Fascinating use of light and molding of space. Beautiful reinterpretation with a sensitive vernacular touch."



LAKEWOOD CEMETERY GARDEN MAUSOLEUM, MINNEAPOLIS
HGA ARCHITECTS AND ENGINEERS, MINNEAPOLIS

CLIENT: "We were seeking a mausoleum that was unique and spectacular, but we didn't want it to dominate the landscape. We wanted it to be in harmony with the cemetery, and HGA Architects achieved that." —Ron Gjerde Jr., president, Lakewood Cemetery

JURY: "The sculpting of natural light in this project is beautiful. The materials are absolutely striking. There is not one false note to this building."

SCAD MUSEUM OF ART, SAVANNAH, GA.
SOTTILE & SOTTILE, SAVANNAH, GA., AND LORD AECK SARGENT, ATLANTA

CLIENT: "We wanted to emphasize sustainability and historic preservation in both the SCAD curriculum and the museum itself, which reuses the remains of the oldest extant antebellum railroad depot in America, and showcases prominent features like the Savannah gray bricks and original heart pine timbers." —Ally Hughes, director of university communications, Savannah College of Art and Design

JURY: "The architects salvaged as many materials as they could, and they fit them into the new building without being false to the finished product. Lovely reinvention of a ruin into an art museum; sensitive reuse, yet clean break with the past."

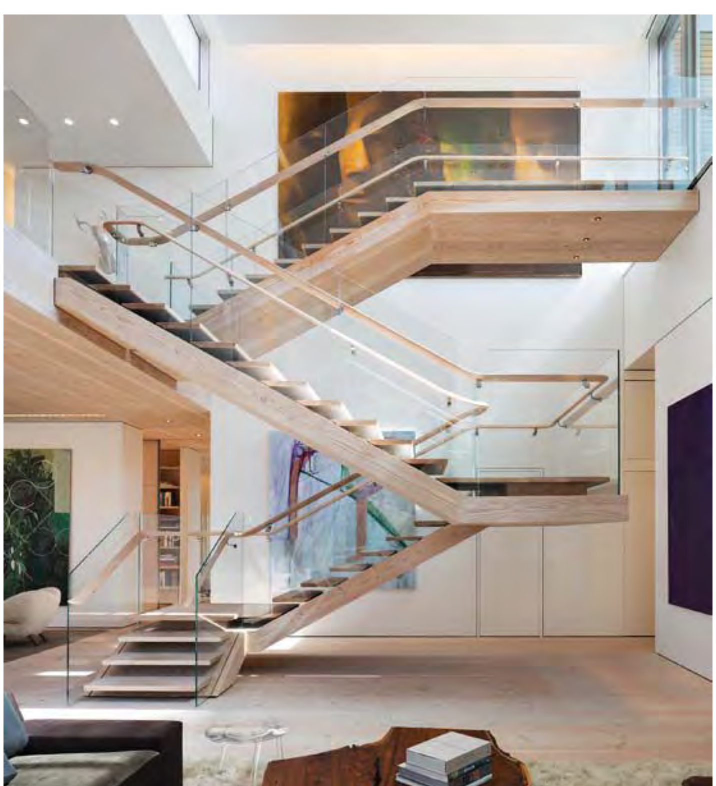
TOP: MICHAEL MORAN/OTTO; MIDDLE: PAUL CROSBY; BOTTOM: SCAD

INTERIOR ARCHITECTURE

BAR AGRICOLE, SAN FRANCISCO
AIDLIN DARLING DESIGN, SAN FRANCISCO

CLIENT: “We wanted everything you touch, from the linens to the walls, to have substance—the quality of materials speaks to the quality of ingredients. And we hoped to capture the unique feel of San Francisco’s agricultural and urban surroundings.” —Thad Vogler, co-owner, Bar Agricole

JURY: “There is a lot of texture where so often we see so much minimalism and sleek crafting. One of the nicest things is the way it manipulates the diner’s experience.”



SOHO LOFT RESIDENCE, NEW YORK
GABELLINI SHEPPARD ASSOCIATES, NEW YORK

ARCHITECT: “We strove for a balance between American and Scandinavian sensibilities, functional preferences and models of domestic living. The entire space and organization is based on light—when ambient natural light hits the art on the walls, the loft comes to life.” —Michael Gabellini, FAIA, founding partner, Gabellini Sheppard Associates

JURY: “The design combines Scandinavian and American character. It is a great frame for the client’s outstanding art collection.”

TOP: MATTHEW MILLMAN; BOTTOM: PAUL WARCHOL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INTERIOR ARCHITECTURE

K&L GATES AT ONE NEW CHANGE, LONDON
LEHMAN SMITH MCLEISH, WASHINGTON, D.C.

CLIENT: "Debra Lehman-Smith's design gave us a new, multidisciplinary approach to the way we organize ourselves and demonstrate value to our clients. Our revenues in London have grown by 35 percent in the last four years—something we simply would not have seen without LSM and their design ideas." —Tony Griffiths, administrative partner, K&L Gates

JURY: "The detailing is thoughtful and sensitive, and the spaces draw your eyes without a lot of fanfare. The design is subtle, clean, spare, and strong."

KNOLL FLAGSHIP SHOWROOM, OFFICES, AND SHOP, NEW YORK
ARCHITECTURE RESEARCH OFFICE, NEW YORK

ARCHITECT: "Knoll envisioned its showroom as a return to midtown—they wanted to transform the industrial space and culture they had in the Meatpacking District into 3.5 floors of a midtown skyscraper. The goal was to increase individual workspace and opportunities for collaborative work, and to create an office that's an extension of the showroom itself." —Kim Yao, AIA, principal, Architecture Research Office

JURY: "The interiors of this project have everything. They tell a good story about furniture design, displaying Knoll products and illustrating how they should be used. They are well integrated, well laid out, and purposeful."

TOP: RICHARD BRYANT; BOTTOM: ELIZABETH FELICELLA

INTERIOR ARCHITECTURE

LOS ANGELES MUSEUM OF THE HOLOCAUST, LOS ANGELES
BELZBERG ARCHITECTS, SANTA MONICA, CALIF.

CLIENT: "The task was to create an interior that lets you explore these original artifacts, and, simultaneously, remember the dead. Hagy Belzberg, FAIA's humanity and his reverence for these men and women shines through in every detail. This museum holds the Holocaust's victims and survivors at its center, at its heart." —Samara Hutman, executive director, Los Angeles Museum of the Holocaust

JURY: "The whole effect is enhanced by the gradients of the light, which are torqued and reflective on the interior of the space."

MARC BY MARC JACOBS SHOWROOM, NEW YORK
JAKLITSCH/GARDNER ARCHITECTS, NEW YORK, AND HLW INTERNATIONAL, NEW YORK

CLIENT: "Two of our goals were seemingly mutually exclusive: maximize daylight and airiness, but make sure that the showroom's various zones were distinct and discreet. In addition, the layout had to be flexible. Adding to that challenge, construction had to be finished in three months. Most importantly, we needed a showroom that was an extension of Marc by Marc Jacobs, so that visitors have a seamless experience of the brand." —Marc by Marc Jacobs

JURY: "It is moody in a good way. The blue-tinted glass, surrounding the central space, pulls your eyes down from the ceiling. It makes you look at a showroom in a way that you wouldn't anticipate. Lighting is a critical element."

THE PIERRE, SAN JUAN ISLANDS, WASH.
OLSON KUNDIG ARCHITECTS, SEATTLE

ARCHITECT: "The client has lived on the site for years. She wanted her memories—and her incredible art collection—to be embedded into the architecture." —Tom Kundig, FAIA, principal and owner, Olson Kundig Architects

JURY: "It makes you ponder the perception of concrete as constructed rock. The industrial detailing is unexpected and works so well."

TOP: BENNY CHAN ; MIDDLE: SCOTT FRANCES; BOTTOM: BENJAMIN BENSCHNEIDER


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INTERIOR ARCHITECTURE

ODEGAARD UNDERGRADUATE LIBRARY & LEARNING COMMONS, SEATTLE
THE MILLER HULL PARTNERSHIP, SEATTLE

CLIENT: "The renovation of Odegaard has been nothing short of transformational. Not only has it brought beauty and light to a tired, heavily used building, it has also created new spaces for collaborative and individual learning. The students love it." —Jill McKinstry, director, Odegaard Undergraduate Library at the University of Washington

JURY: "It is well detailed. The railing facet and how it falls into the underside of the structure is amazing. Both artificial and natural light are important to the project. This is an excellent example of architectural renovation."

VENTURE CAPITAL OFFICE HEADQUARTERS, MENLO PARK, CALIF.
PAUL MURDOCH ARCHITECTS, BEVERLY HILLS, CALIF., AND KAPPE ARCHITECTS PLANNERS, PACIFIC PALISADES, CALIF.

ARCHITECT: While expressing the firm's bold, risk-taking ventures, we also wanted to create a warm environment where employees could feel at home in a garden setting." —Paul Murdoch, AIA, president, Paul Murdoch Architects

JURY: "It pulls you back a generation in a fresh way. It is extremely sustainable, and the prefabrication is well done."

TOP: LARA SWIMMER; BOTTOM: ERIC STAUDENMAIER


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REGIONAL + URBAN DESIGN

THE CREATIVE CORRIDOR: A MAIN STREET REVITALIZATION FOR LITTLE ROCK, LITTLE ROCK, ARK.

UNIVERSITY OF ARKANSAS COMMUNITY DESIGN CENTER, FAYETTEVILLE, ARK., AND MARLON BLACKWELL ARCHITECT, FAYETTEVILLE, ARK.

ARCHITECT: "Little Rock has taken the first steps in reclaiming its Main Street as a great public space once again by restoring non-traffic social functions to the street. Though downtown living everywhere has enjoyed a comeback, cities like Little Rock in particular teach us that the urban street can be an indispensable tool for creating value. The Creative Corridor connects the dots between arts, economy, and ecology towards synthetic models of livability and placemaking that only cities can offer." —Stephen Luoni, Assoc. AIA, director, University of Arkansas Community Design Center

JURY: "The Creative Corridor plan proposes to create a Main Street that is to America what the piazza was to Italy."

SON TRA PENINSULA STRATEGIC VISION PLAN, DA NANG, VIETNAM

SKIDMORE, OWINGS & MERRILL, CHICAGO

ARCHITECT: "The city of Da Nang's Department of Construction wanted a macro-scale development plan—residential properties and resort hotels—for this lush, mountainous peninsula that's the backdrop to the city. We realized, through 3D modeling of the topography, that the best places to build were in the valleys, not the peaks and promontories, so we wouldn't obscure the beautiful landscape." —Daniel Ringelstein, director of urban design and planning, Skidmore, Owings & Merrill's London office

JURY: "The plan reflects deep appreciation for the area's considerable natural assets and provides well-crafted strategies to ensure their preservation for generations to come."

TOP: UNIVERSITY OF ARKANSAS COMMUNITY DESIGN CENTER + MARLON BLACKWELL ARCHITECT; BOTTOM: SOM

REGIONAL + URBAN DESIGN

DENVER UNION STATION NEIGHBORHOOD TRANSFORMATION, DENVER

SKIDMORE, OWINGS & MERRILL, CHICAGO

ARCHITECT: "We wanted an iconic and monumental space for the train hall, complemented by simple-yet-elegant pavilions and canopies—in short, a vibrant public space in the heart of a great American city." —Kristopher Takacs, AIA, Denver Union Station project manager, Skidmore, Owings & Merrill

JURY: "The architecture of the commuter train hall canopy provides an iconic focal point and makes a strong civic statement, yet its contemporary design doesn't upstage the historic station."

THE EAST RIVER BLUEWAY PLAN, NEW YORK

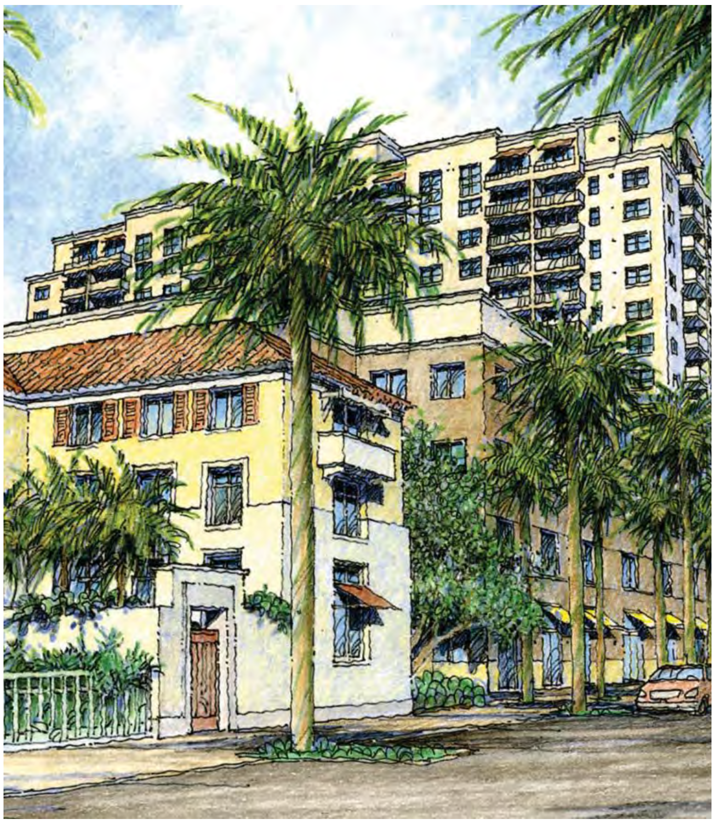
WXY ARCHITECTURE + URBAN DESIGN, NEW YORK

CLIENT: "The East River is a wonderful ocean strait, but because of the seawall it's very hard to access the water, to touch it. We simply wanted to give people a better way to access the water, and we wanted trees and green space and other aesthetic transitions pointing the way." —Christine Datz-Romero, co-founder and executive director, Lower East Side Ecology Center

JURY: "The Blueway Plan is a true model for resiliency; it provides a vision of an accessible and dynamic waterfront yet it also addresses the urgent issue of climate change and its effects."

TOP: SOM; BOTTOM: WXY ARCHITECTURE + URBAN DESIGN

REGIONAL + URBAN DESIGN



MIAMI 21: A NEW ZONING CODE FOR THE CITY, MIAMI
DUANY PLATER-ZYBERK & CO., MIAMI

ARCHITECT: "Through the vision of Mayor Diaz in Miami, the city embarked on an unprecedented mission: to overhaul their zoning code to create more sustainable, predictable, and efficient regulations through the adoption of a SmartCode called Miami21, which entailed a holistic approach to land-use planning." —Marina Khoury, partner, Duany Plater-Zyberk & Co.

JURY: "This project went beyond crafting a vision—in fact, it developed a tool. Other cities will have to address zoning issues in the future, and this plan will serve as an invaluable precedent."

PEARL BREWERY REDEVELOPMENT MASTER PLAN, SAN ANTONIO
LAKE|FLATO ARCHITECTS, SAN ANTONIO

ARCHITECT: "Not long ago, no one was coming to this part of San Antonio, so our greatest challenge was to create a destination. We aimed to animate the site by repurposing 250,000 square feet of historic buildings into a self-supporting district, a sustainable village grounded in the culinary arts and integrated with the riverfront." —David Lake, FAIA, partner, Lake|Flato Architects

JURY: "This project has served as a catalyst for green urban revitalization in a long-neglected portion of San Antonio's inner city."

TOP: DPZ; BOTTOM: CASEY DUNN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2014

AIA AWARDS

WHITNEY M. YOUNG JR. AWARD

IVENUE LOVE-STANLEY, FAIA

Love-Stanley has broken a number of barriers as an architect and as an advocate for the profession. She was the first African-American woman to graduate from the College of Architecture at Georgia Tech, and the first to become a licensed architect in the Southeast. She and her husband, William J. Stanley, III, FAIA—who cofounded Stanley, Love-Stanley in Atlanta in 1978—are the first husband-and-wife duo to receive this award. (Stanley was recognized in 1995.) Love-Stanley has been an advocate throughout her career for underserved and minority communities. She worked for eight years on Atlanta's Midtown Improvement District, has served on the city's Zoning Review Board, and has sat on the board of the Atlanta Preservation Center. Love-Stanley strove to gain recognition for Atlanta's West End neighborhood as a historic district with a unique architectural heritage—a 15-year struggle. "Ivenue used her knowledge of land-use, zoning and [the] historic preservation process, and of design, to make our 19th- and early-20th-century African-American neighborhoods architecturally relevant and contextually better off," wrote Karl Webster Barnes, former director of the Georgia African American Historic Preservation Network, in his letter recommending Love-Stanley for the award.

YOUNG ARCHITECTS AWARD

ILLYA AZAROFF, AIA

The director of design for +LAB Architects in Brooklyn, N.Y., Azaroff was tapped by AIA New York to head the region's recovery efforts following Hurricane Sandy. He co-chaired the Design for Risk and Reconstruction Committee, which published the Post-Sandy Initiative Report last May. He also created a program that helped architects affected by the storm find spare office space in other firms. Azaroff holds an M.Arch. from Pratt Institute.

