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THE MAGAZINE OF THE AMERICAN INSTITUTE OF ARCHITECTS

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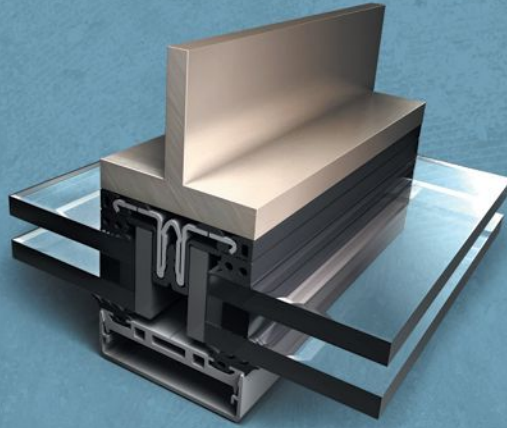
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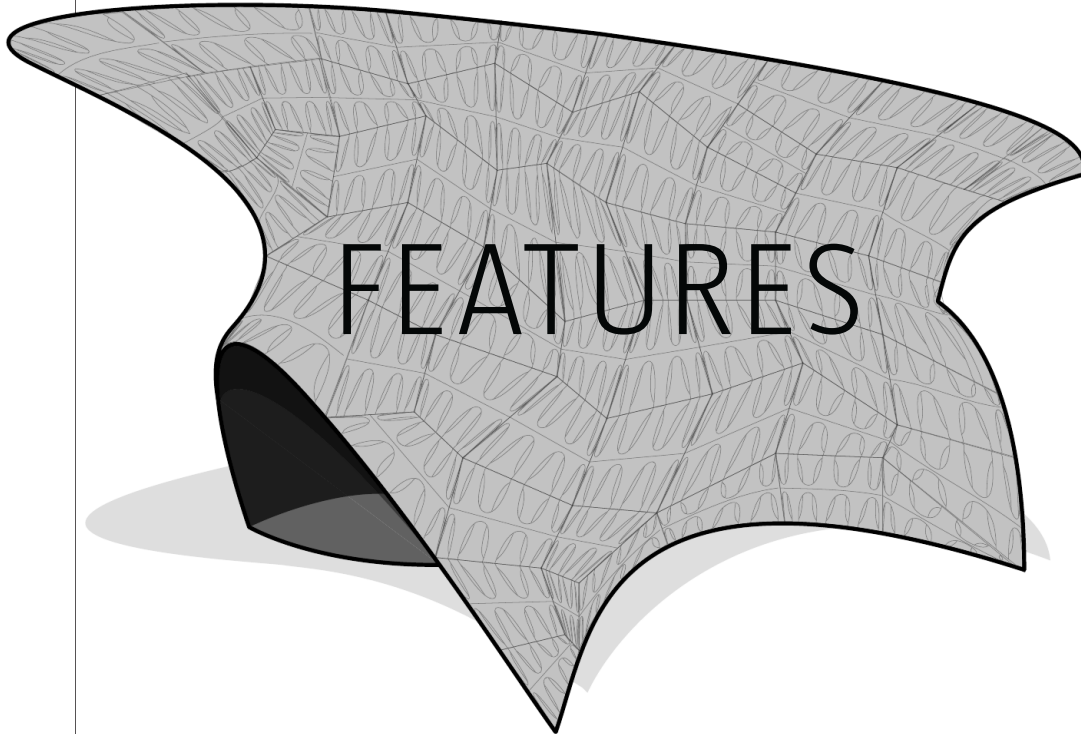
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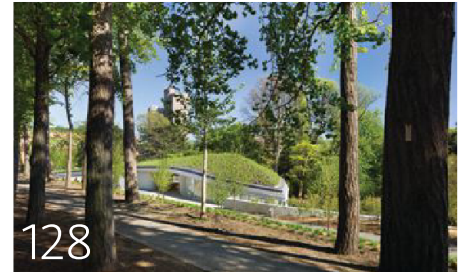
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Contributor Amanda Hess talks to recent UCLA graduates, and we show a roundup of thesis projects.

Blaine Brownell's *Mind & Matter* blog looks at products and materials in development and on the market.

Aaron Betsky's *Beyond Buildings* blog comments on how design affects our society and culture.

Object Lessons: Inveterate Web surfer and ARCHITECT editor-in-chief Ned Cramer shares the designs that catch his eye.

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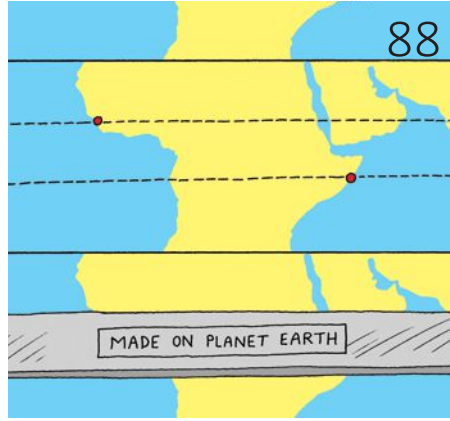
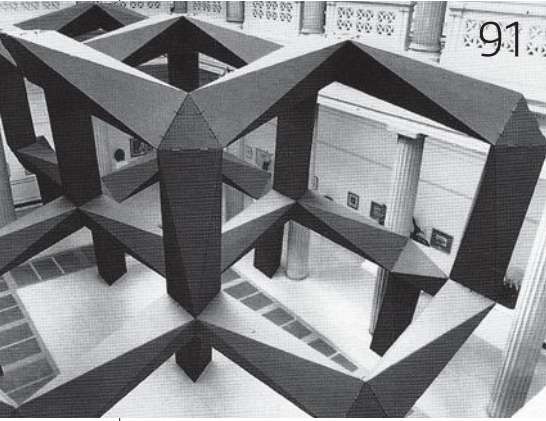
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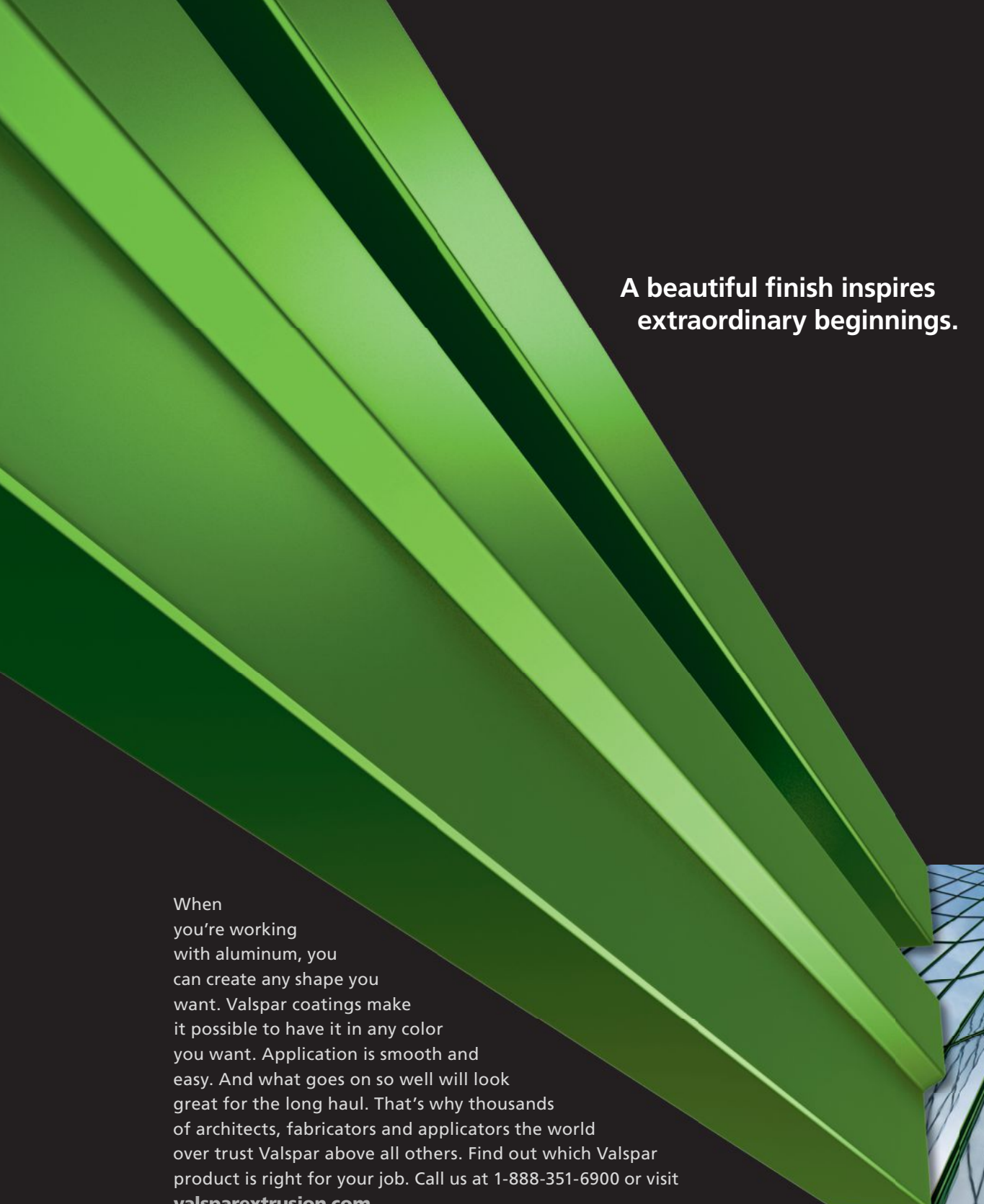
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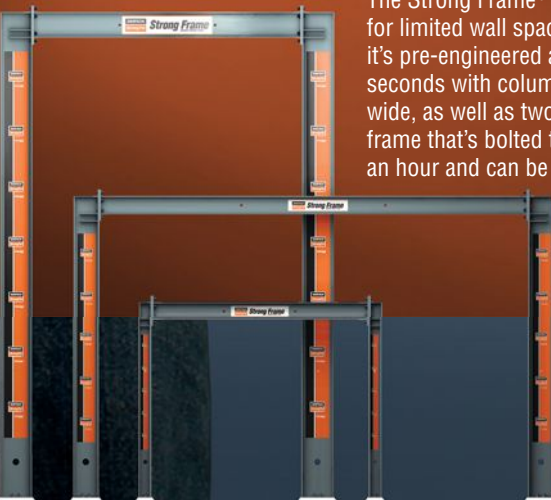
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AMERICAN EXCEPTIONALISM

MY FATHER WORKS at a limestone quarry in Southern Illinois, and when I was a kid we would hunt the surrounding fields for Indian arrowheads and shards of pottery. The tiny stone points were fun to play with but frustratingly elusive. The pottery was comparatively plentiful and easy to find, and so had less appeal. My grandfather had a cigar box full of the stuff at home.

Though I didn't know it at the time, we were picking over the remains of Cahokia, the largest pre-Columbian city in the United States. The fields we scavenged are long gone, excavated for limestone, but a short drive north, a cluster of some 80 manmade hills bump out of the flat landscape. The largest is 100 feet tall and covers an area larger than the Great Pyramid of Giza.

A staggering amount of manpower must have been necessary to move so much dirt without the aid of machines, horses, or the wheel. Archaeologists estimate that the population of Cahokia during its 13th century peak was around 15,000—equal to or larger than that of medieval London.

The city was built by the Mississippian people, who inhabited a territory encompassing the Midwest and Southeast. It blows my mind to think that such a significant and sophisticated culture occupies so little of the American consciousness, compared to, say, Mexico's evident pride in the Aztec and Maya.

Cahokia is a World Heritage Site and a National Historic Landmark, but, tellingly, it is owned and operated by the State of Illinois rather than the National Park Service. An active four-lane road runs 50 feet from the base of the biggest mound and Interstate 70 lies only 500 feet away. These violations would be unthinkable at a place such as Mount Vernon. Why are they admissible at Cahokia?

"Instead of imagining the thousands of people who once teemed on the grand plaza here," Glenn Hodges wrote in *National Geographic* last year, "I keep returning to the fact that Cahokia Mounds in Illinois is one of only eight cultural World Heritage sites in the United States, and it's got a billboard for Joe's Carpet King smack in the middle of it."

Granted, the mounds aren't much to look at. They are covered in grass and, except for their abruptness, are fairly indistinguishable from natural topography. But looks aren't everything. There is a deeper, darker reason why Cahokia isn't a National Park, familiar to every American schoolchild. The story of Cahokia contradicts the received narrative of American Exceptionalism.

Cahokia was abandoned by the time French explorers arrived in the 17th century, and Hodges says that accounts of the ruins were deliberately underplayed in the early 19th century, during the era of Westward Expansion: "The United States was trying to get Indians out of the way, not appreciate their history." Moreover, it's disturbing to ponder the total collapse of a civilization—especially one here in America, where we enjoy a conveniently loose relationship with our past

and an intense, some might say blind, faith in progress.

Sure, we romanticize the distant fall of ancient Rome and Indiana Jones stories of lost cities in the jungle, but we also consider ourselves wiser than our predecessors, more technologically sophisticated, and uniquely favored by the divine. What hubris. The better angels of our nature constantly struggle against our short-sighted animal instinct to consume and prosper. Pride and gluttony are the deadly sins of our times.

We should remember Cahokia not only because it was the center of a mighty civilization, but because we can learn from its failure how to minimize the risk of our own. Cahokia's decline began around 1350, at the advent of the Little Ice Age. Droughts and falling temperatures had a disastrous effect on agriculture. The surrounding woodlands had already been stripped of mature trees for construction, and over-hunting in the absence of grain led to the collapse of the animal population. The starving community made war upon its neighbors for fleeting advantage and committed human sacrifice to curry favor with the gods.

Archaeological evidence of these events upsets the widespread assumption that Native Americans lived in perfect harmony with nature—a fiction exemplified by the famous Crying Indian in the 1971 anti-pollution campaign. As has been documented of the Anasazi, who flourished in the Southwest during the same period, the Mississippian people were exhausting the resources of their known world. A little external pressure in the form of climate change pushed them right over the edge.

We face similar pressures today, including a rapidly changing climate, diminishing resources, an exploding global population, and dying ecosystems. Finding solutions to such problems was ostensibly the purpose of the Rio+20 United Nations Conference on Sustainable Development, held in Rio de Janeiro last month. Tragically, many world leaders failed to attend—including President Barack Obama. Not surprisingly, then, the conference's outcomes are being described in underwhelming terms.

Oxfam chief executive Barbara Stocking released a statement deriding the event: "Rio will go down as the hoax summit. We elect governments to tackle the issues that we can't tackle alone. But they are not providing the leadership the world desperately needs. Paralyzed by inertia and in hock to vested interests, too many are unable to join up the dots and solve the connected crises of environment, equity and economy."

America is a great nation, just as the Cahokia's once was. But are we wise enough to learn from their history and alter the path of our own progress? The lessons lie all around us, if we'd only stop paving over them.

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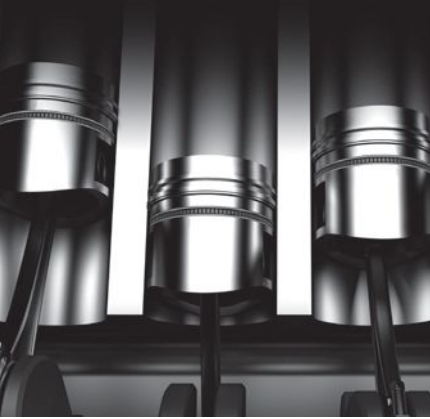
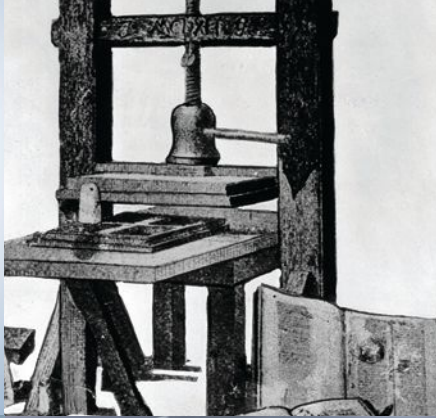
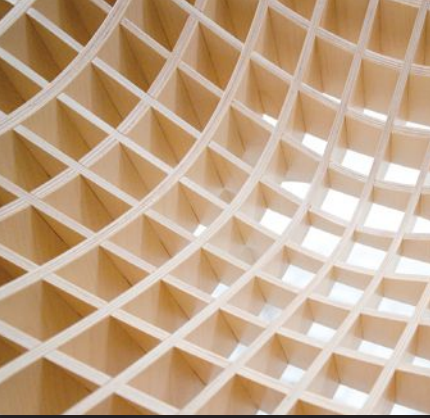
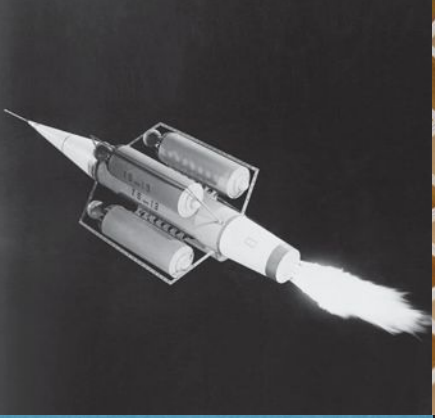
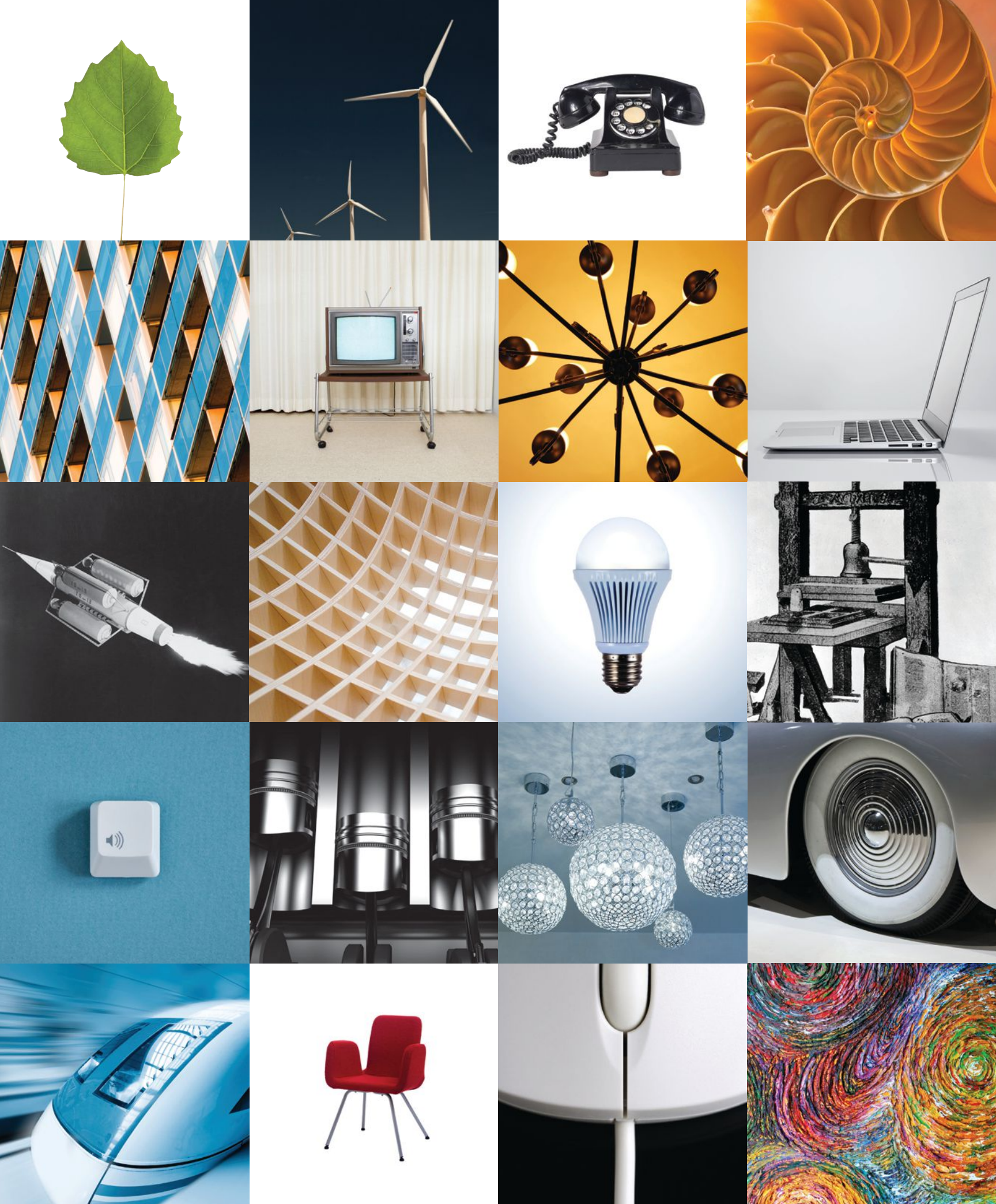
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LETTERS

THE AGENT OF ENLIGHTENMENT, May 2012

Steven Holl was spiteful enough to take the occasion of what—his millionth award with cover story and glam shot—to trash his undergraduate program and “all but one” of its professors. I have no affiliation with the University of Washington, but I felt indignant on their behalf. *Frederika Lang, Ann Arbor, Mich.*

TUSCALOOSA FEDERAL BUILDING AND COURTHOUSE, May 2012

First, the architects' justification for the building style is mistaken. Although the Greek orders were used in the 18th century to symbolize Enlightenment reason, Doric orders were used by the 19th century to convey strength. So the building volume, with its Doric orders, reads as a statement of power, rather than the welcoming design that would offer citizens equal protection under the law.

Second, the primary experience of dealing with federal agencies these days is one of waiting, and yet, while the judges' chambers are luxurious, the building offers no gracious space for people to sit down. What a contrast to the public space in Richard Meier's airy and light-filled Phoenix Courthouse.

Third, the building's long sides face east and west,

without any exterior shading devices beyond the window glass itself on the judges' chambers. Summers are hot in Alabama, but there's no shaded outdoor space.

Fourth, the design doesn't appear compatible with the sustainable-design component of the GSA's Design Excellence Program, which Ned Cramer praises in his editorial. It seems to be an isolated object, without reaching out to serve any larger urban-design objectives. *Nick Roberts, AIA, Los Angeles*

Corrections

Reinventing the Crescent: Riverfront Development Plan, a 2012 AIA Institute Honor Award winner for Regional & Urban Design in the May issue, should have also mentioned Hargreaves Associates, Chan Krieger Sieniewicz, and TEN Arquitectos as collaborators with Eskew+Dumez+Ripple. The plan rendering should also have been credited to Hargreaves Associates.

The Ruth Lilly Visitors Pavilion, a 2012 AIA Institute Honor Award winner for Architecture in the May issue, incorrectly identified the location of Marlon Blackwell Architect. The firm is located in Fayetteville, Ark. We regret the errors.

→ Want to join the conversation?
To write a letter to the editor, email editor-in-chief Ned Cramer at ncramer@hanleywood.com. Or go to architectmagazine.com, where you can add your thoughts in a comment at the end of each story. All letters and comments may be edited for length, content, grammar, and style.

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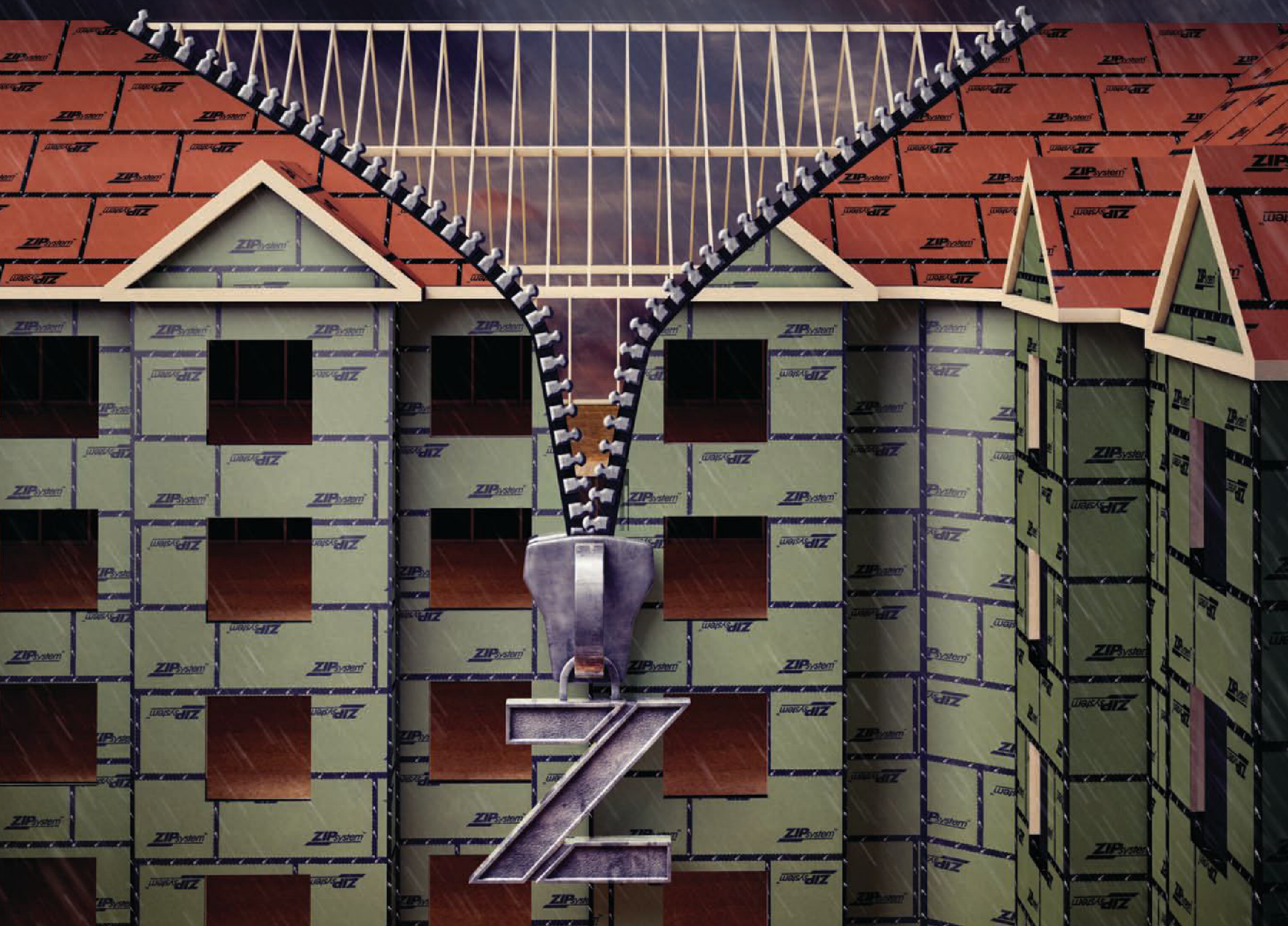
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FROM THE
CREATORS OF



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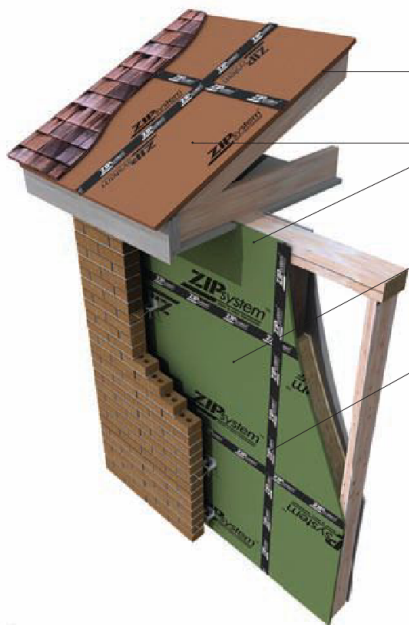
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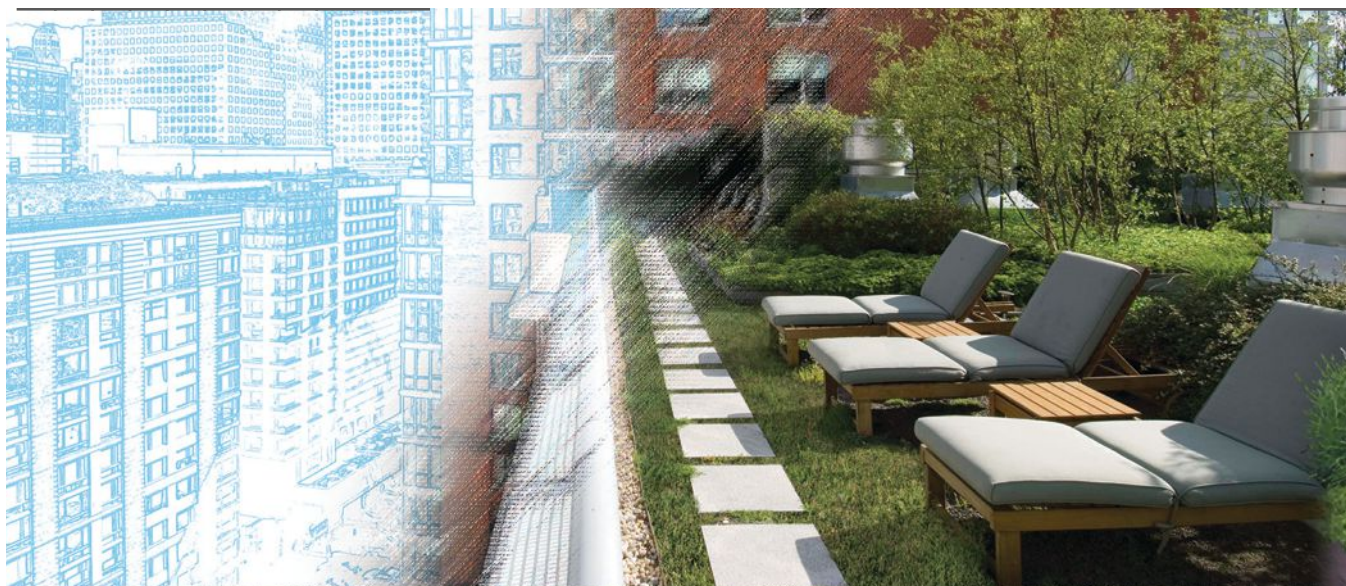


Reed Karaim

Reed Karaim has written for *Smithsonian*, *U.S. News & World Report*, *The American Scholar*, *The Washington Post*, *USA Weekend*, *Fortune*, *Civilization*, and is a contributing editor to *Preservation*, the magazine of the National Trust for Historic Preservation. He has written extensively on development and environmental issues in the American West. Prior to launching his career as a freelance writer, he worked in Knight Ridder's Washington bureau.

Karaim grew up in North Dakota and graduated from North Dakota State University in Fargo. His first job was at a weekly newspaper, *The Cass County Reporter*, in a small town on the eastern edge of the state. He currently lives in Tucson, Ariz., with his wife, the novelist Aurelie Sheehan, and their daughter. In addition to his reporting, Karaim is the author of the novel *If Men Were Angels* (W.W. Norton and Co., 1999), and he has won awards for his fiction, nonfiction, investigative journalism, and poetry.

→ See Reed Karaim's story on the fracking boom in North Dakota, "Welcome to the Boomtown," on page 120.



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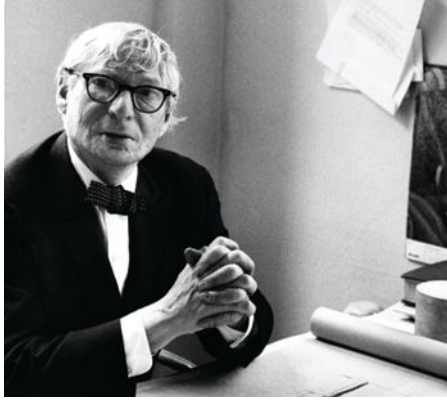
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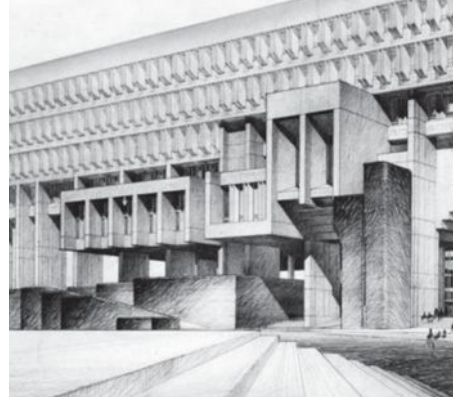
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NEWSWIRE

EDITED BY KRISTON CAPPS



Louis Kahn inspires architectural opera
Lewis Spratlan and Jenny Kallick drew their inspiration for *Architect: A Chamber Opera*—which screens this fall at the New York City Architecture and Design Film Festival in the fall—from the life and work of Louis Kahn.



Boston City Hall designer dies at 97
Gerhard Kallmann, whose firm gained steam during the 1962 competition to design Boston City Hall, has died. The Brutalist pioneer held teaching positions at the Harvard Graduate School of Design, among other institutions.



Knighthood for Zaha Hadid
Queen Elizabeth II made Zaha Hadid, Hon. FAIA, a Dame Commander of the Order of the British Empire. Knighthood is the latest for Hadid's impressive list of accomplishments, which include winning the Pritzker Architecture Prize.