THOMAS BRADLEY BENJAMIN, AIA

Benjamin is the president and CEO of Radium Architecture in Greenville, S.C., and a past chair of the AIA's Young Architects Forum. He was president of AIA Greenville in 2009. Benjamin worked to establish regional chapters for Women in Architecture, Architecture for Humanity, and the ArchiLamp mentoring program. In 2007, he was awarded the AIA's Associate Member of the Year Award. Benjamin has an M.Arch. from Clemson University.


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HARRISON FRAKER, ASSOC. AIA

A pioneer in sustainability circles, Fraker founded the Center for Environmental Studies in conjunction with the engineering department at Princeton University in 1972. The center, now a part of the Princeton Environmental Institute, was created to explore how buildings interact with the environment. Fraker launched two professional practices, Princeton Energy Group (PEG) and Harrison Fraker Architects (HFA), to partner with the center to use research in the application of energy-efficient building design. PEG developed energy-monitoring tools; HFA designed passive solar buildings. In 2013, Fraker published a book, *The Hidden Potential of Sustainable Neighborhoods: Lessons from Low-Carbon Communities*, which explores how sustainable design in Europe can be applied in the U.S. Last year, he was also appointed chair of the UC Berkeley Energy and Resources Group.

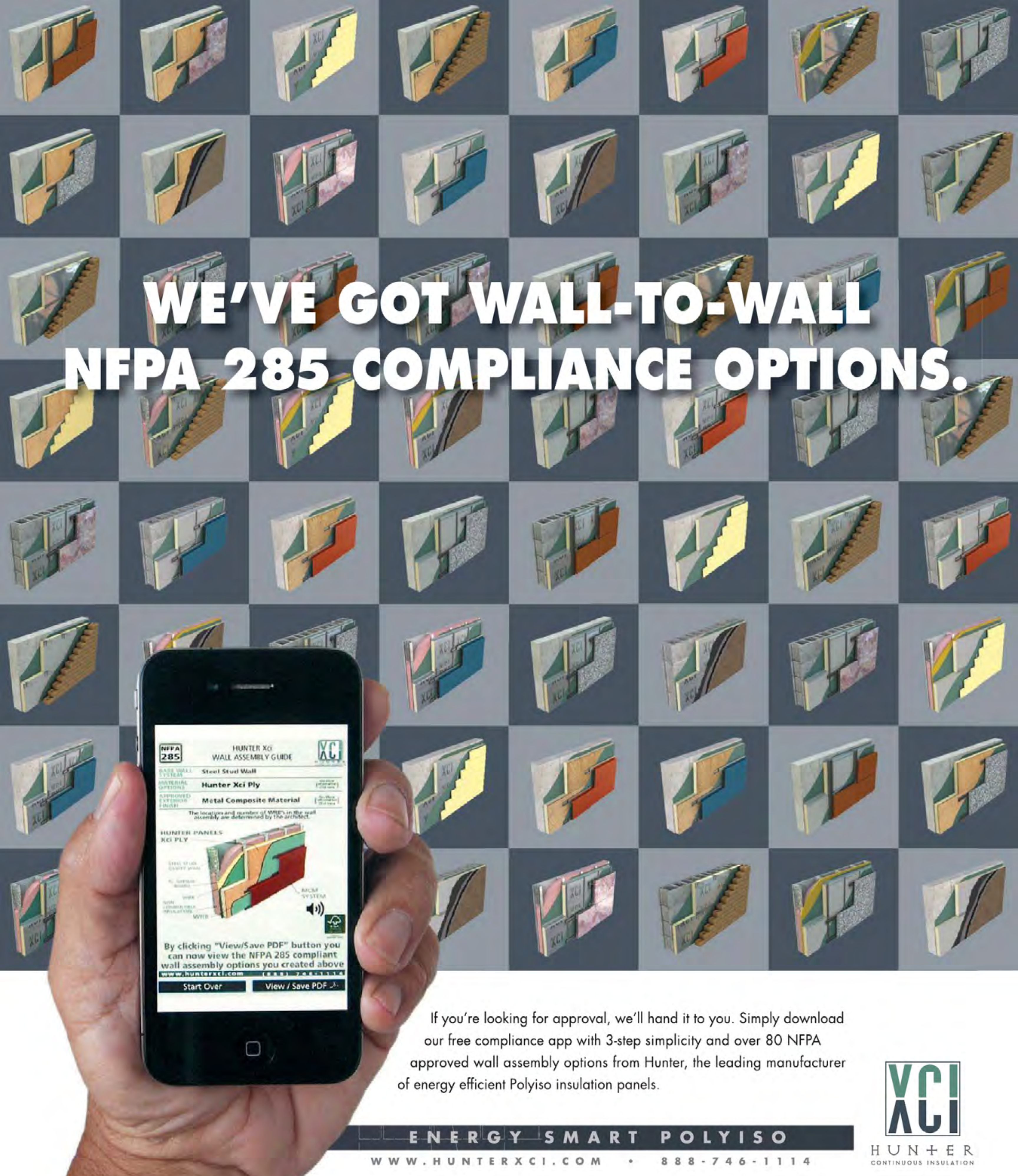
YOUNG ARCHITECTS AWARD (CONT.)

JOSHUA FLOWERS, AIA

Flowers is legal counsel for Hnedak Bobo Group in Memphis, Tenn., and the 2013–2014 knowledge director for the AIA Young Architects Forum. He also was the 2012 president of AIA Memphis as well as the 2011–2012 Young Architect regional director for the Gulf States region. Flowers earned B.Arch. and J.D. degrees from the University of Tennessee.

WYATT FRANTOM, AIA

An associate and architectural designer at Gensler in Los Angeles, Frantom is the 2013–2014 communications director for the Young Architects Forum and was the 2010–2011 Texas regional director for the Young Architects Forum. Frantom co-founded the nonprofit Houston Mod, which advocates for the preservation of modern architecture. The winner of AIA Houston's Young Architect of the Year Award in 2007, he has an M.Arch. from Rice University.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THOMAS JEFFERSON AWARDS

CAROLE J. OLSHAVSKY, FAIA

During a 40-year career in which she served as state architect of Ohio, deputy director of the Ohio Public Works Division, and senior executive of capital improvements at Columbus City Schools, Olshavsky wielded considerable influence over the design of civic and educational buildings in the Buckeye State. As state architect, she oversaw the design of the Wexner Center for the Arts by Peter Eisenman, FAIA, and Trott & Bean Architects, as well as the Historical Center of Industry and Labor at Youngstown State University by Michael Graves & Associates and Braun & Steidl Architects. Graves, FAIA, wrote in his letter supporting Olshavsky's nomination: "Carole's intelligent approach to every situation I was involved in consistently addressed how to make public architecture—the process as well as the product—better and better. A public sector architect can do our built environment no greater service than that, and Ohio has been fortunate to have had such a leader."

JAMES LOGAN ABELL, FAIA

During his distinguished career, Abell specialized in affordable housing and adaptive reuse projects that preserved the vernacular character of the American Southwest, particularly in the urban center of Tempe, Ariz., where he founded Abell & Associates Architects in 1979. In 1988, as part of the AIA's Search for Shelter design charrette, Abell led a group of Arizona State University (ASU) students who explored how abandoned buildings in Phoenix could be renovated for people who were transitioning out of homelessness. He eventually built one such project, Casa Teresa, which inspired public agencies across the U.S. to seek out his public housing expertise, wrote Gerald McSheffrey, AIA, professor emeritus and former dean of ASU's college of architecture, in his letter of recommendation.

ROBERT G. SHIBLEY, FAIA

The dean of the School of Architecture and Planning at the University of Buffalo, where he also serves as campus architect, Shibley made significant contributions to the master planning of downtown Buffalo and its Frederick Law Olmsted–designed park system. His Queen City Hub plan was created as part of The Urban Design Project, a group he founded in 1990 as a collaboration between students, faculty, local governments, organizations, and the community at large. "It is now 10 years since we published the Queen City Hub, and we see the fruits of its logic with cranes in the air, new residential life downtown, and the emergent fulfillment of the plan's aspirations for both the waterfront and our medical campus," wrote Anthony Masiello, the former mayor of Buffalo, in a letter supporting Shibley's nomination.

YOUNG ARCHITECTS AWARD (CONT.)

NATHAN KALAHER, AIA

Kalaher co-founded Plan Architecture, a Sioux City, Iowa–based firm. He has received numerous awards, including consecutive Design Excellence Awards from AIA Iowa in 2012 and 2013. In 2007, Kalaher was recognized as an Iowa Innovator by *IABiz* magazine, and in 2012 he was included in the publication's "10 under 40" list. He is currently the president of AIA Iowa. Kalaher earned a B.S. in Community and Regional Planning as well as a B.Arch. from Iowa State University and an M.Arch. from Cornell University.

EVELYN M. LEE, AIA

A senior strategist at MKThink, Lee is the founder and chief curator of the website The Practice of Architecture. The 2014–15 public relations director for the Young Architects Forum Advisory Committee, she has also held multiple positions with the AIA California Council and received the 2005 AIA Associate Member of the Year award. Lee holds an M.Arch. from the Southern California Institute of Architecture and a Master of Business Administration degree from the Presidio Graduate School.

TIMOTHY W. MADDOX, AIA

Maddox is a founding principal of deMx Architecture (formerly Denoble Architecture), a Fayetteville, Ark.–based firm that has received numerous design awards from the AIA Arkansas chapter. He currently serves on the AIA Arkansas board of directors as the chapter's secretary, and he also received the 2012 AIA Arkansas Emerging Professional Award. He is a member of the board of the group United Cerebral Palsy of Arkansas and chair of its northwest council. Maddox has a B.Arch. from the University of Arkansas.

DANIEL OVERBEY, AIA

Overbey is the director of sustainable design practices at the Indianapolis-based landscape architecture firm Browning Day Mullins Dierdorf Architects. He has taught environmental systems at several institutions, including Ball State University and Boston Architectural College. The winner of the 2012 AIA Indiana Young Architect Award, he has served on the boards of directors for the AIA Indianapolis chapter and the USGBC chapter of Indiana.

MARK PASNIK, AIA

Pasnik is the co-founder of Boston-based interdisciplinary firm Over, Under, and the co-founder of an independent design gallery, Pinkcomma. Pasnik also helped launch BSA Space, home to the Boston Society of Architects, and served as one of the first guest curators for the inaugural exhibition. He participated in the third annual Design Biennial Boston, in 2012, for which Over, Under curated works by previous biennial participants.

MICHAEL PFEFFER, AIA

Pfeffer is a project manager and managing director at the Skidmore, Owings & Merrill's Chicago office, where he worked on the development of the firm's Intern Development Program Committee. He currently is a member of the board of directors for Windy City Habitat for Humanity and volunteers for Rebuilding Together Metro Chicago and the Retrofit Chicago Commercial Building Initiative. Pfeffer holds a B.Arch. from the University of Notre Dame.


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YOUNG ARCHITECTS AWARD (CONT.)

JASON DALE PIERCE, AIA

A project architect with St. Louis–based HOK, Pierce has served as the vice president of the Academy of Emerging Professionals for the AIA California Council and the regional director adviser for the Young Architects Forum. Pierce is also involved with organizations such as Habitat for Humanity and the Practice Management Knowledge Community Advisory Board. He serves on the board of directors for AIA St. Louis. Pierce holds a B.Arch. and B.A. in Theatre from Drury University.

MARK SCHWAMEL, AIA

Schwamel is a project manager for Gensler and serves on the firm's planning and urban design group. He is also the AIA Illinois regional associate director for the National Associates Committee and has served as associate director on the AIA Chicago board. In 2009, Schwamel founded the AIA Chicago Bridge program to provide experienced mentors for young architects and associate AIA members. He volunteers for the Rebuilding Together program for underprivileged families in Chicago.

MATT SLAGLE, AIA

A design architect for TowerPinkster who has been acclaimed for his expertise in sustainable school design, Slagle became eligible to take the Architect Registration Exam by his third year in his graduate program. He has served as the AIA Grand Rapids member services director and volunteers with Habitat for Humanity and ArtPrize. He was named the 2013 Young Architect of the Year by AIA Grand Rapids. Slagle earned a Bachelor of Science in Business Administration and an M.Arch. from the University of Colorado.

CHRISTIAN SOTTILE, AIA

Sottile is the dean of the Savannah College of Art and Design's School of Building Arts and founder and principal of Sottile & Sottile. He has received a National Honor Award for Urban Design from the AIA and a Charter Award from the Congress for the New Urbanism. He was named one of the top 100 academics working today by *USA Today* in 1998. Sottile holds an M.Arch. from the Savannah College of Art and Design and an M.Arch. II from Syracuse University.

LORENA TOFFER, AIA

A project architect for the Dallas firm Corgan, Toffer has served as chair of the AIA Dallas Young Architects Forum, during which time she launched the Portfolio/Resume Workshop and the 10 Under Ten Exhibition. AIA Dallas recognized Toffer in 2011 as the Young Architect of the Year; in 2013, she served as director of networks for the chapter. Toffer has served on both the AIA Dallas Latinos in Architecture and Women in Architecture committees.

BRIAN VITALE, AIA

The design director for the Chicago office of Gensler, Vitale was the recipient of the 2010 AIA Illinois John Wellborn Root Award and received the AIA's Scholastic Gold Medal and Certificate while pursuing his master's degree at Washington University in St. Louis. He has served as an adjunct design professor at the University of Illinois at Chicago. Vitale has a Bachelor of Science in Architectural Studies from the University of Illinois Urbana-Champaign.


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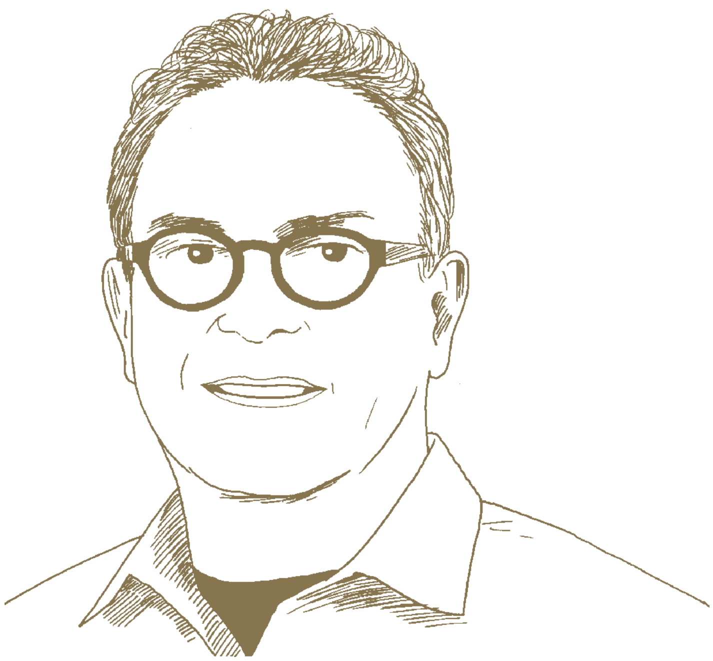
EDWARD C. KEMPER AWARD



FREDRIC BELL, FAIA

The executive director of AIA New York, Bell helped found New York's Center for Architecture in 2003. He has made significant contributions to the city's post-disaster initiatives, working with the design coalition New York New Visions, which developed rebuilding recommendations following the Sept. 11 attacks, as well as on the Post-Sandy Initiative Report. Amanda Burden, director of the city's planning department, wrote in a recommendation letter that "the success of Rick's leadership is evident in the expansion of the Center, anchoring this institution in New York City for the long term. One of Rick's main qualities is an understanding that architecture and design are at their best when they serve wider purposes, and are directly engaged with public policy issues." Bell also sits on ARCHITECT's editorial advisory committee.

YOUNG ARCHITECTS AWARD (CONT.)

KAREN WILLIAMS, AIA

Williams is an architect at HKS working for the commercial assembly and sports and entertainment group. She serves as the secretary for AIA Orlando and has chaired the organization's Women in Architecture committee. Williams also works with the ACE mentorship program. She is the recipient of the Fred Pryor Young Architect Achievement Award. Williams earned an M.Arch. from Florida A&M University.

JEFF YRAZABAL, AIA

A principal at SRG Partnership who is hailed for his efforts to create mentorship programs for young designers, Yrazabal is the AIA Portland president and AIA Northwest and Pacific Young Architect regional director. He co-chaired the AIA Portland Committee on the Environment and volunteers with Rebuilding Together and Architects in Schools. Yrazabal holds a B.Arch. and Bachelor of Science in Architectural Studies from Washington State University.

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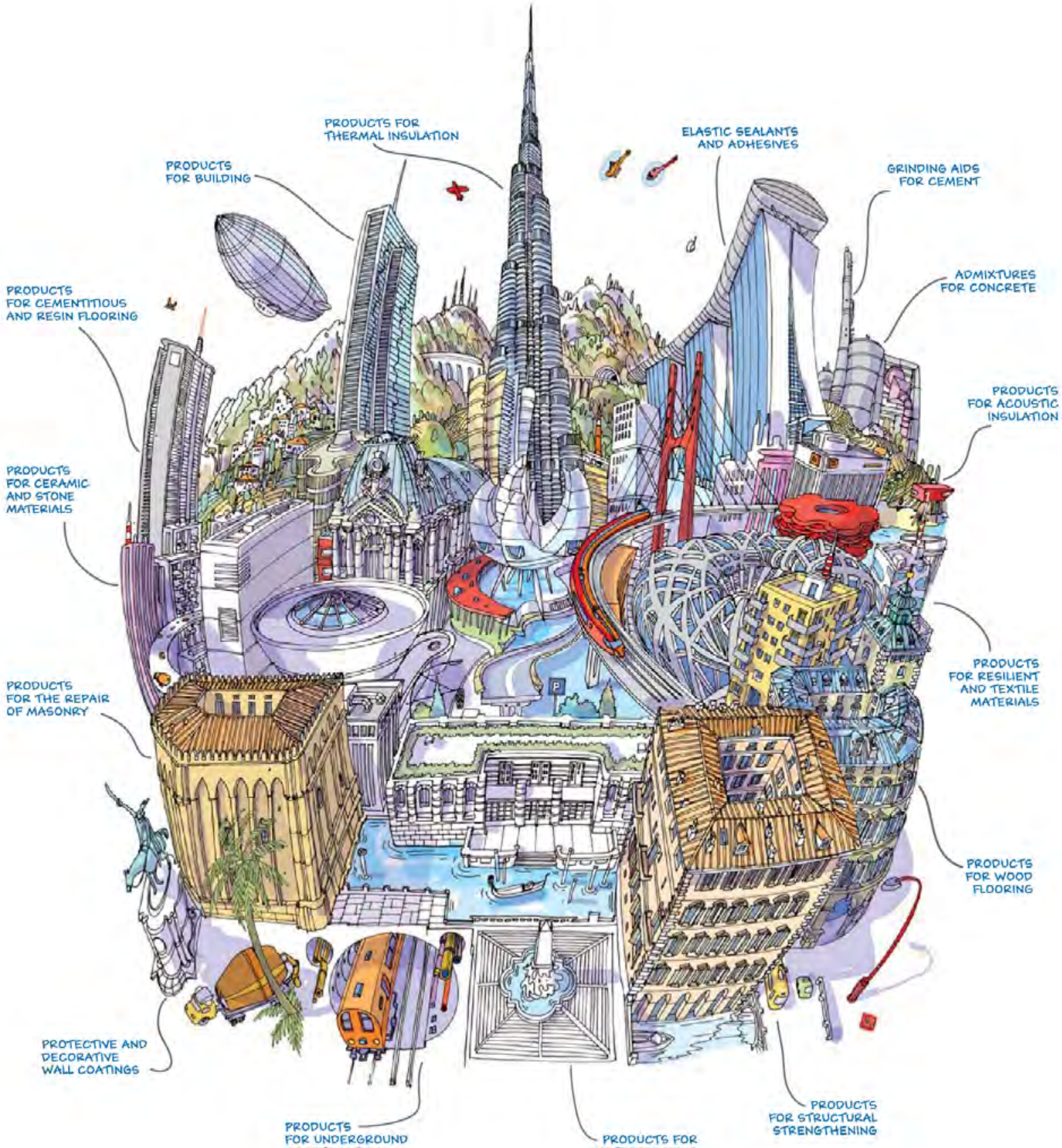

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ASSOCIATES AWARD

ASHLEY W. CLARK, ASSOC. AIA

The associate representative to the AIA National Executive Committee in 2013, and the marketing manager for LandDesign in Charlotte, N.C., Clark has repeatedly lobbied on behalf of young architects. She worked with the North Carolina state licensing board to adopt concurrent testing. And as chair of the National Associates Committee, she helped implement accountability measures for Intern Development Program supervisors.

JULIE ANN ENGH, ASSOC. AIA

Through her various leadership positions with the AIA New York Chapter, including the chapter's Emerging New York Architects Committee and the Architectural Tour Committee, Engh has been committed to increasing public awareness about design, as well as promoting the value of licensure to young professionals. She works in the architecture department at Highland Associates in New York.

ANA ISABEL GUERRA, ASSOC. AIA

As a member of the AIA National Board of Directors and AIA Executive Committee in the mid-2000s, Guerra helped support a move to allow intern architects to take the ARE while completing the Intern Development Program. After the board signed on in 2005, Guerra helped lobby the National Council of Architectural Registration Boards to make the change. Guerra is a project manager at Jacobs Engineering Group in Dallas.

HIROSHI JACOBS, ASSOC. AIA

A designer at Studios Architecture in Washington, D.C., Jacobs has made his mark in the field of design technology. He founded RevitCity.com, which boasts more than 425,000 Revit users, as well as a software plug-in called Chameleon, which helps translate data between Revit and Rhino/Grasshopper. Jacobs is also a lecturer at the Catholic University of America.

COLLABORATIVE ACHIEVEMENT

ACE MENTOR PROGRAM

A nonprofit founded in 1994, ACE was established to help design professionals mentor high school students, especially underserved minority groups and women. The national program (founder Charles H. Thornton, Hon. AIA, pictured) pairs students and mentors, who work together on design projects in teams. Three percent of all applicants to U.S. architecture schools identify themselves as ACE alumni.

NATIONAL BUILDING MUSEUM

Located in Washington, D.C., the National Building Museum (executive director Chase W. Rynd, pictured) has educated the general public and professionals about design since it opened in 1985. The museum has staged hundreds of design exhibits, honored industry leaders with its Vincent Scully Prize, held lecture series on women in architecture and other topics, and helped mentor students with design competitions and other programming.

POST-SANDY INITIATIVE

Led by the AIA New York Chapter's Design for Risk and Reconstruction Committee (current chapter president Lance Jay Brown, FAIA, pictured), the Post-Sandy Initiative brought together a variety of design organizations and thought leaders to help establish best practices during the short- and long-term rebuilding and recovery efforts. The committee's leadership helped inform zoning and construction changes by city agencies.

RICK SMITH

A pioneer in computer-aided design and 3D digital modeling, Smith made invaluable contributions to iconic projects by Frank Gehry, FAIA, including the Guggenheim Museum Bilbao and Walt Disney Concert Hall. Smith collaborated with contractors and fabricators to customize digital tools for those projects, and his work helped to usher in architecture's digital age.

PHOENIX INTERNATIONAL MEDIA CENTER

THE LATEST ICON IN BEIJING IS THE HEADQUARTERS OF CHINA'S LARGEST PRIVATE BROADCASTER—AND IT WASN'T DESIGNED BY A FOREIGN ARCHITECT.

Text by **Joseph Giovannini**
Photos by **Fu Xing**

AS THE 2012 PRITZKER PRIZE was being awarded in Beijing's Great Hall of the People to Chinese architect Wang Shu, the building that truly proves that Chinese architects are emerging on the international stage was already under construction nearby—and it wasn't by Wang. The new Phoenix International Media Center, a ballooning torus formed by a twisting lattice of steel, rivals any structure designed by a Westerner in China over the last decade. Through the design for their new headquarters and broadcast center, China's largest private broadcaster engaged its biggest rival—the government-owned CCTV, housed in the now-famed tower by Rotterdam, Netherlands–based OMA—on a playing field few thought possible: the architectural stage.

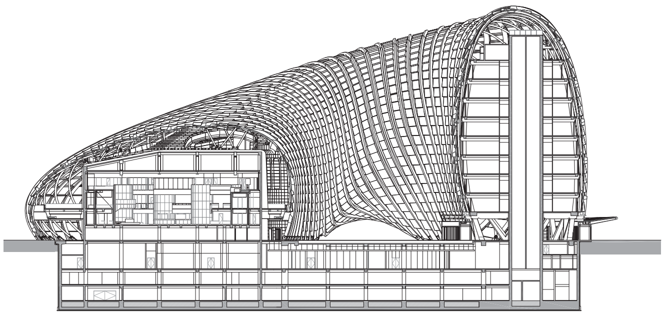
It was inevitable that, sooner or later, Chinese architects would challenge the hegemony of foreign architects "colonizing" China's cities with landmark projects. Wang may have won the Pritzker, but in recognizing an architect who prides himself on thinking and building locally, studiously avoiding what he considers imported architectural spectacle, the prize's committee may have bet on the wrong horse. Representing a different, more internationally competitive point of view is the Phoenix's designer, Shao Weiping, executive chief architect of the government-owned Beijing Institute of Architectural Design (BIAD). He was the local architect that collaborated with Norman Foster, Hon. FAIA, on Beijing Capital International Airport's Terminal 3. But at the Phoenix, there was no Foster, only Shao, fresh with Terminal 3 expertise and a backup crew of architects largely trained abroad.

The Phoenix marks a transfer of knowledge and information, signaling the paradigm shift from "Made in China" to "Created in China," the inference being that China need no longer import talent. If the CCTV tower marked the opening of China for an innovative, modern architecture, the Phoenix means that the baton for the movement might be passing into Chinese hands.

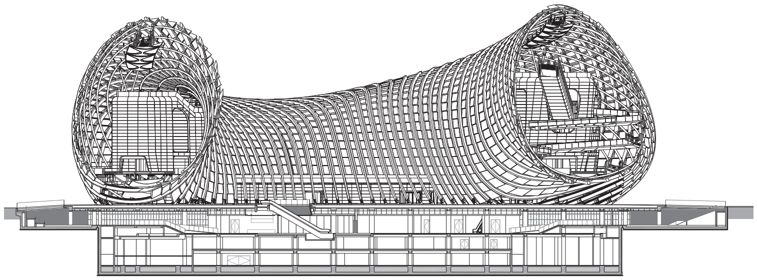
Over the last 15 years, municipal governments and Chinese companies have sought progressive foreign architects to create new structures

Previous Spread: Located between the third and fourth ring roads on the east side of Beijing, the Phoenix International Media Center is a steel torus of structure enclosed with 3,800 glass panels. **This image:** The building is sited at the entrance to Chaoyang Park, one of China's largest planned green spaces.

Section A–A1



Section B–B1



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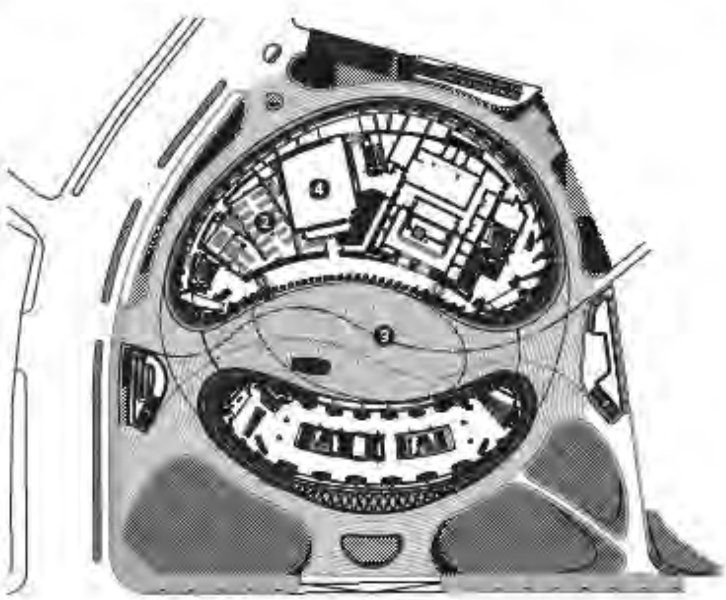
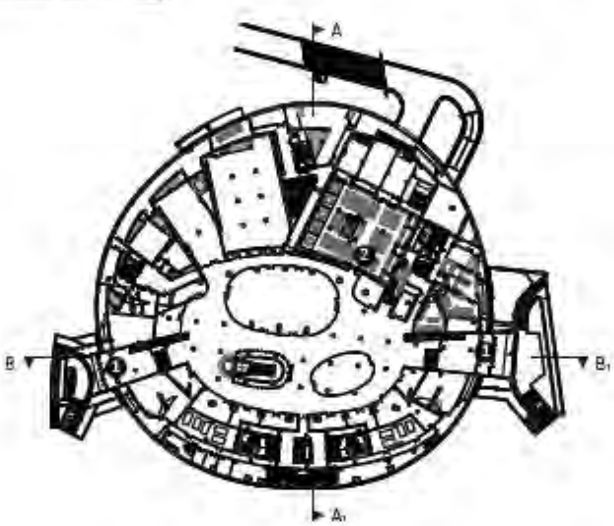
First-Floor Plan

Second-Floor Plan



Basement-Level Plan



1. Entrance
2. Offices
3. Courtyard
4. Studio
5. Garden
6. Ramp
7. Conference room
8. Café

0 33 66

To encourage movement across the site, the torus lifts up from the ground plane at the east and west ends, creating entrances to a public courtyard as well as a direct pathway from the street into the park beyond.

The torus is basically a shell enclosing two freestanding volumes: an office block to the south (at rear) and studios to the north. A circulation system of bridges and ramps are supported by canted columns anchored to the torus's steel-and-concrete structure.

because of their innovative design thinking, so there is irony in the fact that this TV station from Hong Kong, a city that has long been oriented to the West, was the one that sought a Beijing architect when it moved its headquarters to the mainland. Phoenix acquired land between the city's third and fourth ring roads, a prime gateway site into Chaoyang Park, one of China's largest urban greenspaces.

The TV station's objective was to create a transparent headquarters, outside and inside. So the architects integrated gardens and reflecting pools into the site to attract visitors to linger and to provide outdoor spaces for the workers within. At the building's west end, near a busy intersection, the architects lift the torus off the ground to open a path into the central courtyard, and at the far east end, they lift the torus even higher, forming a gateway to the park beyond. With the building entirely glazed with thousands of panels, the interiors are visible from the outside.

Despite the beguiling convolutions, involutions, and revolutions of the torus's compound curves, the building's parti is deceptively simple: The torus acts as a shell enclosing two conventionally structured buildings inside. The architects stacked nine stories of offices within the taller, south side of the torus, and organized the television studios, a club, and high-end restaurants in the lower, northern end. Here, an art café occupies the top level, which is open to the glazed skin of the structure's shell overhead.

Starting near the main entrance, sinuously ramped promenades connect these elements together, passing by the studios, which are open to the viewing public. "It's the only TV broadcasting station in Beijing open to the public," Shao says. At the east end, within an atrium overlooking the park, the promenade leads to a maelstrom of ramps that twist and turn through the air to maximize the intake of views for those walking from the studio area to the offices on the south side.

The complexity of the building's latticed façade, with its differentially stretched web of steel, implies the complexities of parametric modeling, but the form generation was more conceptual than computational, and, as with many recent projects in China, the concept ties into tradition. To the architects, the emblem of the station—a pair of intertwined phoenixes—suggested complementary yin–yang figures, which are often associated with the Möbius strip. The architects transformed the continuously evolving surface of the Möbius strip into the continuously turning volumes of a Klein bottle before settling on the torus, all forms which "remember" the Möbius strip as a primitive.

The volumes of the torus were inflated and deflated to accommodate the interior programs of offices, studios, and public spaces. The architects fixed axes and a series of loops, in plan, from which they generated the geometry for the surface of the torus. Enclosing the final form required 3,800 glass panels, each differently sized and detailed. Shao says that the latest 3D modeling software enabled the architects to conceive and execute the project, which required a high degree of precision. Shao, who heads the Un-Forbidden Office within BIAD, a smaller studio within the larger company, says he did his utmost to create an iconic piece of engineering and artistic beauty to break the pattern of monuments by international designers dominating the capital.

At the very least, Shao and his office have declared their independence with an ambitious design they skillfully executed. They and their colleagues will continue to challenge the bias for foreign architects. With the Phoenix, they have tasted their own success.

Above: An arts café, shown here before the furniture installation, is open to the steel frame above. **Opposite:** The café sits atop a block of studios (at right) on the western edge of the torus.

SPF:A'S MODERN ADDITION TO AN EXISTING 1930S POST OFFICE COMPLEX PROVIDES A NEW CULTURAL EPICENTER FOR BEVERLY HILLS.

Text by **Nate Berg**
Photos by **John Edward Linden**

BEFORE BEVERLY HILLS, CALIF., could become what it is today—alternately the celebrated pinnacle of luxury or the denigrated epicenter of moneyed excess—it had the modest needs of any young city. Between its incorporation in 1914 and the late 1920s, the city had grown from 500 residents to more than 15,000, and locals decided they needed the basic staples of citydom: a city hall and a post office.

City Hall, designed by architects Harry G. Koerner and William J. Gage in the Spanish Renaissance style with a grand arched entryway and an ornately tiled dome, was completed in 1932, and became an instant landmark for Beverly Hills. When it opened, the *Los Angeles Times* noted that it was "the largest and most costly City Hall of any municipality its size in the country." Two years later, architect Ralph C. Flewelling matched City Hall's

WALLIS ANNENBERG CENTER FOR THE PERFORMING ARTS

extravagance with a new post office in the Italian Renaissance style just across the street. A barrel-vaulted ceiling runs the lobby's length, its walls lined in marble with ornamental plaster cornices.

These were elaborate projects for a country in the throes of the Great Depression. They foreshadowed the ostentation to come in Beverly Hills, but they were also an admission that even a city full of movie stars needed a civic center to house its public services. These public buildings validated Beverly Hills as a legitimate city.

And so it's fitting that nearly a century later Beverly Hills is once again turning to its civic center to validate its identity. This time, the city is using the newly renovated and redesigned Beverly Hills Main Post Office to rebrand itself less as a center of consumption, and more as a center for culture, able to compete with the rest of Los Angeles.

In October 2013, after lying vacant for 16 years, the post office reopened as the Wallis Annenberg Center for the Performing Arts, better known as the Wallis. With a 500-seat theater, a 120-seat studio theater, and all the backstage requisites, the center is spacious enough to host the cast and crew of a big show but intimate enough to put the audience up close.