Princeton Chemist Solves a Problem With Space

A Princeton University chemist has tackled an ancient geometry problem—one as frustrating as it is simple: How do you fill a three-dimensional space with objects that aren't cubes?

Salvatore Torquato and his colleagues discovered an arrangement of complex three-dimensional shapes that efficiently fills a cubic space—and can be repeated infinitely. The group's research involves "tiling," also known as "tessellation." The process involves stacking octahedra (solid figures with eight triangular faces) and tetrahedra (figures with four triangular faces) in an arrangement such that it creates no empty spaces as it grows.

A professor at the Princeton Institute for the Science and Technology of Materials and the Princeton Center for Theoretical Science, Torquato follows in the footsteps of architect R. Buckminster Fuller, who described the structural configuration of two regular tetrahedra and a single regular

octahedron as an "octet truss." That geometrical innovation—or discovery—has since influenced everything from space-frame roofing to the tube-frame chassis on Ducati motorcycles.

(But give credit where credit is due: Alexander Graham Bell discovered—or invented—the space frame at the start of the 20th century, a structural innovation that Fuller won acclaim for realizing in the 1950s.)

So what does Princeton's discovery have to do with architecture? Plenty of new buildings employ complex triangular forms, including the Herta and Paul Amir Building for the Tel Aviv Museum of Art by Preston Scott Cohen. But Torquato's research will benefit architecture indirectly: Materials scientists may use his research to develop stronger structures for building.

For all this solution's many potential applications, it's hard to believe that it was ever a problem.

KRISTON CAPPS

Cannon Design and Peter Ellis New Cities Forge New Partnership

In the hopes of expanding their reach in the fields of urban planning and city design, Cannon Design and Peter Ellis New Cities are joining forces in a merger.

Cannon Design does planning and design in the healthcare, education, and sports sectors, among others. Calling itself an ideas-based practice, the firm says that it is committed to prioritizing the project over the object or end-product. With the help of Peter Ellis, FAIA, and his staff, Cannon Design CEO Gary Miller says that he looks forward to expanding Cannon's portfolio in city design.

Ellis, who will now partner with the Cannon Design executive team, worked as a design partner for Skidmore, Owings & Merrill for 30 years before branching off to start New Cities. An expat living and working in India, Ellis developed Sports City, a 5,000-acre city with commercial and residential districts. He will continue working overseas and expand the firm's presence in India. ALEXANDRA RICE

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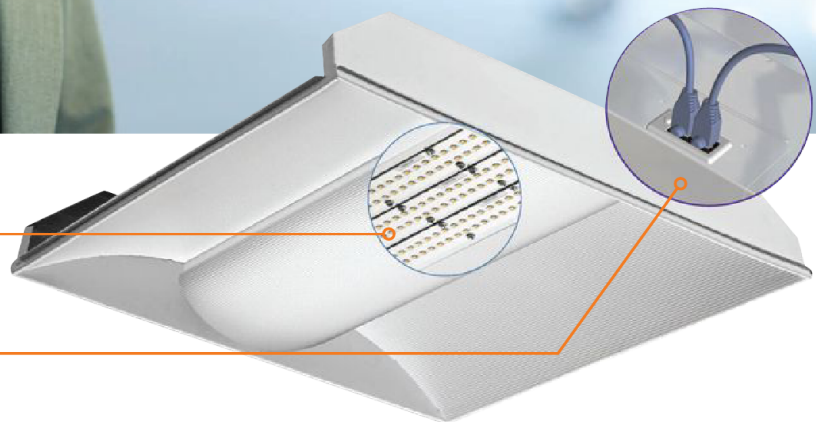
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SOURCE: THE WASHINGTON POST

40%

U.S. CARBON EMISSIONS ATTRIBUTABLE TO BUILDINGS
SOURCE: U.S. DEPARTMENT OF ENERGY

48%

INCREASE IN U.S. ENERGY CONSUMPTION FROM 1980 TO 2009
SOURCE: U.S. DEPARTMENT OF ENERGY

19%

GLOBAL ENERGY CONSUMPTION ATTRIBUTABLE TO U.S. ENERGY CONSUMPTION IN 2010
SOURCE: U.S. DEPARTMENT OF ENERGY

\$80 billion

POTENTIAL ENERGY SAVINGS BY CUTTING U.S. ENERGY USE 20%
SOURCE: U.S. DEPARTMENT OF ENERGY

\$18 billion

POTENTIAL ENERGY SAVINGS BY 2020 FROM ENACTING ENERGY-TRANSPARENCY LAWS
SOURCE: THE INSTITUTE FOR MARKET TRANSFORMATION

8%

RENEWABLE ENERGY AS SHARE OF TOTAL U.S. ENERGY CONSUMPTION, 2010
SOURCE: U.S. ENERGY INFORMATION ADMINISTRATION

→ NUMBERS

United or Not

IF THE UNITED NATIONS CAN'T PUT US ON THE PATH TO SUSTAINABILITY, ARCHITECTS SHOULD STEP UP.

TEXT BY KRISTON CAPPS
ILLUSTRATION BY JAMESON SIMPSON

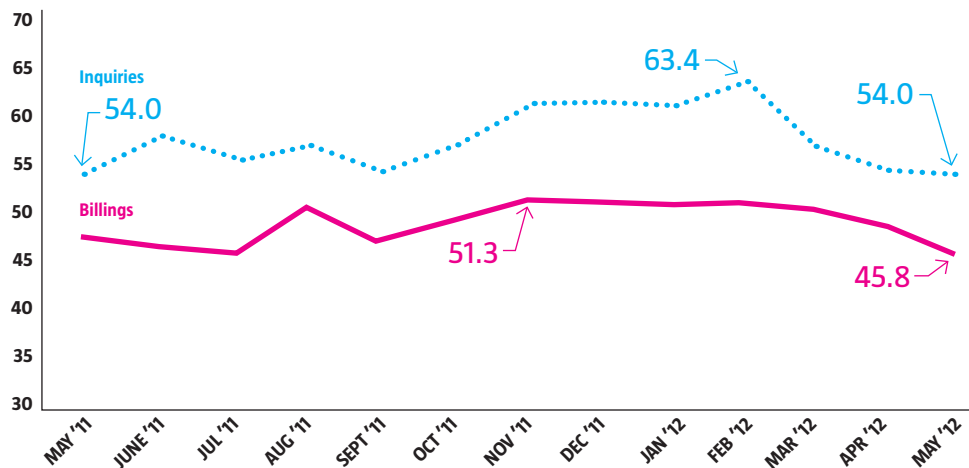


BEFORE THE RIO+20 SUMMIT had reached its conclusion in late June, environmentalists were already arguing that diplomats had agreed to a weak draft. The more than 190 diplomats assembled for Rio+20, United Nations Conference on Sustainable Development, had failed to define “sustainable development goals,” according to reports.

But that’s been true for nearly 20 years. The first Rio Declaration on Environment and Development, adopted in Rio de Janeiro in 1992, outlined 27 lofty principles regarding global environmental stewardship—but no concrete steps to take to get there. Two big pushes since to implement an environmental-protection paradigm with teeth have failed: first, the Kyoto Protocol, which was adopted in 1997, but without the participation of the United States, then the worst energy offender in the world (today, China consumes more energy); and second, the Copenhagen Accord, a nonbinding agreement that passed in 2009 to almost no consequence.

The planet can’t afford to wait another 20 years for world leaders to take steps toward sustainability. Fortunately, architects and builders and their constituent regulatory bodies can succeed where the global regime has failed: by curbing emissions through national and international standards. Much of the world’s fossil-fuel consumption is linked to buildings, and by promoting market transparency and regulatory efficiency standards, states and firms can not only curb emissions—they can save a billion or two. □

BILLINGS AND INQUIRIES INDEXES



MAY 2012 ARCHITECTURE BILLINGS INDEX

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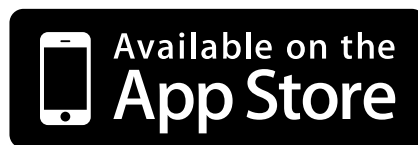
- ↓ 50.7 commercial
- ↓ 45.6 institutional
- ↓ 41.5 mixed practice
- ↓ 48.9 multifamily residential

SOURCE: AIA

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On the Boards

EDITED BY DEANE MADSEN, ASSOC. AIA



China Mobile Headquarters

LEO A DALY

Leo A Daly has won the competition to design the second phase of the new 1.3-million-square-meter (14-million-square-foot) China Mobile headquarters in Beijing, working with local firm WDCE to propose three buildings within the larger 26-building complex. The design concept for two of the three buildings inverts the typical office-circulation core, wrapping research and development labs with perimeter staircases, the paths of which can be read graphically on the buildings' exteriors thanks to large, diagonal windows that punch through the vertical fins of the brise-soleil. The third building, which will house public amenities, aims for Three Star Green Building standards (equivalent to LEED Platinum). The other two anticipate LEED-Gold-equivalent certification; all three buildings are thermally insulated with green roofs. According to Walter E. Geiger, AIA, design director of Leo A Daly's Washington, D.C., office, one of the challenges has been the speed at which the project has progressed: "A lot of these issues on energy get hammered out on a day-to-day basis, as costs are coming in," Geiger says. Throughout the process, however, China Mobile's commitment to energy efficiency has carried through; as Geiger puts it, "energy will always be part of the discussion." Leo A Daly's portion of the project is expected to open in late 2013. **DEANE MADSEN**



Corning Museum of Glass Expansion

THOMAS PHIFER AND PARTNERS

Thomas Phifer, FAIA, has revealed his design for the 100,000-square-foot Corning Museum of Glass North Wing Expansion. The new wing of the Corning, N.Y.-based institution will feature new galleries for the museum's collection of contemporary works in glass and calls for the renovation of the Steuben Glass Factory. Home to a collection of 45,000 objects that span 3,500 years of glassmaking, Corning's campus also has a stellar architectural history, including buildings by Harrison and Abramowitz, and Smith-Miller + Hawkinson Architects. These existing structures and Phifer's expansion will define a new public park, designed by the landscape architecture firm Reed Hilderbrand. The new wing's white-aluminum shell is articulated with ultrathin, vertical glass blades, occasionally interrupted by expanses of flat vision glass, such as a 150-foot-long window wall that will provide views out to the campus green. The new galleries comprise a series of softly rendered sculptural divisions enclosed in a crisp glass-and-steel shell. Phifer's renovation of the Steuben ventilator building will keep the structure's unusual profile, while providing a venue for the museum's live glassmaking presentations. The museum anticipates the new wing to open in 2014. **SARA HART**



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AIA VOICES

SOCIAL AGENT | EXPANDING ARCHITECTURE'S DISCOURSE

Michael Kimmelman, the longtime chief art critic and foreign correspondent for The New York Times, became the newspaper's architecture critic in late September 2011. He has written on a range of topics, including public housing, ballparks, landscape urbanism, campus expansion, transportation, public space, and the reinvention of iconic buildings. Kimmelman thinks that architecture is a public expression and should be discussed as such. "We've allowed the conversation to drift from social agency," he says.

Not exclusively but to a large extent, the public conversation about architecture has been dominated by people who shared particular interests in formal and material innovation. These are central issues and fundamental to my job. But there have always been vast numbers of people interested in buildings, landscape, and urban affairs, infrastructure and planning, in the interaction of formal and social inventions—people who have profound interests in cities and transportation and the way we live—who have felt left out of the conversation. So in part, taking over as the *Times's* critic, I felt that my job should be to broaden the conversation.

Architecture, after all, involves much more than just making sculpture. Architects have to contend with a complex range of economic, social, and practical challenges, and their buildings exist in the real world. I write for a broad public that includes architects and, like all writers, I expect that people ultimately read what I write based on the quality of my voice. Good criticism is in the end about

good writing. Any good critic's first and last job is to be a compelling writer. Lewis Mumford and Jane Jacobs were wonderful writers. Michael Sorkin is a fantastic writer and his positions are invigorated by the vividness of his prose.

And architecture gives a writer an immense range of subjects to cover. One of the many beauties of architecture is how it intersects with so many aspects of life and the news. I'm looking into the design of healthcare facilities now, and that overlaps with issues such as health and social services, Washington politics, science, and technology. My role is of course to be a responsible reporter, to investigate and talk to a wide range of people. But also, I'd like to believe that my role is to act as an advocate, not simply to respond to what's proposed or built—which often means going beyond the role of a reviewer, as criticism is so often defined. Architecture is far too important to lose itself in questions about the state of criticism, which is not interesting.

I look back to Ada Louise Huxtable, who created the position I hold at the *Times* and who treated it as a public-policy job. There's as strong an aesthetic component to her writing as there inevitably is and will be to mine. But the role of the architecture critic is ultimately to situate buildings in the larger world and in the larger conversation, which comes down to how society works, what our values are, where we choose to spend our money, and how our blocks and cities define who we are for each other and posterity.

—As told to William Richards **AIA**

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Compiled by William Richards

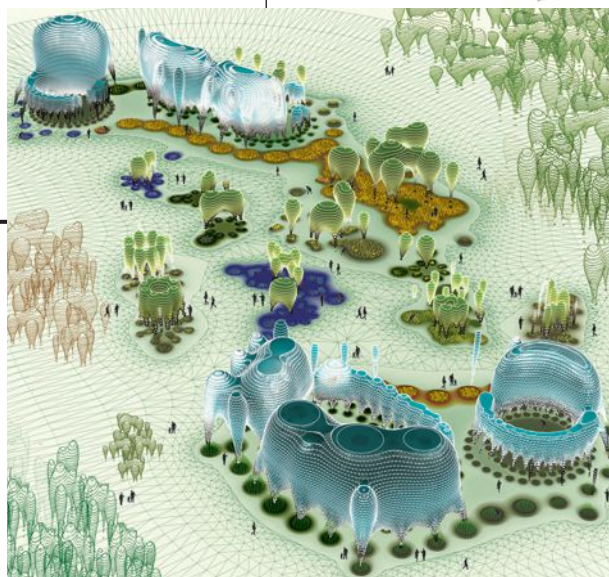


2 Now Boarding

DAM
July 15

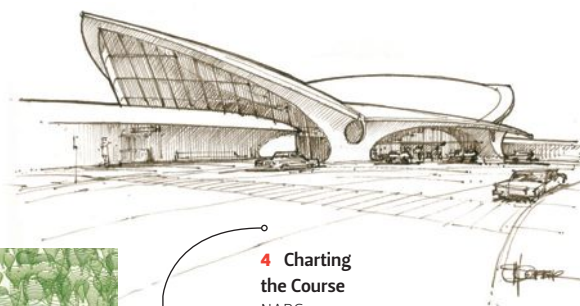
3 Lecture Notes

AA School
July 7 and 9



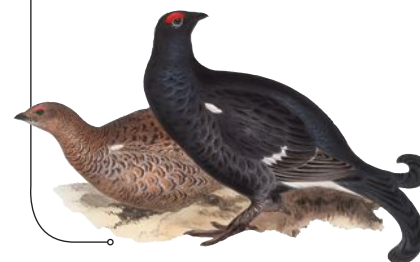
4 Charting the Course

NAPC
July 18



5 100 Years Ago

AIA Florida
and Maine
July 1



1 On the Brink

What is Missing?
Ongoing

1 On the Brink of Extinction. With the Vietnam Veterans Memorial (completed in 1982), Maya Lin transformed the way we think about grief and memory using two simple gabbro walls set into the earth. But her most recent project is not something you'll find from the window of a tour bus or walking down the street: "What Is Missing?" is a Web-based register of extinct and endangered species across the globe. Transforming the memorial genre once again, Lin's site moves away from the static object towards what she calls "a work that can exist in multiple forms and in multiple sites, simultaneously."

➔ Learn more at whatissinging.net.

2 Now Boarding. Despite the hassles of air travel, airports are safer now than they were a decade ago. A number of new designs by Denver-based Fentress Architects balance the things we need an airport to do (protect us) with the things we want when we travel (efficiency, comfort, and maybe a little glamour). "Now Boarding: Fentress Airports + the Architecture of Flight" will chronicle these solutions at the Denver Art Museum from July 15 through Oct. 7, combining film, animation, models, and full-scale mock-ups.

➔ Learn more at denverartmuseum.org.

3. Lecture Notes. Summer design studios have been a staple of architectural education for some time; this summer, two courses are taking on the city-as-subject in innovative ways. The Architectural Association's "Cyber GARDENing the City" (July 7 to 17) draws from a nascent network of biofarms in Milan to see if new models of community design are possible in other cities. More than 3.3 billion people now live in urban areas, and that number will swell to more than 6 billion in 2050, according to the United Nations. So it's a good time to be thinking about the future of the city. The New York-based nonprofit ONELab will launch "Future Cities" (July 9 to Aug. 3) to examine "what is salubrious about the city in both its forms and its life" and its potential to be a self-sustaining place in the coming decades.

➔ To learn more, visit aaschool.ac.uk/milan and onelab.org.

4 Charting the Course. Preservation works unite! The National Alliance of Preservation Commissions holds its biannual forum this month to focus on the needs and issues of preservation commissions and commission staff across the country. "Charting the Course" (July 18 to 22 in Norfolk, Va.) will cover building types, downtown revitalization, disaster mitigation, and historic districting through lectures, panels, mobile workshops, and tours. AIA continuing education credits will be offered.

➔ Learn more at napc.uga.edu/forum2012.

5 And It Seemed About 100 Years Ago. Centennial celebrations this year include Jackson Pollack's birth (Jan. 28), the *Titanic's* end (April 15), and Albania's declaration of independence from the Ottoman Empire (Nov. 28). To round out the list, AIA Florida and AIA Maine also are in the middle of celebrating 100 years. Mainers were treated to a gala celebration in May, and Floridians have been enjoying the results of "Florida Architecture: 100 Years. 100 Places." (aiaftop100.org), which chronicles the state's popular choices among architects and the public.

➔ Learn more at aiamaine.org and www.aiafl.org.

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ILLUSTRATION: RANDY LHMUS

Part two in a three-part series on balancing design and business.

I AM A FORMER WATER BOY FOR AN NFL TEAM, AND NOW A FOOTBALL fan and season ticketholder. At each home game for my team, two guys hold up a large white letter “D” and a small cardboard picket fence, prompting calls for “Deeee-fense!” by the crowd.

But there are times when it’s unclear if we’re spectators or players. Legally, this is not a good position to be in.

Lawyers like to say things in threes. They want you to “discharge, release, and waive” claims, or to “indemnify, hold harmless, and defend” against lawsuits. As legal counsel, what does it mean to defend a client against suits, claims, and demands (another trinity)? It means that you assemble a legal team and hit the field when a lawsuit is filed against your client. But does your insurer cover the defense of your client in a lawsuit that does not name your firm? Before there is any ruling that you are at fault?

What happens if you defend your client all the way to trial and win? You are not at fault; neither was your client. You should not have to pay the legal bill, right? Wrong.

Consider the facts in a 2008 California case, *Crawford v. Weather Shield Manufacturing Inc.* In this, a subcontractor, Weather Shield, contracted with JMP, the developer-builder of a large residential project, to supply wood-framed windows. The subcontract said that Weather Shield would, first, indemnify and hold JMP harmless against all claims for damages or loss growing out of the execution of Weather Shield’s work. Second, Weather Shield (at its own expense) would defend any suit or action brought against JMP founded upon the claim of damage or loss. Nothing said the sub had to actually be at fault—just that the “claims” had to “grow out” of the sub’s work.

Owners of 122 homes sued JMP, Weather Shield, and others, claiming various defects such as leaky windows. JMP then sued

Weather Shield under the subcontract clause, saying that it was entitled to indemnity *and* defense from these claims. The jury found that Weather Shield was not negligent; the leaks were due to another sub’s work. However, the trial court said that Weather Shield had to pay \$131,274 for JMP’s defense costs—and that JMP was allowed to recover an added \$46,734 in attorney fees incurred to sue Weather Shield.

California’s highest court upheld that decision, holding that the subcontract says what it means and means what it says: “The duty promised is to render, or fund, the service of providing a defense on the ... [client’s] behalf—a duty that necessarily arises as soon as such claims are made against the ... [client], and may continue until they have been resolved.” Worse yet, a California statute said that when a person agrees to indemnify another against claims, demands, or liability, that means they’ve agreed to absorb the costs of defense as well, even if the word “defend” is not in the contract.

A helmet to the chest, to be sure. It is likely that an architect’s professional liability carrier would deny payment of these damages. Policies provide for the insured architect’s defense, but not for the client’s defense—especially when the insured architect is found not negligent. A common insurance clause excludes damages assumed by contract that the insured would not otherwise have under the law.

What’s the bottom line? Read your contracts. Carefully. Get your insurance agent to review the indemnity clauses. Don’t presume that just because you are not at fault, you have no liability to your client.

—G. William Quatman, Esq., FAIA **AIA**

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New Amsterdams

As water levels and the risk profiles of major coastal cities rise, new experts are meeting the challenge.

BY BILL MILLARD

IF POPULAR CULTURE IS ANY MEASURE OF COLLECTIVE OBSESSION, people are apparently transfixed by natural calamities. Since 1972, the entertainment industry has produced at least 44 feature films and TV dramas about hydrologic or climatologic disaster (excluding all the earthquake, epidemic, nuclear, and bioterror flicks). A majority of these films are American and appeared after 2000. For a nation fascinated by imaginary catastrophes, though, the U.S. has done alarmingly little to prepare for real ones—the ones that climatologists know are coming.

“With this topic of resilience, we’re where we were with the topic of energy in the 1970s,” says Donald Watson, FAIA, a principal at Trumbull, Conn.-based EarthRise Design, co-author with Michele Adams of *Design for Flooding* (Wiley, 2010), and a pioneer in environmentally responsive architecture for the past five decades. Watson was among the first American architects to approach conservation, sustainability, and resilience—concerns that were cutting-edge when Watson began his career in the 1960s, and that have since been advanced by the AIA, the U.S. Green Building Council, and others on a professionwide scale. Now, Watson champions disaster preparation, viewing it as essential to “resilience in its deepest sense” and calls for collaborations between architects, engineers, insurers, planners, and building owners to accommodate inevitable challenges to the design professions.

The global trend toward urbanization has made disaster preparation even more important: Urban density gives people a light environmental effect per capita, but because major cities have generally developed near water, sea-level rise in a more urbanized future puts more people at risk. Design strategies can help reconcile these benefits and risks,

though, particularly if they use and preserve natural defenses: Wetlands and woodlands, for example, have remarkable absorptive capacity. Pervious pavements, swales, plantings, and terraced reservoirs aid absorption and evapotranspiration; uninterrupted hardscape and heavily managed lawns have the opposite effect, increasing stormwater runoff and exacerbating damage. Defenses such as levees and bulkheads, as Hurricane Katrina proved, are essential but fallible. Lance Jay Brown, FAIA, who, with Illya Azaroff, AIA, co-chairs AIA New York’s year-old Design for Risk and Reconstruction committee (DfRR), attributes some of the recent interest in flood-resilient design to post-9/11 awareness of catastrophic risks as immediate, not remote.

Calculations by insurers support precautionary measures. Klaus Jacob, a geophysicist and urban environmental disaster expert at Columbia University’s Earth Institute, contended at a panel organized by DfRR last October that \$1 spent on hazard mitigation saves an estimated \$4 in destruction deferred. A 2010 Swiss Re/Entergy study of Gulf Coast assets finds that cumulative expected losses could reach \$350 billion by 2030, and makes a conservative projection that \$50 billion in adaptation through code upgrades, wetlands restoration, beach nourishment, roof-cover retrofits, and other “no regrets” measures would spare \$135 billion in annual losses over that same time period. Extreme climate-change scenarios, the Swiss Re report adds, raise risk profiles so that a “once in 100 years” event would be closer to a “once in 40.”

New York’s Balancing Act

Architects and planners in several coastal cities have joined engineers in planning for the worst. Among cities at risk, New York has the



AIAFEATURE

advantage of multiple nonprofit, academic, and public-sector institutions aware of the need for independent local plans. So DfRR and the city's Department of City Planning jointly sponsored the Freeboard Charrette on March 23 to develop new designs for vulnerable urban sites.

The charrette built on several related efforts, including a 2008 competition sponsored by the city's Office of Emergency Management—"What If New York City ..."—which was an exercise in emergency-housing design in the event of a Category 3 hurricane. A 2010 exhibition at the Museum of Modern Art, "Rising Currents," introduced the public to soft-adaptation strategies for New York's harbor and coastline. The city's PlaNYC 2030 and Vision 2020 waterfront plan include extensive wetlands restoration, flood-insurance map upgrades, and storm-sewer construction.

As City Planning's Michael Marrella told the charrette group, the city's model predicts sea levels to rise 2 to 5 inches by 2020, and 12 to 23 inches by 2080. This would submerge large coastal segments of the city—not "the Hollywood doom-and-gloom scenario" of universal inundation, but a higher-base-flood elevation that would worsen the temporary hazard that a 1 percent storm poses to subways, sewers, and streets. The impossibility of evacuating most of the city means that retreat is a less realistic strategy here than accommodation (raising critical mechanical systems above base flood elevation and designing exposed areas to let water enter and recede) and protective structures, both hard (seawalls, revetments, and watertight gates) and soft (graduated edge structures, reducing tidal speed and force).

San Francisco's Trade-offs

On the Pacific coast, accelerating erosion (especially harsh during El Niño years) has become dramatic enough to threaten Ocean Beach, a magnet for tourists, wildlife, and city residents. The south end of the beach is thinning; two years ago, a bluff receded 40 feet in a single season. Moreover, the risk affects not just treasured views and recreation but vital sewer and wastewater facilities along with the Great Highway, a 3.5-mile, 1929-era road above the sewer pipe. Where damage involves rising levels and the power of tides, hardening one area can raise risk in another.

Having produced several reports on regional sea-level rise, the nonprofit think tank San Francisco Planning and Urban Research Association (SPUR) offers a new master plan to orchestrate mitigation at the site. "A fundamental challenge at Ocean Beach is jurisdictional," says Benjamin Grant, SPUR's public realm and urban design program manager. The beach is part of Golden Gate National Recreation Area; the infrastructure

adjacent to the coast is owned by the San Francisco Public Utilities Commission; regulatory purview belongs to the California Coastal Commission. Further complicating the picture are multiple nearby city parks and open spaces. "There hasn't been one logical client entity that's charged with looking at the future of the whole beach, as a place," Grant says.

SPUR's plan is threefold: "managed retreat" through rerouting and narrowing of the Great Highway; targeted hardening of the sewer pipe beneath a lower cobblestone structure; and "sacrificial beach nourishment" to dissipate wave energy, using sand that the U.S. Army Corps of Engineers annually dredges from the Golden Gate ship channel. SPUR's planners have opted for strategic trade-offs between advocates of "armoring the hell out of the whole thing" and advocates of abandoning the existing infrastructure. "In a way, we're the tip of the spear," Grant says. "What we're seeing at Ocean Beach is a taste of what we're likely to see much more broadly as sea-level rise sets in."

New Orleans's Comprehensive Plan

Hurricane Katrina made New Orleans and other Gulf communities the national test cases for this field of planning and design. "The first lesson from New Orleans is: You can't move a community," says David Dixon, FAIA, principal at Boston's Goody Clancy and a part of the team behind the United New Orleans Plan (UNOP), the city's recently adopted master plan, and the related Comprehensive Zoning Ordinance (CZO) currently going through drafts and hearings. "You can't move a city; it's almost impossible in America today to move a neighborhood."

After former Mayor Ray Nagin and the Urban Land Institute's 2006 green-dot plan to reshape settlement patterns aroused ferocious opposition in affected neighborhoods, officials and planners learned that mandatory abandonment of homes, even for beneficial features such as parks, was a nonstarter. UNOP, funded by the Rockefeller Foundation but driven by grassroots input, established every neighborhood's right to survival and protection. These principles were revisited and affirmed in the new master plan, which thanks to a city-charter amendment passed in 2008, will have the force of law.

Another lesson learned is the need for more-accurate property valuation. "Now that we know what it costs to rebuild after a storm," Dixon says, "we have some pretty good numbers for what it costs to build New Orleans. And we know what percentage of those costs, or what share of those costs, at least the last time around, was borne by insurance companies. So if your house is not elevated, for instance, your premiums are much higher."

"New Orleans is actually relatively safer today than it was before Hurricane Katrina," he notes. "It is a city that is going to be protected, as is the Netherlands, by manmade interventions and man-led interventions, meaning restoring wetlands."

But the most decisive change may be cultural. "Before Katrina, New Orleans had begun a comprehensive plan that got pretty much withered," Dixon says. "It was not a city that took planning seriously; land-use decisions, building decisions, city-infrastructure investment decisions were all political." UNOP helped change the atmosphere, building on a tradition of community-based activism to create a new culture of participatory community-based planning. Dixon concludes that "it's about getting people comfortable with planning" so the process can be flexible, responsive, and, above all, effective. **AIA**

➔ To learn more about disaster mitigation and recovery, visit aia.org/disasterresponse.

AIA PERSPECTIVE

AN ARCHITECTURE OF ABUNDANCE



PHOTO: WILLIAM STEWART



I HAD PLANNED TO DIG DEEPER IN THIS COLUMN INTO ARCHITECTURAL criticism, a topic that I raised in last month's AIA Perspective. But in light of the recent AIA Convention in Washington, D.C., I want to take a different, if related, tack. The historian David McCullough, our first keynote speaker, got a chuckle from the crowd when he called attention to our nation's deliberate cultural amnesia. This is how he put it: When we greet one another, we say, "What's new?" We never ask, "What's old?" In a musical phrase, this would be a leading tone that sets the chord progression. McCullough lamented our tendency to ignore the lessons of the past, implying that our profession might be susceptible as well. While there is much to know in historical precedent, he was not advocating nostalgia. Instead, he was making a point about how careless we can be about telling our stories.

Let me rephrase that: Too often we let other people tell our stories. When we do the talking, too often we spend more time complaining than anything else: There are not enough students going for their licenses, the academy doesn't understand the world of practice (and vice versa), clients nickel and dime us to death, and other members of the design and construction team are eating our lunch. And this is where the state of architectural criticism is relevant: How can we expect observers of the scene to be more positive and supportive of the profession when we ourselves are so hard on one another?

Without dismissing the very real challenges facing our profession, let me suggest that it might be time to tell the other side of our story—a point I touched upon last month. Let's focus on what we have, not what we lack. Call it speaking from the perspective of abundance and not of scarcity. Consider what AIA Convention attendees experienced in the general sessions: an architect who was honored for devoting his life to increasing the opportunities

for a more inclusive profession; a professor celebrated for lighting creative fires in the minds of his students; a firm recognized for demonstrating the very best of collaborative work; an AIA Gold Medal recipient who paints with light; projects from all over the country that are making a positive difference in their communities; men and women elevated to AIA fellowship for a lifetime of accomplishment; non-architects awarded honorary membership because of their support for architects and architecture.

Architecture is a profession of incredible abundance. Consider the increasing number of emerging professionals who regard pro bono work not as something one does after hours, but the very core of what it means to be an architect. Yes, the average person may never hire an architect. Yet consider the potential effect of millions of new clients—all of the people hungry for the creativity, empathy, and joy that defines what we do and the spaces we create. We've barely scratched the surface. This is the other story we should and must be telling.

McCullough's keynote appearance at the AIA Convention was bookended by the architects involved in post-9/11 rebuilding and memorializing in New York, Shanksville, Pa., and at the Pentagon, who relayed what the rebuilding experience has meant to them. They certainly conveyed a positive message about our profession's ability to aid healing in the midst of pain, and to affirm life over death. As we listened, who could not be proud to be an architect? Without stories, memory falters; and without memory, imagination fails. Ours is a story we must tell to inspire those around us and, not least, ourselves. **AIA**

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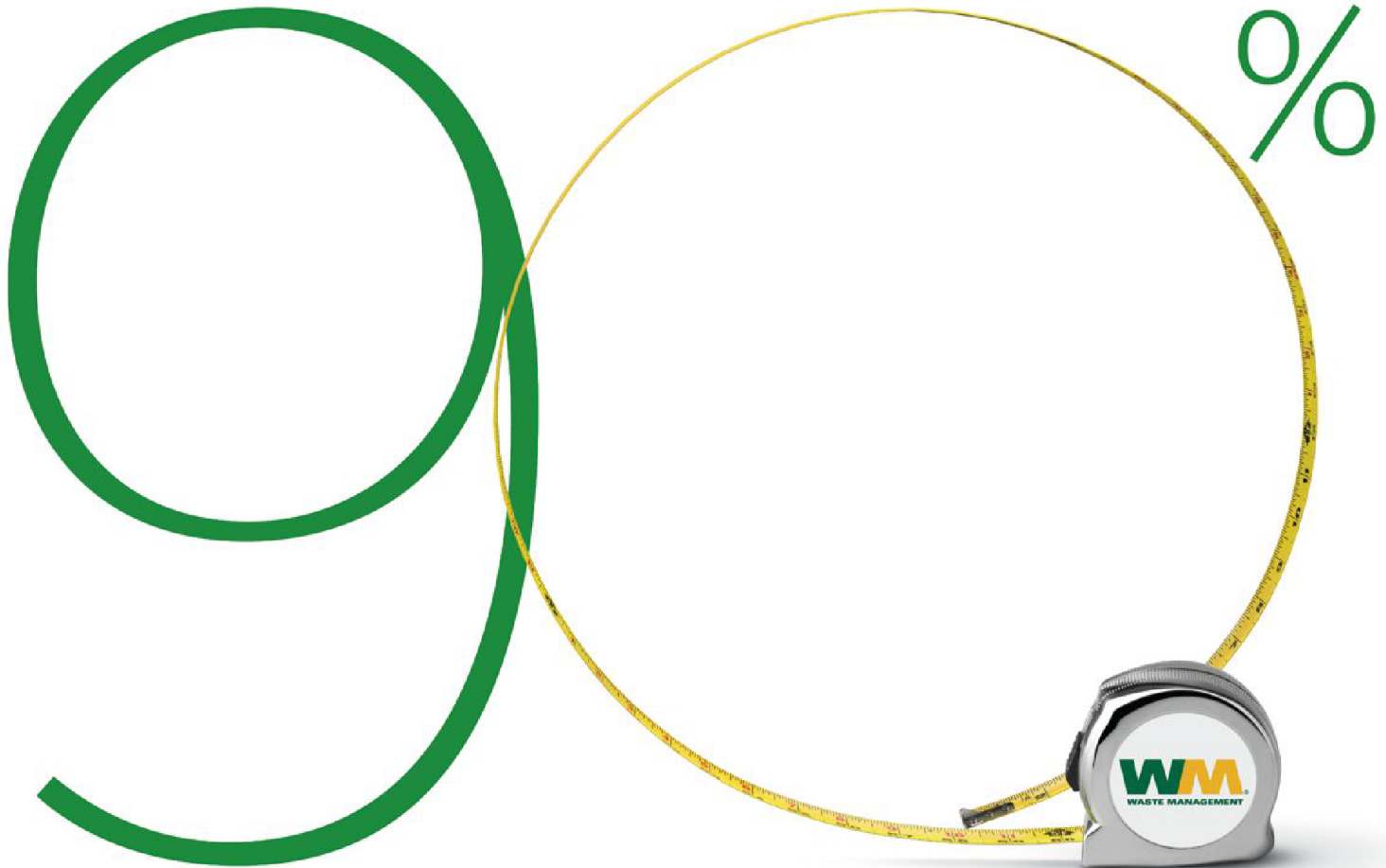
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THE LACK OF DIVERSITY IN ARCHITECTURE ISN'T A SIMPLE PROBLEM, BUT THERE ARE BETTER AND WORSE WAYS TO APPROACH THE ISSUE. ARCHITECT AND YALE UNIVERSITY PROFESSOR **DEBORAH BERKE** OUTLINES WAYS TO PURSUE DIVERSITY.

INTERVIEW BY ERNEST BECK
PHOTO BY NOAH KALINA





THE FREQUENT COMPLAINT that the architecture field lacks gender and racial diversity is backed up by statistics. As of 2011, just 15 percent of licensed architects were women, and just one percent were black, according to statistics assembled by the AIA. While a number of women architects have recently ascended to more-prominent positions and global recognition—Zaha Hadid, Hon. FAIA, was named a Dame Commander of the Order of the British Empire in June—women and minorities are still underrepresented in the profession. Though they face numerous hurdles getting ahead today, the field is slowly starting to change, according to Deborah Berke, 58, founder and partner of the 33-person

blows help drive women and socioeconomic minorities out of the profession.”

Seek diversity.

“I don’t want to reduce male architects to a stereotype either,” Berke says. “It’s a broader problem than that.” Architects must address a number of issues facing the entire profession, such as reducing student debt, she says, because that discourages lower-income students from entering the field. At the same time, students should see at a young age that the world of architecture is a viable profession for women and minorities. And within the field, architects need to increase awareness among the suits at the table using “constant gentle pressure” to push others to be more patient, more open-minded, and more inclusive. “Because in the long haul, everyone benefits from being aware that change is necessary and essential to have more diversity in the field,” Berke says.

Get certified.

Certification as a Women’s Business Enterprise (WBE), which grants eligibility to bid on certain projects with provisions for women- and minority-owned businesses, can be good for certain firms. “We were certified in 1988, at a time when I thought it would be helpful for a young practice. Over the years, I can’t say that certification has changed my life or has been a major factor in securing work for the firm,” Berke says. “Yet there have been instances where having it has mattered to someone on a committee, or in a non-official capacity. It is a higher credential that might be considered as part of a qualifying process and so it does mean something, especially if you are bidding as a subcontractor.” If you think that WBE certification can help you get work, then it is certainly worth considering.

Seek out—or serve as—a mentor.

“There weren’t many women in my class at architecture school, but when I see my students now at Yale, they are very articulate about many of these concerns,” she says. “They are aware of the issues and are talking about what it means to be a woman architect. In my studio design class this semester, six out of the 10 students are women. And most of them said they had chosen that class because they wanted to study with a woman professor. They are looking for role models, and, in turn, these women will foster more role models.”

Stay strong.

Just as there is not one reason for the disparity in architecture, there is not one solution to the problem. You must have endurance, diligence, and fortitude. But know that things are changing. “Ultimately, being an architect for me is so profoundly satisfying and fulfilling that it has been well worth the trudge,” Berke says. “I would like to convince other women and anyone from different races and religious and ethnic backgrounds that this could be true for them as well. I want them to say, ‘Oh my God, I can make a living from doing this job.’” □

“THERE WEREN’T MANY WOMEN IN MY CLASS AT ARCHITECTURE SCHOOL, BUT WHEN I SEE MY STUDENTS NOW AT YALE, THEY ARE VERY ARTICULATE ABOUT MANY OF THESE CONCERNS. THEY ARE AWARE OF THE ISSUES AND ARE TALKING ABOUT WHAT IT MEANS TO BE A WOMAN ARCHITECT. IN MY STUDIO DESIGN CLASS THIS SEMESTER, SIX OUT OF THE 10 STUDENTS ARE WOMEN.”

firm Deborah Berke and Partners in New York—which employs about a nearly equal number of men and women. Berke, who also teaches architectural design at Yale University, spoke to ARCHITECT about the challenges that women and minorities confront in a profession dominated by white men.

What’s missing?

There are a number of women architects who are currently at the top of the profession. Zaha is the name that everyone cites, but there are others, such as Jeanne Gang, Elizabeth Diller, and Annabelle Selldorf, Berke says. “I myself am doing well. For these people, I would say, the issue of being a woman has less importance now than when they started out. But the broader problem is not about the exceptions,” she says. “It’s about the general absence of women and minorities in the field, whether it’s in design or related construction and engineering industries.”

Know the (many) reasons.

Those who reduce the absence of women from the field of architecture to a single reason—such as a desire to raise children—miss the real reasons that women feel discouraged. “Family concerns are, of course, part of challenge, but it’s more like death by a thousand cuts, including low salaries or the experience of being a young woman architect who is ignored when she’s in a room that is 90 percent male,” Berke says. It’s the repeated occurrence of several dozen little things, rather than one fixed particular element, she says. “These recurring small



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It started with a whisper in 1996. Arquitectonica's adaptive-reuse Ballet Valet Parking Garage on South Beach retained historic Art Deco storefront façades on the street level, but installed a lush, vertical-gardened garage on top for a quiet, urban landscape. Herzog & de Meuron cranked up the volume 14 years later with its

hotshot Miami Beach garage, 1111 Lincoln Road. It may be the first parking-garage-as-destination—it has even hosted weddings. "There's nothing that causes a blander look than telling people, 'I'm taking you to a parking garage,'" said Miami resident Chaire Sicha, cofounder of the website *The Awl*, when asked by *The Huffington Post* where he takes out-of-town guests. "And you're like, 'Wait, don't panic, it's a parking garage with a *New Yorker* architecture critic review!'"

Then there's TEN Arquitectos, Gehry Partners, and Zaha Hadid Architects, who have all brought their talents to South Beach as well. But it's not just Miami that's experimenting. Everyone is trying new solutions. As a few recent projects make clear, some innovators would like to build garages that do more than just house cars.



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Ehrlich Architects, for one, would like to supplement sportscars with sports. In Claremont, Calif., the firm recently consolidated Pomona College's parking into a garage with a lacrosse-and-soccer field on top. The college wanted to free up space for further campus expansion, using old lots for new building sites. So the firm, based in Culver City, Calif., partnered with Watry Designs, a parking-specialist firm from San Jose, Calif., to design the two-story, 318,000-square-foot facility, whose 608 spots opened in April 2011. "Look at it as an opportunity rather than a hunk of concrete that stores cars," says principal

Steven Ehrlich, FAIA. "A lot of people are creating structures out of photovoltaics to shade cars, but I think we should push conceptual issues even further."

Michelle Watry of Watry Designs, the structural engineer and executive architect for the project, says that besides serving multiple purposes, the garage checks off another trend, the seemingly counterintuitive one of integrating car parks within their environments. Ehrlich and Watry bermed up the southeast corner of the



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“A LOT OF PEOPLE ARE CREATING STRUCTURES OUT OF PHOTOVOLTAICS TO SHADE CARS, BUT I THINK WE SHOULD PUSH CONCEPTUAL ISSUES EVEN FURTHER.”

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garage so that it fuses into the campus. “It’s like a non-building,” Ehrlich says. “It’s more like an earth-landscape environmental piece, even though it is a fairly large volume where cars park.”

In the city center of Carros, France, a half-hour away from Nice, N+B Architectes also turned the pragmatic, nonaesthetic parking structure into a multipurpose architectural design that fits cohesively with its environment. “Usually a parking structure is only a box for cars,” notes N+B principal Elodie Nourriga. But the 46,274-square-foot lot-on-a-landscape takes advantage of its roof by offering an open public space and a shop. Benches and trees surround the site, offering suburban respite. And the exterior of the 240-spot garage is wooden and latticed—an additional connection to the landscape.

The 2010 garage, commissioned by the cultural center of the Coteaux d’Azur, effectively serves as connective tissue between the city and surrounding countryside, providing an activation point rather than a dead hole in the manmade-to-natural fabric. “On one side, it’s the suburban part, and on the other, it opens onto a beautiful natural landscape,” Nourriga says.

And speaking of landscapes, those architects are getting in on the parking game, too. New York landscape firm Michael Van Valkenburgh Associates (MVVA) is now working on an underground garage in Toronto for the Harbourfront Centre, the number-one cultural destination in Canada, says associate principal Gullivar Shepard.

The structure, a collaboration with New York architecture firm Beyer Blinder Belle, was commissioned in 2009 as a 300-spot garage that would free up public space on the York Quay of Lake Ontario. MVVA pushed that program to include an installation by James Carpenter Design Associates (JCDA), also based in New York. On the inside of the structure, a light well by JCDA will bring daylight into the stereotypically dank, dark, and often anxiety-inspiring experience of an underground garage. It’s also a wayfinding point, one that helps limit the garage’s dependence on electrical energy for lighting. Passive-air circulation, aided by a few fans, will bring air, sunshine, rain, and snow into the structure, to keep it connected to the outside. “You had to do something big and robust to counter some of that deadness of garage architecture,” Shepard says.

The project also has an urban strand of trees on top. Through selective coppicing—an ancient form of forestry that involves cutting trees off at the trunk, so that each tree regrows stick-straight—MVVA hopes to offer the Harbourfront Centre timber for harvesting as well as an





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artistic attraction when the trees are uniform stumps. Shepard thinks that the firm's "urban-stand-of-trees-as-green-roof" may be a first.

"Would you traditionally have a landscape architect do this project? No," he says, "but we're interested in exploring this new conceit of landscape urbanism that's out there now." The surrounding area will also be available for programming by the center when the project is finished this October.

In truth, starchitect garages go back even further than Arquitectonica's 1996 Miami project—Paul Rudolph's 1962 Temple Street Parking Garage in New Haven, N.J., and especially Bertrand Goldberg's 1965 Marina City in Chicago come to mind—but this generation's focus on multipurpose parking is surely the fruit of a denser 21st century. "We're at a pivotal point in what has become a very dynamic industry," says Shawn Conrad, executive director of the International Parking Institute, which conducted the *2012 Emerging Trends in Parking Survey* in May. "With new, high-tech tools, we have unprecedented ways to improve the landscape, enhance customer service, and support environmental stewardship."

So pay no attention to the garages behind the concrete walls. If architects have their way, like Sicha, you too will soon enough be treating your guests to a visit to the local parking garage—slash park, slash event space, slash gym, slash garden ... □

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SOY-BASED ADHESIVES

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THE PRODUCTS

Soy-protein-based wood adhesives have been used for centuries. Since World War II, they have been largely replaced by petroleum-based adhesives with superior performance and economics. Current research is focused on developing and commercializing two soy products.

1. A soy/phenol-resorcinol-formaldehyde (PRF) system for use in oriented strand board (OSB) and plywood.
2. A soy meal/flour formaldehyde-free adhesive to replace UF adhesives.

EMERGING MARKETS

There appear to be emerging new markets for soy in heat-resistant adhesives, biobased composites and enzymatic processing for new soy hydrolyzates. Soy adhesives do perform very well in high-heat testing of structural engineered wood products like finger joints and I beams. These adhesives have been shown to have superior heat resistance, prolonging the structural integrity of the wood structure in a fire.

Soy proteins are being developed as a binder to provide a renewable, plant-fibers-composite particleboard and medium density fiberboard. These composites could be a cost-competitive, formaldehyde-free solution to traditional wood composite particleboard and medium density fiberboard.

Iowa State University has developed an enzymatic approach to making soy hydrolyzates that can be tailor-made to be used with phenol formaldehyde resins in OSB and softwood plywood. The new approach is more environmentally friendly and less expensive than the traditional use of caustic and high-temperature and high-pressure approaches.

New applications have been found in the construction adhesives and sealants markets. Bondaflex has introduced products that were developed by replacing petrochemical polyols with soy-based alternatives in urethane adhesives. The soy component has been shown to offer improved adhesion on a wide variety of substrates.

STATE OF THE ART

Most USB-sponsored research has concentrated on either reducing formaldehyde emissions in UF-produced wood composites or reducing the costs of using phenol in structural wood composites such as OSB and softwood plywood.

RELATIVE ECONOMICS/SUPPLIES

The major adhesive resins used for wood-composite panels contain phenol or urea, plus formaldehyde. Formaldehyde is made from methanol, which is made from natural gas. Phenol is derived from benzene and cumene, which are made from petroleum and propylene, which is made from natural gas in most of the world. Urea is a product of ammonia, which is primarily made from natural gas and carbon dioxide.

Formaldehyde pricing is dependent on methanol, which has fluctuated greatly in the last few years based on shortages worldwide. Urea pricing rose due to increased costs of ammonia then dropped significantly during the economic situation early in 2009. The costs of phenol are attributed to the cost of the base stock petroleum, which has followed the same trends as urea.

Soy meal/flour costs have remained flat for many years, but they recently increased due to increased demand for soy meal/flour. In spite of these recent price increases, soy meal/flour remains an inexpensive raw material for wood adhesives.

ADVANTAGES AND THE PATH FORWARD

New soy adhesives promise both improved performance and economics to the wood products industry. They also have shown to be excellent alternatives to urea-based products for interior applications where legislation now restricts emissions of formaldehyde.

USB supports research and testing to commercialize these products and ensure they meet industry standards. Working with industry partners, USB helps develop standard industry practices, an infrastructure to supply the products and acceptance of the resulting end products at all levels.

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NEW PROJECTS**1. UNIVERSITY OF LOUISVILLE CLINICAL & TRANSLATIONAL RESEARCH BUILDING**

Architect: Arrasmith, Judd, Rapp, Chovan, Louisville (architect of record); SmithGroup JJR, Detroit (design architect and lab planners)

Construction Cost: \$107 million

Completion: 2009

2. 21C MUSEUM AND HOTEL

Architect: K. Norman Berry Associates Architects, Louisville (architect of record); Deborah Berke & Partners Architects, New York (design architect)

Completion: 2006

3. RIVERVIEW PARK VISITOR SERVICE BUILDING

Architect: De Leon & Primmer Architecture Workshop, Louisville

Construction Cost: \$360,000

Completion: 2011

MARKET STATS**3.45**

EXPANSION INDEX VALUE, LOUISVILLE

The Expansion Index from Reed Construction Data is a 12- to 18-month look ahead at the construction marketplace. A value of 1.0 or higher signifies growth.

SOURCE: REED CONSTRUCTION DATA

1.2 MILLION

POPULATION, 2010

SOURCE: U.S. CENSUS BUREAU

4.2%

PROJECTED METRO POPULATION GROWTH BY 2022

SOURCE: NIELSEN SOLUTION CENTER

7.8%

LOUISVILLE MSA UNEMPLOYMENT, APRIL 2012

SOURCE: U.S. BUREAU OF LABOR STATISTICS

9.5 MILLION S.F.

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SOURCE: CBRE | LOUISVILLE

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CLASS A OFFICE VACANCY RATE, LOUISVILLE, Q1 2012

SOURCE: CBRE | LOUISVILLE

738

COMMERCIAL BUILDING PERMITS ISSUED THROUGH Q1 2012

SOURCE: U.S. CENSUS BUREAU

→ LOCAL MARKET

Louisville, Ky.



TEXT BY MARGOT CARMICHAEL LESTER AND CLAIRE PARKER

THERE'S MORE TO LOUISVILLE than college hoops and Churchill Downs. Research is big here, too.

"U of L made a commitment to establishing itself as a top research institution," says Arnold M. Judd Jr., vice president of Louisville's Arrasmith, Judd, Rapp, Chovan. "Over \$1 billion in new construction is planned over the next 20 years."

The University of Louisville's award-winning, roughly 290,000-square-foot Clinical & Translational Research Building is the first LEED-certified research facility in the state—and the first in a wave of projects heading for the city. The university foundation's economic-development arm, Nucleus KY, recently broke ground on a new 180,000-square-foot, eight-story building downtown.

These projects, along with the new KFC Yum! Center sports and entertainment complex, "have been very successful in bringing people to the center city," says local architect and developer Bill Weyland of CityVisions Associates. "The medical and research side alone is expected to create 30,000 jobs in the next five years."

These projects have spurred demand for multifamily rentals as well as for visitor amenities, such as the 21c Museum and Hotel. An adaptive-reuse project, the 90-room boutique hotel and restaurant was partially financed by New Markets and Historic Tax Credits. It earned a 2011 Honor Award from AIA Kentucky and a 2007 Excellence in Design from AIA New York State.

Louisville benefits directly from its strategic

convergence of three interstate highways. Home to UPS, the city is one day's drive from two-thirds of the U.S. population, making it a burgeoning hub for retailers such as Zappos.com and Amazon.com. "You can fly non-stop to any destination in the world—as long as you can fit in a UPS mailer," quips principal M. Ross Primmer, AIA, of De Leon & Primmer Architecture Workshop.

"Transportation is our greatest strength and is also our greatest weakness," explains Thomas Kute Jr., owner of local firm Thomas Kute. "Do the math. The city's northern and westernmost border is the Ohio River, over which we have three bridges that connect to the state of Indiana. Thousands of people live there and work here and vice versa." Congestion will be eased by the Ohio River Bridges Project, adding two new bridges at the most-needed locations by 2018.

The city's roadways were preceded by abundant green space. In 1887, city leaders engaged Frederick Law Olmsted to design a park and parkways system, which are still in use today. The Riverview Park Visitors Service Building I, the latest addition to the system, won a 2011 Annual Design Review award from this magazine as well as a 2011 AIA Kentucky Honor Award.

All this keeps River City residents bullish on their fair city, says Steve Eggers, AIA, managing principal of hometown firm K. Norman Berry Associates Architects. "Louisville is big enough to provide a great quality of life and small enough that you can make a difference." □

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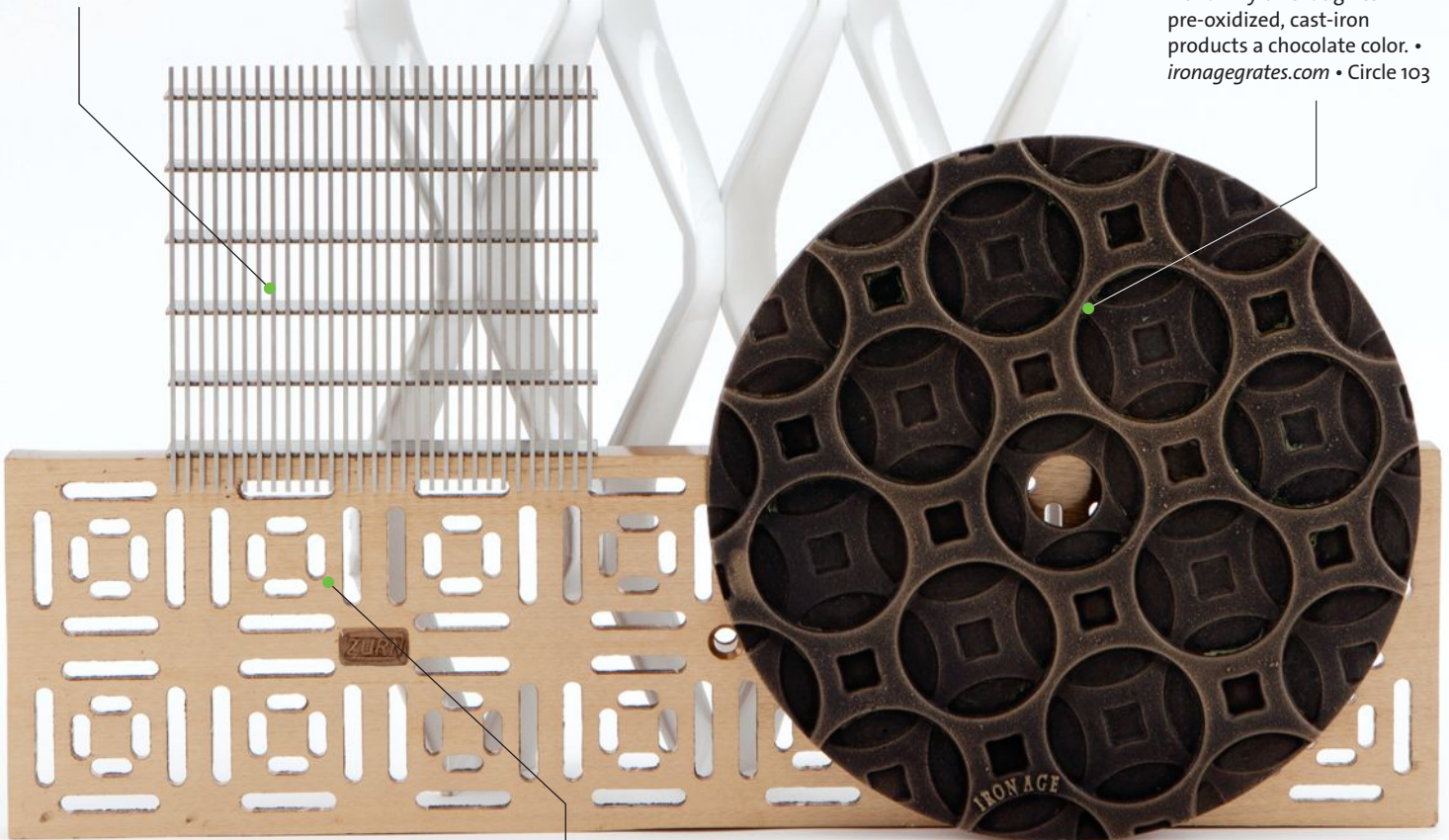
TEXT BY WANDA LAU

When two architects couldn't find an acceptable or affordable custom railing replacement for a multifamily residential project, they naturally started their own company, **Bök Modern**. Freed by technology from the traditional rigors of welding and grinding architectural metalwork, Bök laser cuts patterns out of flat metal sheets to create panels for walls, fences, and, yes, railings. As a bonus, all factory waste is recycled. **Lotus** (pictured here), a custom pattern inspired by a nest, is derived from a California casino owner's desire to update the exterior of his 1970s building. • bokmodern.com • Circle 100

In 1952, just seven years following his liberation from a World War II prisoner of war camp, the late Robert McNichols—the sole survivor of a B-17 bomber crash—founded **McNichols Co.**, dedicated to selling metal products with holes, such as its **Entrance Mat Grating**. The stainless steel grating with $\frac{1}{8}$ " slots allows dirt and water to pass (but, thankfully, not high heels). The future of the company, founded on a heroic past, now rests in the third generation of McNichols. • mcnichols.com • Circle 101

A good idea never goes bad, as illustrated by the process—first patented in the 1880s—used by **AMICO** to create expanded mesh. After die-cutting a sheet or coil of aluminum or steel with special knives that create a particular aperture pattern, such as **Apex 02**, the manufacturer stretches the material carefully into mesh suitable for cladding everything from ceilings to buildings. To wit, a little bit of metal can hold a lot of potential. • www.amicoarch.com • Circle 102

Based on classical designs dating from the Victorian era, **Interlaken** is one of many architectural casting patterns offered by Seattle-based **Iron Age Designs**. The company can apply a patina to give its bronze grates and lids an aged look. It also offers eco-friendly finishes such as raw-as-cast and baked-on-oil, the latter of which uses reclaimed french-fry oil that gives pre-oxidized, cast-iron products a chocolate color. • ironagegrates.com • Circle 103



Perhaps it is fitting that **Zurn Industries**, a global manufacturer in the oft-underrated drainage and fixture markets, had humble beginnings. Founded in the barn of J.A. Zurn's mother in 1900, the company got its break when it purchased a patent for a backwater valve from Erie City Iron Works. Today, Zurn's many product lines include the **P6-BZ**, which has a polished bronze finish. The company continues to run its original foundry in Erie, Pa. • zurn.com • Circle 104

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TEXT BY BRIAN LIBBY
ILLUSTRATIONS BY PETER ARKLE

More than four decades after the release of the sci-fi classic *2001: A Space Odyssey*—and 11 years after that film's namesake year—we're still working our way toward HAL 9000, the movie's omniscient computer that controls every aspect of our interior environment. But as the following four designers attest, we are making strides in the development of smart control systems for buildings. Though no building management system (BMS) is intelligent or crazy enough yet to wreak havoc as HAL did in Stanley Kubrick's film, today's systems go beyond turning on and off lights: They also anticipate user needs and adjust to changing conditions. In other words, they—like HAL—can think.



Michael Tatoyan, Stantec

Stantec engineer Michael Tatoyan underscores the “management” aspect in BMS. “They have logic capability. You can tell them how to behave and decide things based on conditions,” he says. One key development is the ability to monitor, report, and provide operations trends and history. “They tell me not just whether a valve was opened or closed, or how much energy you used, but also how much energy you didn't use.”

Thinking systems are becoming the norm on high-performance systems. “They give owners an opportunity to control a building to its actual needs ... and it will give designers data for what works and what doesn't,” Tatoyan says. Though automation systems exist primarily on larger commercial and institutional projects today, he says, “In the not-too-distant future, these are going to be code-minimum buildings.”

Designers should specify BMS manufacturers whose equipment operates on an open communications protocol to allow for system expansion or upgrading. A BMS with components proprietary to the manufacturer can lock the owner into expensive, long-term service arrangements.



Don Bailey, TLC Engineering for Architecture

Nemours Children's Hospital in Orlando, now under construction, is one of many hospitals advancing building management systems. Its BMS integrates lighting, HVAC, security, nurse calls, and patient-room controls to save costs and improve the patient experience, says senior mechanical engineer Don Bailey of local firm TLC Engineering for Architecture. “They're trying to not only take advantage of the integration of these systems for economic reasons, but it also makes their patient experience a lot better,” he says.

Nemours selected **Johnson Controls** as its installing contractor for building automation. Other big providers of building management systems are **Siemens** and **Honeywell**, Bailey says. Unfortunately, regardless of the manufacturer, a project's BMS can become obsolete even before its implementation because it must wait out construction. “We design a system maybe two years before it's turned over for use,” he says.

BMS can add 1 to 3 percent to the total construction cost—which hospitals can recoup in two to five years, Bailey says. “It's a no-brainer for most of our projects.”

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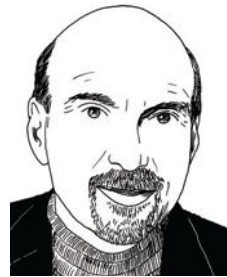


Ian Nestler, PGAL

From airport expansions to government buildings, Houston firm PGAL has designed projects with automated management systems of increasing sophistication. But the ongoing challenge is user interfacing, says principal Ian Nestler, AIA.

"Many times, we've installed a sophisticated system with all the bells and whistles, and then the owner and staff don't feel like they can operate the system as it's supposed to be operated," he says. "It's like being in class. You sit there and listen, but sometimes you still don't retain it. It takes a lot of follow-up to make that thing work." Designers must consider the available technology as well as their clients' willingness to maintain the system. "Some people love to play with programmable thermostats in their homes. Some want one that just turns on and turn off," he says.

BMS "installers come in and provide training to the maintenance staff, and we think they've got it," Nestler says. "Then you walk away, and the staff didn't realize this, that, or the other thing. Follow-up training is essential. ... If you're going for LEED certification, one credit requires coming back and analyzing performance over time; that helps to pinpoint a particular set of circumstances."



David Hobstetter, KMD Architects

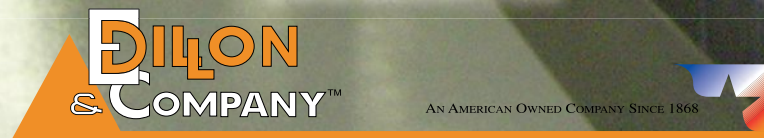
For San Francisco's new Public Utility Commission (PUC) headquarters, David Hobstetter, AIA, principal of local firm KMD, developed a custom BMS that controls 11 different systems, including electrical, mechanical, daylighting, and security. Because every system must be customized to the project, costs can be a barrier. "These systems do save money, but they all have payback requirements," Hobstetter says. Whether "you're looking for a one-, seven-, or 10-year payback will inform you as to what you can invest." Today, entry-level control systems are more affordable. "Even on run-of-the-mill developer buildings, we're seeing BMS," he says.

In the future, he says, "we'll see BMS become more sensitive and basically able to report more and give a finer grain of information as time goes on. This is all rapidly evolving. It's getting a lot more user friendly." One trend to look out for is the integration of additional buildings through shared-district or neighborhood-scaled energy generation. "Even from doing a super-green building, we knew we could make investments in the district energy that would reap huge savings," Hobstetter says. "Being able to load share and optimize from one end of the district to another is a very, very good thing." □

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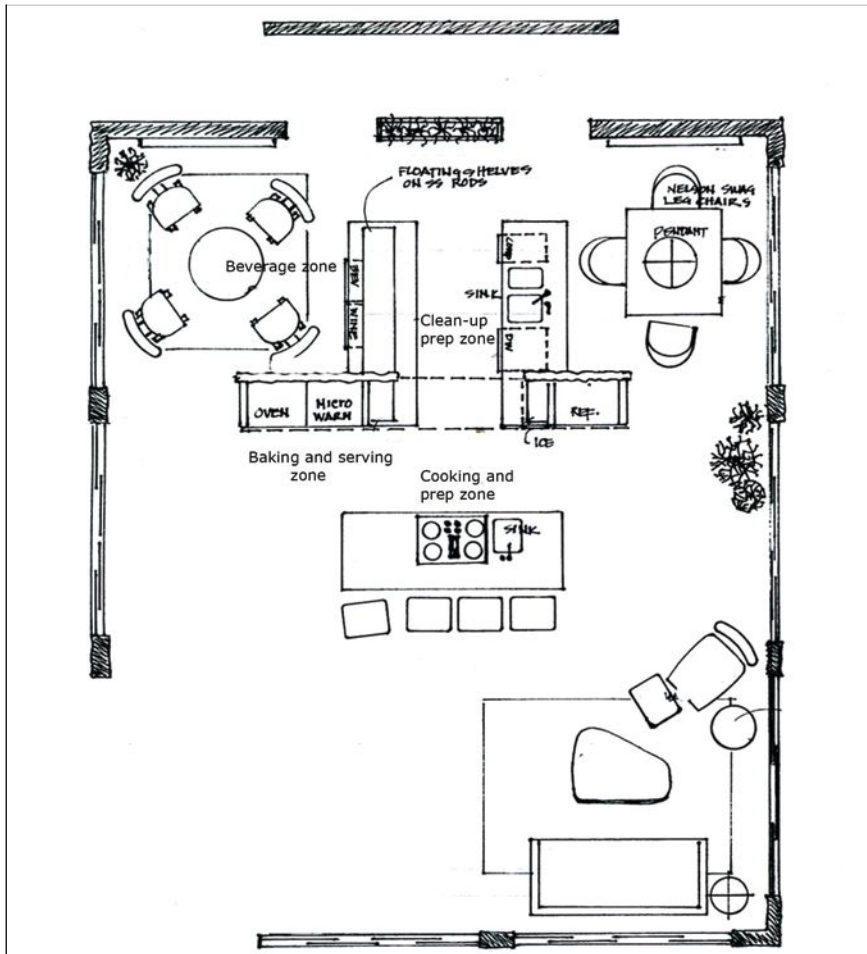




Presents:

The New Face of Zone Design for the Kitchen

By: Mary Jo Peterson - CKD, CBD, CAPS, CAASH



This kitchen includes the generous traffic and work clearances and the multipurpose zones so critical in today's kitchens. (Jenn-Air)

In the 1950's, the kitchen was singularly focused- one cook, one refrigerator, one sink, and one range, with room for the family to eat at a table in the kitchen, closed off from the rest of the house. Since then, it has been evolving, and in 2012 the kitchen is more and less, but certainly changed. The kitchen is more important and has more space, but with the focus on the kitchen as the center of home life and entertaining, and there is often less overall space given to actual food preparation and more given to flexible space for socializing and other activities. There are many more appliances and more technology, and as their importance has grown, there is often a shortage of storage and even of work surfaces. There are more people in the kitchen, yet there is less time to prepare and enjoy meals. We spend less time on daily meals, but more time enjoying cooking as a leisure activity. There are more things on a client's wish list, but there is less willingness to spend without reason. The work triangle of old is more important than ever, but there are more of them, and so we will look at the centers of work that can be created in a kitchen to suit the way we live today.