Instead of following the initial design brief and packing it all into the original post office building, Culver City, Calif.–based Studio Pali Fekete Architects (SPF:a) and its lead designer, Zoltan Pali, FAIA, added a new building to house the main theater. A back area of the old post office is now a walkway leading to a staircase that ducks below grade into the lobby of the newly added theater building. The subterranean connection is not

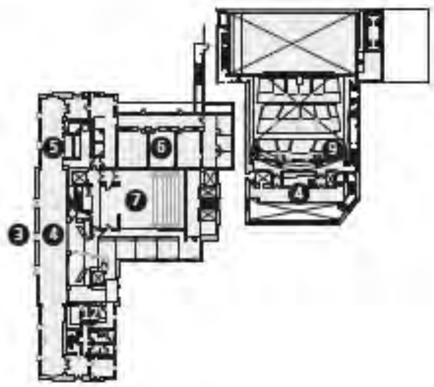
Previous Spread: The Wallis takes advantage of a stepped site to connect the lower level of the city's historic former post office (at left) with the lobby of an addition that houses a 500-seat theater (at right). **This image:** The addition cantilevers over the entrance to a 450-car parking garage shared by the Wallis and City Hall (beyond). **Opposite:** In a nod to the old post office, gaps between the cement-fiber panels from Swisspearl are intended to evoke the flaps of envelopes.

evident from the outside, creating the impression that the interconnected buildings are completely separate structures.

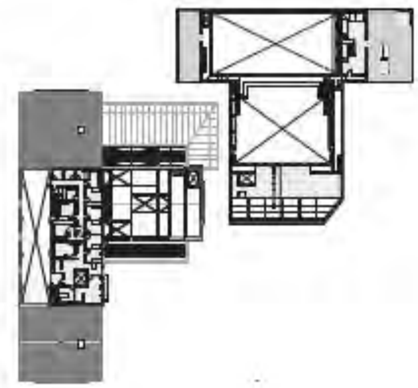
Walking around the site on an unusually hot spring day, Pali ducks into the shade to point out the interplay between the two buildings, each T-shaped and perpendicular to the other, like Tetris blocks about to interlock. “That’s a part of the project I really like a lot, the part where the two different buildings almost touch,” Pali says. “It’s like walking through an old European city, like Genoa. You’re winding through alleyways with multiple different architectural styles.”

Pali says it was important to reflect the cultural history of the site, not necessarily its architectural history. In contrast to the old office, his addition is unabashedly modern, with a striking copper-toned façade of cement board panels shaped and spaced to suggest hundreds of opened envelopes. The color changes with the sun, but it continues to pair well with the terra-cotta of the historic post office and the oxidized copper over-

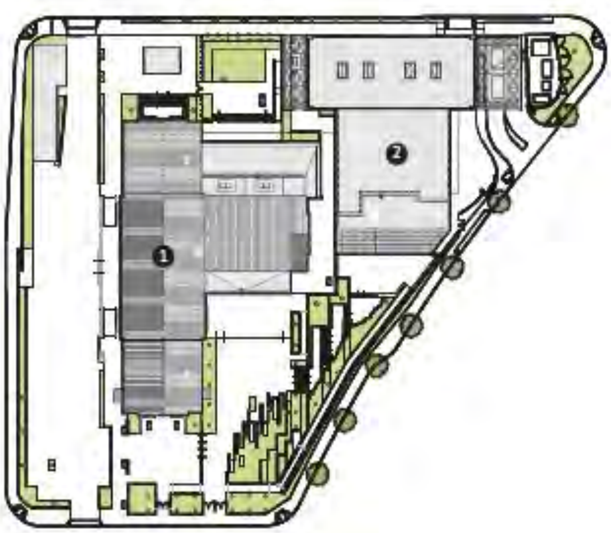
Ground-Level Plan



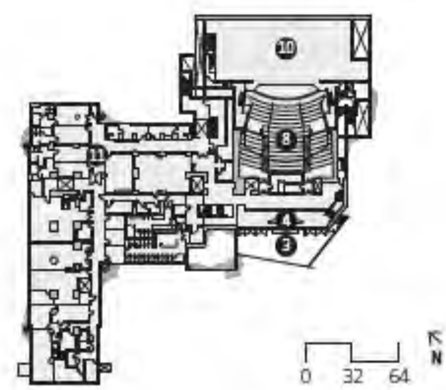
Second-Floor Plan



Site Plan



Basement-Level Plan



1. Historic Post Office
2. Bram Goldsmith Theater (addition)
3. Entrance
4. Lobby
5. Box office
6. Classroom
7. Studio
8. Seating
9. Balcony seating
10. Stage
11. Green room
12. Offices

hang above the old loading docks. Now, instead of hosting idling trucks, that space is filled with glass-fronted classrooms that bounce reflections of the modern addition, superimposing the new on the old.

Zigzagging through the miniature alley, the site opens up to a terraced sculpture garden leading down to a patio outside the theater's lobby. Inside, shades typically cover the floor-to-ceiling west-facing windows during daylight hours to prevent glare. The theater space itself seems deep for its modest size, and manages to fit in 350 seats (and a soundproof "crying room") on the ground floor and another 150 in a balcony.

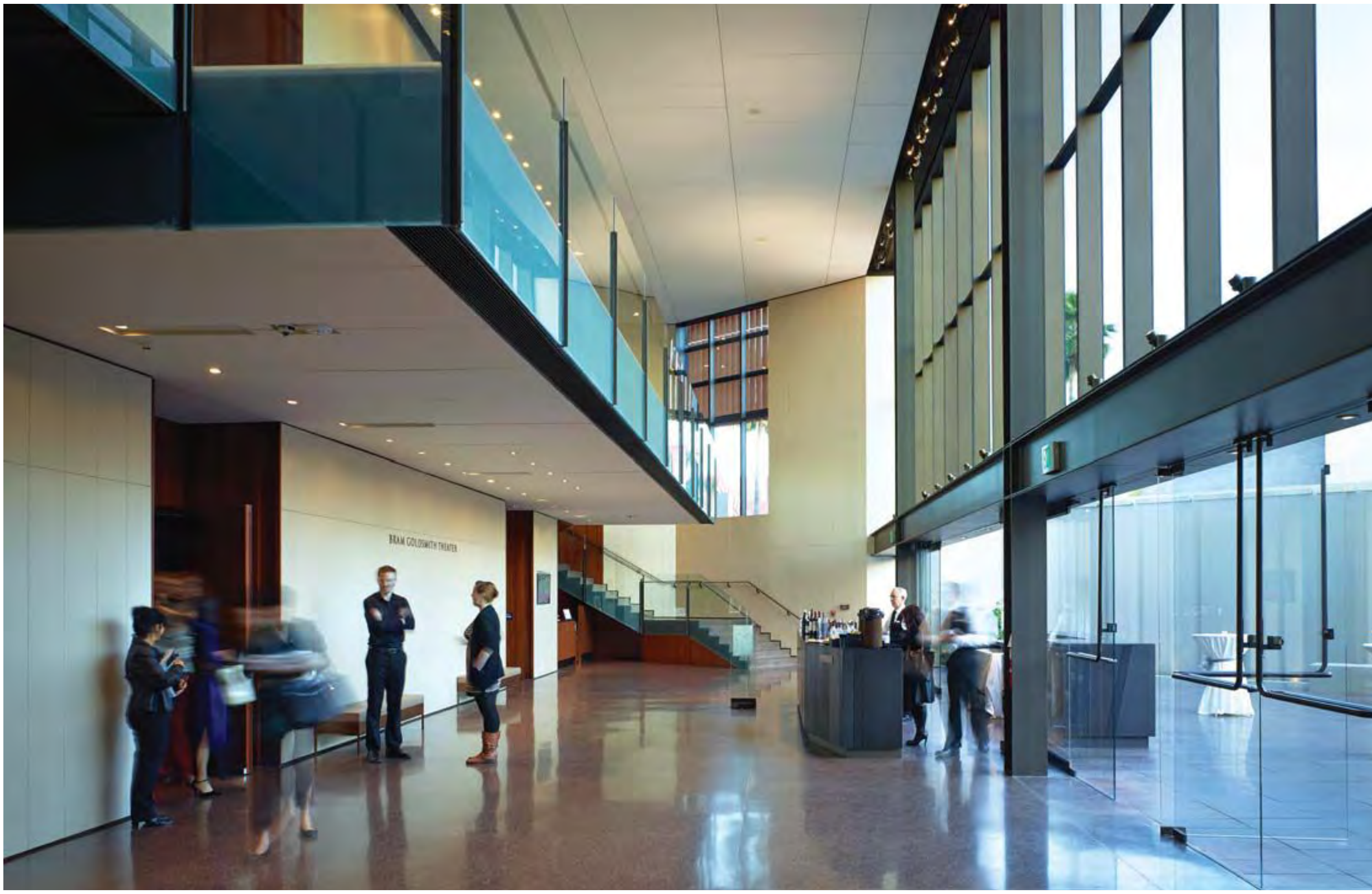
While the new building is certainly a highlight, the historic post office remains an important part of the $70 million project. Its main hall, once frequented by locals to buy stamps, now serves as a ticket counter and grand entrance, with its restored vaulted ceiling and original frescoes.

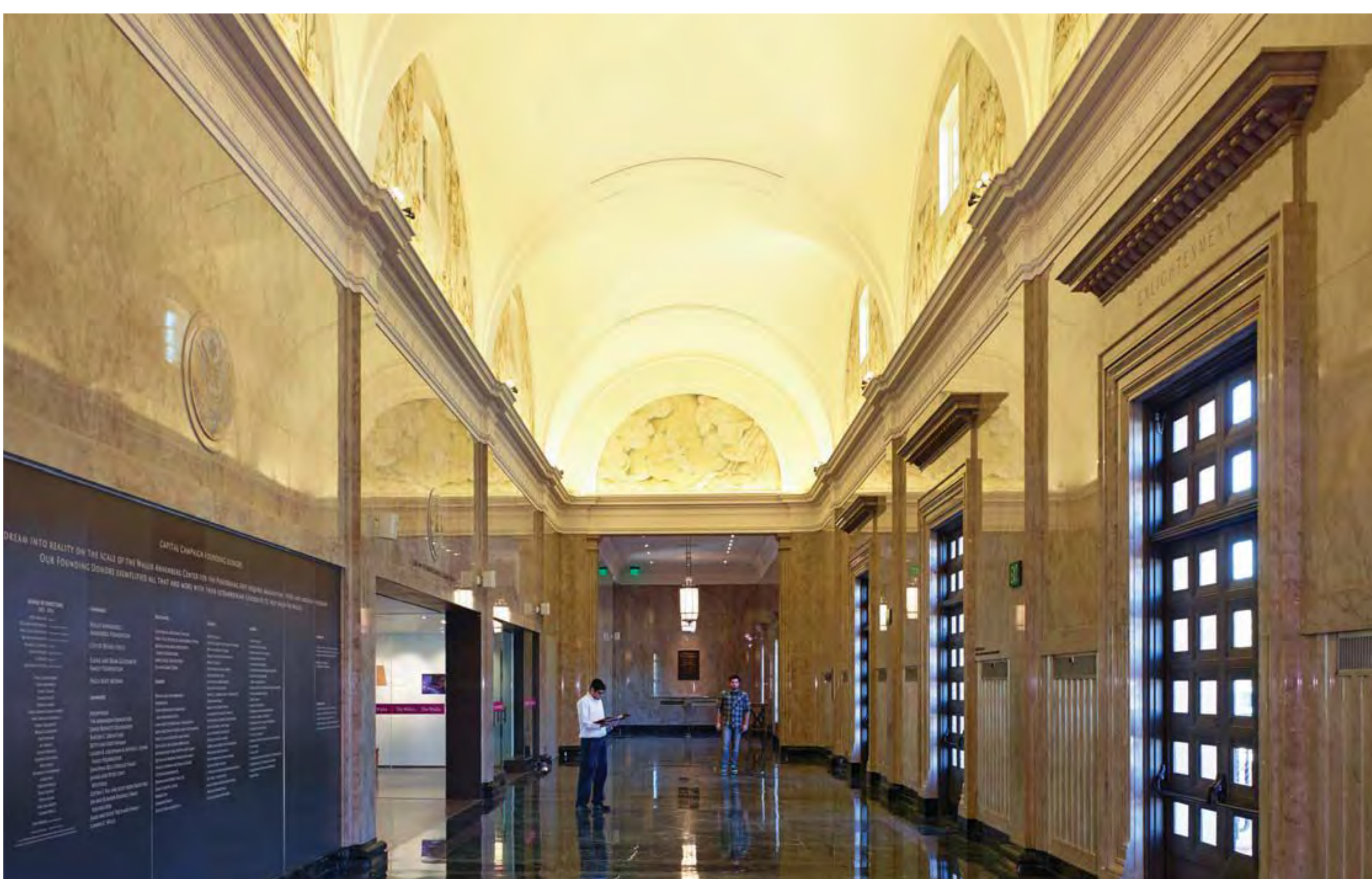
"Everyone was happy with that because the post office is really where the energy was," says Lou Moore, executive director of the Wallis. "That was the impetus from the beginning, to save the post office and bring it back to life for the whole community."

"I remember standing out there on opening night. It felt like someone took a little handful of culture dust and 'Poof!' It felt like, 'Wow, there's culture here now,'" Pali says. "Even though there's people with a tremendous amount of money and art, it never really felt like there was a place in Beverly Hills that was striving for the highest aspirations of culture."

When the post office was decommissioned in the late 1990s, the city was quick to buy the building, and, even then, city leaders already had a cultural center in mind. With the opening of the Wallis, the city has finally gotten what it wanted.

A row of glass-enclosed classrooms (at right) was tucked under the post office's existing loading-dock canopy; these classrooms, along with the northern edge of the new theater (at left), frame the "education courtyard."


BRAM GOLDSMITH THEATER



Opposite top: The Bram Goldsmith Theater lobby overlooks a terraced courtyard through a west-facing window wall. **Opposite bottom:** The vaulted post office lobby boasts restored frescoes by WPA artist Charles Kassler. **This image:** The Bram Goldsmith Theater, lined with acoustically and visually transparent wood paneling, seats 500.


RED RIVER COLLEGE

OLD MARKET SQUARE STAGE

5468796 ARCHITECTURE'S NEW PUBLIC PAVILION IN WINNIPEG'S OLD MARKET SQUARE IS MORE THAN A BANDSHELL. IT'S AN EXAMPLE OF HOW R+D CAN INFLUENCE THE URBAN ENVIRONMENT.

The façades are essentially aluminum curtains hung from a steel structure. The architects spent months devising an aluminum extrusion that would reflect light to allow for projections from inside. Pairs of the identical aluminum pieces were riveted together before being strung on aircraft cable. The pieces were then riveted to alternating pieces on each side, creating a stable, but flexible, mesh. The curtains can hang on all four sides (as seen here) to form a solid cube. On two sides, the mesh can be pulled back into the structure by inexpensive winches, forming canopies and revealing the stage.

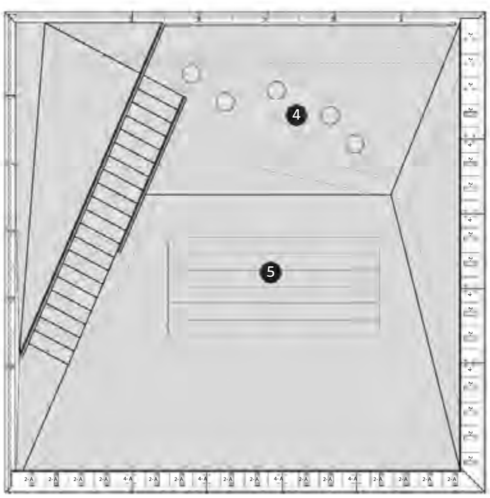
Text by **Katie Gerfen**
Photos by **James Brittain**

THE EXCHANGE DISTRICT, in Winnipeg, Manitoba, Canada, is home to a host of structures dating back to the city's early 20th-century heyday as a critical waypoint for the country's grain trade. The town had a booming population and economy, and much of the activity was focused on what is now known as Old Market Square. What remains from those salad days is a collection of historic industrial buildings populated by an arts community, and the square has become a public green space that plays host to summer festivals, outdoor concerts, impromptu yoga classes, and even weddings. And now, at the center of all this is an aluminum mesh cube, 28 feet long, wide, and tall.

The work of local firm 5468796 Architecture, Old Market Square (OMS) Stage is the result of a city-funded design competition to replace an old bandshell, which was used as few as 15 times per year, with something that would better engage the urban environment. "One of our inspirations was the monolith from *2001: A Space Odyssey* that travels through time and fascinates everyone," says firm principal Sasa Radulovic. "We thought: 'Can we create something that could emanate that kind of energy from within?' and 'How can we do that with music, sound, and light from within so that it becomes a player in the city?'"