WHAT MAKES A WORK ZONE?

Theoretically, a work zone can be created for almost any activity or hobby, taking into account the user who will use the zone, the equipment and tools that will be used, and the space required to do the work. In the kitchen, the main work zones have been defined by the appliances or fixtures that anchor them, and in the work triangle this has been the sink, the cooking or baking appliance, and the refrigerator. With our expanded use of the kitchen, we are going beyond these three main anchors to include secondary sinks, refrigerators, and cooking appliances to support additional zones. Within each work zone, there must be storage, a work surface and clear floor space to allow the cook to organize and operate.



Credit: 1 AIA CEH

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

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LEARNING OBJECTIVES

1. Explore the differences in demands on kitchens today as compared to kitchens of the past.
2. Define the concept of work zones in the kitchen, and list the zones in today's kitchens.
3. Describe options in design concepts and products for the work zones of the kitchen.
4. Explore concepts for overlapping work zones in the kitchen.

WHICH WORK ZONES ARE RIGHT FOR YOUR CLIENT?

With most of us wanting the proverbial 10 pounds in a 5 pound bag, it is the designer's responsibility to help clients to prioritize the program and develop a space that sustains and enriches the clients and their lifestyle. One approach is to consider your clients' activities, the logical steps throughout the space and their day when planning zones. For this article, the sequence of the way our clients use the zones in-and-around the kitchen begins with the end of the school and work day, when groceries are brought home and preparation begins for dinner, and ends with leaving the house in the morning, and then considering how this changes in leisure time. Breaking down tasks into zones helps identify the storage, space and equipment needs for each of these daily tasks, and based on research, the National Kitchen and Bath Association (NKBA) has created standards to guide the process.

Drop Zone

This is the place where mail, keys, cell phones, wallets and purses are dropped, literally. Ideally, to keep this area from being junked with piles, a waste basket and a file drawer storage should be included or within reach of the drop zone so bills, statements, coupons, homework, and kids' artwork can be organized immediately. These files can be transferred to long term storage elsewhere in the house quarterly or yearly. It makes sense that items dropped at the end of the day are in one spot and convenient for pickup on the way out in the morning. This should also be where cell phones and other devices are charged every night so they won't be forgotten in the morning.

For kids, this is a place where school bags are dropped, in cubbies or on hooks off the floor. This drop zone should be located between the entry door or mudroom, and the kitchen. It should be where kids seem to go for a snack right after getting home from school and convenient to where they do homework. There should be a landing counter where papers are organized, for example: homework requiring action (sign, information and dates to transfer to a

calendar or to-do list), artwork to keep forever, and a recycle bin.

Command Zone

With the growth of home offices and computer work spaces in the rest of the house, the traditional desk in the kitchen has evolved to include storage for the message center, calendar, cookbooks, and related items and often not a separate place to sit to do this work. It may be a telephone and a calendar hidden behind a cabinet door, near a standing work counter where a laptop might be used, or it may simply be a smart phone or tablet which don't need a work surface and leave the house with us; client habits and equipment will influence this part of the design. Another growing concept is the small space near the kitchen, where the "commander" might still see kitchen activities but be able to conceal the mess

of organizing the household when not engaged in the task. This zone may also be a place where stamps, envelopes, and pens are stored, or where batteries are stored, along with the screw driver, flash light and other general maintenance tools. Your client may still want a traditional command zone with a place to sit in the kitchen proper, or he/she may prefer the more common small station near, or combined with the drop zone, and convenient to the family.

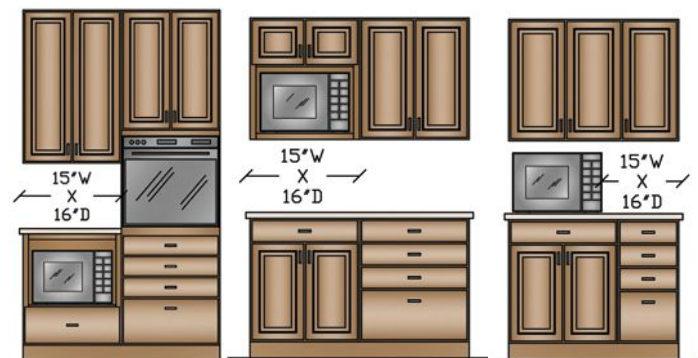
Storage Zone

Because the actual preparation area in the kitchen may be divided into specific task areas, and because we have so many appliances to augment our cooking efforts, some amount of storage is often adjacent-to, but not located in the kitchen proper. The storage zone is a combination of this storage space outside the kitchen used for bulk items and back-up, as well as storage at-hand in the kitchen. Rare is the client who has enough storage at the point of use, so this separate zone can be the answer. Ideally, when the storage zone

is a dedicated area off the kitchen or garage, there is a rolling cart that can be moved to and from the kitchen. Often, clients have a love affair with the concept of a walk-in pantry, and remote storage can be very desirable, but careful consideration must be paid to the amount of clear floor space given up to access the walk-in pantry. Often, a cabinet pantry can make better use of the available space and prove more convenient to the cook.

Kids' Zone

The kids' zone can be broken down into snacks, food preparation, and children's kitchen activities. They may get snacks independently or they may help an adult prepare a meal or a school lunch. As part of the morning routine, the lunch box zone could simply be a



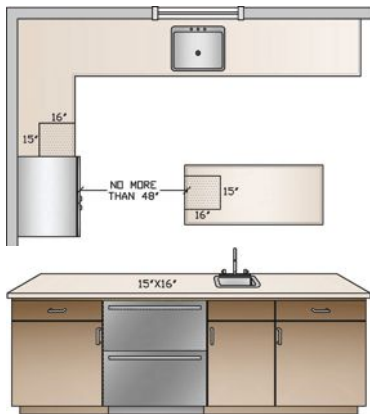
NKBA Kitchen Planning Guideline 22. Of the NKBA-recommended microwave landing areas, the undercounter and on-the-counter options work best for children.

drawer, near a refrigeration appliance, that is deep enough to store a lunch bag, thermos, containers, and any pantry items such as peanut butter, crackers or fruit snacks that are used daily. These items used and consumed by children can be placed in a cabinet within reach and with a work surface at proper height for their safe access, possibly the table or counter where they will eat and play or do homework. For toddlers and children too young to be independent in the kitchen, a bottom drawer of toys and activities to keep them busy while the adult is preparing food, cooking or cleaning, can evolve into a snack or lunch zone as they age.

Snack foods, breakfast foods, and school lunch items might be included here, as well as the tableware and equipment used for these activities. If this zone can

be created near the casual eating area of the kitchen, the table or counter will be at a comfortable height and will do double duty for both snacking and doing homework or other activities. To be within reach, these items must be stored not higher than the child's reach range, and 48" above the finished floor (A.F.F) is a maximum height to include. This is a good zone in which to consider a small refrigerator, a sink, and a microwave oven, depending on the age of the children and their ability to use these items safely.

Ideally, microwaves are placed within the universal reach range of 15" to 48" above the floor, which is comfortable for children as well as all family



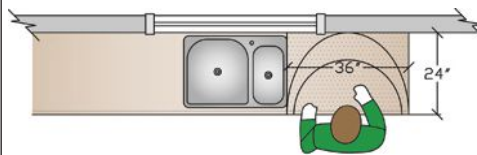
NKBA Kitchen Planning Guideline 16: Refrigerator Landing Areas

members and guests. Given that the range of height for an 11-year old is approximately 53" to 62", microwaves placed in a base cabinet on the counter, or under a raised snack bar are both within reach. Research has indicated that the best and safest use of the microwave results when it is placed between 2" below the cook's elbow and 3" below his/her shoulder (NKBA Guideline 21). A landing counter at least 15" wide by minimum 16" deep should be immediately above, below or adjacent to the microwave (NKBA Guideline 22). These parameters exclude the over-the-range microwave but leave many choices, especially considering the drawer microwaves available today. As with any equipment, safe use can only be dictated by responsible parents.

If a refrigerator can be dedicated to this zone, drawers or a small undercounter style will be within the child's reach, and this can encourage a child to choose healthy snacks. The landing counter for a refrigerator should be a minimum 15" wide by 16" deep, above or adjacent to the handle side of the door (NKBA guideline 16), needed when children lift heavy objects, like a gallon container of milk.

Preparation Zones

Beginning with a look at the traditional kitchen, where there was only one of most things, the prep center included work surfaces and storage near the sink, and often between the sink and the refrigerator.



NKBA Kitchen Planning Guideline 12: Preparation/Work Area

At least one prep zone should be included in the kitchen, a minimum 36" wide by 24" deep (NKBA guideline 12). The depth suggested in this area is greater than the recommended minimum counter depth of 16" because the cook will assemble ingredients in the back portion of the work surface and actually mix, measure and prep in the front section. Based on an average of at least 24" in each direction, or 48" total side reach, the 36" width makes a good minimum, and it might easily grow if space allows. Multiple counter heights can allow for children to comfortably help an adult with food preparation and for the seated cook. This lower counter may be a table, a counter above a 30" inch high base cabinet, or a pull-out work surface.

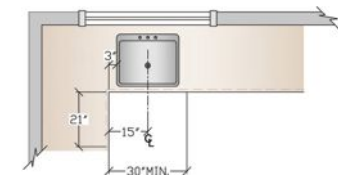
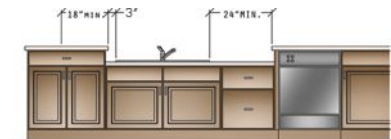
The lower counters can also be useful for adults when mixing and baking (see baking zone below). Storage must include the bowls, equipment and utensils used to prepare food, and today, the diversity and the options are greater. Also included should be a waste container or disposer or both, and

sometimes staples and frequently used food items. Proximity to a refrigerator helps, and small appliances used in prep like a toaster or food processor, might be stored in this area. Instant hot and chilled water are sometimes added to this zone.

The sink is the main anchor in this zone, and the size of this sink will be influenced by its intended purpose. The landing areas for the main sink should include a minimum of 24" to one side and 18" on the other, and the landing areas for a smaller prep or auxiliary sink should include a minimum of 18" to one side and only 3" on the other.



NKBA Kitchen Planning Guideline 11: Clean-up/Prep Sink Landing Area.



NKBA Kitchen Planning Guideline 15: Auxiliary Sink Landing Area

The refrigerator is often the other anchor to the prep zone. Full-door refrigerators and freezers, or side-by-side refrigerators, place both refrigerator and freezer storage at a comfortable and safe height. The newer style French door refrigerator also provides a second drawer for frequently used items, speaking to children, and results in energy savings as the main doors are not opened as frequently.

Microwaves are also often included in the prep zone, used for defrosting, reheating and melting. With all these appliance options, storage is at a premium, and we have incredible accessories to help make best use of every bit of space.

When extra depth is available on the work surface, the Europeans have given us caddies that recess into the rear space for storage of small items, knives and utensils. Backsplash storage systems offer additional storage. As storage gets pushed into the pantries, a rolling cart is a way to gather ingredients from the walk-in pantry and bring them to the prep zone. When multiple prep centers exist, the storage plan will need to include duplicates of certain items, according to planned activities.



This side-by-side refrigerator provides full access to both the refrigerator and freezer. The knee space and stool provide a place for someone to sit during food preparation. (Jenn-Air)

WHAT DOES IT TAKE TO CREATE A SECOND PREP ZONE?

It takes a work surface, and a smaller width can work, plus storage for utensils and equipment. Although not a requirement, if space and budget allow, the addition of a small second sink for prep frees up the main sink for clean-up, cutting down on two cooks overlapping. There are ways of creating an additional prep zone without changing the kitchen footprint. One design solution is to replace the small table and chairs in an eat-in kitchen with an island, which can make an excellent primary or secondary prep zone, with a sink, generous work surface, the storage not provided by a table, and the chance to face a view or to socialize.

An island also provides an easy opportunity to change counter materials based on the activity planned for the space, and to stack or otherwise vary heights to accommodate cooks of various sizes. It can even offer knee space for the team member who prefers to sit. Often the island itself will guide or control the work flow, so multiple cooks do not cross paths.



This cooking zone includes a second sink, supporting two prep zones, the second that can also function as a beverage or serving zone when entertaining. (Jenn-Air)

Saving the most important for last, our client will be our best guide in terms of what to plan where, how each space will be used, and what each prep zone must include. Determine if meals planned from scratch with fresh food or if frozen dinners the standard. Ask if there is one cook or many. Are the cooks tall or short, and who does what?

Are the multiple cooks doing the same tasks or is one making a salad and one grilling?

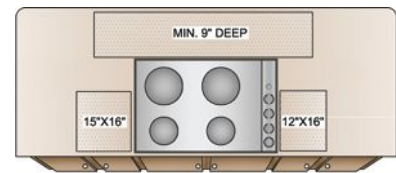
We have a responsibility to guide them in terms of options based on what is available and what is appropriate in a given space, and then to change roles and listen to them as they define what their space priorities are.

Cooking Zones

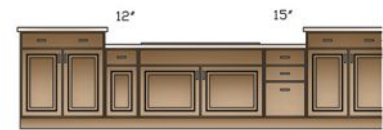
The cooking zone can be broken down into several activity centers; the first anchored by the cooktop; the second by the oven; and the rest anchored by the many appliances available today to support necessary and leisure-time cooking activities.

The Cooktop

The cooktop is a primary cooking center because of its relation to the tasks of the other main zones in the kitchen. Safety issues connected to heat make the landing spaces here critical, and they should include a minimum of 12" on one side, 15" on the other side, and in the case of an island or peninsula, 9" behind the cooktop (NKBA guideline 17).



NKBA Kitchen Planning Guideline 17. Cooking Surface Landing Area



This allows for preparation of food, safer moving of hot pots, and protection of surfaces adjacent to the heat. Work surface materials should be heat-resistant for the same safety reasons. Given the size and design of surface cooking appliances today, a continuous grill or a smooth top can double as additional landing space for cooking pots. Multiple cooks and activities in the kitchen increase the need for care in maintaining these clearances for safety.

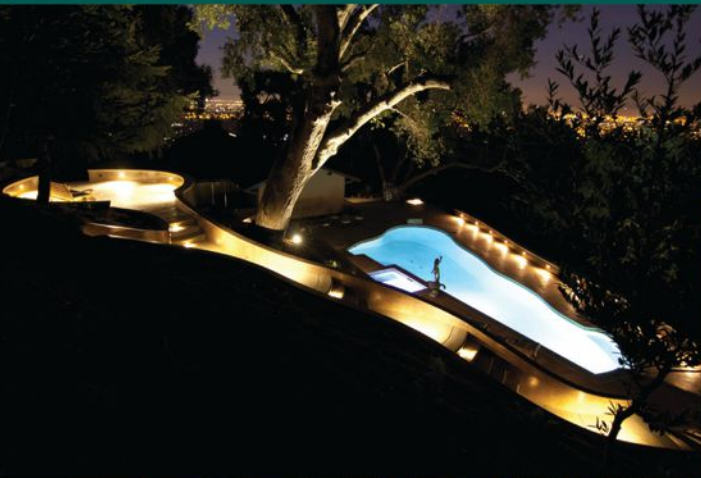
The location of the cooktop will be influenced by the habits and preferences of the client. Traditionally it has been placed against a wall, with

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Learning Objectives

1. Describe why brownfields are attractive properties for redevelopment.
2. Describe the basic steps required to determine if and what contaminants are present on a brownfield site.
3. List at least three remediation strategies discussed.
4. Briefly describe the role of the key players in brownfield site assessment, remediation, and development.



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NO MATTER WHERE you live in the United States, chances are you are near a brownfield. It could be a section of the city that once bustled with industrial and commercial activity, but now resembles a backdrop for the 1981 film *Escape from New York*. Or it could be a long-ignored site, such as a decommissioned landfill, that has grown uncomfortably close thanks to sprawl.

Today, architects are frequently called upon to use their planning skills to help create productive metropolises out of derelict wasteland. The U.S. Government Accountability Office estimates the country has up to 425,000 brownfields, while the National Brownfield Association says some 5 million acres of abandoned industrial sites exist. Along with state and federal governmental incentives, an increased interest in the regeneration of postindustrial cities has

put a lot of that land at a premium. The fact that many brownfield sites occupy valuable property, often on the waterfront—as is the case with decommissioned navy yards in New York, Philadelphia, and San Francisco—only spurs the drive for their redevelopment. Understanding brownfields, real estate market forces, and remediation strategies will help architects have a voice at a table typically filled with regulators and environmental engineers.

Site Appeal

Developers are attracted to brownfields because they can generally pick them up at a cheap price due to the presence—or perceived presence—of environmental





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After four years of remediation followed by a decade of site restoration and monitoring, the EPA removed the 90-acre Reed Keppler Park in West Chicago from its National Priorities List. Today, the park is home to an aquatic center, athletic fields, playgrounds, and a 5,300-square-foot skatepark.



contaminants; not all brownfields veritably harbor dangerous contaminants, but just bearing that potential qualifies them as such. “Brownfields are not environmental projects—they’re real estate projects with an environmental twist,” says Michael McLaughlin, a senior vice president in the Reston, Va., office of SCS Engineers, an environmental consulting firm.

Along with the land’s below-market price, governmental incentives such as tax increment financing (TIF) or the Environmental Protection Agency’s (EPA’s) brownfield and land-revitalization grants often cover or reduce the cost of assessing and cleaning up the site. In 2002, the Bush Administration further incentivized brownfield redevelopment with the Small Business Liability Relief and Brownfields Revitalization Act. The act contains three titles that deal with funding and liability for assessing and cleaning up contaminated properties, setting aside \$200 million annually in federal funding. It also provides exemptions from owner or operator liability for persons whose properties are contaminated by toxins due to contiguous properties, or dumped by previous owners or unrelated parties.

“With the Brownfield Revitalization Act, the government basically said, ‘We’re going to make it easier for you in terms of liability to turn over your property,’” says Julie Bargmann, founder of D.I.R.T. Studio, a New York City-based design-research practice specializing in urban regeneration. “They’re like, ‘It’s time for you to ... say you’re [your site’s] a brownfield, and here’s some money to help you with that.’”

Of course, the government doesn’t hand out these incentives freely. To qualify for assessment and cleanup grants, or for liability protection, property owners have to satisfy specific statutory requirements. Prior to development, owners must meet environmental due-diligence requirements by undertaking a regimeted



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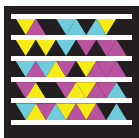
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inquiry process into the previous uses and ownership of the property. If contaminants are found, owners have to take measures to manage them—for which they can apply for government grants or TIF—before redevelopment can begin.

Super isn't Always Great

Not all toxic wastelands are revitalized electively, or in the hope of turning a profit. In many cases, the EPA has had to step in and either effect a remediation or make those responsible for the contamination clean up their mess. Enter the realm of Superfund.

“Superfund sites are the biggest and baddest brownfields,” Bargmann says. The Superfund was established by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 after the 1970s discovery of toxic waste dumps such as Love Canal in Niagara Falls, N.Y., and Times Beach, Mo.

Among Superfund's successes is Reed Keppeler Park, a former landfill in West Chicago that became a public park in the 1970s. In the early 1990s, the EPA discovered that the fill used to cap the site contained radioactive thorium wastes, placed the park on the National Priorities List (NPL)—a register of the most-pressing known or threatened releases of hazardous substances, pollutants, or contaminants—and went looking for those responsible.

The fill had come from a nearby, defunct rare-earths plant last owned and operated by the (now also defunct) energy and chemical company Kerr-McGee Chemical Corp., which agreed to fund the cleanup. In 1997, Kerr-McGee began excavating more than 114,600 cubic yards of contaminated soil, which was transported to a disposal facility. Four years and \$33 million later, the company completed the cleanup, but the project remained on the NPL until 2010, after the EPA was satisfied with the groundwater uranium levels.

The Remediation Roster

The primary players in brownfield redevelopment include the property owner and a real estate or specialized environmental attorney who ensures that the project complies with all applicable laws, including the Brownfield





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“IN THE AAI PROCESS, THEY GO IN, LOOK AT THE SITE’S HISTORY, AND ASCERTAIN WHAT THE CONTAMINATION MAY BE—THE OPERATIVE WORD THERE IS ‘MAY.’”

—JULIE BARGMANN

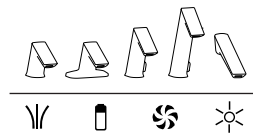
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Revitalization Act. Then comes the usual coterie of design talent: architect, landscape architect, civil and geotechnical engineers, consultants for above and below grade—such as a foundation engineer—and the environmental engineer, who will do the heavy lifting of designing the remediation.

Determining whether the site is contaminated is the first step in remediation. Owners seeking EPA assessment and cleanup grants must undergo a process called All Appropriate Inquiries (AAI) that an environmental professional—usually an environmental engineer or scientist—must complete. “They go in, look at a site’s history, and basically ascertain ... what the contamination may be,” Bargmann says. “The operative word there is ‘may.’”

The process includes interviewing current owners and occupants regarding present and past uses, reviewing historical sources and government records, searching for environmental cleanup liens, and visually inspecting the site and adjoining properties. Following these activities, the redevelopment team should know whether site contamination is a possible concern. The next step involves testing the soil itself, another job of the environmental professional.

Characterizing and monitoring the nature of a site’s contaminants requires technologies running from the straightforward—such as sending soil, soil gas, and groundwater samples to the lab for analysis—to the complex, such as employing gas-chromatograph mass spectrometers to determine what contaminants are present in which media. The litany of possible contaminants includes arsenic, chromium, dense nonaqueous phase liquids (DNAPLs), dioxins, mercury, methyl tertiary butyl ether, persistent organic pollutants, polychlorinated biphenyls, and trichloroethylene. McLaughlin says that the list includes “heavy metals, which people have to contact directly—for example, eaten or breathed as dust—to be harmed” and “volatile contaminants, many of which are present as vapors or gas and can leave the dirt and come into a building on site, much like radon.”

Strategic Cleaning

Once a site’s contaminants have been characterized, the environmental professional designs a remediation solution that complies with state and federal environmental regulations. For some types of remediation, prescribed methodologies based on established practice can guide the process. “Brownfields





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Local power generation: 78%.

Activate air barrier, rear exit.

Occupancy alert: Activate

Greywater storage 87% capacity.

Close air vents, Zones 12 and 14.

Alert: Change air filter, Zone 6.

Parking area fully occupied.

Alert: Change air filter, Zone 6.

Automated HVAC upgrades in progress.

Routine maintenance notification, Zone 10.

Valve actuator 7: Open.

Expect occupant return in 15 minutes.

Seasonal water usage audit in progress.

Seed lifting led.

Cycle solar water system pump.

Air Quality Index: 87. Cycle exterior ventilation.

Activate lighting controller, Zone 2.

Water quality level: Optimum.

door sensors: Low.

Automated HVAC upgrade in progress.

Change smoke detector battery, Zone 3.

Set geothermal heat pump for sleep mode.

Floor unoccupied. Reduce lighting.

Alert: Change

Interior temperature: 79°. Activate heat exchanger.

Activate Variable Air Volume, Units 5-9.

4:27 PM. Lower west-facing blinds.

emand: Access

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able

energy

usage.

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Indoor humidity level: 35%.

Rotate light shelves.

Building Start Report. Log for more info

Greywater storage 63% capacity.

Peak demand: Access Energy savings reminder: Power down computer.

Energy usage audit in progress

Occupancy alert. Increase HVAC load, Zone 1.

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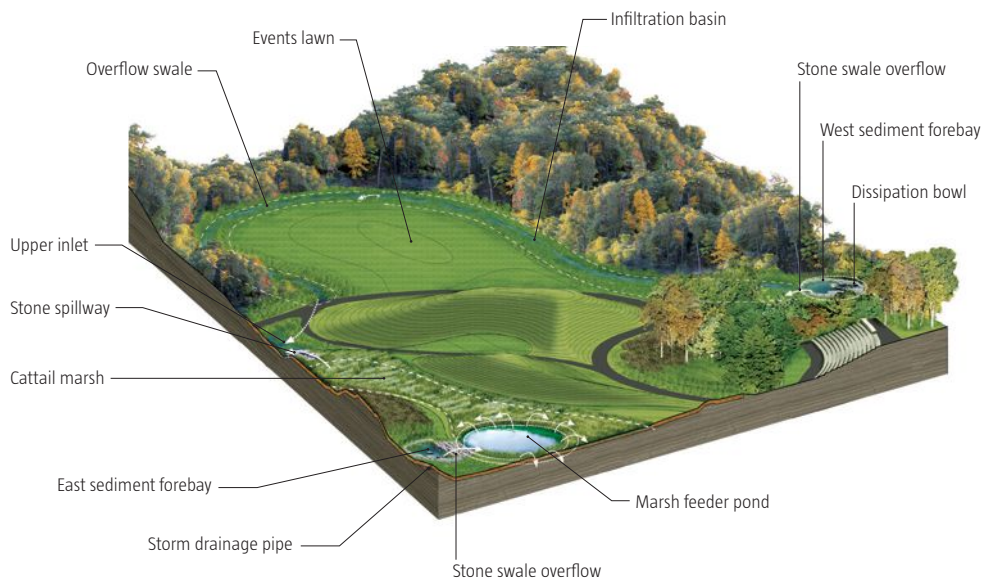
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technology

Site Restoration, Alumnae Valley



are hardly new," McLaughlin says. "A lot of states have pretty mature programs to get developers to remediate their sites the smart way—without a massive amount of liability and wasted cost. Just about everybody has redeveloped a gas station or dry cleaner's, and there are proven ways of dealing with them."

The most cost-effective solution for contaminants such as heavy metals often is to bury them in situ and cap the site with a building, parking lot, or at least one or two feet of clean soil and plantings. For non-heavy metal contaminants, such as volatile organic compounds (VOCs), an oft-employed solution is to extract and cart away the toxic material to an EPA-approved disposal site.

Bargmann calls these old-standby remediation methods "cap and cover" and "hog and haul." "You're only leaving the contamination for the next generation to deal with," she says. "That could be a good thing because they might be better equipped than we are, but ... I've been an advocate of bioremediation," which uses microorganisms and their enzymes to absorb and break down pollutants naturally.

Bioremediation works only on certain contaminants such as VOCs and oils; heavy metals generally cannot be bioremediated. The emerging technology often happens naturally, without any human intervention, but people can nudge the process forward.

"We can help nature get rid of compounds through science," McLaughlin says. "For example, particular biological microbes thrive in anaerobic conditions. If you can turn aerobic subsoil anaerobic, you can make a lot of toxins disappear very quickly. We're feeding bugs, adding bugs, and doing what we can to help process along."

Bioremediation technologies include: air sparging, in which air or oxygen injected into contaminated aquifers removes volatile and semivolatile organic contaminants by essentially evaporating them; and bioventing or biosparging, in which air is injected into the soil through wells.

Phytoremediation, a close cousin to bioremediation, uses plants to absorb and sequester pollutants—including heavy metals, fertilizers, pesticides, solvents, explosives, and petroleum products—from the soil and groundwater. The plants are then harvested and either used or disposed of in an approved site. Phytoremediation only works in the top layers of the soil and shallow groundwater within reach of the plants' roots.

Outside of bioremediation, soil-vapor extraction, in which the earth is literally vacuumed to remove volatile and semivolatile compounds, attempts to treat contaminants on site, as does thermal treatment, which

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→ exposes the contaminated material, either in situ or ex situ, to high temperatures, thus separating, destroying, or immobilizing the waste.

Other techniques for remediation range from the mundane, such as soil washing, to the cutting edge, such as the use of nanotechnology: scientists can engineer specific nanoscale materials, which have large surface

areas compared to their volumes, to react to—and rapidly reduce the concentration of—contaminants.

Finding Beauty in Brownfields

While architects have little to do with devising remediation strategies, their input can be invaluable to determining the logical and potential uses for the site. “The first thing that architects bring to the table is the notion of planning,” says Edmund Klimek, AIA, a partner at Princeton, N.J.-based KSS Architects, which has worked on many brownfield redevelopments. “We don’t design the remediation, but we can give it a sense of purpose and a sense of hierarchy so that the remediation supports the project’s larger goals” and makes economic sense, he says.

Unfortunately, architects often aren’t brought into the project until the remediation measures have already been implemented. “The remediation becomes a technical question that is handled by the environmental engineer,” says Matt Urbanski, a principal in the Brooklyn, N.Y., office of the landscape architecture firm Michael Van Valkenburgh Associates (MVVA). “Designers have to work around whatever technical solution has been put into place.”

“A LOT OF STATES HAVE PRETTY MATURE PROGRAMS TO GET DEVELOPERS TO REMEDIATE THEIR SITES THE SMART WAY—WITHOUT A MASSIVE AMOUNT OF LIABILITY AND WASTED COST.”

—MICHAEL MCLAUGHLIN

Landscape design and remediation strategies played off each other in the restoration of Wellesley College’s Alumnae Valley. MVVA was brought in early to design the 13.5-acre landscape while environmental engineering firm Haley & Aldrich characterized the site’s contaminants and developed remediation solutions.

In the 1920s, Wellesley built a coal-gasification plant in Alumnae Valley, which abuts the campus’s cherished Lake Waban, and later replaced it with a parking lot. MVVA originally proposed cutting out the parking lot, excavating the earth, and bringing the shore of the lake closer to the nearby student center. However, Haley & Aldrich discovered three different contaminants on the site: heavy metals, including lead chromate, found in low levels in excavated earth saved from the student-center construction for landscaping; spilled fuel oil; and, deeper down, a layer of DNAPLs—basically tar.

Haley & Aldrich remediated each contaminant differently. The fuel-oil-contaminated soil was excavated

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and appropriately discarded, while the earth containing heavy metals was consigned to a cap-and-cover treatment. For the low-viscosity DNAPLs, which were about 20 feet below grade, engineers had to set up a series of extraction wells in which the gooey liquid would pool over time before being pumped to the surface, barreled, and taken to an appropriate disposal location.


Bringing the lake shore closer to the student center created a concern that the DNAPLs might migrate into the water, MVVA went back to the drawing board. “The environmental condition forced us to be more creative about our design,” says Andrew Gutterman, an associate principal at MVVA. The firm proposed a raised wetland that would sit above the below-grade contaminated area and also function as the campus’s stormwater-management system.

MVVA also added several sculptural landforms: large, grass-covered berms built up with the contaminated excavation material, mixed with clean soil, and capped with clean soil. “The larger campus is characterized by its hilly topography,” Gutterman says. “We built upon that character with our sculptural berms, which also allowed the contaminated fill to remain on site. It’s an example of design and environmental goals working hand in hand.” Altogether, remediating the site and completing MVVA’s design took four years to complete, from 2001 to 2005. Today, Alumnae Valley’s sculpted wetlands teem with plant and animal life, and are enjoyed by students and staff: a testament to the success that an integrated remediation-and-design strategy can bring.

Make the Change

Though designers are not regularly involved with the nitty-gritty details of brownfield remediation, their planning expertise, when closely integrated with cleanup logistics, can create quite elegant solutions. Beyond the site, architects can help the process by engaging the local community. “A lot of brownfields involve newer industrial uses on older industrial land,” Klimek says. “When you reintroduce new industry into an urban environment, you have to go to the town and help them understand how it can be brought back into the urban fabric in a healthy way.”

Designers armed with a broad base of knowledge about brownfields will be better equipped to steer redevelopment projects on a sustainable path. Knowing the ins and outs of the regulatory and remediation processes will only improve the chances that an architect will have more say in the direction and planning of brownfield redevelopments, and help ensure that past mistakes are cleaned up. □



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QUIZ

1. The United States has up to 425,000 brownfields and about _____ acres of abandoned industrial sites.

- a. 1.5 million
- b. 2 million
- c. 5 million
- d. 10 million

2. Why can developers purchase and remediate brownfields so cost-effectively?

- a. Because of the perceived presence of environmental contaminants
- b. Because of the availability of tax increment financing (TIF)
- c. Because of federal funding and grants
- d. All of the above

3. True or False: To qualify for government-assisted assessment and cleanup grants, property owners have to satisfy specific statutory requirements.

4. What is the Superfund?

- a. An aggregation of funds from local governments to invest in brownfields
- b. A list of brownfield sites that are now public parks
- c. A list of contaminated sites that are profitable to remediate

d. A federal program that effects and enforces the remediation of hazardous waste sites

5. Which of the following professionals are frequently key players in a brownfield project?

- a. Property owners
- b. Attorneys
- c. Civil, environmental, and geotechnical engineers
- d. Architects and landscape architects
- e. All of the above

6. What is the first step to remediating a brownfield site?

- a. Purchase a site from the NPL
- b. Excavate the site to see if contaminants are found
- c. Research the site history to determine if contaminants may be present
- d. Hire an environmental professional to create a remediation plan

7. What is the most cost-effective solution for remediating heavy-metal contaminants?

- a. Extract them from the site
- b. Bury them in situ and cap the area

c. Burn as much as possible and cap the rest

d. Inject air or oxygen into the soil

8. What is a common solution for remediating volatile organic compounds?

- a. Extract it from the site
- b. Bury it in situ and cap the area
- c. Burn as much as possible and cap the rest
- d. Inject air or oxygen into the soil

9. Bioremediation uses microorganisms to breakdown pollutants metabolically. It is more effective on certain contaminants, such as:

- a. Volatile organic compounds
- b. Non-heavy metal liquids
- c. Heavy metals
- d. Heavy liquid metals

10. True or False: Architects are often brought into a brownfield project early in the project development stage.

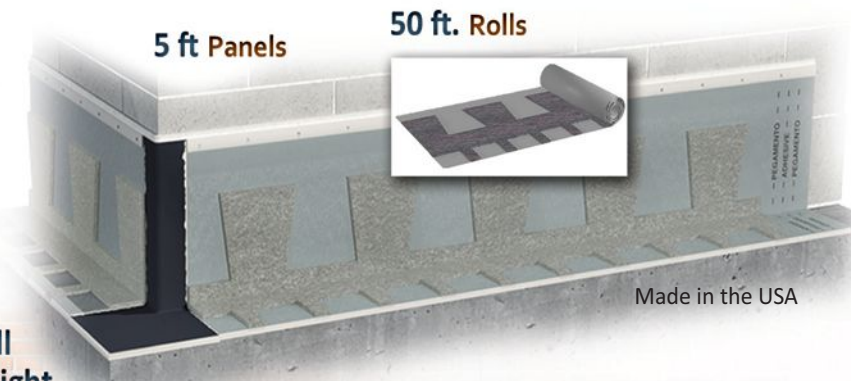


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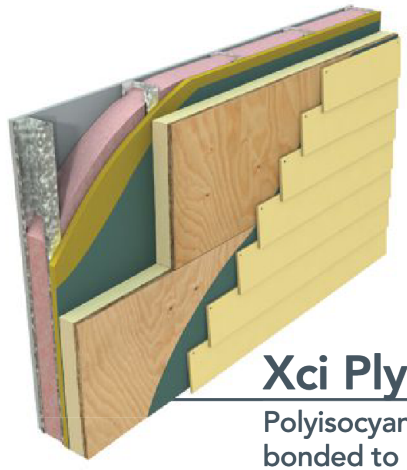
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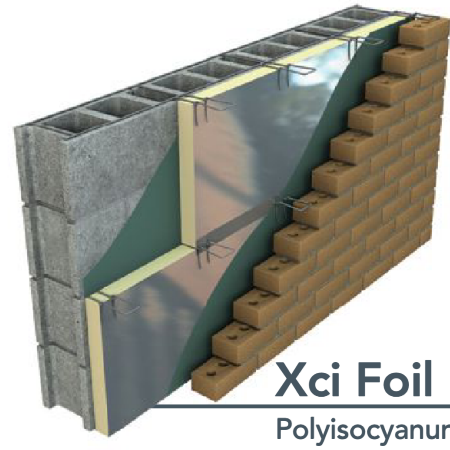
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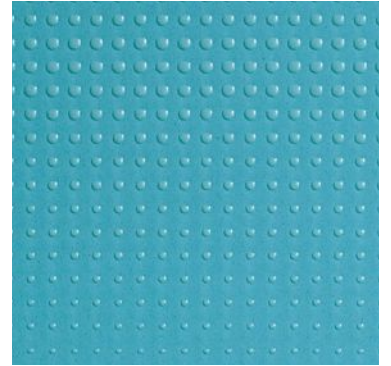
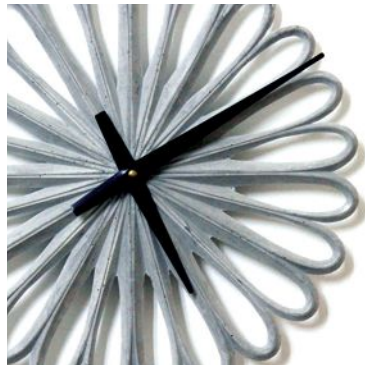


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Editor's Choice



TEXT BY WANDA LAU

4

The number of years it took Michelangelo Buonarroti to paint the Sistine Chapel. Contrary to popular belief, the sculptor-turned-painter had to create his frescoes standing up, enduring years of neck pain.

SOURCE: MICHELANGELO AND THE SISTINE CHAPEL BY ANDREW GRAHAM-DIXON (SKYHORSE PUBLISHING, 2009)

Fresh off a successful capital fundraising campaign, Brooklyn, N.Y.-based startup **Leelabs** is busy handcrafting **Para Clocks**, which are made using CNC-carved molds and high-strength, fiber-reinforced concrete. The 8"-, 12"-, and 16"-diameter clocks use digitally derived, parametric design to achieve intricate radial geometries such as Bloom (shown). An app allows users to customize their own design and create their own timeless timepiece. • paraclocks.com • Circle 120

Ceiling frescoes are known for their beauty while ceiling tiles are valued for their efficiency. **Armstrong** merges the merits of both with its **Ultima Create!** custom design capability, which allows photographs or artwork to be printed on several of Armstrong's acoustical ceiling product lines. The result is a washable, stain-resistant panel—with a noise-reduction coefficient of 0.70—that can serve as an eye-catching centerpiece or a subtle room accent. • armstrong.com • Circle 123

With the increasing awareness of the energy consumed by buildings' HVAC systems, **Caleido's** Fine Design collection brings the typically discreet wall radiator into the limelight as a formed and functional design object. **Shine** (shown), one of 12 designed radiators in the collection, embodies convection and air movement in translucent line work set against an LED-illuminated metal panel. It can operate on electricity or hydraulics. • caleido.bs.it • Circle 121

Even from volcanic rocks can designers create inviting and organic seating pieces. Latvian designer Raimonds Cirulis of **Maffam Freeform** found his niche in making design objects and furniture out of basalt fibers and natural resin. The compact **Chair Boss** features armrests, ample storage, and the basalt fibers, which are stretched from basalt rock using a specialized spinner and have three times the tensile strength of steel. • maffamfree.com • Circle 124

After four years of researching nonwoven textiles and touring European manufacturing plants with **Maharam Design Studio**, German designer Konstantin Grcic created **Band**, a vinyl textile that plays with dimensionality and texture. Resin printing accurately places individual droplets at a specific density and size onto the base layer. The overall effect is a study of proportion and movement that creates a depth as great as Grcic's design versatility. • maharam.com • Circle 122

For Il Bagno Alessi's One project by **Laufen**, designer Stefano Giovannoni celebrated the bathroom as a sanctuary for imagination and as a hub where he sees four personal, affective codes—maternal, childhood, erotic body, and paternal—intersecting. The collection's porcelain pieces, for example, follow the maternal code; thus, the form of the washbasin **Tuna** (shown) is round and soft. One also includes bathtubs, urinals, vanity units, and mirrors. • laufen.com • Circle 125

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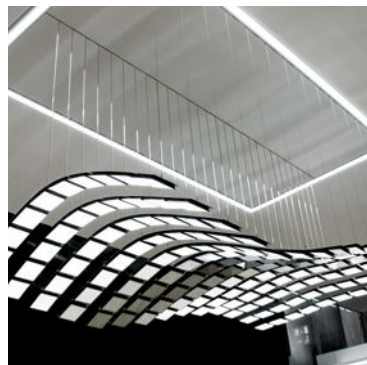


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Designed by Edward Barber and Jay Osgerby for **B&B Italia**, **Tobi-Ishi** embodies the beauty and simplicity of the ornamental stones found in traditional Japanese gardens, for which the table is named. With a cantilevered, 63"-diameter wooden top and a base that varies in look depending on your viewing angle, the structural, polyurethane-foam table has a cement-grout finish coat, giving the piece a smooth, but textural, appearance. • beitalia.com • Circle 126

Joining the many architects venturing into product design, **Olson Kundig Architects** has launched a steel accessories line comprising 25 hardware pieces used in kinetic moments that occur in buildings. Fabricated by fellow Seattle-based firm 12th Avenue Iron, the Tom Kundig Collection includes the **Peek Sliding Door Pull**—made from a folded steel plate and darkened with a wax finish—as well as rollers, cabinet pulls, and additional door hardware. • olsonkundigarchitects.com • Circle 127

Combining 140 paper-thin OLEDs and mechatronics, Selux and **Art+Com** created **Manta Rhei**, a 1.2m-by-2.4m kinetic fixture that can change form, lighting scenarios, and movement patterns. What does remain consistent throughout its choreographies is the overall quantity of light that the fixture produces, due to a custom-built intelligent control system. Manta Rhei serves as a concept model for a potential, future line of kinetic luminaires. • artcom.de • Circle 128

Photovoltaics continue to make their way into more building products. In 2009, **Dow Solar** merged the weather protection offered by the tried-and-true form of the asphalt roofing shingle with the energy-generating potential of CIGS thin-film photovoltaic cells to create **Dow Powerhouse Solar Shingles**. Manufactured in Michigan, the 22.8"-wide-by-10"-high and 0.5"-thick shingles are being gradually rolled out throughout the United States. • dowsolar.com • Circle 129



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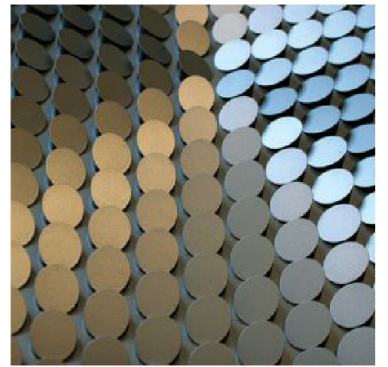
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More than 70 years after its introduction, glass blocks are still used to provide privacy and security in bathrooms and basements. **Seves Glassblock** now elevates the aesthetic of conventional glass-block construction with **VetroPieno**, a glass brick that transmits a high level of light through its solid-glass construction, creating stunning visual effects. Offered in four colors, VetroPieno may be used horizontally or vertically in interior and exterior applications. • sevesglassblock.com • Circle 131

Unexpected beauty occurs when a needle shifts during the carpet tufting process. Inspired by this simple moment, **Tandus Flooring** created **DV8**, a linear pattern that takes a zigzag course across the floor. Offered as a modular tile or as hybrid-resilient sheet flooring—in which the carpet's nylon fibers and cushion are fused together—DV8 uses recycled backing and cushioning materials and is itself entirely recyclable. • tandusflooring.com • Circle 132

Drawing from the art of bas-relief, **Surface** introduced **Ombræe**, a three-dimensional tiling system that creates small- or large-scale images using physical pixels angled at a specified gradient and direction. Any digital image or design can be created through stamping, casting, or machining—mysteriously, no pigments, paints, or dyes are required in the end result. Currently, Ombræe is offered in aluminum or Cor-Ten steel. • thesurfacegallery.com • Circle 133

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37

THE PERCENTAGE OF U.S. COMPANIES THAT HAVE CONSIDERED RETURNING MANUFACTURING OPERATIONS TO THE UNITED STATES FROM CHINA.

SOURCE: THE BOSTON CONSULTING GROUP

TEXT BY BLAINE BROWNELL, AIA
ILLUSTRATIONS BY PETER ARKLE

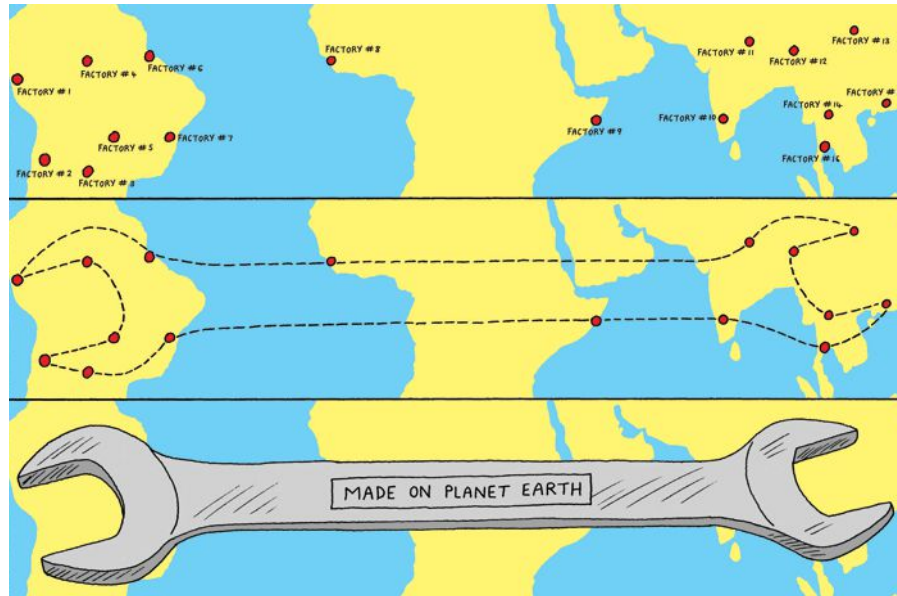


→ Read more of Blaine's reports on cutting-edge tech at ARCHITECT's Mind & Matter blog: go.hw.net/brownell.

→ MIND & MATTER

In the Hothouse

THE NEXT INDUSTRIAL REVOLUTION MAY BE HAPPENING IN OUR OWN BACKYARDS.



DIGITAL FABRICATION AND advanced manufacturing have made possible design ideas that were once impossible to execute. A recent report in *The Economist* highlights these technologies—under the sweeping theme of “The Third Industrial Revolution”—and elucidates their roles within a broad economic context.

One notable insight is the rationale behind the locations of developing manufacturing centers. Many assume that the intense activity in China, for example, stems largely from its relatively low cost of labor. But the reality is more complicated. In a cost study of a \$499 iPad, University of California at Irvine researchers determined that only \$8 goes towards Chinese labor, out of a total of \$33 spent on labor costs worldwide.

With such a small percentage of the product's overall cost going to international labor, why couldn't iPads be manufactured elsewhere? The answer, according to *The Economist*, is that Shenzhen (home of the now-infamous Foxconn) hosts an incredibly successful industrial cluster with “a network of firms with sophisticated supply chains, multiple design and engineering skills, intimate knowledge of their production processes and the willingness to leap into action if asked to scale up production.”

This notion of a successful manufacturing nexus reminds me of Barton Kunstler's book *The Hothouse Effect* (AMACOM, 2003), which investigates the basic ingredients required to develop the “creative hothouses” that have influenced technological history, from the Roman Empire to the Bauhaus. According to Kunstler, these key elements are tied to social networks, from shared values to the

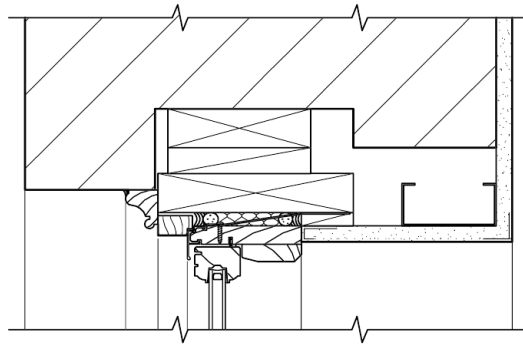
exchange of ideas and education. As digital fabrication and collaborative manufacturing continue to take hold, the social network will not diminish in importance (although the hothouse effect may move online). Rather, the strength of these connections will determine the economic success of future material technologies.

In architecture, creative hothouses are emerging in the form of digital-fabrication laboratories—or digifab labs. By taking advantage of less expensive, faster, and more readily available equipment, digifab labs provide affordable and accessible computer-automated fabrication services to practitioners and students. The labs, often owned and run by nascent, crossover architects and designers to further their own practices, include Situ Studio and Associated Fabrication—launched respectively by Cooper Union and Columbia University graduates—and online distributed manufacturing outfits such as Ponoko and Shapeways. These service hubs not only satisfy fabrication needs, but also serve as places for in-person and online community interchange and education—providing architects with much-needed guidance related to new construction techniques, prototyping methodologies, specialized material applications, and even consumer marketing.

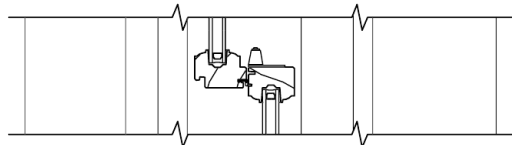
Although relatively young, this new breed of manufacturing consultancy provides the critical social network necessary for the creative hothouse effect, empowering a community of architects to make more intricate designs that exhibit a greater awareness of material efficacy and performance simultaneously. □

TECHNICAL CAPABILITIES.

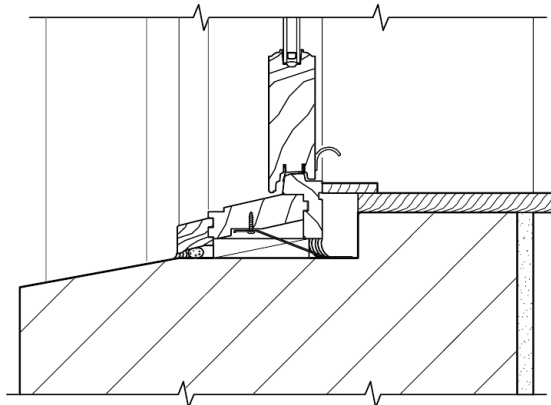
CREATIVE POSSIBILITIES.



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CULTURE

EDITED BY LINDSEY M. ROBERTS

→ OBJECT

Athletics gear has come a long way since Ethiopian Abebe Bikila won the 1960 Rome Olympics marathon running barefoot. Take the shark-skin-imitation swimsuit that Michael Phelps wore when he won eight gold medals in Beijing in 2000. Or the **Lotus Type 108 Olympic Pursuit Bike**, shown, with which Chris Boardman set a world record for the 4,000m in Barcelona in 1992. The bike, designed by Mike Burrows, is now on exhibit at the Design Museum's "Designed to Win," which highlights athletic gear and materials that helped achieve victories. And it reminds us that while watching the London Olympics, which start July 27, we should pay as much attention to the shoes as we do to the scores. Through Nov. 18. • designmuseum.org



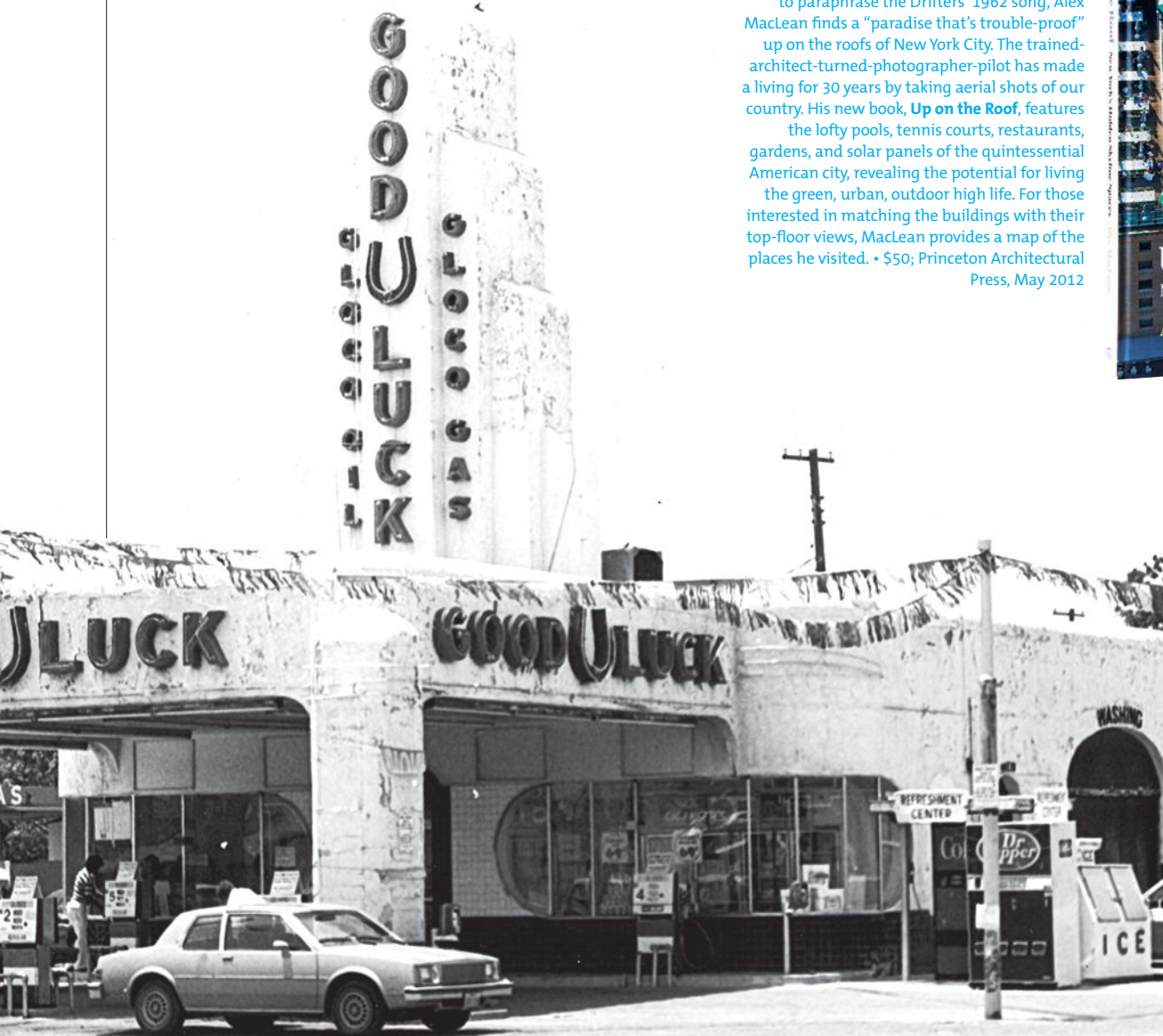
→EXHIBIT

Kevin Roche, FAIA, a third-generation Modernist and 1982 Pritzker Prize winner, embraced the U.S.'s transition to an information-based economy by introducing systems analysis into architecture; his designs were some of the first to include transportation needs and infrastructure. The National Building Museum's retrospective **Kevin Roche: Architecture as Environment** examines the way that his approach appealed to leading postindustrial corporations and institutions, including IBM, the United Nations, and the Ford Foundation. Since 1967, Roche has also continued to shape the Metropolitan Museum of Art (shown) into a greenhouse-like structure, "the kind of building one would expect to find in a park." Through Dec. 2. • nbm.org



→BOOK

When this old world starts getting him down, to paraphrase the Drifters' 1962 song, Alex MacLean finds a "paradise that's trouble-proof" up on the roofs of New York City. The trained-architect-turned-photographer-pilot has made a living for 30 years by taking aerial shots of our country. His new book, **Up on the Roof**, features the lofty pools, tennis courts, restaurants, gardens, and solar panels of the quintessential American city, revealing the potential for living the green, urban, outdoor high life. For those interested in matching the buildings with their top-floor views, MacLean provides a map of the places he visited. • \$50; Princeton Architectural Press, May 2012



→EXHIBIT

There's a lot to be said about hair and football in the Big D. But history? **Lost Dallas**, a new exhibit mounted by the Dallas Center for Architecture, considers the historic buildings and places that were demolished during the city's rapid, oil-fueled rise. One such example is the 1939 Good Luck Gas Station, shown, which was an Art Deco icon destroyed in 1982, despite economic incentives offered to the landowners. Featuring images from private and public collections, as well as from *The Dallas Morning News* archives, "Lost Dallas" takes a look back at a city that was only founded in 1841, but has pressed relentlessly forward ever since. Through July 13 • dallasfa.com



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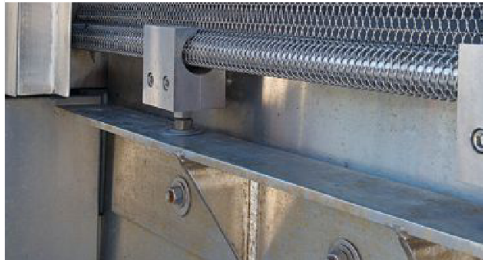
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culture



→ EXHIBIT

For museumgoers who savor nothing more than a trip to the gift shop, the Chicago Architecture Foundation's new pop-up shop may inspire some sticker shock. A hair dryer costs \$291, and the bottled water has been marked up 2,000 times. A store-exhibit hybrid, **Loop Value: The How Much Does It Cost? Shop** reveals the hidden costs of the products that we buy every day: Though that hair dryer may have a sticker price of \$21, it really costs a total of \$291 over 10 years, largely because of the electricity needed to power it. You may not go home with a funky set of museum-approved measuring cups, but you'll likely gain an appreciation for how price tags only tell part of the story. Through 2012. • architecture.org



→ EXHIBIT

The sinuous lines, the juxtaposition of light and shadow, the abstract black-and-white composition: these are hallmarks of the work by acclaimed architectural photographer Judith Turner, who, in this photo, turned her lens on Frank Gehry, FAIA's Vitra Design Museum in Weil am Rhein in Germany. In **Judith Turner: The Flatness of Ambiguity**, mounted by the University of Michigan Museum of Art, approximately 60 photographs from Turner's three-decade-long career are displayed, including images of buildings by Alvar Aalto; Shigeru Ban, Hon. FAIA; Zaha Hadid, Hon. FAIA; Louis Kahn; and Renzo Piano, Hon. FAIA. Through Sept. 2. • umma.umich.edu

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→ **EXHIBIT**
Stadia: Sport and Vision in Architecture, at Sir John Soane's Museum in London, examines the evolution of stadiums and how architects have used the typology, from antiquity onward, to push innovation. (Rome's Colosseum inspired Soane himself.) Populous, the firm behind the 2012 Olympic Stadium, shown, sponsors the exhibit, and posits that the stadium is the new cathedral, putting towns and cities on the map. To top it all off, "Stadia" is also the inaugural show in the museum's new temporary exhibition space, renovated by Caruso St. John Architects. Through Sept. 22. • soane.org

→ **BOOK**
 The gee-whiz factor in **Vitamin G** is high, even when the technology isn't. This best-of compilation and sourcebook of green projects features several lo-fi sustainable projects, including a plant-based air purifier and a bamboo-tube bicycle. There are big-ticket items, too, including Beijing's GreenPix Zero Energy Media Wall, which claims to be the first photovoltaic-integrated curtainwall. But the best new sustainable idea? Repairing broken plastic baskets with rattan for a new life of high design. • \$75; Phaidon, May 2012



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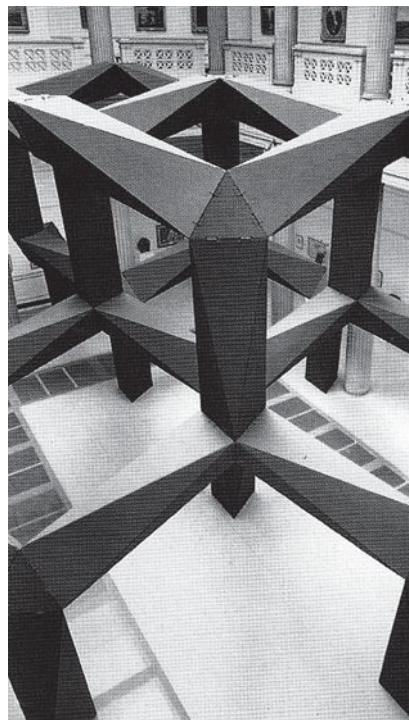
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→ **BLOG**
 What, you may ask, is **Betonbabe**? It's where *béton* (German for "concrete") meets babe, who is Princeton University School of Architecture graduate student Viviane Hülsmeier. Her nifty Tumblr site features a collection of "lost and found" pieces of architecture, urbanism, and design, such as this 1962 photo of "Smoke" at the "Scale as Content" exhibit at D.C.'s Corcoran Gallery of Art. Visiting her site is akin to stumbling upon a flea market staged by design geeks: the only known photos of Harry Bertoia's sculptured fountain in Calumet, Ill., for instance, have been rescued from an old suitcase and posted for all to see. Bookmark the site. We have. • betonbabe.tumblr.com

TOP: COURTESY SIR JOHN SOANE'S MUSEUM
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→STUDIO VISIT

Olson Kundig Architects

THE STUDIO CRIT REMAINS A CRUCIAL PART OF THE CULTURE AT THIS SEATTLE-BASED FIRM, EVEN AS IT HAS GROWN FROM TWO TO NEARLY 100 PEOPLE.

TEXT BY KRISTON CAPPS
PHOTOS BY JASON FULFORD

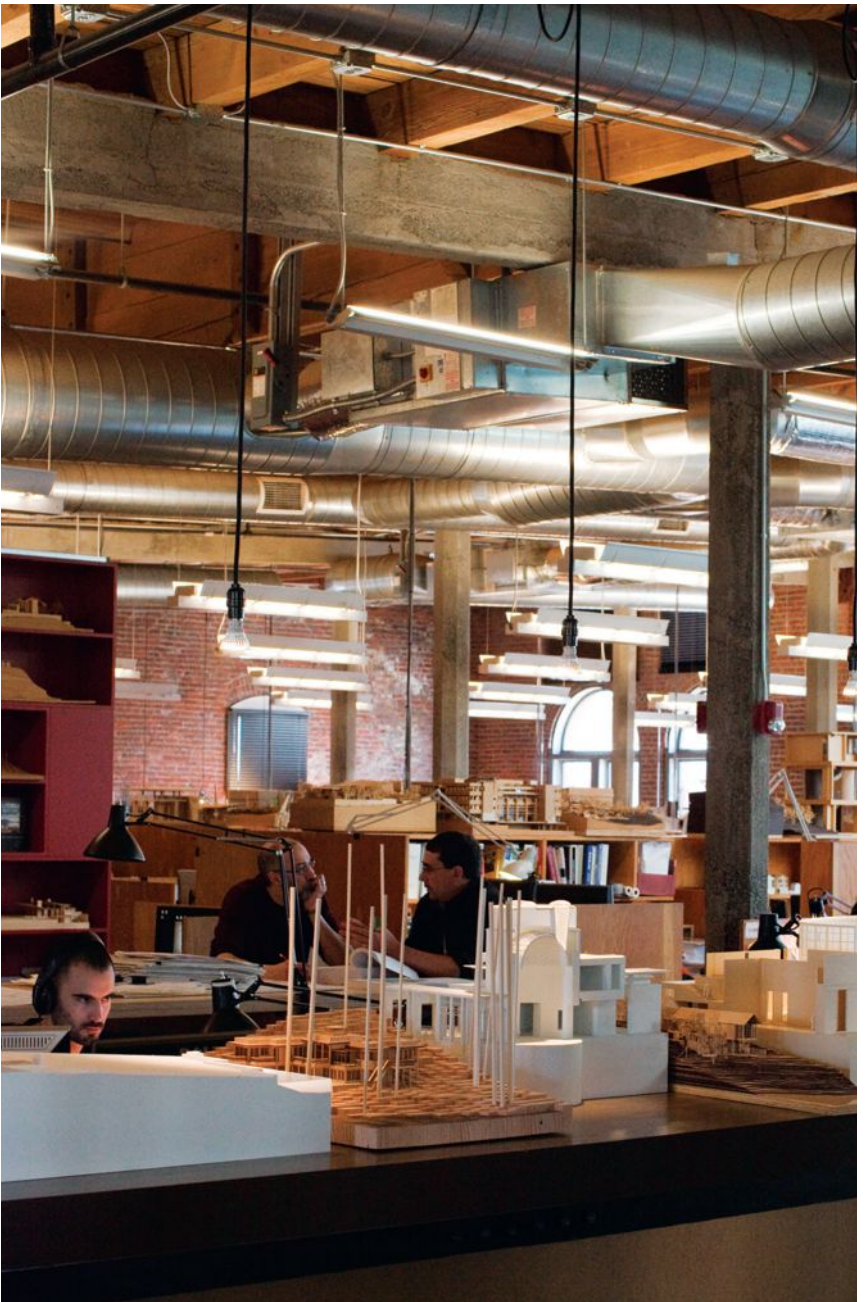
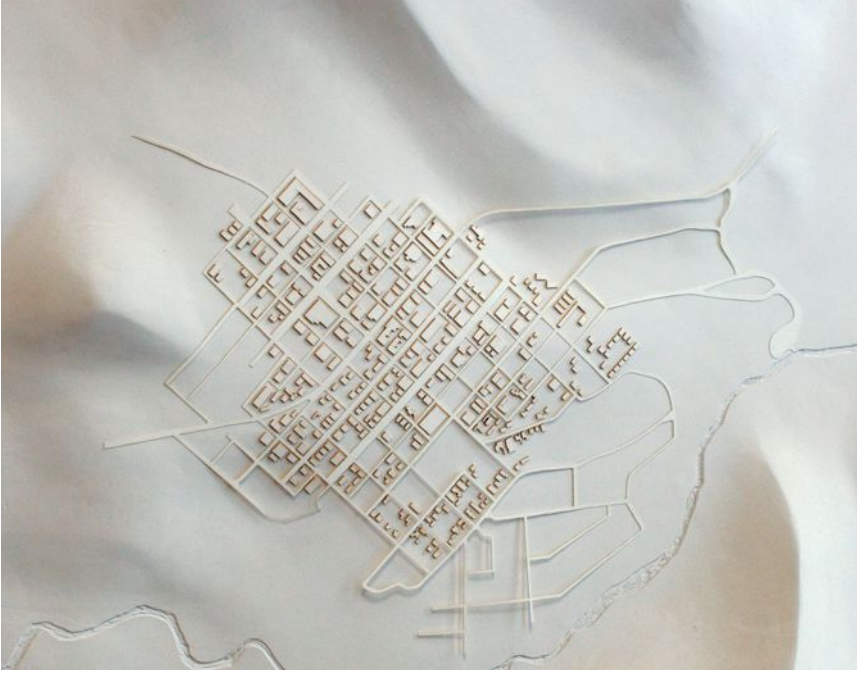
Though all four of the principals at Olson Kundig have been working in the studio for more than 20 years, they have a hard time pinning down exactly when it grew to its present size. "It's grown incrementally," says Kirsten Murray, AIA, pictured opposite. "It's sort of like gaining weight. You gain a pound a year and you go, 'Oh, wait?'"