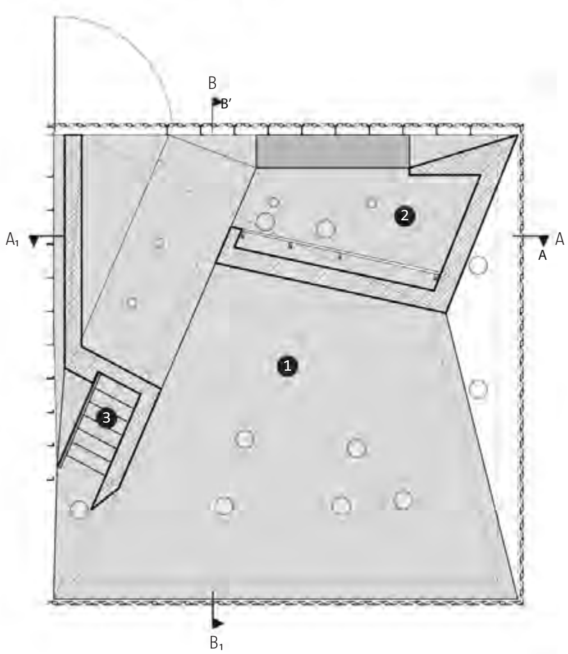
The new stage is lined with curtains formed from 20,000 identical extruded aluminum pieces, rotated to form a complex pattern. These modules are the final in a series of extrusions developed after months of research with metalworkers in a local Hutterite colony. They are held together with aircraft cable and rivets, and form a versatile backdrop for projections and illumination; the flexible mesh curtains can also be winched back on two sides of the cube to reveal the stage within. "The project started off as a bandshell, but ended up being something else," Radulovic says. "Whether your event is 30 people or 30,000 people, you can hold it there."

Upper-Level Plan

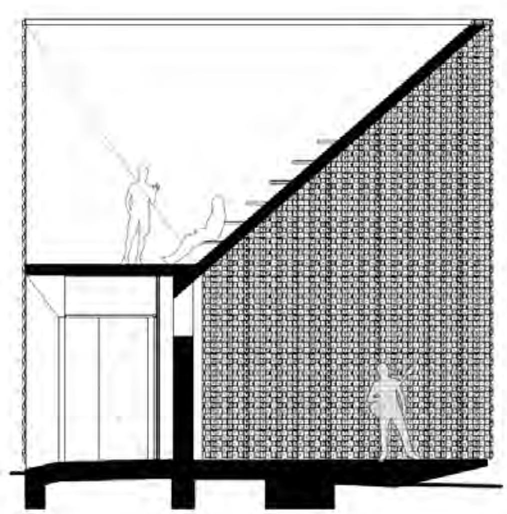


A–A$_1$ Section

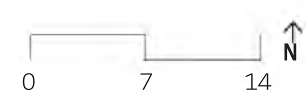
Ground-Level Plan



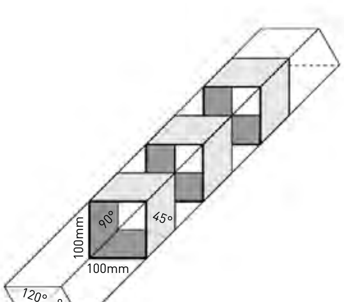
B–B$_1$ Section

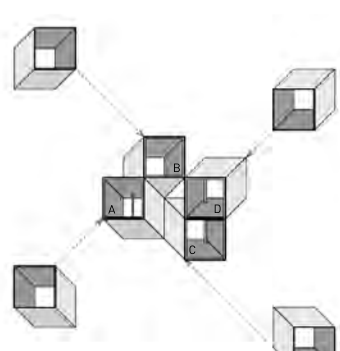


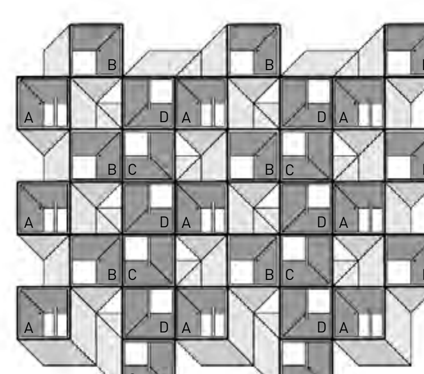
1. Main stage
2. Green room
3. Staircase
4. Private stage
5. Bleacher seating



Aluminum Extrusion Diagram







Opposite: The acoustics in the mesh structure required articulating the concrete core to project the sound toward audiences in the park. The core also houses a green room for performers. A benefit of the mesh is the dappled quality of light as it plays off the concrete inside. The result is what Radulovic calls a "chapel-like quality," and the space has, in fact become a popular wedding venue. **This image:** On the second level, the concrete core supports a private stage with metal bleacher seating, accessible via a concrete staircase.

This image: The new stage is used for concerts about 75 days a year, a 400-percent improvement over the schedule at the old bandshell. Part of the draw is a plug-and-play sound system and integrated lighting and production equipment that make the pavilion far cheaper to use for bands than other similar structures in the city—some of which can cost up to $10,000 to run for a night. "It's designed so that anyone can go up and plug in a guitar and be ready to play," Radulovic says. **Opposite:** On days when the pavilion isn't hosting an event, it is lit in different colors using the integrated lighting equipment. "On Feb. 14, they project a heart on it, and on St. Patrick's day, it glows green. That's a use as well," Radulovic says. "It becomes a player in the city."

Usage Diagrams

Beacon | Exhibition space | Rooftop stage | Projection | Front stage | Interior stage | Side stage | Hibernating




EDWARD P. EVANS HALL

NORMAN FOSTER STUDIED UNDER PAUL RUDOLPH AT YALE, BUT HIS SCHOOL OF MANAGEMENT BUILDING ON THE UNIVERSITY'S NEW HAVEN CAMPUS TAKES A DIFFERENT TACK.

Text by **Thomas de Monchaux**
Photos by **Chuck Choi**

ONE OF THE MORE INTRIGUING lost chapters in modern architectural history is the period of time that 1962 Yale School of Architecture graduate Norman Foster, Hon. FAIA, spent studying with Paul Rudolph. Other than the 1963 Creek Vean House—a semi-subterranean concrete-block fugue designed with fellow Yalie Richard Rogers, Hon. FAIA, for the latter's then-in-laws—it's hard to see much of the Brutalist master's heavy hand and gorgeous gloom in Foster's subsequent output of determinedly lightweight and relentlessly sunlit glass-and-steel buildings.

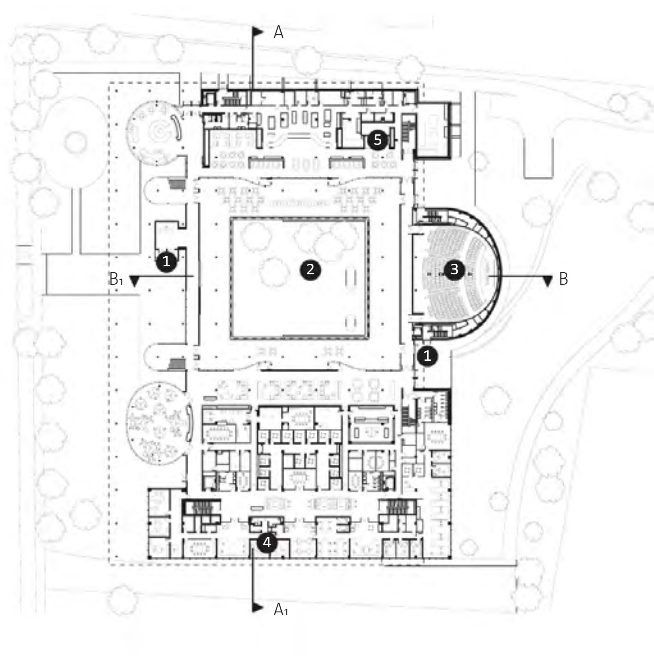
The latest in this succession is, fittingly, back in New Haven, Conn.: Edward P. Evans Hall, the new home of the Yale School of Management, which opened in January. At 249,743 square feet and a reported $189 million, the building assembles the school's formerly scattered facilities, which serve some 300 students, around a grassy little courtyard and under one deeply overhanging roof. Monumentally shiny and not especially subtle, the building is closer in geography and spirit to the nearby Eero Saarinen and Philip Johnson buildings on Yale's peripheral science and athletic campuses than it is to the dense Rudolph and Louis Kahn masterpieces at the university's heart.

Foster's recent work generally divides itself between the latently classical and the retro-futuristically biomorphic. Evans Hall tends toward the former, with—somewhat in the manner of the architect's 1993 Carré d'Art at Nîmes, France—a row of 15 tall and slender columns (some 60 feet high on 25-foot centers) along its entrance façade. Set back behind that colonnade, under a pale canopy, is a deeply modulated glass curtainwall.

The modulations are informed by Foster's signature half-circle stair landings and a boxy reading room, as well as the perimeter expressions of interior elliptical volumes that add a touch of the biomorphic to the plan. On the ground floor, these drum-like elements house a coffee shop and commons. On two double-height upper levels, they enclose 16 generously scaled classrooms. Their deep blue cladding, visible through the glass façade, is vanishingly close to the signature Pantone 289 of Yale's heraldry. Aligned with the main entrance across the courtyard is a semi-elliptical 350-seat auditorium and event space.

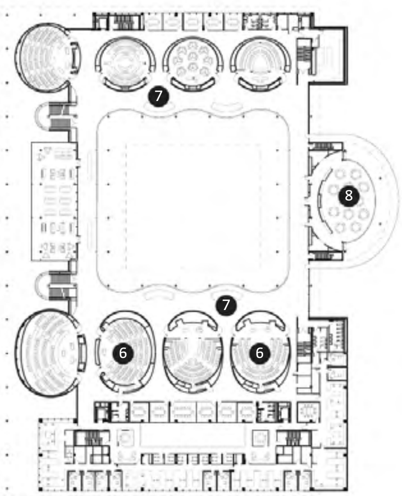
The ovoid geometry propagates toward the central courtyard's glazed walls, which wiggle in and out along the north and south sides. This curvaceousness ensures some sparkle in varied daylight, directs the drift and

Ground-Floor Plan

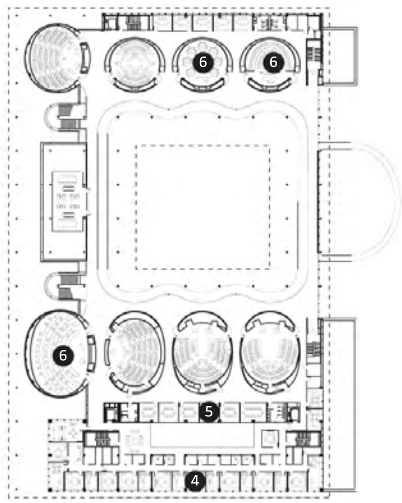


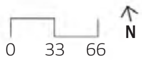
The north and south walls of the central courtyard feature undulating curves that reflect the elliptical classroom spaces within.

Second-Floor Plan



Third-Floor Plan

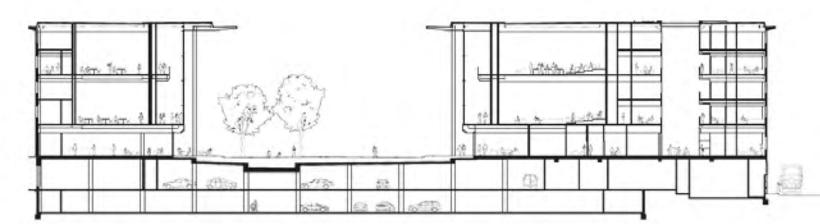




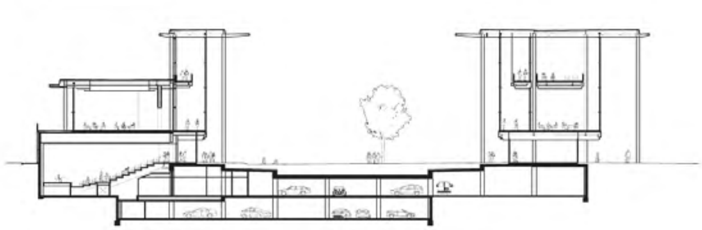
1. Entrance
2. Courtyard
3. Theater
4. Offices
5. Conference room
6. Classroom
7. Common space
8. Café

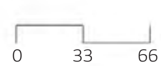
Previous Spread: The main entrance to Edward P. Evans Hall is flanked by two curved volumes clad in blue glazing, which house stacked lecture halls on the upper levels. **Right:** Circulation space around the building's central courtyard is programmed as flexible gathering space.

Section A–A1



Section B–B1





flow of students and faculty through the adjacent circulation space—and presumably encourages the serendipitous encounters and spontaneous gatherings on which good management relies in this era of wearable technology and flat organizational charts.

Today's corporate and academic campuses favor breakout spaces—nooks, perches, lounges, cafés—as architectural expressions of the reconfigurable formlessness characteristic of adaptive and technologically driven organizations. In Foster's well-populated renderings of Evans Hall, each area between the elliptical classrooms and curved glazing features lively gatherings on banana-shaped furnishings—evoking something between a conversation pit and an airport gate. These once-secondary areas, nominally circulation space, may come to accommodate the primary functions of both the building and the organization it houses—a confluence of current best practices in architecture and management and a stimulating inversion of Kahn's canonical division of buildings into served and servant spaces. However, the willful North–South symmetry of Foster's plans—a tidy classicism not abundantly evident in the collegiate gothic of the surrounding campus—doesn't allow for a fuller realization of this transformation.

During Foster's time at Yale, while Rudolph's Art and Architecture building was still underway, architecture studios were accommodated on the top floor of Kahn's Yale University Art Gallery. Although that building is primarily known for its famous blank brick wall along Chapel Street, it is also Kahn's glassiest work, with largely unbroken curtainwalls along its north and east façades. Some memory of those promisingly open edges beneath a broad sheltering roof must have animated Foster's design for Evans Hall. Perhaps over this new building's life, as in any architecture studio, the lively asymmetries and messes missing in the plan will be provided by the students themselves. (And, for MBAs in the long shadow of the Great Recession, a dash of necessary Rudolphian gloom, too.)

Opposite: The 16 elliptical classrooms on the upper two levels are laid out in different orientations to accommodate the different styles of classes in the school of management. **This image:** A triple-height atrium is programmed with lounge furniture to promote interaction between the students and faculty.

LIVERPOOL DEPARTMENT STORE–INSURGENTES

A 10-FOOT-DEEP FAÇADE EXTENSION IN MEXICO CITY, DESIGNED BY ROJKIND ARQUITECTOS, TRANSFORMS A STANDARD DEPARTMENT STORE INTO AN ACTIVE PUBLIC SPACE, INSIDE AND OUT.


Liverpool

Previous Spread: Rojkind Arquitectos transformed the Liverpool department store on Mexico City's Avenida de los Insurgentes by wrapping three sides of the building in a 10-foot-deep layer of programmable hexagonal pods. **This image:** The addition was spurred by recent neighborhood development, including the 2012 opening of a metro stop on the site.

Text by **Mimi Zeiger**
Photos by **Jaime Navarro**

"CAN ARCHITECTURE SERVE as a way to reconnect parts of the city or enhance human experience?" asks architect Michel Rojkind, founder of Mexico City–based Rojkind Arquitectos. The question is ambitious, even a little outsized, considering that we've sat down over coffee to discuss the firm's remodel of an outpost of Liverpool, a Mexican department store. But Rojkind is sincere and determined to create designs that give back to the community.

Located on the southern part of Avenida de los Insurgentes, one of Mexico City's longest streets, the original Liverpool building followed a typical big-box strategy: A blank stucco wall facing the busy street, with all the retail activity turned inward. Over the years, the site's meager outdoor plaza was encroached upon by additions or left unmaintained. When a new metro station opened in 2012 on a corner of the site, bringing increased pedestrian traffic, it was clear that a beige façade had no chance of enticing people into the store or contributing to the urban environment.

"Where city planning failed, can we do something with architecture?" Rojkind asks. With the original Liverpool store, the failure was one of imagination, and the store was desperately in need of an identity that would engage the street. The "something" that Rojkind and his team developed is a habitable façade that wraps the old department store in a honeycomb of eye-catching design and activity.

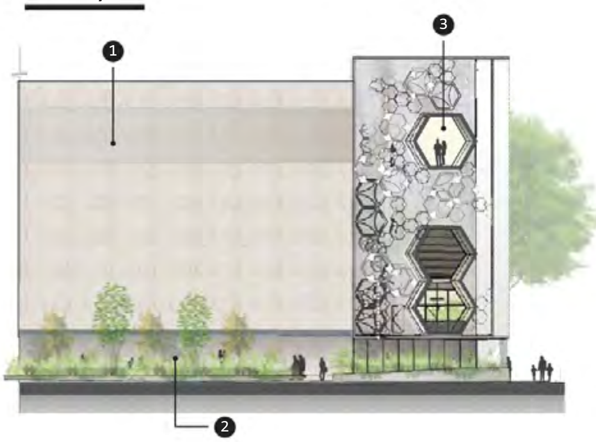
The three-layered façade system—what appears to the passerby as merely a pattern of overlapping, glazed hexagons—covers the top five floors of the six-story building. At roughly 10 feet deep, the façade extension adds 8,800 square feet of floor space to the store and opens up the inside retail departments to the urban environment. Shoppers enter the space at ground level, traverse the traditional department store layout, and then, surprisingly, re-emerge into daylight at the perimeter, where they can occupy the room-sized hexagons and navigate between them via a series of stairways and ramps. A square, hollow-section steel structure attaches to the building's existing steel beams and supports the hexagonal layers of black fiberglass, white steel plate, and matte gray aluminum. The final layer is a glass-and-aluminum curtainwall for enclosure. During the day, the playful patterning on the façade unifies the street corner, offering a few glimpses of its depth. At night, Rojkind's design turns the department store inside out. The façade transforms into filigree accented with neon, the interior departments showcased through the hexagonal vitrines.