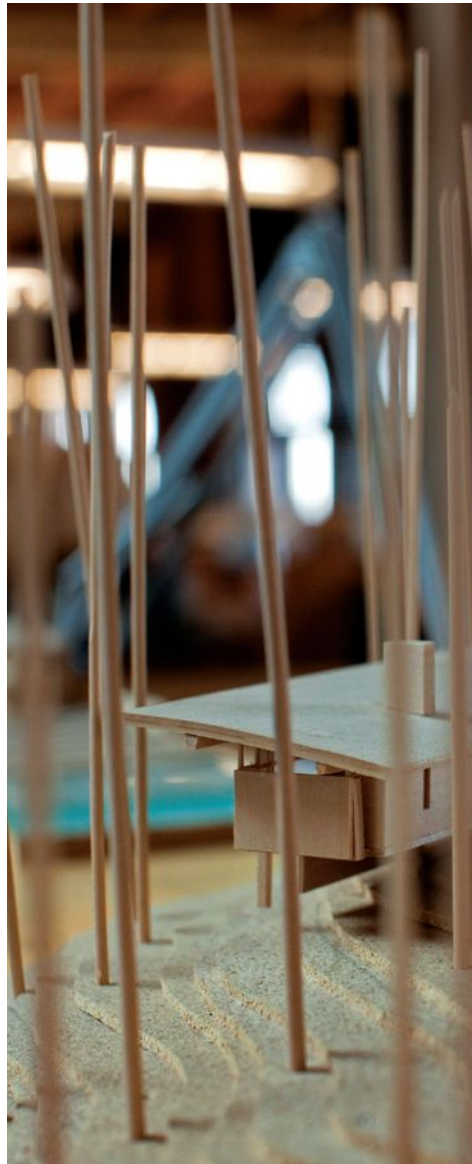
"It's kind of lonely working all by yourself," says Jim Olson, FAIA. When he started his own shop in Seattle in 1966, he split a warehouse office with another architect, Gordon Walker. "I've always liked working by myself and bouncing it off somebody and going back and working by myself again," he says. "This relationship was perfect, because he kind of liked to do the same thing. That idea has pretty much stuck with us all the way for these 40-some years."

Tom Kundig, FAIA, joined the firm in 1986 after working in Switzerland and Alaska, where he had his own firm. "I came back to Seattle and was working for another firm when the opportunity to work with Jim arose," Kundig says. "I had long been an admirer of Jim's spirit and jumped at the opportunity."

Principal Alan Maskin joined the firm 20 years ago—but he says that he knew its work before he started architecture school. For Maskin, art was the draw. "When I was hired, I was torn between pursuing a career in architecture or art," he says. "I gave myself five years to see if there was enough art and design at Olson Kundig to keep me in the practice. I still ask myself the question every five years, and the answer, for me, remains a definitive 'yes.'"









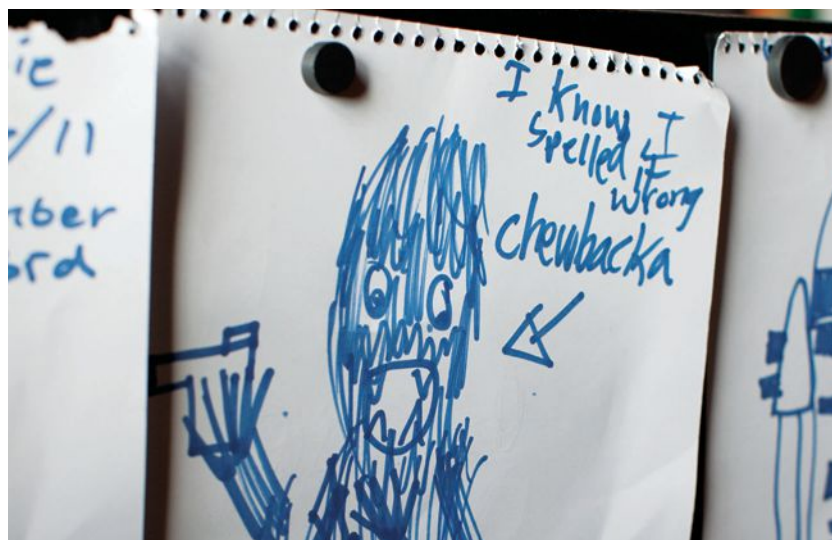
Critique drives the culture at Olson Kundig. "I'm sure my partners have told you about our weekly crit," says Maskin, 57, pictured far left. (It's true: every one of them did.) "Every Thursday since the inception of the firm over four decades ago, we turn off computers and put down pencils, and the entire office gathers in a conference room to discuss an ongoing project. While there is beer and some food, the prime motivator is a design discussion."

Even when 50 people are giving one-minute presentations, the crits are more than scratch sessions. The firm came together "in real time" to design a project for a Seattle ideas competition, Murray, 47, says. "The products of that [the crit sessions] were what we submitted."



"All the office is completely open. There's very little hierarchy," says Olson, 71, pictured at top. "My desk looks like everybody else's, pretty much." The firm keeps its Pioneer Square warehouse space flexible in part by building out the interior with plywood cubes, which allow for modular, personal work spaces. The hours are flexible, too. "It's kind of like a beehive," Olson says. "I might go there at 10 o'clock at night—and there's always someone there."

Much of the studio's work is still centered in Seattle and residential in nature. But the firm is engaged abroad more and more, says Kundig, 57, pictured near left. "It is hard to predict, but we will go where clients are interested in our work and where they want us to help them make special places."



"The project types we do are still predominantly reasonably small, whether it is adaptive reuse or residential," Murray says. "Growth was never our plan. We're a little surprised by how big we are. Lots of firms create a need and profile for their firm—higher-ed, healthcare. We've always looked for projects that are a little bit on the edge." The choosey approach to projects helps them work small.

Olson doesn't foresee much more growth. "It's been about this size for 10 years. We're handling about as much as we physically can," he says. The firm rarely loses any metaphorical weight. "Most people stay here forever and ever."

→ BEYOND BUILDINGS

Back to Basics

AARON BETSKY ASKS A SIMPLE QUESTION: WHAT IS ARCHITECTURE?



WHAT DEFINES ARCHITECTURE as a discipline? My students ask me what architecture is or is for. I don't know, but I suspect there is an answer. Architecture is, of course, in its essence, about building. It is how we think about buildings, how we talk about buildings, how we design buildings, and how buildings appear. The core of architecture is building, or, to extend that verb and noun, the human-made environment. All that shapes, forms, frames, and extends that artificial space is architecture.

How one should do that framing, forming, shaping, and extending; with what means; and to what ends make up the questions as to the nature and character of architecture. Buildings of the traditional, stand-alone sort are more often than not the tombs of architecture, in that they are defined these days not by design, but by code: life-safety codes, building codes, behavior and appearance codes, computer codes, and, above all else, financial codes.

There is another way to define architecture, though, and that is through its place in society. In those terms, architecture is what licensed architects produce for hire. Those architects, in turn, are the products of accredited schools of architecture. Architects produce architecture when they create products that answer to codes, under a contract. These architects are then responsible and liable for their products under the terms of that agreement.

This means that a reductive definition of

architecture would be that it is produced neither by engineers stamping drawings, nor by artists. It is not something that appears because an architect has a vision that she or he then just produces. It is a social activity that has a space within our economic and political system.

By that same token, architecture in that definition often finds itself entombed within those same relations, thus becoming a suppression or burial of the life that it is meant to frame. Architecture in this definition also becomes the fixing in place of the social, political, and economic status quo, reflecting the values and needs of those who have the means to commission the architect.

The notion of architecture as a way of making space for social relations through the use of visualization and organizational skills is an opportunity. Talking about network or organization architecture has become all the rage, and architects could capitalize on the realization that their spatial models might have broader relevance. And the notion that you can resist power through occupation or other self-organizing systems could benefit from the skills and talents that architects possess.

With any definition, whether it's making us at home within a human-made space, or making space for humans within systems that often seem beyond our control, there is a great deal of work to be done by architects beyond the production of buildings. □

TEXT BY AARON BETSKY
ILLUSTRATION BY PETER ARKLE



→ Read more of Aaron's design observations at ARCHITECT's Beyond Buildings blog: go.hw.net/betsky.

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TEXT BY WANDA LAU AND KATIE GERFEN
ILLUSTRATIONS BY CLINT FORD

2012 R+D AWARDS

THE SIXTH-ANNUAL RESEARCH AND DEVELOPMENT AWARDS CELEBRATE PRAGMATIC SOLUTIONS TO REAL PROBLEMS THAT ARCHITECTS FACE.

COMPOSING A JURY is a bit like performing alchemy: You gather a series of industry luminaries from different backgrounds and areas of expertise, put them together in a room, and sit back, fingers crossed, hoping that everyone will get along. Thankfully, this year's jury—which included Martina Decker, Gordon Gill, AIA, and Jinhee Park, AIA (see their bios on page 111)—clicked immediately, coming together with a single-minded focus on finding solutions that can immediately solve problems that confront architects all the time. In other words, pragmatism was the order of the day.

With new construction still crawling (a look at the precipitous fall in May's Architecture Billings Index on page 20 bears that out), this jury wasn't looking for beautiful one-off projects. They were looking for technical solutions to real-world problems—solutions that can be deployed industry wide. "Is it scalable?" and "Is it reproducible?" were questions that Gill asked multiple times during the daylong deliberations. And the winners—which include a modular classroom, a noninvasive solar-panel support, hardware that eases the installation of reveal-edge base details, and a ventilation system for gas fireplaces that reduces the likelihood of burn injuries—all answer the call.

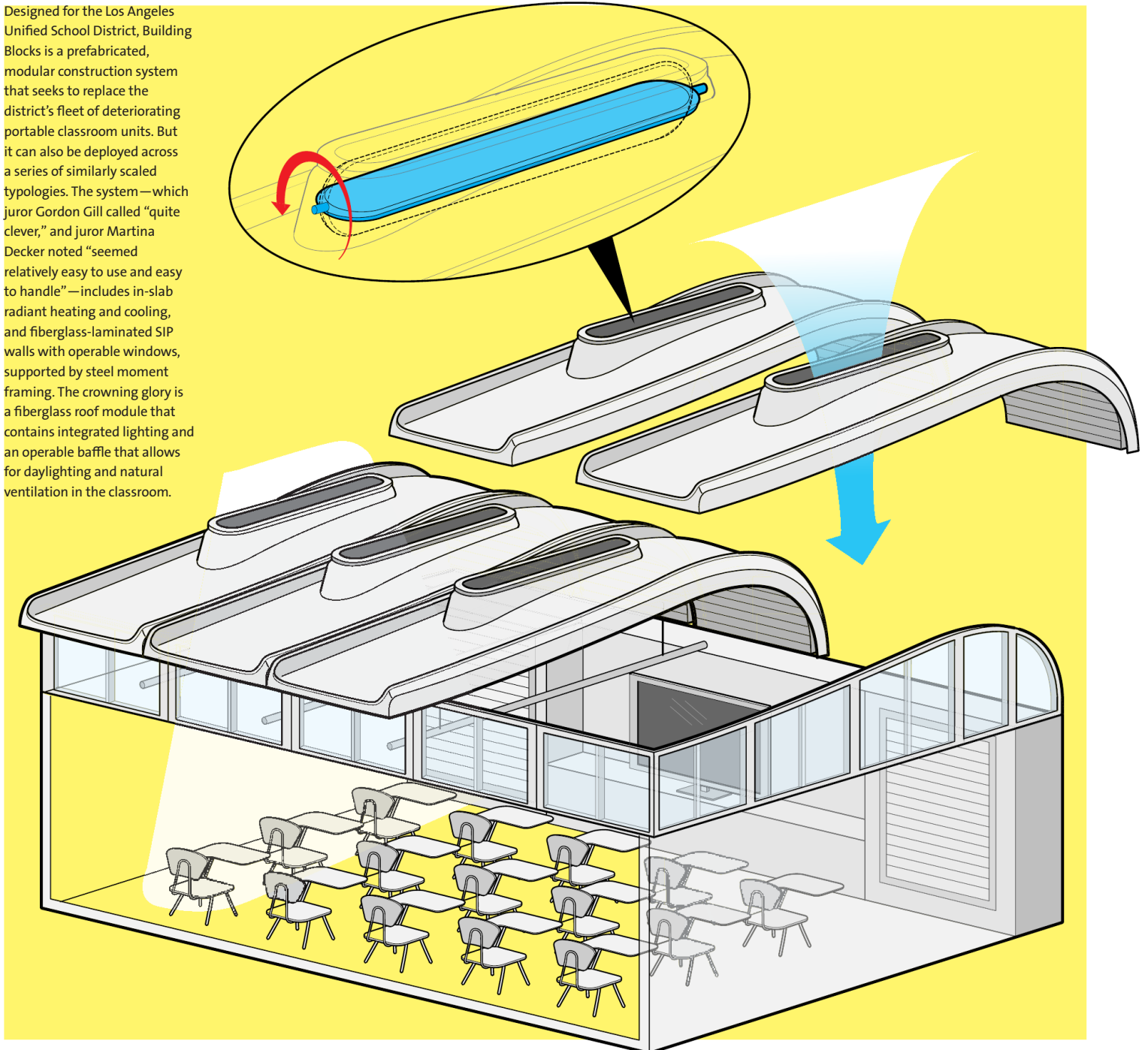
"Research and development doesn't necessarily mean that you invent something perfectly new," Decker said, synthesizing the jury's thesis. Sometimes it's "being able to do something that we've been able to do before, but now, we have a new elegance to it." And while the winners that follow might not seem, at first glance, like the flashiest of innovations, they do call to mind the tagline first associated with this program six years ago: **Geek is good.**

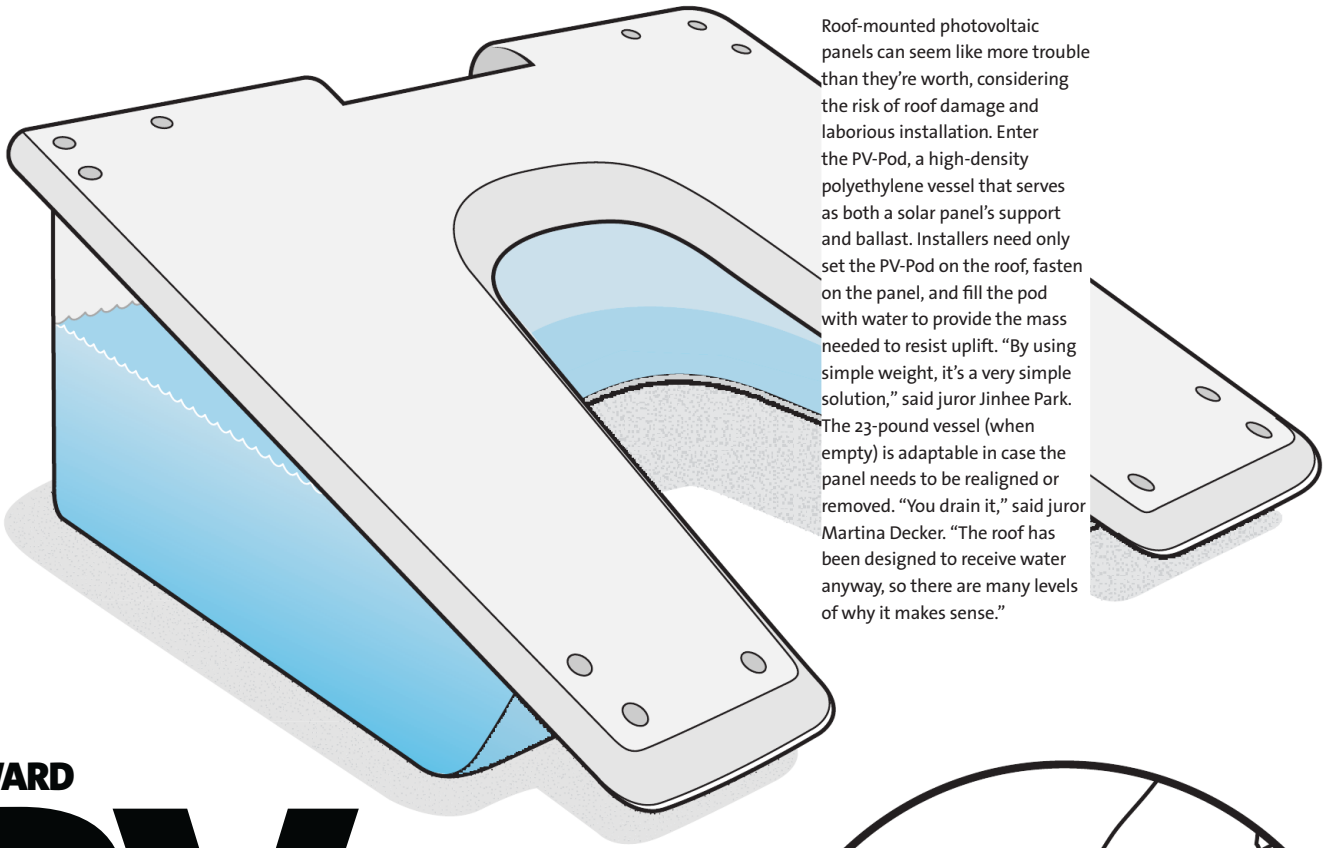
AWARD

BUILDING BLOCKS

Architect Hodgetts + Fung Design & Architecture

Designed for the Los Angeles Unified School District, Building Blocks is a prefabricated, modular construction system that seeks to replace the district's fleet of deteriorating portable classroom units. But it can also be deployed across a series of similarly scaled typologies. The system—which juror Gordon Gill called “quite clever,” and juror Martina Decker noted “seemed relatively easy to use and easy to handle”—includes in-slab radiant heating and cooling, and fiberglass-laminated SIP walls with operable windows, supported by steel moment framing. The crowning glory is a fiberglass roof module that contains integrated lighting and an operable baffle that allows for daylighting and natural ventilation in the classroom.



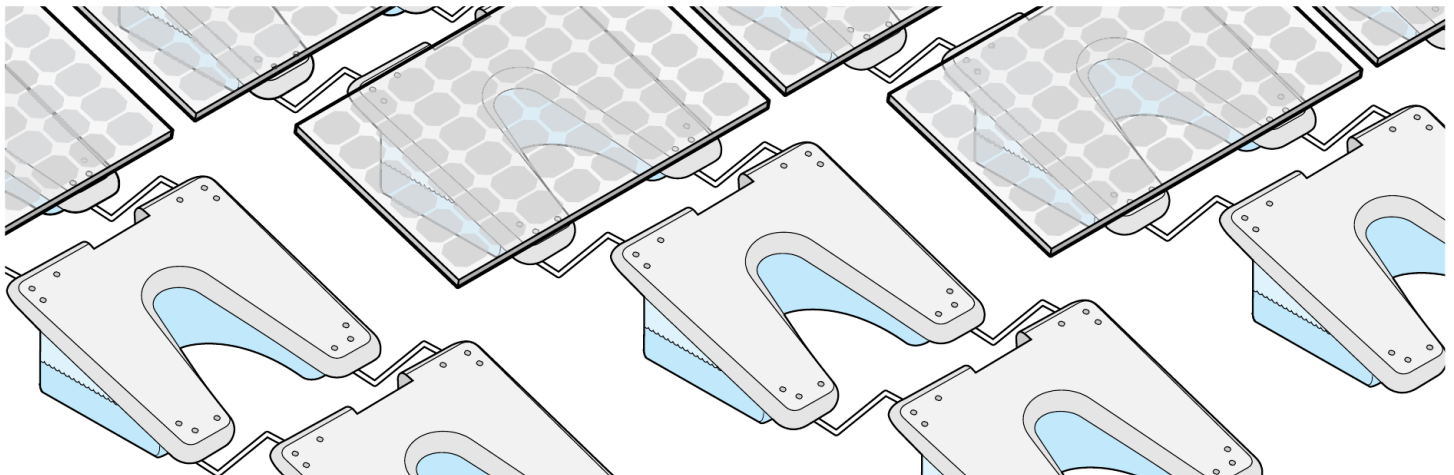
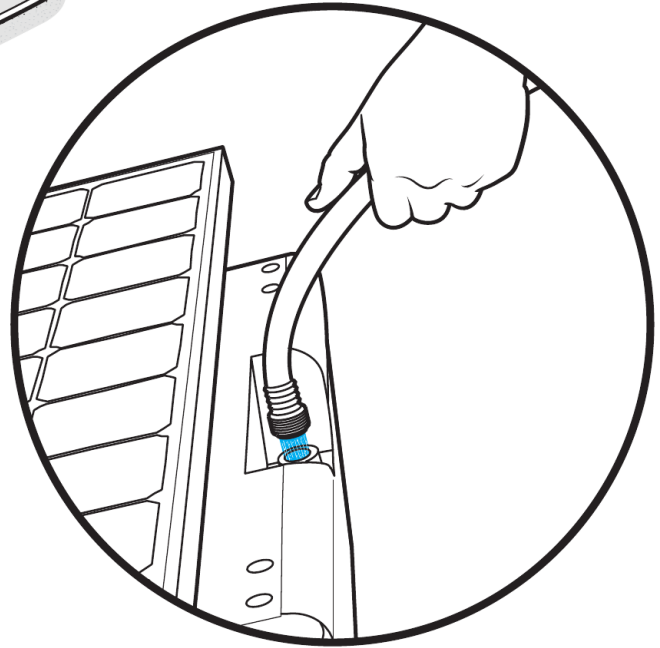


Roof-mounted photovoltaic panels can seem like more trouble than they're worth, considering the risk of roof damage and laborious installation. Enter the PV-Pod, a high-density polyethylene vessel that serves as both a solar panel's support and ballast. Installers need only set the PV-Pod on the roof, fasten on the panel, and fill the pod with water to provide the mass needed to resist uplift. "By using simple weight, it's a very simple solution," said juror Jinhee Park. The 23-pound vessel (when empty) is adaptable in case the panel needs to be realigned or removed. "You drain it," said juror Martina Decker. "The roof has been designed to receive water anyway, so there are many levels of why it makes sense."

AWARD

PV-POD

Primary Investigators MetaLab

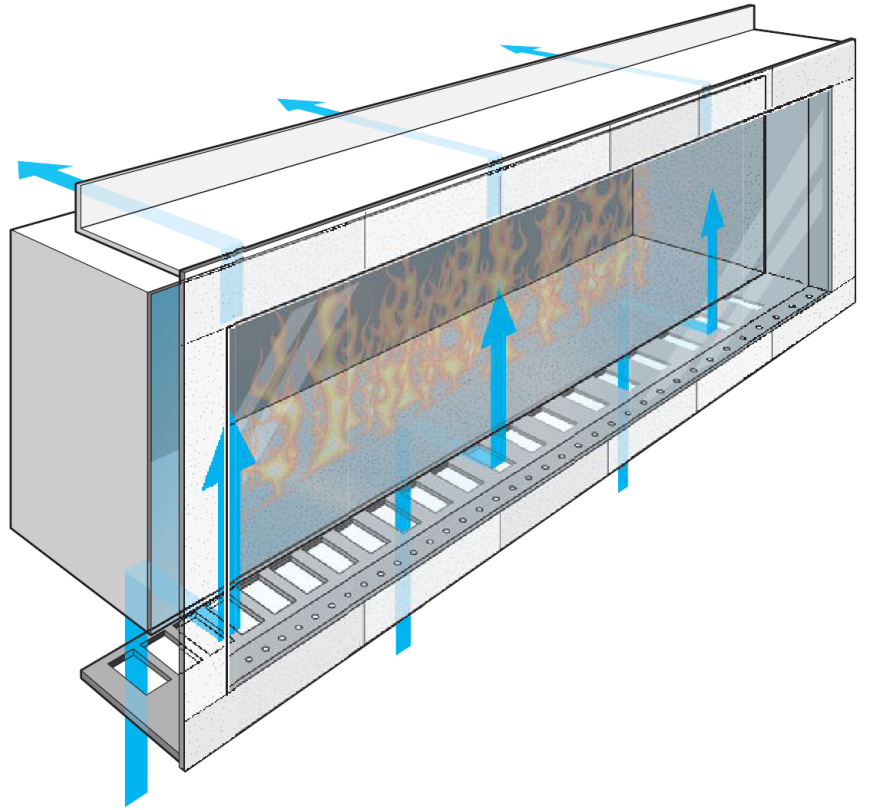


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Manufacturer Montigo

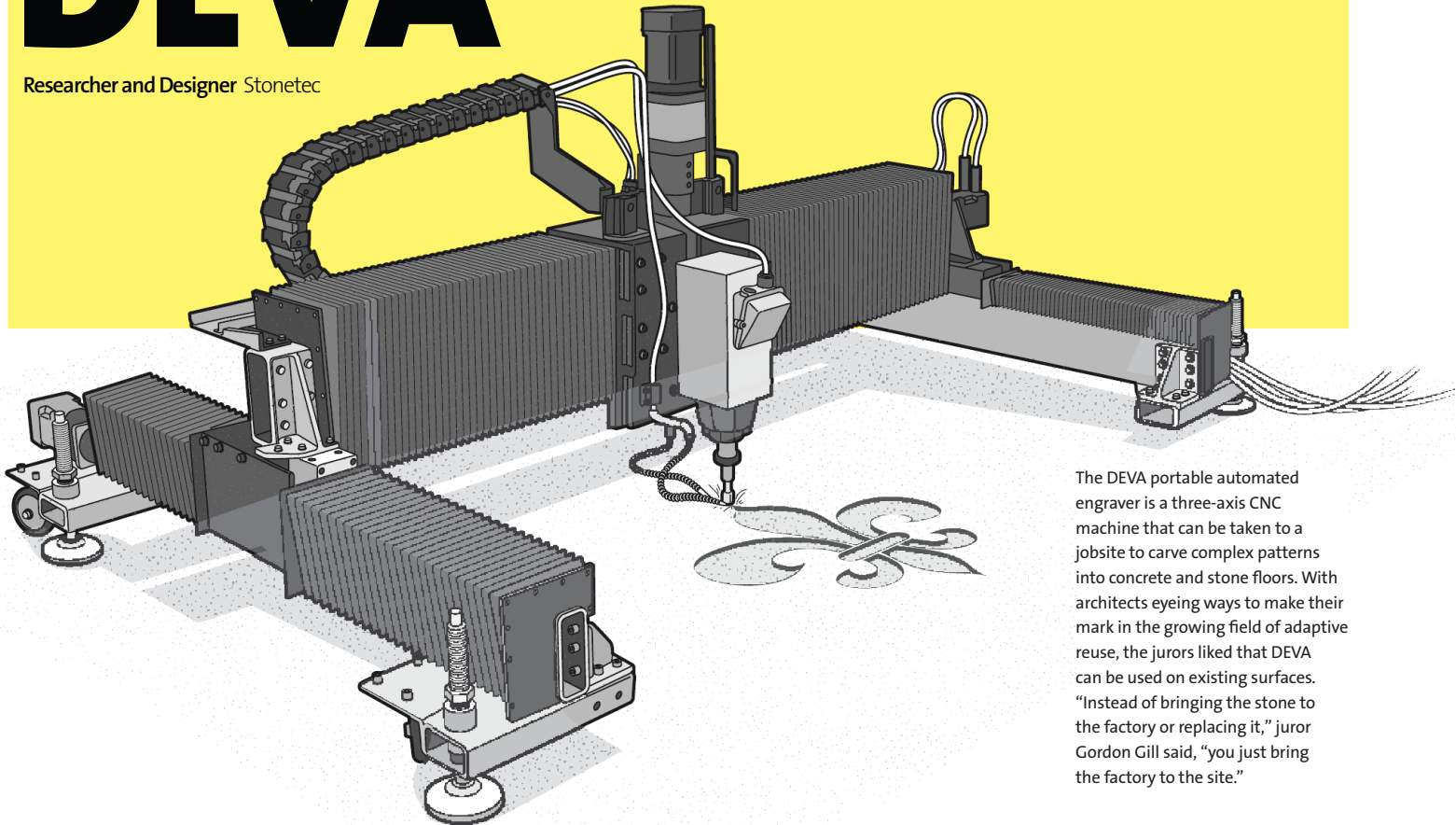
Long a standby in hotel lobbies and restaurants, architectural gas fireplaces are appreciated for their aesthetics, not their performance. "I have been in situations where the comfort of the room ... [was] compromised because of the fireplace," said juror Gordon Gill. The Cool Pack system creates an insulating air pocket between two glass panes in front of the fire that helps prevent unwitting guests from overheating or getting injured. The gravity-induced or fan-powered air movement between the panes can drop the temperature of the outermost layer of glass from 450 to 600 F to 110 to 180 F. By assuaging liability worries, the Cool Pack system "offers you the opportunity to put them [fireplaces] in locations where you couldn't ... before," Gill said. Cool Pack is available with eight different gas-fireplace configurations.



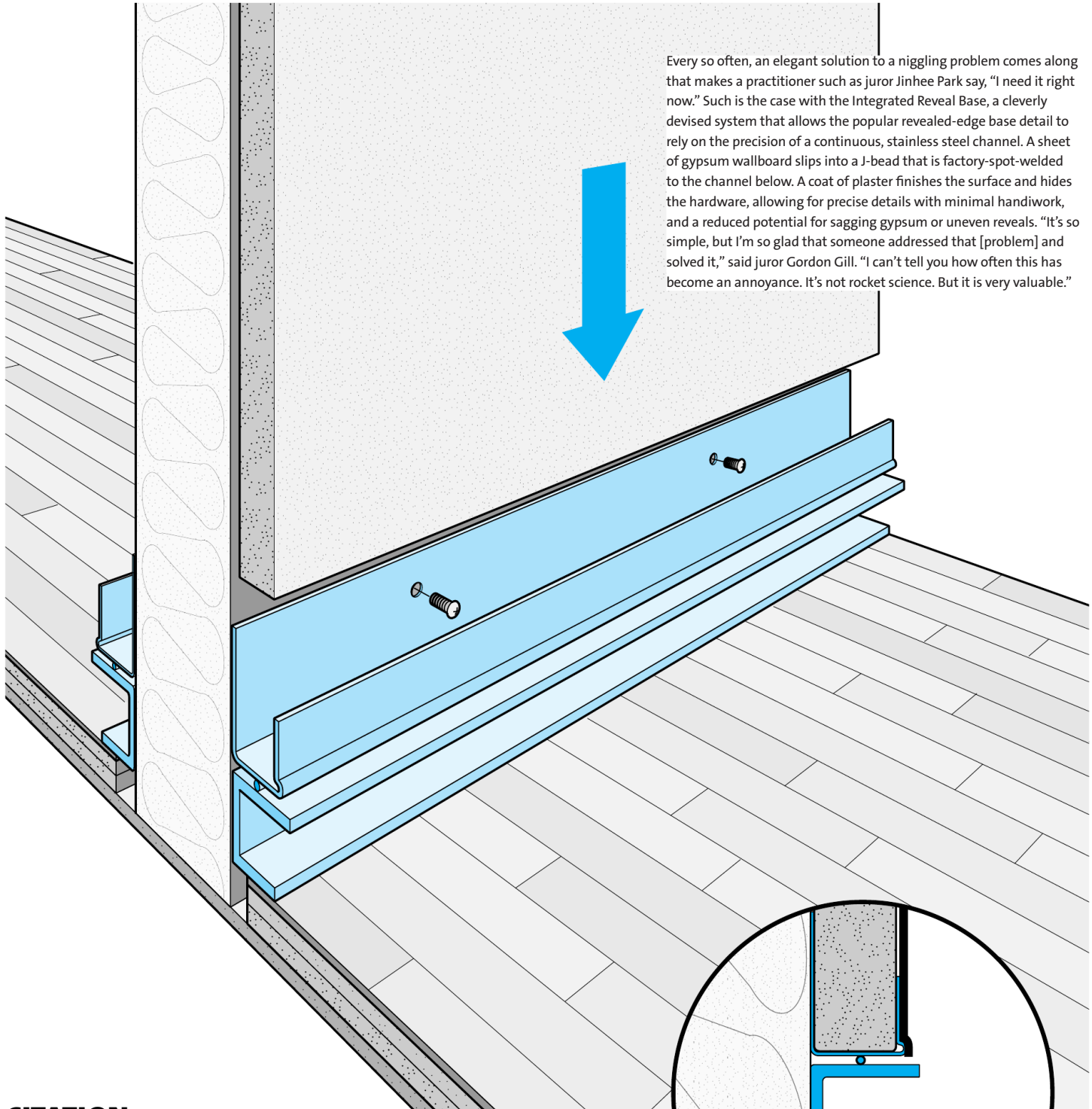
CITATION

DEVA

Researcher and Designer Stonetec



The DEVA portable automated engraver is a three-axis CNC machine that can be taken to a jobsite to carve complex patterns into concrete and stone floors. With architects eyeing ways to make their mark in the growing field of adaptive reuse, the jurors liked that DEVA can be used on existing surfaces. "Instead of bringing the stone to the factory or replacing it," juror Gordon Gill said, "you just bring the factory to the site."