In his office in the Mexico City neighborhood of Condesa, Rojkind shows off the concept models; each is a lacy, laser-cut affair. There's even a nearly full-size mock-up of one of the hexagonal pods—a fabrication test of complex geometries. The aesthetic is undeniably computational, but Mexico is still a place of craftsmanship, with a long metalwork tradition. Although the plan was to use a CNC router to cut out the hexagons for the façade, in a city where labor is plentiful, it was actually more

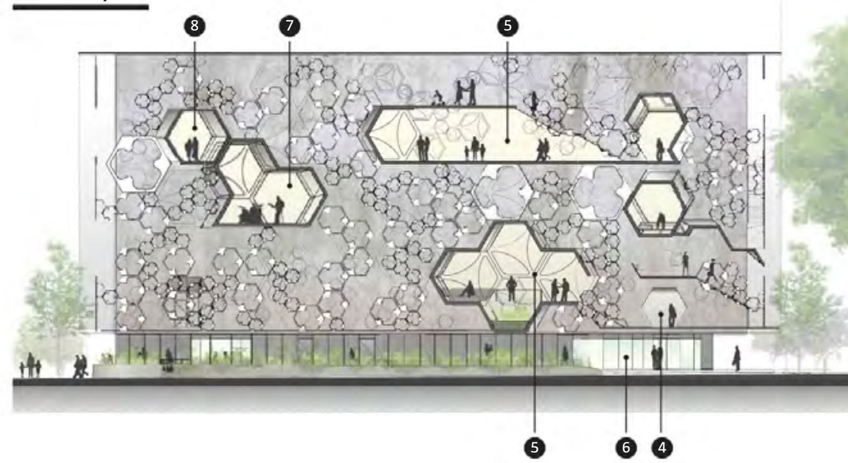
Façade Section

1. 4mm-thick aluminum panel
2. Interior layer of 16-gauge steel plate, matte white finish
3. Black fiberglass layer
4. Aluminum curtainwall
5. Existing store
6. 12-gauge steel plate with an 8mm laminate floor
7. Aluminum ceiling

East Façade



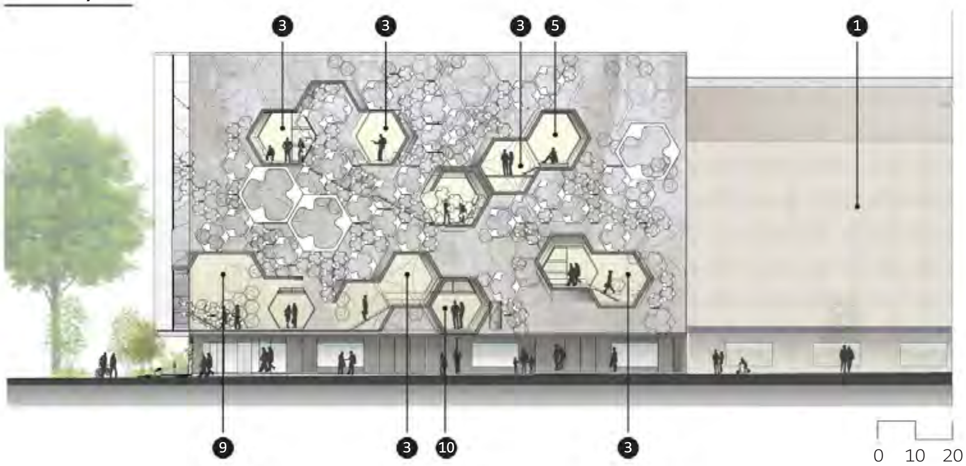
North Façade



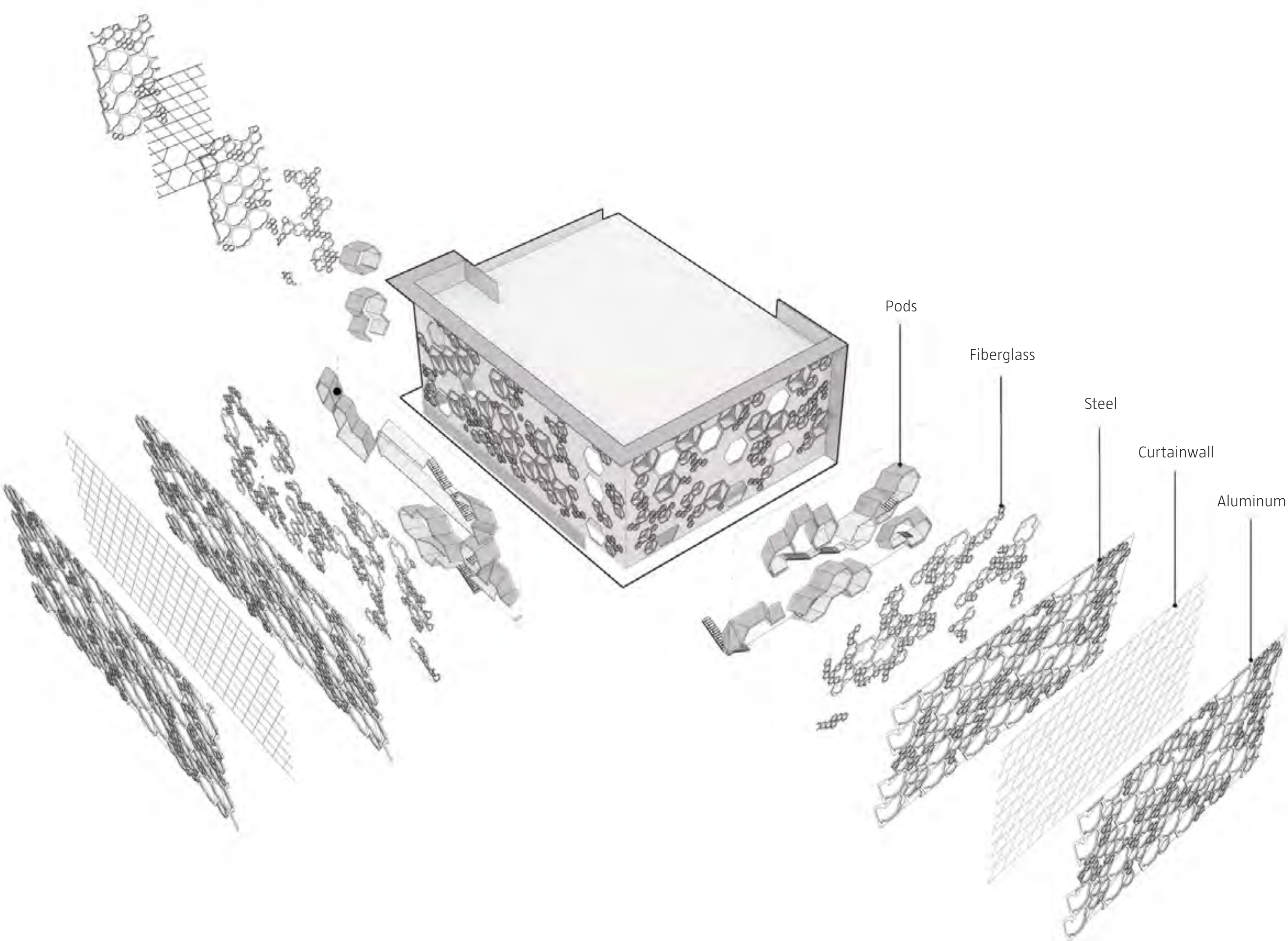
1. Existing façade
2. Garden
3. Hexagonal pod
4. Terrace entrance
5. Terrace
6. Store entrance
7. Design center
8. Showroom
9. Restaurant
10. Private dining room

Opposite bottom: At night, the hexagonal pods that form the façade extension are lit from within by neon strip lights embedded into the gypsum walls. The unoccupied sections are lit as well, showcasing the three-dimensionality of the structure.

West Façade



Exploded Axonometric



This image: Throughout, the hexagonal pods are programmed for different uses. The upholstered bench seen here provides a seating area for customers waiting for a table in the adjacent restaurant. **Opposite:** The restaurant also has tables within the façade expansion. The staircase leads to another pod.

RIGHT: GERARDO SALINAS

cost effective to cut each piece by hand—all 1,193 of them. The result is a building that is equal parts digital and analog.

With the flagship at Insurgentes, Liverpool and Rojkind are betting on a simple axiom: Design adds value. Liverpool was founded in the latter half of the 19th century and it reaches a broad market without being a discount retailer. Rojkind Arquitectos first worked with the store's parent company, El Puerto de Liverpool, on the design for Liverpool Interlomas in suburban Huixquilucan de Degollado, Mexico. There, they created a dynamic double-skin façade, but it was the roof terrace and event space that proved the real success: Rooftop spectacles of the gastronomic and fashion persuasion allow the client to extend its hours of operation late into weekend evenings. According to the client, the new space accounts for a 30 percent increase in store revenue, and it was this proof of concept that convinced Liverpool to take a further risk with the façade extension in Mexico City.

At Insurgentes, the formal qualities of the façade recall motifs and techniques drawn from the global architecture marketplace, but Rojkind's scheme aims to create an experience unique to this urban environment through temporary programs that reflect the store brand. In drawings of the building, the voids in the façade are described generically: booth, terrace, or showroom. Ask Rojkind and he paints a more vibrant picture: a local radio station spinning records, a high-tech co-working space, a cooking demonstration, or a yoga class. The opportunities are endless, the trick is figuring out how to and who should curate them. In this case, the architects are incredibly involved in the populating of the space, proving that their job was not complete once the final punch-list items were finalized.

If any architect were to contribute in such a way, Rojkind is particularly well-suited: Having spent a decade as a rockstar drummer in Mexico, his interests extend beyond architecture and into food, art, and music. Those proclivities are what led him to convince the Liverpool client to ditch the mannequins and let people fill the show windows in the first place. He struggles with the idea that architecture's influence is primarily limited to the building itself, and his work tends to blend design with culture and strategic branding. "Architecture and the profession are evolving," he says. "Architecture is the hardware, but who designs the software—the experience?" At Insurgentes, the architects are lending a helping hand.

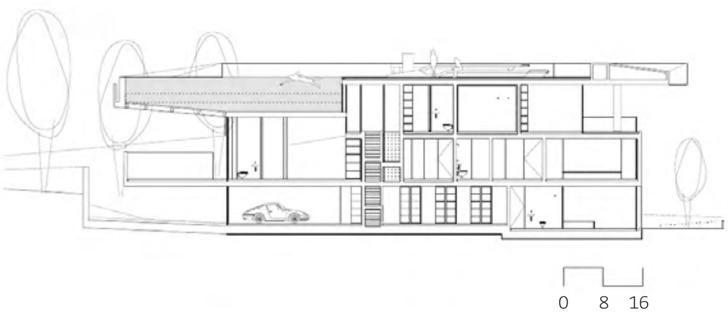

benavides

Opposite: The manager of the store was so taken with the vantage points offered by the pods that he requested that one be used as a sitting area in his office. **This image:** Up close, the layers of the façade become evident. The outer layer is black fiberglass, followed by matte aluminum, and finally white stainless steel.

JELLYFISH HOUSE

THIS NOT-QUITE-BEACHSIDE HOUSE BY WIEL ARETS, ON A HILLSIDE IN SPAIN, BRINGS THE WATER TO THE RESIDENTS.

A–A1 Section



Text by **Aaron Betsky**
Photos by **Jan Bitter**

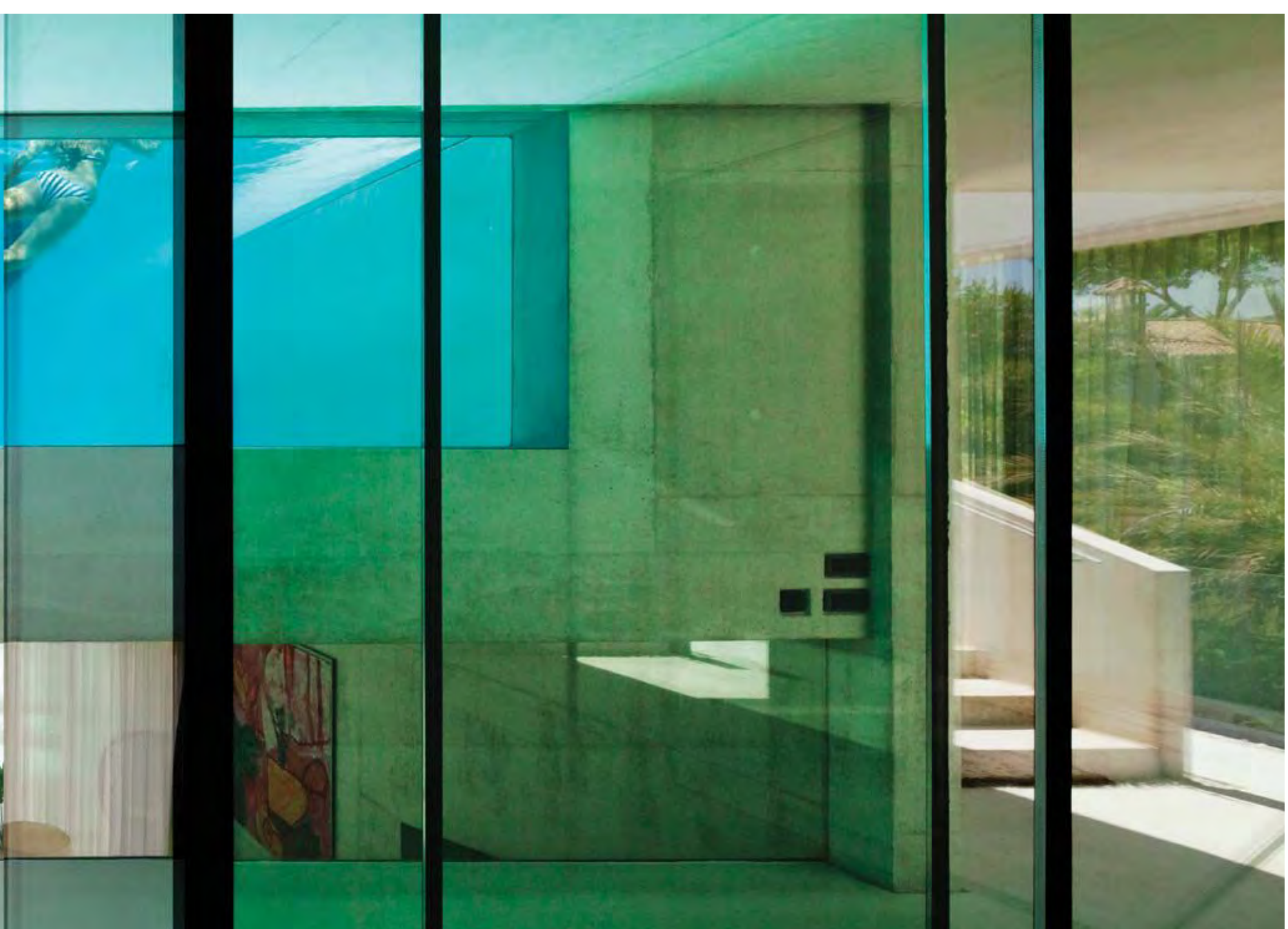
WIEL ARETS IS a hermetic and hedonistic architect. Relying on concrete, glass, and not much else to create drama in his severely abstract buildings, he seduces us with the way light strikes concrete's bare skin or the way space shoots up or down into barren vistas. In Marbella, Spain's oasis for wealthy sun-worshipers, his firm, Wiel Arets Architects (based in Switzerland and the Netherlands) has taken that approach beyond the logical with the Jellyfish House, cantilevering a glass-bottomed pool beyond the canted walls and convoluting the entire structure into movement as sinuous as swimming.

Arets was forced into this strategy because of the house's site. Near, but not on, the beach, the lot did not have any ground-floor views of the Mediterranean Sea, let alone access to it. So the architect created a paean to the water: From the rooftop pool, the ocean is visible while you swim or sunbathe. The roof structure, which protrudes to form a glazed (and water-filled) canopy over the house's entry, also bares what such houses are all about, much in contrast to the neo-classical, neo-Moorish, and neo-modernist boxes that surround it.

Underneath this aqueous heart, the nearly 7,000-square-foot house develops as a set of fairly conventional living areas that Arets designed with his usual attention to hiding all details and focusing your attention on form and space. There is a "slow" circulation pattern connecting the structure's four levels through stairs that emphasize the continuity of both the exposed concrete structure and the rooms that it frames. There is also a "fast" route that takes you up glass stairs directly to the pool, bypassing the daily-used rooms to get you right to the point.

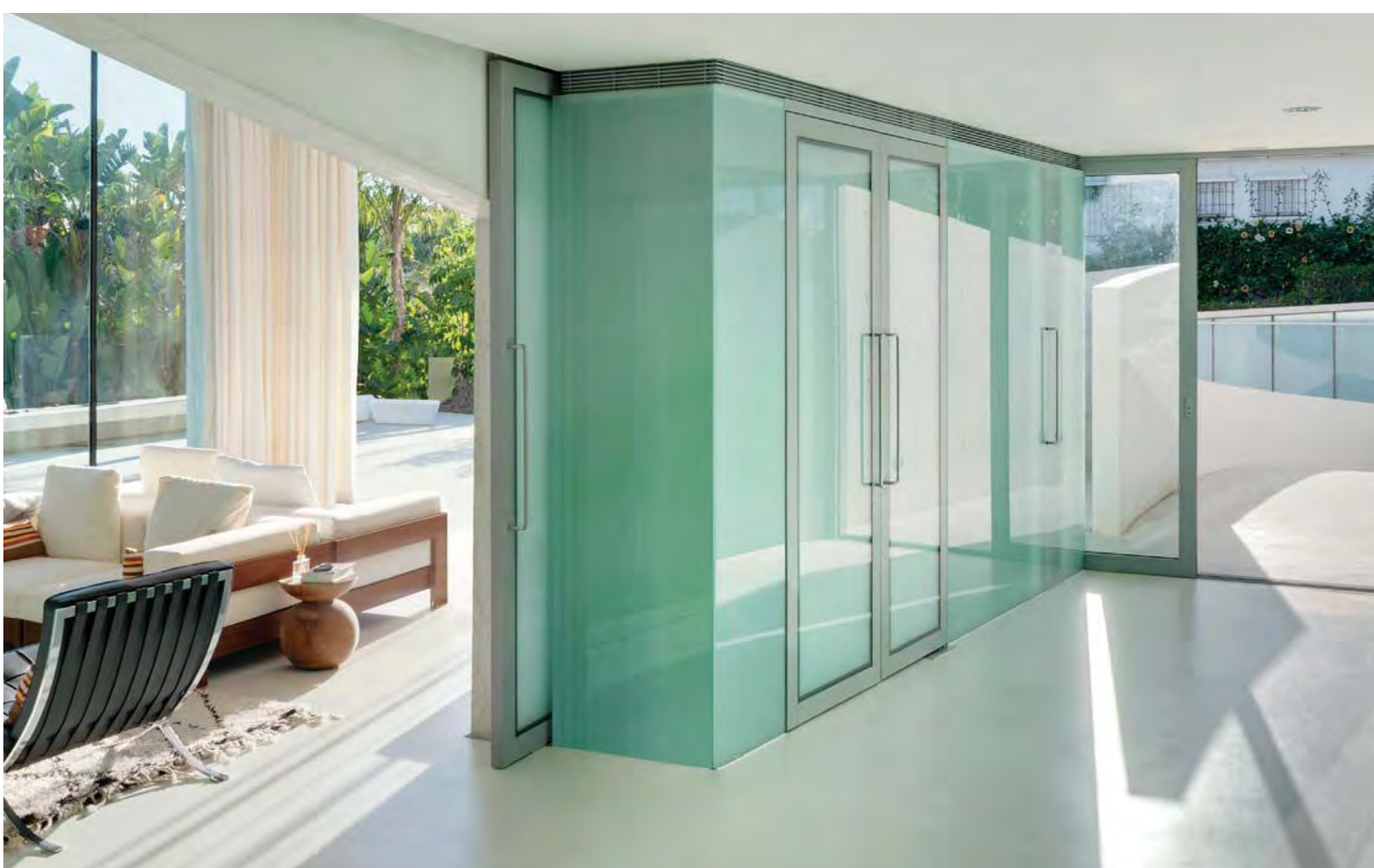
The house is as accepting of the elements as Arets could make it within its relatively narrow lot. A dining room opens up completely to the outdoors, while a sheltered patio hides under the cantilevered pool. Where the structure's core gathers to make all this openness possible, translucent glass closets and narrow passages remove density.

The Jellyfish House gets you out there while remaining framed, private, and secure. It might not be as blobby as its name implies, but it instead translates that sea creature's complexity into human-made forms that make you aware of both how close and how far water, and nature in general, are from this artificial vessel.

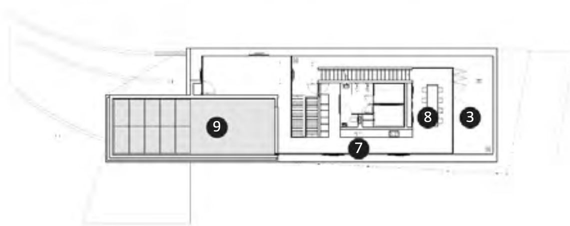


Opening page: A rooftop pool cantilevers 9 meters (29.5 feet) over the entrance to the Jellyfish House in Marbella, Spain. **Top left:** Circulation through the house follows two paths, a "fast stair" that moves directly from the basement level to the pool (seen at right), and a "slow stair," with deeper risers, that winds through the interior (at left). **Top right:** The white concrete walls of the house contrast against the saturated jewel tones of the Mediterranean sky. **Left:** Glazed walls on the first floor offer views into the living area below and the pool above.

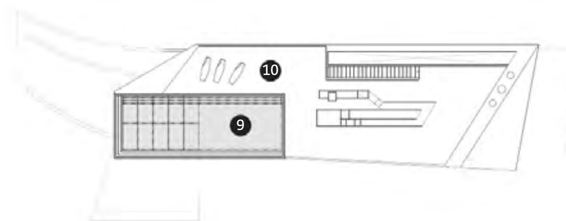
This image: The first-floor dining area features sliding glass doors that open the space entirely to a wide terrace beyond. **Below:** A curved ramp leads to the front entrance (at right), which opens onto the living room. **Opposite:** The rooftop pool deck features white concrete benches and views to the Mediterranean Sea beyond.



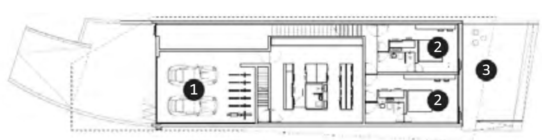
First-Floor Plan



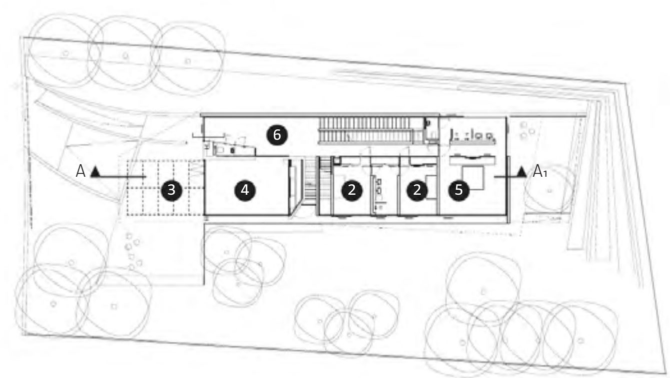
Second-Floor Plan



Lower-Level Plan



Ground-Floor Plan



1. Garage
2. Bedroom
3. Terrace
4. Living room
5. Master bedroom
6. Entrance
7. Kitchen
8. Dining room
9. Pool
10. Deck

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The underside of the cantilevered pool structure is glazed, allowing sunlight to filter through the water to the entry ramp and adjacent terrace below.


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Project Brooklyn Botanic Garden Visitor Center, Brooklyn, N.Y.
Architect Weiss/Manfredi Architecture/Landscape/Urbanism, New York
Acoustics, A/V, Security Consultant Cerami & Associates
Construction Manager The LiRo Group
Cost Estimator AMIS
Curtainwall Consultant Heintges & Associates
M/E/P/FP Engineer Jaros Baum & Bolles
Structural/Civil Engineer Weidlinger Associates
Environmental Consultant Viridian Energy & Environmental
Food Service Consultant Ricca Newmark Design
Geothermal/Geotechnical Engineer Langan Engineering & Environmental Services
General Contractor E.W. Howell
Landscape Architect HMWhite
Lighting Design Consultant Brandston Partnership
Retail Consultant Jeanne Giordano
Security Consultant TM Technology Partners
Traffic Consultant Sam Schwartz Engineering

Project King Street Station, Seattle
Architect ZGF Architects, Portland, Ore.
Acoustical Design Sparling
Civil Engineer KPFF Consulting Engineers
M/E/P Engineer Arup; Rushing
Structural Engineer Arup; Coughlin Porter Lundeen
General Contractor Sellen Construction Co.
Geotechnical Engineer Hart Crowser & Associates
Historic Preservation Consultant Artifacts Consulting
Lighting Design Pivotal Lighting Design; Affiliated Engineers; Eleek
Plaster Restoration Performance Consulting; EverGreene Architectural Arts

Project Centre for International Governance Innovation Campus, Waterloo, Ontario, Canada
Architect KPMB Architects, Toronto

Project Harry Parker Boathouse, Boston
Architect Anmahian Winton Architects, Cambridge, Mass.
Contractor Consigli Construction Co.
M/E/P Engineer R.W. Sullivan Engineers
Structural Engineer RSE Associates
Waterfront Structural Engineer Childs Engineering Corp.
Envelope Consultant Richard Keleher Architect; Wiss, Janney, Elstner Associates
Geothermal System Harriman
Landscape Architect/Civil Engineer Stantec
Lighting Design Lam Partners
Sustainable Systems Analyst The Green Roundtable

Project Jackson Hole Airport, Jackson, Wyo.
Architect Gensler, San Francisco
Associate Architect Carney Logan Burke Architects
Baggage Systems BNP Associates
Civil Engineer Jacobs Engineering Group
M/E Engineer Swanson Rink
Structural Engineer Martin/Martin
General Contractor Wadman Corp.
Landscape Design Hershberger Design

Project Los Angeles Museum of the Holocaust, Los Angeles
Architect Belzberg Architects, Santa Monica, Calif.
Electrical Consultant A&F Engineering Group
Environmental Engineer Enviropro
Mechanical Consultant Dorius & Assoc.
Methane Engineer Carlin Environmental Consulting
Soils Engineer William Koh and Associates
Geologist Irvine Geotechnical
Plumbing Consultant Tom Nasrollahi & Associates

Project The Pierre, San Juan Islands, Wash.
Architect Olson Kundig Architects, Seattle
Civil Engineer Coughlin Porter Lundeen
Geotechnical Engineer Associated Earth Sciences
Structural Engineer MCE Structural Consultants
General Contractor Schuchart/Dow

Project St. Louis Public Library, Central Library Transformation and Restoration, St. Louis, Mo.
Architect CannonDesign, St. Louis, Mo.
Architectural Support Grice Group Architects
Construction Manager BSI Constructors
Consulting Restoration Architect Frens and Frens
Environmental Graphics and Signage Kuhlmann-Leavitt
M/E/P/FP Engineer, A/V, Lighting Design William Tao & Associates
Structural and Civil Engineer (Exterior Restoration) David Mason & Associates
Lighting Design Derek Porter Studio

Project Quaker Meeting House and Arts Center, Sidwell Friends School, Washington, D.C.
Architect KieranTimberlake, Philadelphia
Acoustical Consultant K2 Audio
Cost Estimator International Consultants
Civil Engineer VIKA
Geotechnical Engineer GeoConcepts Engineering
M/E/P Engineer Bruce E. Brooks & Associates
Structural Engineer CVM
General Contractor The Whiting-Turner Contracting Co.
Landscape Architect Studio|Bryan Hanes
Lighting Consultant Arup
Specifications Consultant Wilson Consulting Associates
Surveyor A. Morton Thomas & Associates

Project Lakewood Cemetery Garden Mausoleum, Minneapolis
Architect HGA Architects and Engineers, Minneapolis
General Contractor M.A. Mortenson Co.
Landscape Architect/Master Plan Consultant Halvorson Design Partnership
Mausoleum Consultant Carrier Mausoleums Construction

Project SCAD Museum of Art, Savannah, Ga.
Architect Sottile & Sottile, Savannah, Ga., and Lord Aeck Sargent, Atlanta
Associate Architect Dawson Architects

2014 Institute Honor Awards for Interior Architecture, PAGE 210

Project Bar Agricole, San Francisco
Architect Aidlin Darling Design, San Francisco
Acoustical Consultant Charles M. Salter Associates
Concrete Fabricator Concreteworks
Contractor Northern Sun Associates
Custom Chair Design Sebastian Parker Furniture Design
Structural Engineer Berkeley Structural Design
Mechanical Engineer MHC Engineers
Food Service Restaurant Consultation & Design
Glass Sculpture Design Nikolas Weinstein Studios
Graphics Albertson Design
Lighting Designer Revolver Design
Metal Fabricator Chris French Metal
Sustainability Consultant Simon & Associates
Wood Hull Fabricator Matarozzi Pelsinger Builders
Woodworker Cabinet Works Co.

Project SoHo Loft Residence, New York
Architect Gabellini Sheppard Associates, New York
Acoustical, A/V Consultant Cerami & Associates
Code Consultant Jerome S. Gillman Consulting Architects
M/E/P Consultant Edwards & Zuck
Landmarks Preservation Commission Consultants Higgins Quasebarth & Partners
Landscape Consultants Vert Gardens
Lighting Consultants Tillotson Design Associates

Project K&L Gates at One New Change, London
Architect LSM, Washington, D.C.

Project Knoll Flagship Showroom, Offices, and Shop, New York
Architect Architecture Research Office, New York
A/V Cerami & Associates
Code Consultant William Vitacco Associates
M/E/P/FP Engineer AMA Consulting Engineers
Structural Engineer Robert Silman Associates
Graphic Design Project Projects
IT, Security TM Technology Partners
LEED Consultant Watkins Architect
Lighting Design Tillotson Design Associates

Project Los Angeles Museum of the Holocaust, Los Angeles
Architect Belzberg Architects, Santa Monica, Calif.

Project Marc by Marc Jacobs Showroom, New York
Architect Jaklitsch/Gardner Architects, New York;

HLW International, New York
Structural Engineer Hage Engineering
Fabricator/Millworker Buzzoni
General Contractor Apogee Design and Construction
Glass Vendor McGrory Glass
Lighting Designer Illumination Works

Project The Pierre, San Juan Islands, Wash.
Architect Olson Kundig Architects, Seattle

Project Odegaard Undergraduate Library & Learning Commons, Seattle
Architect The Miller Hull Partnership, Seattle
Contractor M.A. Mortenson Co.
M/E/P Engineer Affiliated Engineers
Structural Engineer Coughlin Porter Lundeen
Graphics/Wayfinding Mayer|Reed

Project Venture Capital Office Headquarters, Menlo Park, Calif.
Architect Paul Murdoch Architects, Beverly Hills, Calif.; Kappe Architects|Planners, Pacific Palisades, Calif.
Contractor Louis Ptak Construction
Civil Engineer BKF Engineers
Electrical Engineer Morrow-Meadows Corp.
M/P Engineer ACCO Engineered Systems
Structural Engineer Simpson Gumpertz & Heger
Landscape Architect HMH
Lighting Designer Sean O'Connor Lighting

2014 Institute Honor Awards for Regional & Urban Design, PAGE 218

Project The Creative Corridor: A Main Street Revitalization for Little Rock, Little Rock, Ark.
Architect University of Arkansas Community Design Center, Fayetteville, Ark. ; Marlon Blackwell Architect, Fayetteville, Ark.
Design Specialist National Endowment for the Arts

Project Son Tra Peninsula Strategic Vision Plan, Da Nang, Vietnam
Architect Skidmore, Owings & Merrill, Chicago
Construction City of Da Nang Department of Construction; Da Nang Construction Planning Institute

Project Denver Union Station Neighborhood Transformation, Denver
Architect Skidmore, Owings & Merrill, Chicago
Contractor Kiewit Corp.
Engineer AECOM
Master Developer Union Station Neighborhood Co.
Public Realm Designer Hargreaves Associates

Project East River Blueway Plan, New York
Architect WXY Architecture + Urban Design, New York
Consultant S + M Studio
Consulting Engineer AKRF; Arcadis; Philip Habib + Associates; Weidlinger Associates
Environmental Engineer eDesign Dynamics
Landscape Architecture Judith Heintz
Lighting Domingo Gonzalez Associates
Strategic Advisory HR&A Advisors

Project Miami 21: A New Zoning Code for the City, Miami
Architect Duany Plater-Zyberk & Co., Miami
Economic Development Sub-Consultant Economics Research Associates
Legal Lewis, Stroud & Deutsch, P.L.
Parks and Open Spaces Goody Clancy
Public Outreach Subconsultant Village Marketing Bureau

Project Pearl Brewery Redevelopment Master Plan, San Antonio
Architect Lake|Flato Architects, San Antonio
Associate Architect Durand-Hollis Rupe Architects; RVK Architects; Ford, Powell & Carson Architects and Planners; WGW Architects
Civil Engineer Pape-Dawson Engineers

Mechanical Engineer Beyer Mechanical
Structural Engineer Danysh & Associates
General Contractor Artistic Builders
Landscape Architect Rialto Studio
Lighting Brown Design Consultants; Lang Lighting