Every so often, an elegant solution to a niggling problem comes along that makes a practitioner such as juror Jinhee Park say, "I need it right now." Such is the case with the Integrated Reveal Base, a cleverly devised system that allows the popular revealed-edge base detail to rely on the precision of a continuous, stainless steel channel. A sheet of gypsum wallboard slips into a J-bead that is factory-spot-welded to the channel below. A coat of plaster finishes the surface and hides the hardware, allowing for precise details with minimal handiwork, and a reduced potential for sagging gypsum or uneven reveals. "It's so simple, but I'm so glad that someone addressed that [problem] and solved it," said juror Gordon Gill. "I can't tell you how often this has become an annoyance. It's not rocket science. But it is very valuable."

CITATION

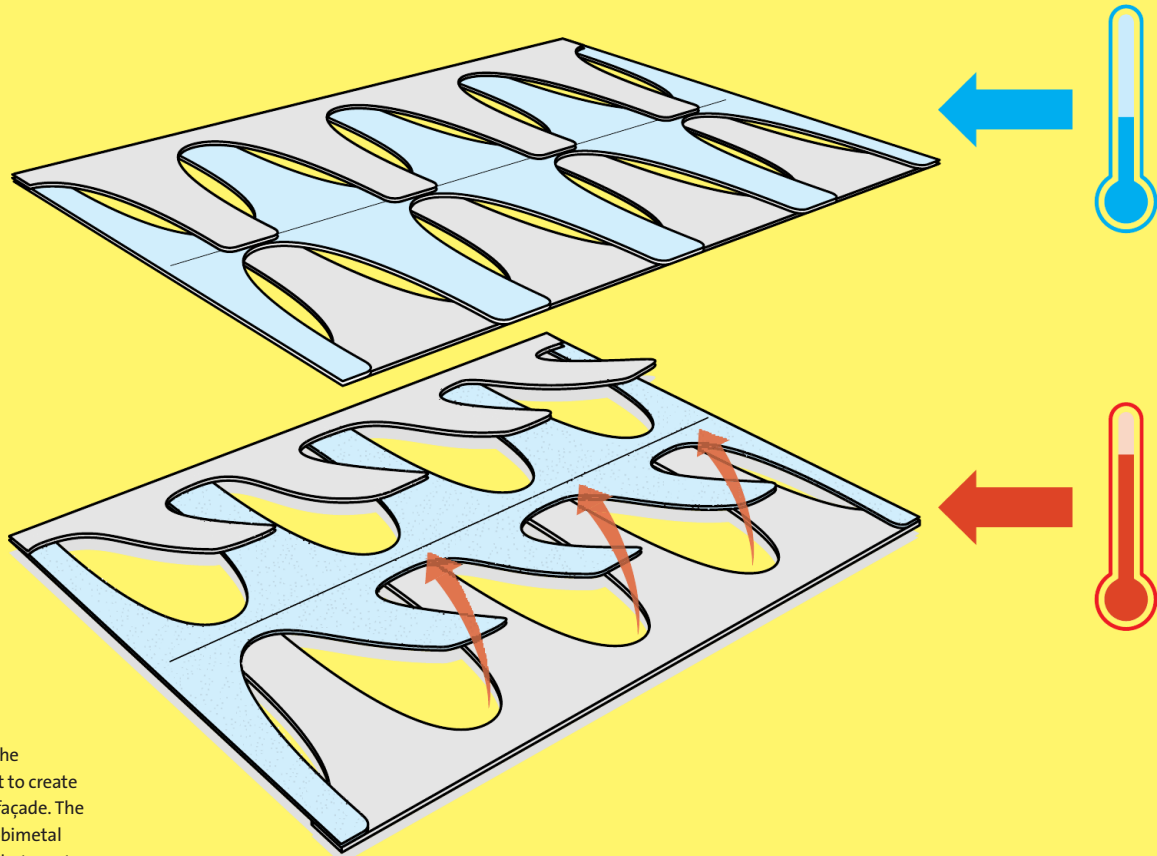
INTEGRATED REVEAL BASE

Primary Developer Bogue Trondowski Architects

HONORABLE MENTION

BLOOM

Primary Investigator Doris Kim Sung, Assoc. AIA

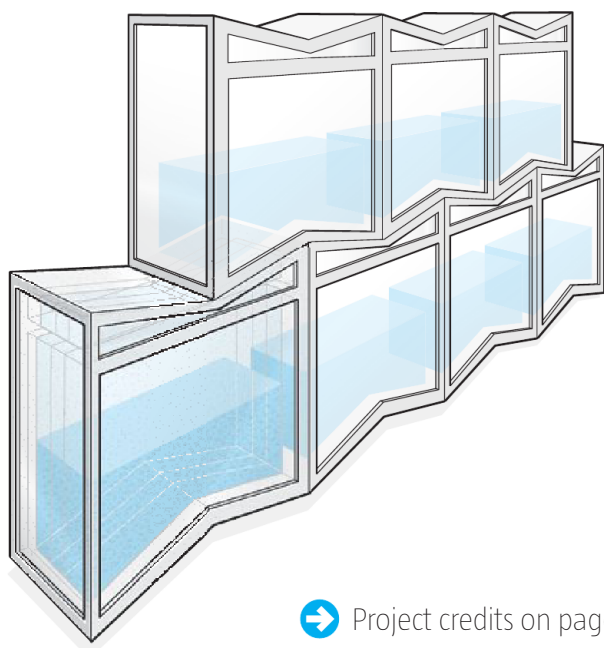
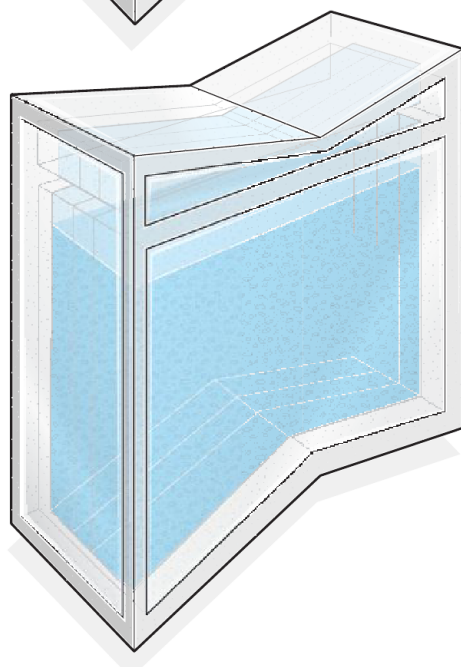
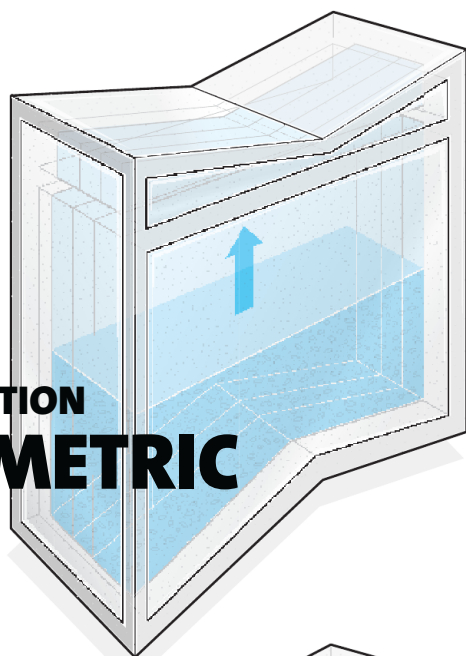


In designing Bloom, the research team set out to create a zero-energy active façade. The team utilized thermobimetal (two layers of metal that react differently to heat) and created a pavilion covered in 414 tiles, each comprising bimetal tabs. When exposed to the sun, the tabs curl, providing both shading for the people inside and openings for hot air to vent. And while juror Martina Decker called the pavilion “a beautiful sculpture,” it was less the design than the research that really captivated the jury. “I find that material investigation to be interesting,” juror Gordon Gill said.

HONORABLE MENTION THERMOMETRIC FAÇADE

Architect Davidson Rafailidis

Following a material investigation that juror Gordon Gill called “valuable and interesting,” the concept for Thermometric Façade then took shape—literally. The project uses the thermal and volume-expansion behavior of wax-based phase-change materials to create a modular, structural glass block that becomes clear or opaque depending on the ambient temperature. Stacked together, the blocks can create dynamic walls that react to programmatic or environmental conditions. “It turns something discreet and hidden into an element of design,” juror Martina Decker said.



 Project credits on page 136



THE JURY

Gordon Gill

A founding partner of Chicago-based Adrian Smith + Gordon Gill Architecture, Gordon Gill, AIA, is a leading practitioner in performance-based design. His work includes many of the world’s largest buildings such as Pearl River Tower, the first net-zero-energy skyscraper, and the 1-kilometer-tall Kingdom Tower. Gill, also a co-founder of the consulting firm PositivEnergy Practice, counts among his many accolades an AIA Honor Award for Regional & Urban Design for the Chicago Central Area Decarbonization Plan, which also won a 2010 R+D Award.

Jinhee Park

AIA Young Architects Award recipient Jinhee Park, AIA, is a founding principal of Cambridge, Mass.–based SsD, the 2012 recipient of the Emerging Voices Award from the Architectural League of New York, and a winner of 10 AIA chapter awards, including one for the Big Dig House in Greater Boston. Currently a design critic at Harvard University’s Graduate School of Design, her alma mater, Park focuses on the convergence of aesthetics and sustainability in her work, which includes cultural, residential, furniture, urban design, and research projects.

Martina Decker

With a list of projects bearing such names as Carbon Nanotubes, Shape Memory Alloys, and Wet Artificial Muscles, Martina Decker redefines building technology. A partner at New York–based Decker Yeadon, an architectural research firm that explores emergent, smart, and nano materials, Decker has been a critic and instructor at Cornell University and the Rhode Island School of Design. Her award-winning work in architecture, art, and consumer products is often featured in publications, including the forthcoming book *Performative Materials in Architecture and Design* (Intellect, 2012).





A SKYSPACE IN HOUSTON

JAMES TURRELL'S LATEST PROJECT IS AN ARCHITECTURAL PAVILION THAT FRAMES AN ARTWORK—AND AN ARTWORK THAT ACCOMPLISHES AN ARCHITECTURAL FEAT.

TEXT BY THOMAS DE MONCHAUX
PHOTOS BY IAN ALLEN

A FLAT EXPANSE OF SPRAWL and scrubland spread around a hazy downtown—one populated by Flavins, Warhols, Twomblys, and the best Rothkos on the planet—Houston is an unlikely confluence of low-lying landscape and high-flying art. That's due in part to the intercessions of civic patroness Dominique de Menil, who over the last century inspired the development of a remarkable local constellation of collections and commissions. Cultural houses that she launched or promoted include her own eponymous gallery (its original building the first major solo act by Renzo Piano, Hon. FAIA, its latest the breakthrough gig for emerging Los Angeles firm Johnston Marklee), the Museum of Fine Art (with buildings by Mies van der Rohe, Rafael Moneo, Hon. FAIA, and soon, Steven Holl, FAIA), and the Rothko Chapel.

The latest star in that constellation, at one end of a long quadrangle at Rice University, is by the artist James Turrell (with Thomas Phifer and Partners as assisting architects). Titled *Twilight Epiphany*, it's a 118-foot-square earthwork with grassy bermed walls enclosing a near-cubical bench-lined atrium, 28 feet square. Those

berms form a truncated pyramid that slopes up at an unvarying 19 degrees towards a 72-foot-square white canopy that, perched on just eight 6-inch-diameter steel-tube columns paired at its corners, seemingly hovers 21 feet up in the air. That canopy is punctured at its center by a 14-foot-square skylight—the signature element of Turrell's "skyspace" works, this being his 73rd.

It was through de Menil that Turrell first met Suzanne Deal Booth. A Rice graduate and former de Menil intern, Booth became Turrell's studio assistant, working on an early skyspace at Queens, N.Y.'s MoMA PS1 museum. Booth's financial support would later enable Rice to commission this new \$6 million project, which went through years of gestation and a year of construction and calibration. The founder of Friends of Heritage Preservation, a conservation-focused charitable group based in Los Angeles, Booth has, along with her husband, financier David G. Booth, continued de Menil's cultural philanthropy.

Dawn and dusk at the Rice skyspace see some 244 LED fixtures lining parapets at the top of the berms illuminating the underside of the


canopy with a moody sequence of hues. Those hues are programmed to vary over the year with the length and luminosity of sunrise and sunset. Viewed from within the atrium enclosure (where pew-like benches of mottled Texas Pink Granite accommodate 44 visitors), or from the 7-foot-wide channel at the top of the berms (where cast-concrete benches of similar profile seat another 76), the effect of this light show is uncanny. One's visual perception is not so much that the LED array is changing the color of the canopy, but that the sky beyond is itself impossibly shifting toward complementary shades, cycling through bruised purples and eschatological greens, gradually and suddenly darkening and lightening, while the canopy itself remains a mysterious constant.

Turrell got his start in the 1960s Los Angeles art scene with the Light and Space movement, which included artists Robert Irwin and Doug Wheeler. His early work featured installations of screens and partitions that regulated light from existing windows and fixtures—as much about the impurities of architecture, perhaps, as the purities of light. His ongoing magnum





The 7-foot-wide channel at the top of the berm walls affords dramatic views of the skylight and Rice's campus. The pew-like seating in the upper viewing area has the feel of balcony seating in a theater. And even though the upper deck stands at just 9 feet above grade, the view from about 14 feet above grade is theatrical for the superflat Houston landscape.

The image shows a minimalist interior space with dark, textured walls and a dark floor. A large, rectangular opening in the center of the wall provides a view of an outdoor courtyard. The courtyard features a green lawn, a central fountain with water spraying upwards, and several trees. The sky is bright blue with some white clouds. The lighting is dramatic, with strong shadows cast across the walls and floor, suggesting a high sun position. The overall aesthetic is clean and modern, emphasizing geometric forms and natural light.

Turrell's skyspace for Rice is the first to be engineered for acoustics, with 12 speakers built into the structure's plaster walls to facilitate performances by students from the university's Shepherd School of Music and Rice Electroacoustic Music Labs. The space's two viewing levels could serve as listening stations for sound installations or other kinds of auditory performances.

opus is a complex of Earth Art interventions around Roden Crater, a volcanic formation near Flagstaff, Ariz. Turrell has designed skylit spaces with far fewer bells and whistles than are to be found at Rice, as at the understated room installed in 2000 at the nearby Houston Live Oak Friends Meeting House. Then there's *The Light Inside* (1999), a high-tech installation in the tunnel between two wings of the Houston Museum of Fine Arts, in which lights embedded in translucent glass partitions, framing a walkway between knife-edged plaster cycloramas, produce a scintillating illusion of seeming reflection and indeterminate space. In the Rice proj-

steel at its edges, its PVC-membrane hip roof and flat stucco soffit enclosing a steel frame in which tapering cantilevers extend every 4 feet from 2-foot-5-inch-deep members spanning between those hard-working corner columns.

Throughout the project, seams and joints achieve remarkably fine tolerances and are deployed in ingenious ways. Examples include drainage carefully channeled between the tightly spaced stone pavers of the atrium floor, or the deployment of 2-inch reveals where the high backs of the stone benches meet the atrium walls to provide outlets and returns for that most essential of building systems in Houston:

him a good assistant and neighbor both.) Phifer's project is distantly visible from Turrell's. While one is a work of architecture and the other a work of art—insofar as this distinction is serviceable—the two pavilions nevertheless address each other. Both are square in plan and white in color, and resolve at their perimeters toward crisply cantilevered canopies.

The Brochstein Pavilion features an overhead matrix of light scoops and screens that diffuse and dapple daylight. "It's an interesting dialogue between the two," observes Richey, who worked on both projects. "You're letting light in through a canopy, but it [the Brochstein Pavilion] has that filtered light that is similar to light through trees, while the Turrell light is focused." Both projects provide a tart counterpoint to the stately arcades and ponderously historicist brickwork that constitute much of the Rice campus, and both provide intimate indoor-outdoor gathering spaces in a landscape that remains stubbornly automotive in scale. "It adds an outdoor room, developing an interesting typology from a cloister or a courtyard," Whiting says of the Turrell pavilion. "You are enclosed, without being closed off."

Turrell's enclosure can be entered by two aligned portals that recall the similar incision-into-hillside detail at the Tomb of Agamemnon in Mycenae—by way of Philip Johnson's reinterpretation of that ancient archetype for his semi-subterranean art gallery in New Canaan, Conn. Turrell's portals are flanked by narrow staircases leading to the parapet-level seating, their framing walls as well as a broad, lintel-like panel all rendered in the same clean white stucco as the atrium interior and canopy underside. The result is rigorous. But it is also—for an artifact that, through its skylight, wrestles to ground an infinite *axis mundi* between heaven and earth—exceedingly well mannered.

Some architectural observers might like to see all those cosmic forces wrapped up a little less neatly. The tidy combination of tasteful white-walled modernism and structural bravura recalls Berthold Lubetkin's 1934 Penguin House for the London Zoo—and like that magnificent folly, Turrell's structure has a strident profile, a presence that sometimes risks the object becoming a monument to the visual experience for which it is merely the means.

And yet, at dusk and dawn, such contentions fade. Perhaps the structure's most brilliant gesture is in deploying that vanishingly fine edge around not only its central skylight, but also around the canopy's outside circumference. By meeting the outer world exactly as it meets the world within, the artwork stages a generous and startling inversion of public and private, sacred and profane, high and low. It's a turning-inside-out that, all along that razor's edge, somehow turns all the sky into a skylight, somehow shelters its entire expanse—enlisting and transforming, to its furthest horizon, all of that low-lying landscape into high-flying art. □

MUCH OF TURRELL'S WORK CAN BE UNDERSTOOD AS ART RENDERED IN THE MEDIUM OF ARCHITECTURE—AN ENCOUNTER NOT ONLY BETWEEN NATURE AND ARTIFICE, BUT BETWEEN DIFFERENT MODES OF ARTIFICE. LIKE RELATED WORK BY GORDON MATTA-CLARK AND ROBERT SMITHSON, IT TRANSCENDS CONVENTIONS OF ARCHITECTURAL CRITICISM. NEVERTHELESS, TWILIGHT EPIPHANY HAS SOME LESSONS FOR ARCHITECTS, SUCH AS THE EFFORT BEHIND SEEMING EFFORTLESSNESS.

ect, the natural and artificial combine in both resonance and tension.

Much of Turrell's work can be understood as Art rendered in the medium of Architecture—an encounter not only between nature and artifice, but between different modes of artifice. Like related work by Gordon Matta-Clark and Robert Smithson, it transcends conventions of architectural criticism. Nevertheless, *Twilight Epiphany* has some lessons for architects, such as the effort behind seeming effortless. "It takes a lot of architecture to be barely architecture," observes Rice University School of Architecture dean Sarah Whiting of Turrell's work. "The more ephemeral something is, the more work goes into it." Eric Richey, who was project architect for Thomas Phifer in assisting Turrell with the realization of the design, confirms this: "We did some gymnastics. It was a lot of steel, a lot of rebar, and an amazingly stout structure, but the goal was to get it all as slender as possible." That hovering canopy tapers from almost 3 feet in depth to a knife-edge 5/16-inch strip of

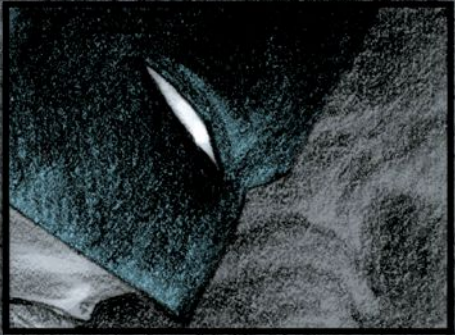
air conditioning. Those atrium walls contain 12 invisibly embedded audio speakers for musical performances and sound installations, and are tilted a single imperceptible degree back from vertical in order to suppress what would otherwise be a fluttering echo effect.

"It's a teaching tool to have on campus," Whiting says. "You can look over there at that structure that looks very simple, and look at how they pulled that off—a very straightforward example of something very complicated. You can explain it's not just a piece of chipboard floating in the air." She adds, "Houston's hard on buildings. You need things to be well made to pull off elegance, so there's a local legacy of technologically sophisticated architecture in the service of modern design."

Part of that legacy is nearby, in Phifer's own 2009 Brochstein Pavilion, a small student center wrapped in delicately Miesian glass and steel that aligns across a shared quadrangle with Turrell's project. (A Phifer hallmark is careful management of daylight, which has made



NEWSFLASH!!
REPORTS HAVE JUST
COME IN: THE CEILING NIGHTCLUB
HAS COLLAPSED AND BROKEN IN TWO,
JUST MOMENTS AGO, SENDING PATRONS
SCRAMBLING FOR SAFETY AND CROWDS
BELOW SCATTERING FOR COVER.
ACCORDING TO EYEWITNESS ACCOUNTS,
THE BAT-MAN WAS IDENTIFIED AT THE
SCENE, AS WELL AS THE NOTORIOUS
JOKER, AND A THIRD, AS-YET-
UNIDENTIFIED, COSTUMED
FIGURE.



ALL WERE
APPARENTLY INVOLVED IN
THE DESTRUCTION OF THE GLEAMING
NEW STRUCTURE, PERCHED HIGH IN THE
GOTHAM SKIES. KEM ROOMHAUS, THE
ARCHITECTURAL MASTERMIND BEHIND ITS
DESIGN, WAS AT THE SCENE AND IS
REPORTEDLY UNHARMED. MORE NEWS
TO COME AS DETAILS EMERGE FROM
THIS ASTONISHING CATASTROPHE.
THIS GOTH-I-TONE RADIO
NEWS.

DEATH BY CLICHÉ!

IN CHIP KIDD'S LATEST GRAPHIC NOVEL, *BATMAN: DEATH BY DESIGN*, THE CAPED CRUSADER AND THE JOKER ARE JOINED BY A CAST OF ARCHITECTURAL ARCHETYPES: A STOP-AT-NOTHING PRESERVATIONIST, A CORRUPT UNION BOSS, AND AN OUT-OF-TOUCH STARCHITECT. THE RESULT, SADLY, IS ONE BIG CLICHÉ.

GOtham City is broken. As crucial to the Batman mythos as the black cape is this concern: If Batman doesn't act, Gotham will perish. When it's Ra's al Ghul threatening to burn the city for its excesses or Killer Croc wrecking it just because he can, the stakes are clear. Sometimes, though, Batman's rivals don't come at him with nerve gas and switchblades. Sometimes they bring petitions.

Batman: Death by Design (DC Comics, June 2012) casts the Caped Crusader in a modern-day preservation battle, set against comicdom's most beloved noire backdrop. In this one-off Bat-book, celebrated graphic designer Chip Kidd takes up drafting duties—pushing the plot, not the pencils, which are handled by artist Dave Taylor. As inexplicable construction accidents mount, Batman battles foes familiar (the Joker) and unexpected (organized labor). But a larger question looms: What's worth saving in Gotham City, and who are the heroes and villains in these public battles? By the end, Batman solves a series of crimes against Gotham City—but also commits one himself.

The book opens with Batman's alter-ego, the eccentric millionaire playboy Bruce Wayne, speaking at a press conference to kick off the demolition of Wayne Central Station. A crane collapse in Midtown derails the demolition plans, putting Batman on the case. On the scene, too, is Richard Frank, the fresh-faced architecture

critic for the *Gotham Gazette*, who finds himself in unfamiliar territory when he is asked to report the story, not just opine on design.

Wayne Central Station is clearly a callout to New York's original Penn Station, but the parallel is off. For example, as depicted by artist Taylor, Wayne Central Station is an Art Deco skyscraper. But no matter. Taylor's moody rendering conveys all the grandiosity of McKim, Mead & White's original 1910 Penn Station, and even keeps the Gothic clock face presiding over its grand concourse—the set-piece for the book's dramatic final battle.

But the similarities end there. Whereas the 1963 demolition of New York's Penn Station shocked onlookers who watched as the unthinkable unfolded, Gothamists don't seem overly upset to lose Wayne Central Station. Which is not to say they're pleased with Wayne's choice to replace it: starchitect Kem Roomhaus. It doesn't take a detective to figure out who Roomhaus is supposed to be—or what Kidd thinks of him. “The native of Holland claims that he is often frightened of his own genius,” reads one exposition-y news report, “while several notable critics have claimed that there's actually nothing to be scared of.”

Practically the only person rooting for the restoration of Wayne Central Station is preservationist Cyndia Syl, also the book's romantic foil. The notoriously paranoid Batman immediately suspects Syl in the crane collapse,

so, in true Bat-fashion, Wayne proceeds to date her. She meets him at the opening of Roomhaus's hot new nightclub, Ceiling, which is—wait for it—a soaring pane of cantilevered glass whose corners are supported by four skyscrapers. As a 1963 editorial published by *The New York Times* on the occasion of Penn Station's demolition inveighed, “a city gets what it wants, is willing to pay for, and ultimately deserves.” Gotham City apparently deserves elitist flights of fancy.

Roomhaus's public unveiling is spoiled by the Joker, for no apparent reason. Now, the Joker has never needed much of a reason—but he does require a logic. Heath Ledger's Academy Award-winning turn as the villain in Christopher Nolan's *The Dark Knight* gave us an elemental force for chaos; Alan Moore's take in 1988's *The Killing Joke* advanced the idea that the Joker is insane, but no more insane than the Batman. But in *Death by Design*, the Joker simply moves things along. One of this graphic novel's greatest missed opportunities is Kidd's failure to cast the Penguin as the arch-villain: a ruthless tycoon who could easily sub as Gotham City's Larry Silverstein.

As the story unfolds, it also unravels. Complicating Batman's battle with the Joker (wherein the Ceiling nightclub is destroyed), is the appearance of the mysterious Exacto, an architecturally themed figure whose true identity is telegraphed from the get-go. Both Exacto and the *Gazette* writer peg

the collapse of Roomhaus's “Maxi-Minimalist” Ceiling to a structurally unsound design and shoddy union work by Gotham Local 27. Batman follows the thread; readers may not.

Death by Design does have a persistent theme: a conservative tendency, marked by an eager deployment of bitter clichés. Especially troubling is the sinister depiction of union boss Bart Loar (and labor as a whole). The larger takeaway from Kidd's masculinist story is that buildings, and the men who built them, used to mean something—not like today's corrupt labor movement and out-of-touch designers. The book is conservative even at a formal level: Thought balloons, which went out of fashion years ago, serve up steady interior exposition.

Spoiler alert! In the end, Bruce Wayne decides to rebuild the old Wayne Central Station, ditching pompous Roomhaus. Gotham City had lost sight of its values, so Batman restored them. But whose values? The demolition of Penn Station brought to life the modern preservation movement—but it didn't mark the end of great buildings in New York. New ideas have a place in Gotham City, and it's due for a new look. (If Nolan's newest *Batman* film follows its predecessors, it will show us a Gotham that could be Toronto.) Pity that Kidd, who is known for his fresh takes on familiar concepts, didn't give us that here. When it comes to design, cliché is a fate worse than death. □





WELCOME TO THE BOOMTOWN

THE FRACKING OIL INDUSTRY HAS DESCENDED ON NORTH DAKOTA, BRINGING WITH IT THOUSANDS OF WORKERS AND THEIR FAMILIES. THE MIND-BLOWING SCALE AND PACE OF DEVELOPMENT HAVE LOCAL ARCHITECTS AND OFFICIALS SCRAMBLING TO PLAN FOR THE FUTURE.

TEXT BY REED KARAIM
PHOTOS BY IAN ALLEN

IN WILLISTON, EPICENTER of North Dakota's oil boom, the local Walmart recently became the only one in the nation selling 8-foot-by-10-foot modular dwellings that can be lifted with a forklift and dropped wherever you can find a spot to set one. They come with a couple of bunks, a desk, closet space, but no running water, all for \$24,900.

If that sounds like madness, it's only part of a much larger craziness. The oil boom has set off an explosion of money and change in a land that has known little of either during most of its history. About 210 wells are being drilled right now in rolling prairie previously notable mostly for its haunting, windswept sense of emptiness. Thousands of workers have swarmed to the area, setting off a second boom—a building boom that's transforming the landscape.

Hotels are being tossed up on the edges of Dickinson and Williston, the two small cities in the oil patch, as if they were Vegas in the 1950s. Fields that only months earlier swept unhindered toward the horizon are filling up with row upon row of cookie-cutter houses and blocks of apartment buildings most notable for their utilitarian uniformity (you could call the style middle-American Soviet).

There are so many prefabricated metal buildings going up to house the associated industry that comes with drilling that, if you can't own a well, the corrugated metal business would be your next best bet for getting rich. More substantial corporate offices are also being built, edifices of precast concrete and reflective glass that feel like they were teleported from suburban Houston. Most surreal are the "man camps," grim places where thousands of oil-field workers are housed in facilities that, with their long barracks and chain-link fences, most resemble minimum security prisons.

"What are they building here? Everything," said Janet Prchal, AIA, president-elect of AIA North Dakota and a Dickinson native who owns Hulsing & Associates Architects, a local firm, as she showed me around earlier this year. Yet even as the western prairie rings with the

sound of a thousand hammers, it's not enough. People are living in trailers, pop-up campers, even tents. For a while, a village of campers and RVs had sprung up in the Walmart parking lot before the store finally hired security guards to clear everyone out at night.

I'm a native North Dakotan, and I remembered this country well. I'd read the stories about what was happening before I came up to take a look, but I was still unprepared for the degree of change, for the mildly unhinged energy filling the streets. There's no doubt the boom is a huge economic boost for the state. But as Prchal and Burton Youngs, another architect in her firm, drove me around, I couldn't help but wonder what is being done to channel the gusher of money into rational development, to seize the opportunity to build things of lasting worth, both structures and communities, that residents can be proud of when the boom has boomed.

Does anybody, in other words, have a plan?

The Start Of The Boom

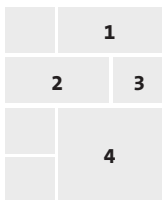
Oil was first discovered in western North Dakota in the 1950s. There was a boom in the '80s, but the current one dwarfs everything that came before. It depends on fracking, the controversial technique that uses underground explosions, to exploit two massive oil fields, the Bakken and Three Forks formations, which the U.S. Geological Survey calls the largest continuous oil accumulation it has ever assessed. North Dakota recently became the nation's second-largest oil producing state, trailing only Texas.

State Highway 85 runs north-south for about 100 miles through the oil fields. I remember when it was such a lonely stretch of road that you could just about park and have a picnic on the white line. No more. On my drive from Dickinson to Williston, the highway was so crowded with trucks and heavy equipment that I felt that I was traversing the world's largest construction site. Youngs recently counted 204 trucks on a 45-mile section of 85. "I was watching a show on gold rushes a couple of nights ago," he says. "It's exactly the same. They had a gold rush. We're having an oil rush."

Williston is the county seat for Williams County. The last census listed the county population as 22,398, but Dan Kalil, county commission chairman, says a survey in late 2011 found it had swelled to 37,776. The county expects it to reach 50,000 within the next few years. Other oil-field counties are dealing with similar growth. Kalil's family has been ranching and farming here for three generations, and he sees a world he knew being swept away. "I used to go days without seeing a person," he says. "We've lost our solitude. Lost our privacy. Our quiet is gone. This is a monumental change. ... I call it the complete industrialization of western North Dakota."

Kalil acknowledges the benefits of the boom—he jokingly calls North Dakota "the land of angry millionaires"—but he says that the prosperity has come with a cost, distorting land values and the labor market while putting a huge strain on roads and other infrastructure. Williams County has hired Winston Associates, a Boulder, Colo.-based planning firm, to help draft a comprehensive development plan. "We're trying to grow our communities logically," Kalil says, "keep industrial with industrial and residential with residential."

But with the flood of rigs and people continuing



1. Epping, a small town near Williston
2. Temporary housing in Williston, managed by Black Gold Oilfield Services
3. A cookout in Williston sponsored by the North Dakota CattleWomen
4. A van in Williston that sells vinyl decals for cars







Halliburton relocated this metal-framed building, originally used as temporary lodging during the 2010 Winter Olympics in Vancouver, British Columbia, Canada, to house some of its employees in Williston. The Muddy River Lodge, as it's called, has 281 units.



unabated, it's been nearly impossible to get a handle on the situation. "They drill on this square, this square, this square," he says. Practically overnight, 10 rigs go up, and "we don't even know they're here."

In Williston, the boom has distorted the local economy to the point where the McDonald's is offering \$15 an hour to recruit employees, and the Chevrolet dealership is reputed to be selling the most Corvettes in the nation (the owner neither confirms or denies it, but allows he's doing very well).

The city is sprawling in every direction—new housing developments, oil derricks, metal industrial buildings ("tin-can alley," Allen Domagala, a Hulsing & Associates project manager, calls the worst strip), temporary housing called man camps—a crazy quilt that reaches far into the countryside. A thousand housing units were built last year, and 2,000 to 3,000 are planned for 2012, according to Mayor Ward Koeser, along with up to 10 new hotels or motels. But no one expects it to be enough. "We anticipate between 3,000 and 4,000 new jobs," Koeser says.

Yet there is a glimmering sense of impermanence to it all. The oil companies have thrown up buildings of every kind, but nothing that makes you stop and linger. Almost everything looks as if it was done yesterday and could come down tomorrow. In June, a "Bakken Housing Summit" in Williston attracted 370 industry representatives from 33 states. While some spoke of the need to build sustainable communities, several seemed focused on seizing what Michael Milner, a Salt Lake City developer at the conference, called the biggest economic opportunity for builders in 50 to 100 years.

Williston recently worked with Minneapolis-based SRF Consulting Group to complete a master plan for growth, which is already outdated. "Although we spent a million dollars on planning, it's not enough," Koeser says ruefully. The city is focused on encouraging permanent housing and has added three people to its building department to speed the process. Koeser's biggest concern is simply the number of new people flooding in. "If you're a town of 20,000, you just can't add 5,000 year after year," he says. "You don't have the water, the houses, the infrastructure. You just can't grow that fast."

Listening to him, I thought that no one really manages a boom like this one; you hang on and hope not to be swept away. In essence, that seems to be Williston's approach—make it through and go from there. "If you stay busy enough long enough, you transition from gold rush to permanent industry," Koeser says. "Right now, we're going through a lot of stress and strain, but three years from now, we're going to be a better community than we are today."

Neglected Downtowns

Hulsing & Associates have been very busy in both Dickinson and Williston, but Prchal says that none of their business has come from the oil companies or the major hotel chains. Youngs just recently got his first inquiry from a firm connected to the oil business.

Both cities have old-fashioned middle-American downtowns with buildings dating to the early 20th century—assets that have been largely ignored. Dickinson's downtown retains more of its original character (including a 1908 Neoclassical Carnegie Library that was beautifully restored and expanded

with a well-integrated addition by Prchal's firm).

As Prchal drove me through the city center, she lamented that with all the growth, there has been little interest in rehabbing downtown buildings, including a vacant six-story, 1950s hotel. "I look at this as a person who grew up here," she says. "It's near and dear to my heart, and I believe in respecting the past. I get upset when people put all the new development ahead of things that will be lost forever."

She was, it was clear, speaking of more than buildings. She talked about her parents, who now hardly dare to drive through much of the town because of the traffic. She talked about the relentless pace of the development and how it has taxed Dickinson physically. "I feel like our town is being broken," she says. "It's like your 600-pound uncle sat on your couch, and it's going 'crack.' We weren't built for this."

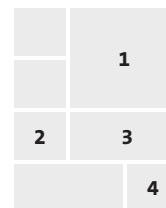
But Mayor Dennis Johnson says he is determined that Dickinson retain its character as it grows. "We think we began with a community that has fairly decent curb appeal," he says. "We want to maintain that. We want to grow in an orderly fashion." To that end, the city is trying to protect the corridors around the main roads into the city from industrial development. Dickinson also rejected plans for a 3,000-person man camp that was to be built right on the edge of town. It will now be constructed farther out.

The boom arrived later around Dickinson, giving the city more time to prepare, and it, too, is fashioning a plan for growth. "We're looking at land use, looking at transportation, water, recreation, everything," Johnson says. The city has already commissioned Hulsing & Associates to design a new elementary school in a fast-growing part of town.

Before the boom, Prchal says, new construction was scarce in western North Dakota, and architects mostly did restoration or addition projects. Her firm, known for an eclectic and pragmatic approach, designed its studio by transforming what was essentially a metal industrial building that had been a clay plant, a modular housing factory, and a hockey rink.

For the new school, Prchal wanted to update the vernacular brick designs found in most North Dakota towns by incorporating a modern, largely glass atrium. But the reality of oil-boom construction helped define her choices. The building, for example, is made of precast concrete with a brick veneer. "It all has to do with the labor force," she says. "I can't find masons." Or other workers, for that matter. The structure had to be built in Grand Forks on the eastern side of the state and hauled in, because, Prchal explains, "we don't have enough people available here to do this project."

Despite the challenges, government and local institutions are investing in other significant buildings. Almost all of the area hospitals and clinics are expanding. Dickinson is also planning a new public-works building and a law-enforcement center. Johnson emphasizes that they will be built to last. "Public government should make architecture interesting," he says, "because it sets the tone for the rest of your community."



1. A modular dwelling sold by the Williston Walmart for \$24,900

2. Spools of electrical cable in storage

3. A mother and daughter who moved from Colorado to North Dakota and started a food truck business, Blondie's Burritos

4. Robert Venturi, eat your heart out



BROOKLYN BOTANIC GARDEN VISITOR CENTER

WEISS/MANFREDI'S SYMPHONY IN GLASS AND COPPER MERGES STRUCTURE AND LANDSCAPE IN A WAY THAT INTRODUCES A NEW CROP OF VISITORS TO THE GARDEN, AND, AT TIMES, MAKES THE BUILDING DISAPPEAR.

TEXT BY JOHN GENDALL
PHOTOS BY ALBERT VECERKA

FOR THE LAST 102 YEARS, the month of May at the Brooklyn Botanic Garden (BBG) has meant the arrival of spring blooms. This year, May brought something else: a new 22,000-square-foot, \$28 million visitor center. With growing attendance (a typical 10-week springtime surge sees 500,000 people pass through its gates), BBG needed a more efficient way of welcoming and orienting crowds. So, in 2004, it hired New York-based Weiss/Manfredi Architecture/Landscape/Urbanism—and the firm's trademark expertise in merging landscape with buildings—to design a new gateway to the gardens.

Weiss/Manfredi carefully crafted two sinuous pavilions (one for events and exhibitions and the other for a gift shop), stitched together by a ribbon of shaded breezeway. The entrance is marked by an expansive plaza—paved with a local mix of concrete and dotted with custom benches—that allows for the kind of urban experience the institution prizes. Two planted gardens that flank the building help capture rainwater runoff.

"There's a big elasticity in visitor numbers," explains BBG president Scot Medbury, citing a Mother's

Day attendance of 37,000 but fewer people in colder months. The plaza works to accommodate a full range of numbers—big enough to handle crowds, but intimate enough to not seem barren on a quiet day.

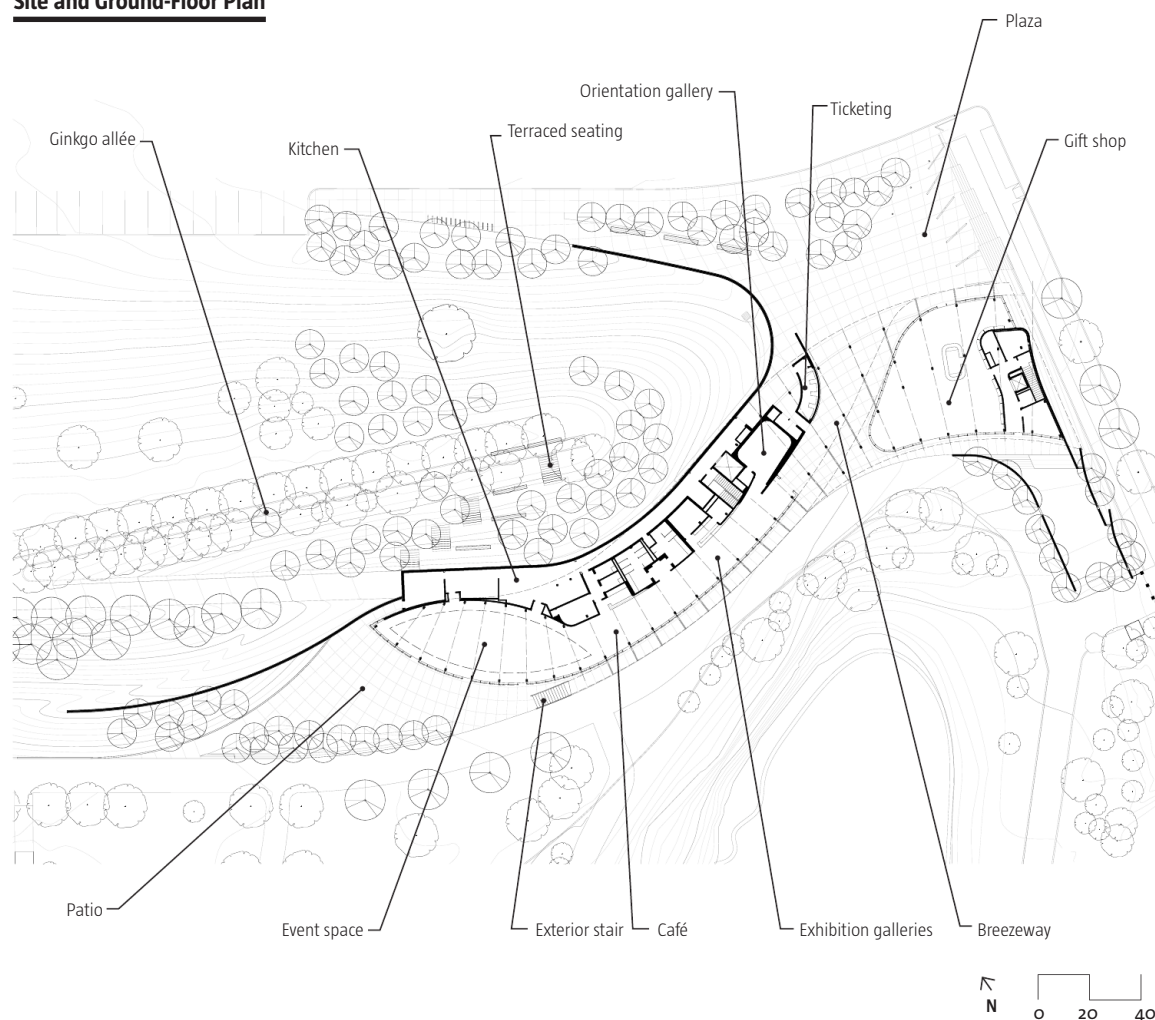
The plaza narrows as it curves between the gift shop on one side and the ticket window on the other. After buying tickets, visitors amble through the curved exhibition space or along the pathway beside it, which is shaded by a canopy that hugs the building perimeter. At the terminus of the exhibition hall is a leaf-shaped event space whose garden side is clad in floor-to-ceiling glass. Since its other side is partially embedded into a berm, Weiss/Manfredi finished the opaque wall with ginkgo panels milled from a tree that had to be felled in order to make way for construction. An ample clerestory frames a view of the allée of ginkgo trees that crowns the berm, visually serving up that species in two forms.

The stretched elliptical event space is sandwiched between two discrete outdoor areas. Along the glass wall, a terrace provides space for visitors to congregate and for BBG to host outdoor events. On the other, bermed,



Although the roof plane of the visitor center (previous spread) is composed of two different materials to distinguish the pavilions on the urban and garden edges of the site, the surfaces are united by a theme: "We have two green roofs," Marion Weiss says. "One is copper [which will oxidize] ... and the other is planted." On the ground plane, visitors move through the site via a shaded breezeway (this image) that moves past ticketing and creates a choreographed entry sequence into the gardens.

Site and Ground-Floor Plan



edge, stepped terraces—accessed by an exterior stair that wraps the event space and feeds visitors to a passage that cuts through the building—lead up to the ginkgo allée.

The project's mastery is to be found in the way it manages to assert itself by providing a legible system of organization, while allowing for certain slippages to occur (most notably, between the urban and botanical). "The city seeps into the garden," says principal Marion Weiss, FAIA, "and the garden seeps into the city."

"It's a building that wanders, which you never really see in its entirety," Weiss says. Rather than passing a definitive threshold, visitors glide from the sidewalk, past the ticket window, then down one of several curved paths. This experiential fluidity is formalized on the roof, where the event space is capped by a planted roof while the gift shop's urban edge—the one elevation that the architects deem overtly architectural—is covered by a pleated copper roof.

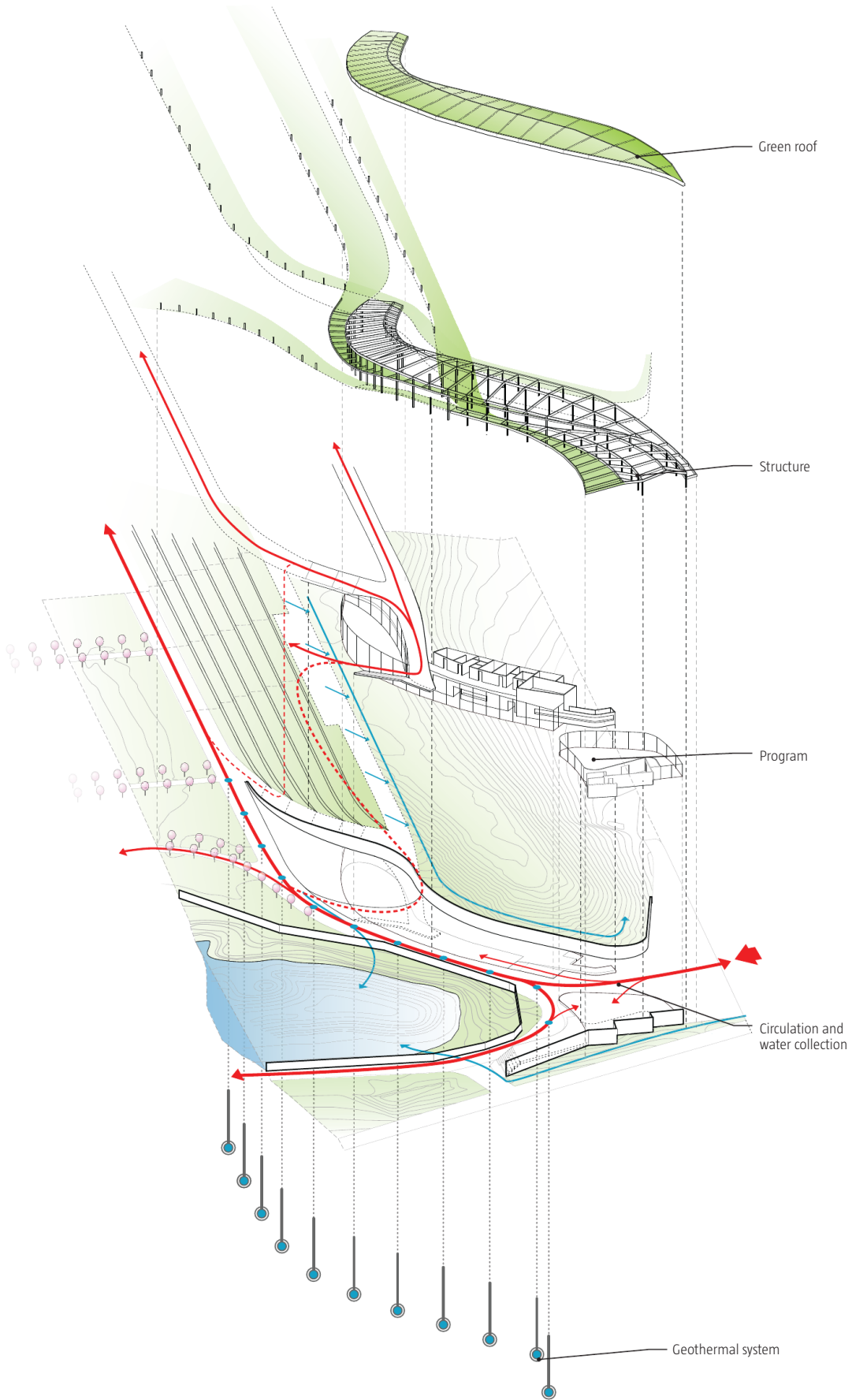
The sigmoidal roof visually stitches together the garden's tranquility with the bustle of Washington Avenue, but it also makes broader associations. BBG's offices are housed in a McKim, Mead & White building with a now-patinated copper roof, so from certain points in and out of the gardens, the visitor center's two

roofs are visible from a single vantage. And while the planted roof pays obvious homage to the gardens that surround it, Weiss/Manfredi places it into a matrix of subtle perspectival relationships. From certain angles, the building seems to disappear altogether as the glazed wall becomes shrouded behind the garden's vegetation: the mounding vegetated roof looks like just another berm.

Another relationship that the building mediates is that of the architectural history of the greenhouse. Weiss/Manfredi includes subtle references to this 19th-century invention with vertical frits on glazed surfaces and the thin white filaments of the entry plaza gates. But unlike the greenhouse's typological origin, which is steeped in colonialism and aristocracy, Weiss/Manfredi's nod to this type is driven by access and inclusiveness, effectively undoing its privileged status.

As BBG sets out on what it calls a "Campaign for the Next Century"—which includes the visitor center and a redesigned entrance by Architecture Research Office—it highlights the importance of design in defining an institutional identity. "Environmental design has never been more important than it is today in enhancing the success of cultural institutions of all sizes," Medbury says. "Excellent architects are essential partners."

Exploded Axonometric





The planted green roof (this image) on the western pavilion not only serves as a laboratory for BBC's botanists, but also allows the building to merge with the surrounding landscape—so much so that from certain angles, the roof is virtually indistinguishable from the natural ground plane. The northern edge of the visitor center hugs a berm, which allows for terraced seating and access points to the surrounding garden environments.



Project Credits

Project Brooklyn Botanic Garden Visitor Center, Brooklyn, N.Y.
Client Brooklyn Botanic Garden
Architect Weiss/Manfredi Architecture/Landscape/Urbanism, New York—Michael A. Manfredi, FAIA, Marion Weiss, FAIA (design partners); Armando Petruccelli (project architect/manager); Hamilton Hadden, Justin Kwok (project architects); Christopher Ballentine, Cheryl Baxter, Michael Blasberg, Paul Duston-Muñoz, Michael Steiner (project team); Patrick Armacost, Jeremy Babel, Caroline Emerson, Eleonora Flammini, Kian Goh, Michael Harshman, AIA, Aaron Hollis, Hanul Kim, Hyoung-Gul Kook, Lee Lim, Jonathan Schwartz, Na Sun, Jie Tian, Yoonsun Yang (additional team members)
Structural and Civil Engineer Weidlinger Associates Consulting Engineers
M/E/P/FP/IT Engineers Jaros, Baum and Bolles Consulting Engineers
Landscape Consultant HM White Site Architecture
Glazing Consultant R.A. Heintges & Associates
Sustainability/Commissioning Consultant Viridian Energy and Environmental
Geothermal/Geotechnical Consultant Langan Engineering and Environmental
Lighting Consultant Brandston Partnership
Acoustical/Audiovisual/Security Consultant Cerami & Associates/TM Technology
Exhibit Consultant Thinc

Food Service Consultant Ricca Newmark Design
Building and Fire Code Consultant Code Consultants
Concrete Consultant Reginald Hough
Waterproofing Consultant James R. Gainfort
Retail Consultant Jeanne Giordano
Building Department Consultant Design 2147
Specifications Consultant Construction Specifications
Construction Management LiRo Group
General Contractor E.W. Howell
Size 22,000 gross square feet
Cost \$28 million (total construction cost)

Materials and Sources

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Inside, the visitor center orients guests with exhibits about the flora on display (opposite). The curving exhibition gallery terminates in the leaf-shaped event space (this image), which is lined with milled ginkgo boards harvested from one of the few trees that had to be felled in order to make way for the new building.

WELCOME TO THE BOOMTOWN

cont. from page 127

Before the boom, the city built a striking new community-recreation center—designed by Denver-based Ohlson Lavoie Collaborative—which features a series of sharply angled forms intended to reflect the surrounding landscape of buttes and plateaus. Johnson believes that the center helped entice companies to base their operations in town. “Marathon Oil is locating its offices here. Lufkin [an oil-well-equipment company] is locating here,” he says. “Why does it matter? Well, Lufkin will be here forever.”

Asked what he hopes the legacy of the boom will be, Johnson says, “I would hope that we would make the investments in infrastructure that 30, 40 years from now, people would look back and say, whoever was in charge then did a good job.”

I hope so, too. But North Dakota has a character deeply rooted in practicality and parsimony. (It’s not, shall we say, a state of big tippers. I once left a couple dollars on a table at a small-town café and the waitress followed me out the door to tell me I had forgotten my change.) The state currently has a budget surplus of \$1 billion, and sees no particular reason why it should spend it on much of anything, including more aid that would help the oil patch better manage the new development.

I wanted to believe that the plans by Johnson, Kalil, and Koeser would prevail. Still, I was living in North Dakota when the previous boom struck. Everyone was sure that a new age of prosperity had dawned, until the price of oil tumbled and the oil companies slipped away as quickly as they had come. Most everyone seems to believe that it will be different this time, and there are reasons why they might be right: these oil fields are bigger; the global economy has changed.

Yet there will come a day when there are no more wells to dig. Both Williston and Dickinson will be bigger and probably more prosperous than they were, but it’s hard to imagine that they will still need the number of hotels now being built; it’s hard to imagine that the modest, quickly tossed-up houses now filling square miles of old farmland will satisfy families looking for a home they want to grow old in.

It’s easier to imagine tumbleweed blowing through the deserted remains of some of the new development. The man camps are modular and can be hauled away, but not all of the warehouses and other buildings will be so easily removed. They’ll have served their purpose—plenty of money will have been made—and walking away will likely be easy.

North Dakota has a history of boom and busts, the result of an economy overly dependent on agriculture and mineral extraction. This history has helped fashion a state character in which determination and fatalism have long coexisted uneasily, an old struggle I saw being played out again as I visited. Will it really be different this time? I wanted to believe so, but I’m not sure. I’m still a North Dakotan, after all. □

R+D Project Credits

cont. from page 111

Building Blocks: Prefabricated Modular Construction

Client Los Angeles Unified School District—Richard Luke (facilities manager); Kevin Newman (senior design manager); Briana Garcia (facilities-development manager)

Architect Hodgetts + Fung Design & Architecture, Los Angeles—Craig Hodgetts, FAIA (creative director); Hsinming Fung, AIA (design director); Darin Vieria (senior designer); Amber Langois (project manager); Anina Bach (designer)

Structural Engineer Thornton Tomasetti—Bruce Gibbons, Chuan Do (architecture); Marine Engineer—Alex Kozloff (fiberglass)

M/E/P Engineer Capital Engineers Consultants—Roland Thomas (project manager)

Fabrication FinCo Fabrication—Steve Brown

PV-POD

Initial Installation Client City of Houston Central Permitting Center

Primary Investigators Joe Meppelink, Assoc. AIA (principal, MetaLab; director of applied research/adjunct assistant professor, University of Houston Gerald D. Hines College of Architecture); Andrew Vrana (principal, MetaLab; visiting assistant professor, University of Houston Gerald D. Hines College of Architecture); Travis McCarra (research and design assistant)

Project Development Grant University of Houston Gerald D. Hines College of Architecture, Green Building Components Program

Fabrication Deep South Plastics

Electrical Engineer Chris Boyer
Structural Engineer Insite Structures—Brad Dougherty

Montigo Cool Pack and Power Cool Pack

Manufacturer Montigo, Langley, British Columbia, Canada—Dan Binzer (president and innovator); Alex Titov (lead designer); Rick Stokes (lead developer)

DEVA Portable Automated Concrete and Stone Floor Engraver

Research and Design Stonetec, Montreal, Quebec, Canada—Julian Morar (mechanical engineer, inventor and head designer), Viorel Morar (automation engineer, inventor and head designer)

Fabrication and Construction

Stonetec; Micha Usinage Express—Marcel Samoila

Tests and Marketing Phys. Iuliana Morar; Special credit for envisioning the need of such machine for the industry to Med Boukhni, Montreal (2008)

Investment The construction of the prototype was possible due to private investment by Civil Eng. Alexandru Horatiu, from Canalex Construction Montreal and Eng. Iancu Septimiu, Toronto.

Integrated Reveal Base

Client Marc and Giulia Weisman
Primary Developer Bogue Trondowski Architects, New York—Bogue Trondowski (principal); Yongjoo Shin, Wojciech Zaborniak, Robert Muszynski (development team)

Fabrication and Construction DiSalvo Contracting Co.

Bloom

Client Materials & Application—Jenna Didier, Oliver Hess (co-directors)

Primary Investigator Doris Kim Sung, Assoc. AIA (assistant professor, University of Southern California; principal, DOSU Studio Architecture)

Consultant Ingallil Wahroos-Ritter, AIA (chair, Woodbury University; principal, WROAD)

Research and Design Assistants Dylan Wood (project manager); Kristi Butterworth, Ali Chen, Renata Ganis, Derek Greene, Julia Michalski, Sayo Morinaga, Evan Shieh

Fabrication and Construction Assistants Dylan Wood, Garrett Helm, Derek Greene, Kelly Wong (core contributors); Manual Alcalá, Eric Arm, Lily Bakhshi, Amr Basuony, Olivia Burke, Kristi Butterworth, Jesus Cabildo, Shu Cai, Ali Chen, Taylor Cornelson, Erin Cuevas, Matt Evans, Chris Flynn, Renata Ganis, Bryn Garrett, Ana Gharakh, Oliver Hess, David Hoffman, Alice Hovsepian, Casey Hughes, Ross Jeffries, Justin Kang, Syd Kato, Andrew Kim, Glen Kinoshita, Ingrid Lao, Jennifer MacLeod, Max Miller, Mark Montiel, Laura Ng, Robbie Nock, Raynald Pelletier, Elizabeth Perikli, Nelly Paz, Evan Shieh, Hector Solis, Raven Weng, Leon Wood, Tyler Zalmanzig
Structural Engineer Matthew Melnyk, Nous Engineering
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Thermometric Façade

Architect Davidson Rafailidis
Primary Investigator Georg Rafailidis (Davidson Rafailidis; assistant professor, Buffalo School of Architecture+Planning (B/a+p), University at Buffalo, the State University of New York)
Co-Investigator Stephanie Davidson (Davidson Rafailidis; clinical assistant professor, B/a+p, University at Buffalo, the State University of New York)
Structural Consultant Arne Künstler, Imagine Structure
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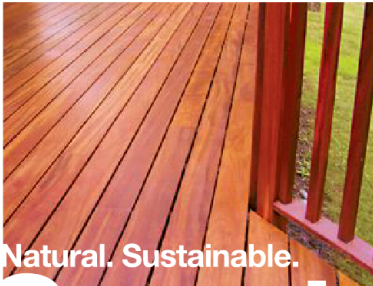
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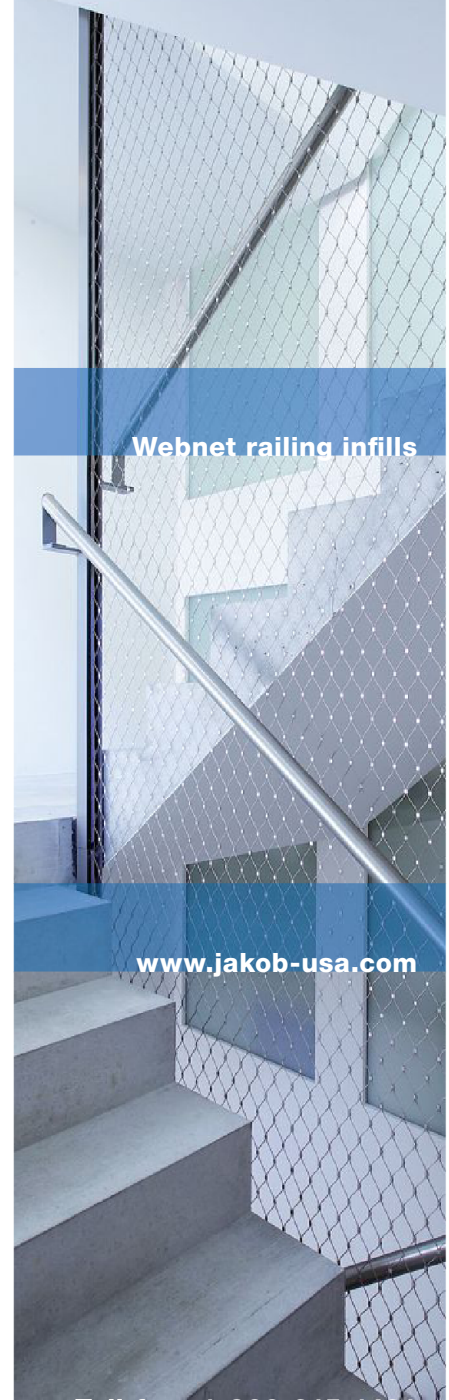
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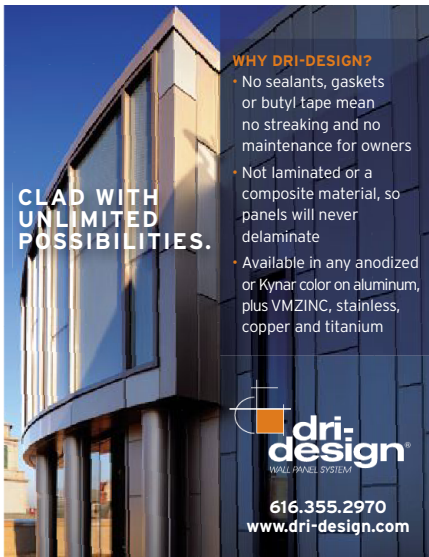
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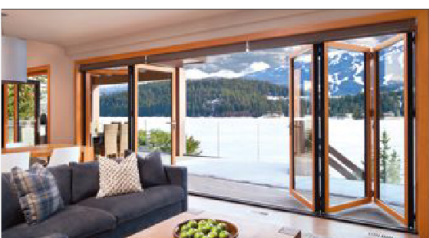
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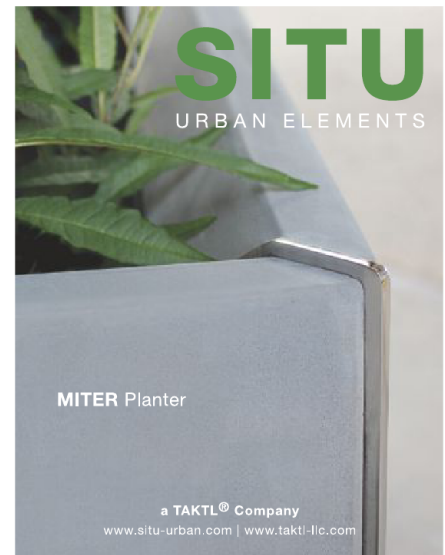


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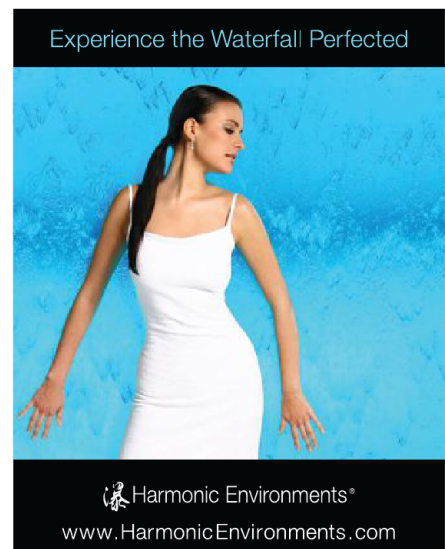
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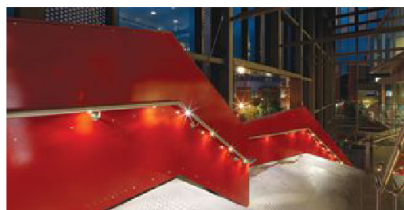
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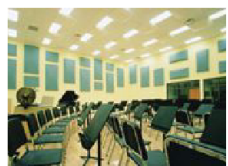


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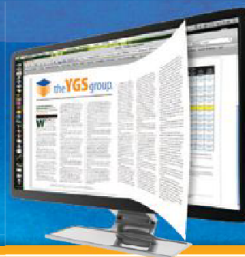
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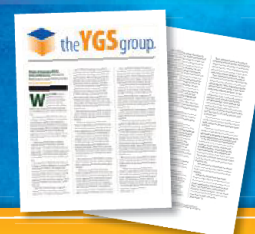
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→ 1964 P/A AWARD

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IN HIS SCIENCE TOWER AT YALE, THE DEXTEROUS PHILIP JOHNSON MIXED FUNCTIONALISM, CLASSICISM, AND CONTEXTUALISM.

1964 P/A Awards Jury

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 Vincent G. Kling, FAIA
 Ernest J. Kump
 William J. LeMessurier
 Harry Weese

THE KLINE BIOLOGY TOWER is the signature component of a science center planned by Philip Johnson & Associates for a hilltop site in Yale University's science precinct. The structure's cylindrical ground-floor columns become half-cylinder exhaust ducts as they rise toward its crown, which houses a chiller plant sized to serve several buildings. Johnson's respect for classical precedent is reflected in both the emphatic columns (thought by one juror to be "obsessive") and the tower's rigorous symmetry. His meticulously crafted surfaces of iron-spot brick and sandstone echo the varied masonry of nearby Gothic Revival structures, though not their picturesque massing.

The 1964 P/A Award honored Johnson's entire multibuilding proposal (which included the geology building he had completed in 1963), but the focus of

the jury was the tower that remains a prominent feature of New Haven's skyline. The jurors praised the project's respect for existing context, a concern that had emerged among Modernists by the early 1960s. Further construction of science facilities didn't quite adhere to Johnson's plan, but subsequent buildings have deferred visibly to his commanding tower.

The housing of academic functions in towers is now frowned upon, believed to discourage the socializing that's thought to promote scholarship. So Yale has recently installed a café and lounge on the generously scaled first floor. Reporting on this development, the Yale student newspaper characterized the tower as "overbearing" and "menacing"—a starkly different view of a building that the P/A jurors considered an "elegant" good neighbor. □

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