Phoenix International Media Center, PAGE 240

Project Phoenix International Media Center, Beijing
Client Phoenix Television
Architect BIAD UFo (Beijing Institute of Architecture Design, Un-Forbidden office), Beijing—Shao Weiping (executive chief architect); Liu Yuguang, Chen Ying, Li Gan, Zhou Zewo, Wu Xi, Hao Yihan, Pan Hui, Xiao Lichun, Wang Yu (project team)
Structural Engineer Shu Weinong, Zhu Zhongyi, Zhou Sihong, Zhang Shizhong, Shen Zhenkai, Wang Yi, Bu Longgui
Mechanical Engineer Zhang Tiehui, Yang Yang, Qian Qiang, Liu Yun
Electrical Engineer Sun Chengqun, Jin Hong
Plot Plan Design Engineer Lv Juan
Lighting Engineer Zheng Jianwei
Economist Zhang Ling
BIM Engineer Chi Shengfeng
Landscape Design LAURstudio
Interior Design SAKO Architects
Lighting Concept Consultant Speirs + Major
BIM Consultant Beijing BIMTechnologie Co.
Construction & EPC Beijing Tianrun Construction Co.
Steel Structure Jiangsu Huning Steel Mechanism Co.
Curtainwall Consultant Shenzhen King Façade Decoration Engineering Co.
SRC Curtainwall Shanghai Winsun Building Products Co.
Interior Decoration Suzhou Gold Mantis Construction Decoration Co.
Lighting Haoersai Lighting Technology Group Co.
Size 65,000 square meters (699,654 square feet)
Cost Withheld

The Wallis, PAGE 250

Project Wallis Annenberg Center for the Performing Arts, Beverly Hills, Calif.
Client The Wallis
Architect Studio Pali Fekete Architects, Culver City, Calif.—Zoltan E. Pali, FAIA (founder and principal)
M/E Engineer ARC Engineering
Structural Engineer Structural Focus
Civil Engineer Rothman Engineering
Geotechnical Engineer Geotechnology
Construction Manager Freeman Group
General Contractor Matt Construction Corp.
Landscape Architect Lutsko Associates
Lighting Designer Horton Lees Brogden Lighting Design
Mural Restoration Zebala & Partners
Acoustics Jaffe Holden
A/V Electrosonic
Size 70,000 square feet
Cost $50 million

Old Market Square Stage, PAGE 258

Project Old Market Square Stage, Winnipeg, Manitoba, Canada
Client Winnipeg Exchange District BIZ
Architect 5468796 Architecture, Winnipeg, Manitoba, Canada—Mandy Aldcorn, Apollo Au, Brandon Bergem, Ken Borton, Jordy Craddock, Jason Ejzenbart, Michelle Heath, Aynslee Hurdal, Johanna Hurme, Cristina Ionescu, Eva Kiss, Grant Labossiere, Jayne Miles, Colin Neufeld, Zach Pauls, Sean Radford, Sasa Radulovic, Shannon Wiebe, Sharon Wohl (project team)
Structural Engineer Lavergne Draward & Associates
Electrical Engineer Williams Engineering Canada
Lighting Design Ambiances Design Production
Builder Green Seed Development Corp.
Metal Fabricator KlarTech
Size 784 square feet
Cost $1 million Canadian ($914,495 U.S.)

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Edward P. Evans Hall, PAGE 266

Project Edward P. Evans Hall, New Haven, Conn.

Client Yale University

Architect Foster + Partners, London—Norman Foster, Hon. FAIA (chairman and founder); David Nelson, Spencer de Grey, Nigel Dancey, Chris West, David Burton, Georgia Bez, Kathleen Laskin, Danny Shaw, Zoe Stokes, Jorge Uribe (project team)

Collaborating Architect Gruzen Samton

M/E and Structural Engineer Buro Happold

Quantity Surveyor Davis Langdon

Lighting Consultant Claude Engle

Landscape Consultant Olin

Acoustics, A/V, IT and Security Consultant Arup

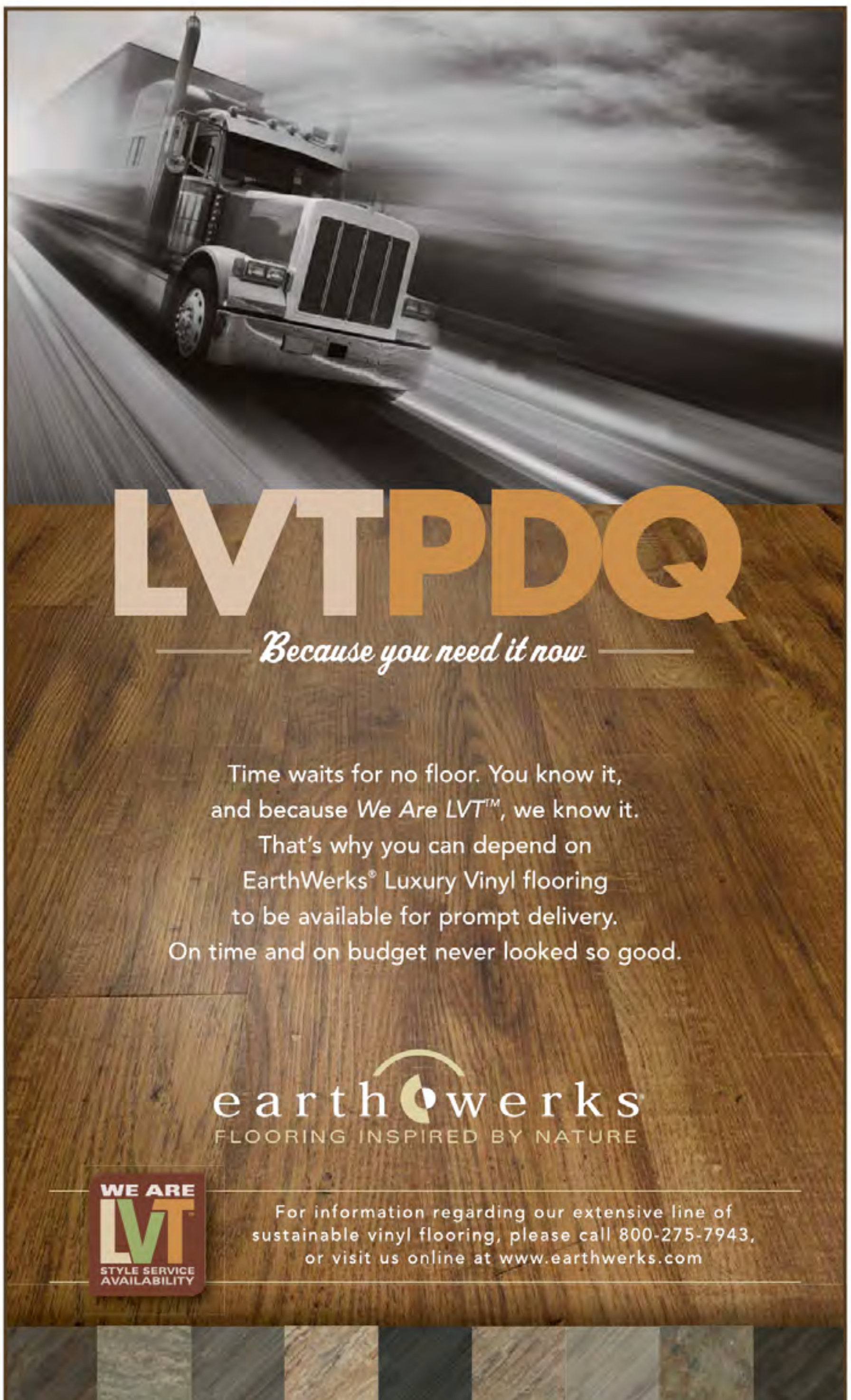
Vertical Transport Consultant Van Deusen and Associates

Food Service Consultant Ricca Newmark Design

Main Contractor Dimeo

Size 249,743 square feet (gross)

Cost Withheld



Liverpool Department Store—Insurgentes, PAGE 276

Project Liverpool Department Store—Insurgentes, Mexico City

Client El Puerto de Liverpool

Architect Rojkind Arquitectos, Mexico City—Michel Rojkind (founding partner); Gerardo Salinas, AIA (partner); Alberto Villarreal, Rodrigo Medina, Arie de Jongh, Victor Martínez, Juan Carlos Sainz, Adrian Aguilar, Alfredo Hernandez, Andrea León, Beatriz Zavala, Marielle Rivero, Nadezda Stankovic, Felipe Castañeda, Isaac Smeke, Víctor Alemán, Enrique de la Barrera, Rosalba Rojas, Monique Rojkind (team)

Interior Design Servicios Liverpool

Structural Engineer EMR

Façade Engineer Studio NYL

M/E/P Engineer RCC

Landscape Consultant Entorno Taller de Paisaje

Lighting Consultant Ideas y Proyectos en Luz

Façade Installation Alitech, Arquimart, Todo en Metal

Size 825 square meters (8,880 square feet)

Cost Withheld

Jellyfish House, PAGE 285

Project Jellyfish House, Marbella, Spain

Client Private

Architect Wiel Arets Architects, Maastricht, the Netherlands—Wiel Arets, Bettina Kraus, Lars Dreessen, Dennis Villanueva, Carlos Ballesteros (project team)

Collaborators Paul Draaijer, William Fung, Johannes Kappler

Consultants West 8, ABT BV, Cauberg-Huygen Raadgevende Ingenieurs BV, Nieto Sobejano Arquitectos S.L.P.

Size 650 square meters (6,997 square feet)

Cost Withheld

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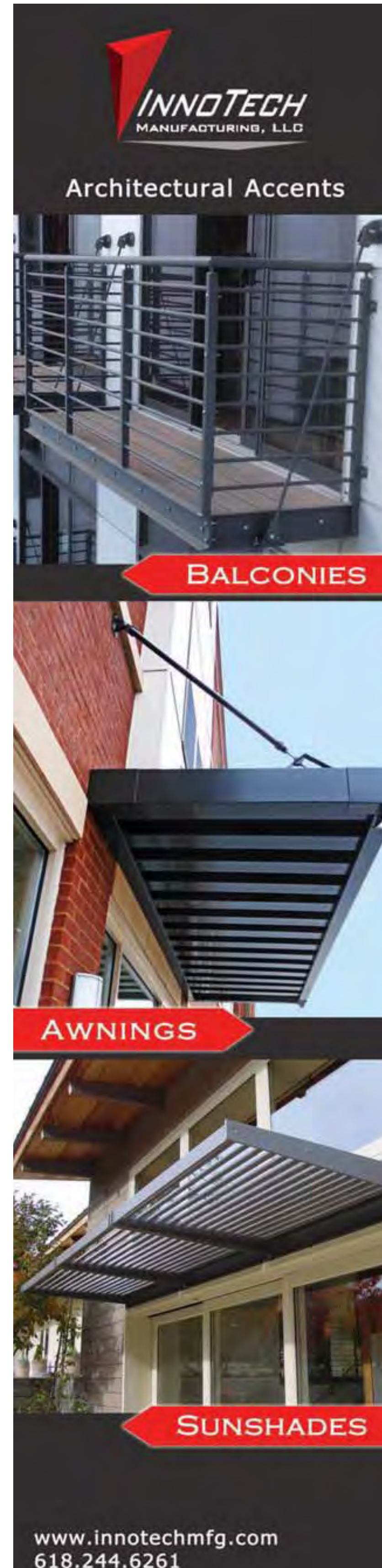

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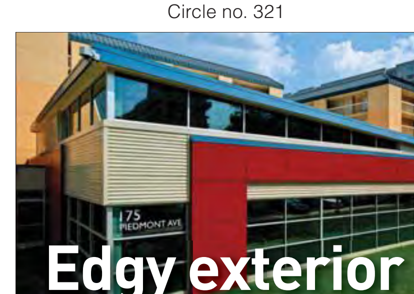

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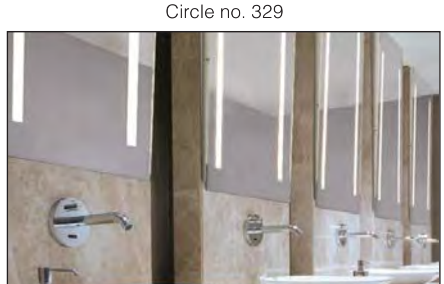

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BACK

MARY ANN SULLIVAN

CITATION

1976 P/A Awards Jury
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PAST PROGRESSIVES

NURTURE VERSUS NATURE

GREEN WALLS HAVE EMERGED AS A WAY OF COVERING BUILDINGS, BUT THIS P/A CITATION-WINNING PROJECT OFFERS A CAUTIONARY TALE.

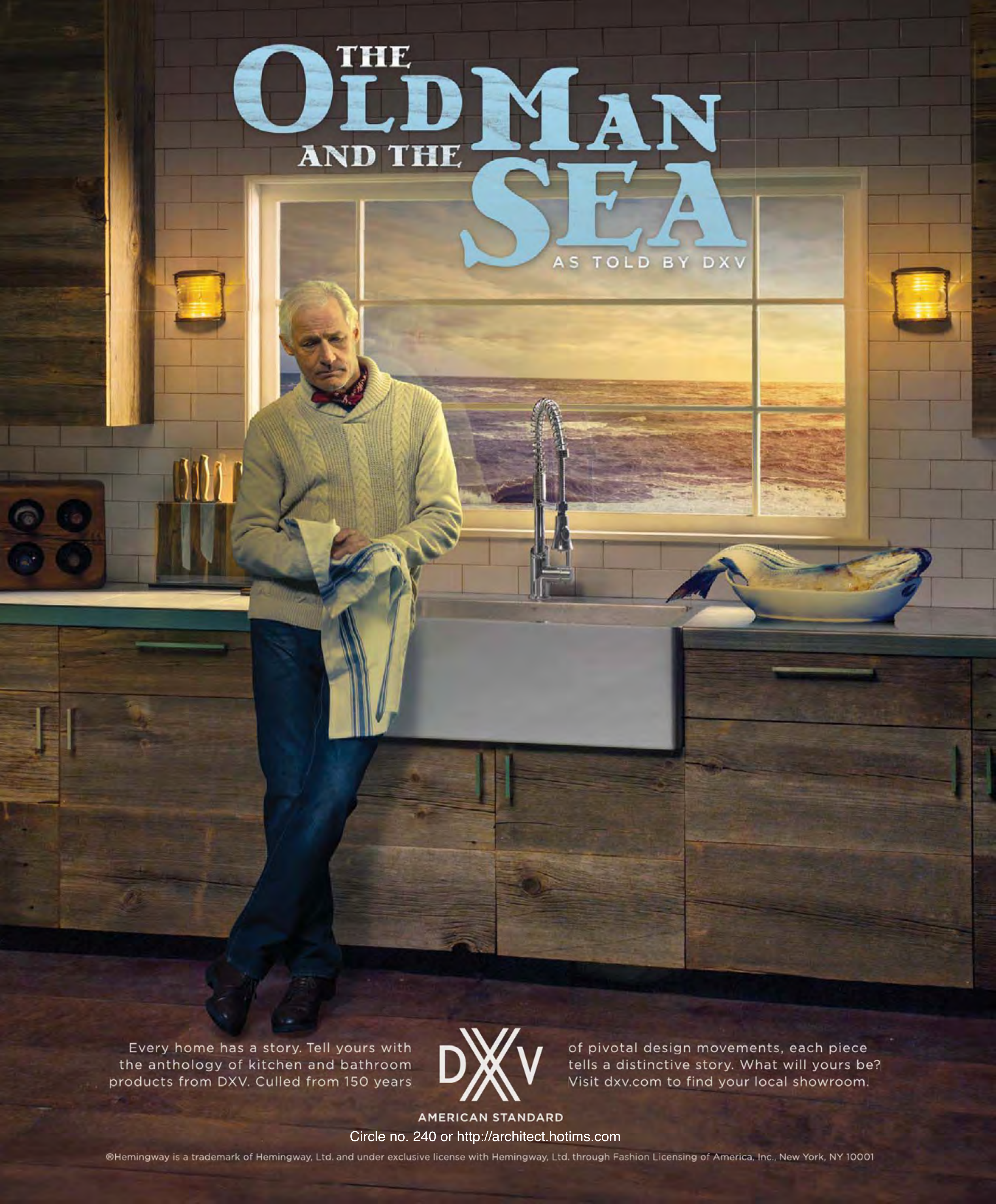
Text by **Thomas Fisher, Assoc. AIA**

WITH ALL OF THE eye-catching buildings in Columbus, Ind., the addition to the Indiana Bell (now AT&T) Switching Center, designed by Paul Kennon of Houston's Caudill Rowlett Scott (which was acquired by HOK in 1994), has received less attention than it deserves. Kennon wanted to hide this one-story addition to a three-story telephone equipment facility within its residential context by wrapping both structures in reflective glass. He disguised the nearly windowless facility with a vertical space-frame trellis that supports climbing vegetation. The trellis, together with pear trees along the corner lot, shaded narrow brick plazas as well as the building's south and east façades. Kennon placed nine brightly colored mechanical ducts by a rear alley, standing sentinel-like as if guarding the all-glass building.

As Kennon's vision became a reality, wisteria covered the trellis and the pear trees grew to the point where the building visually disappeared behind a green wall (above). But the lush vegetation became a haven for birds, whose droppings proved a nuisance and maintenance expense. This led AT&T to cut down the trees and—over the objections of local preservationists and Kennon's son Kevin Kennon, AIA—remove the vines and all but the top of the trellis.

While the reflective glass has been cleaned, the mechanical ducts repainted, and the brick plazas repaired, the building now looks sadly naked, standing as a caution to all who understandably want to plant the walls of buildings. This makes perfect sense environmentally, but it reminds us that nurturing a building doesn't always work with nature.

More images at architectmagazine.com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