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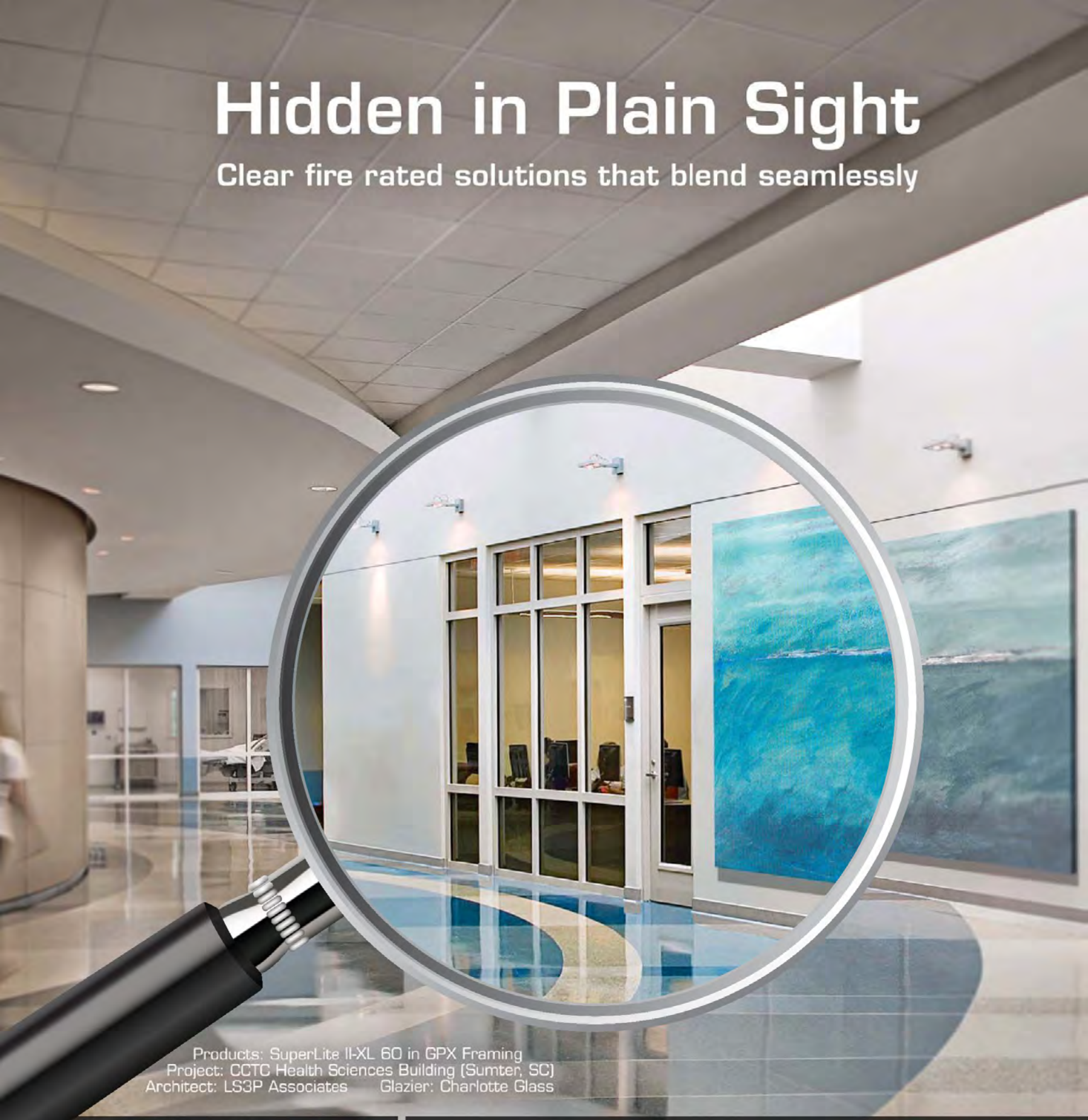

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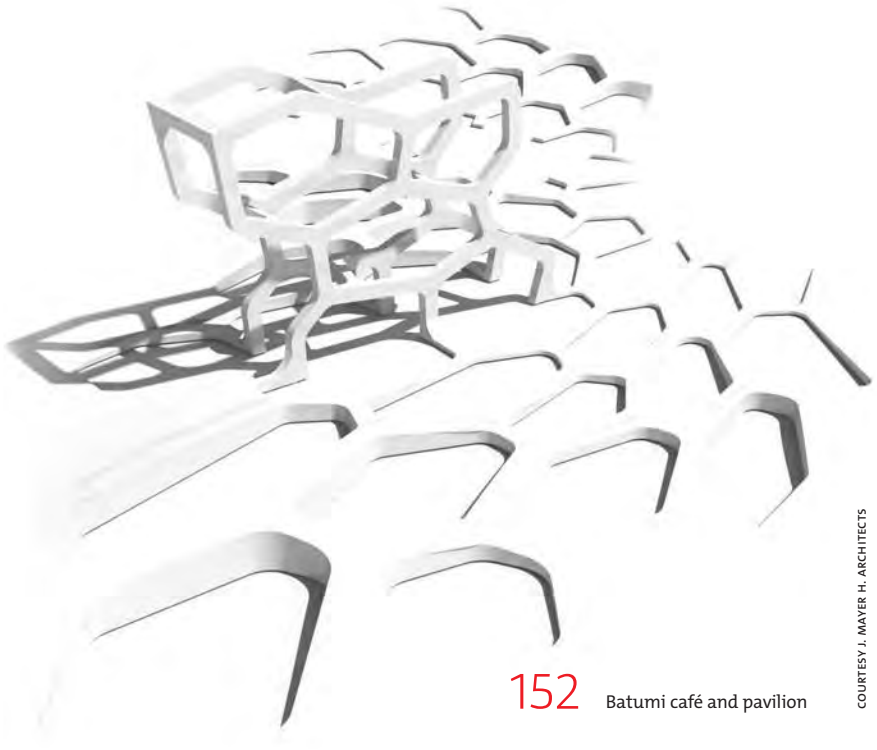
J. MAYER H. IN GEORGIA

In 2009, J. Mayer H. Architects was drawn to the former Soviet republic of Georgia by the country's president, Mikheil Saakashvili, who hoped that the German firm's innovative architecture could help reinvent his nation for the 21st century. Just a few years later, principal Jürgen Mayer H. can point to a portfolio full of Georgian projects, many completed, some under construction, and several more on the boards. From a border station along the Black Sea to an airport in the Caucasus, we sent a reporter and photographer to the still-developing nation to document the architect's progress.



152 Batumi café and pavilion

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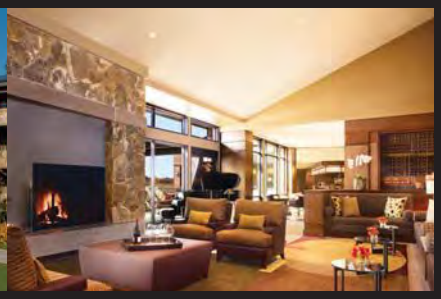

Mitsubishi Electric Helps Oregon Hotel Achieve LEED® Gold.

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ON THE COVER

The pier sculpture in Lazika, Georgia, designed by J. Mayer H. Architects. Photo by Marcus Buck.

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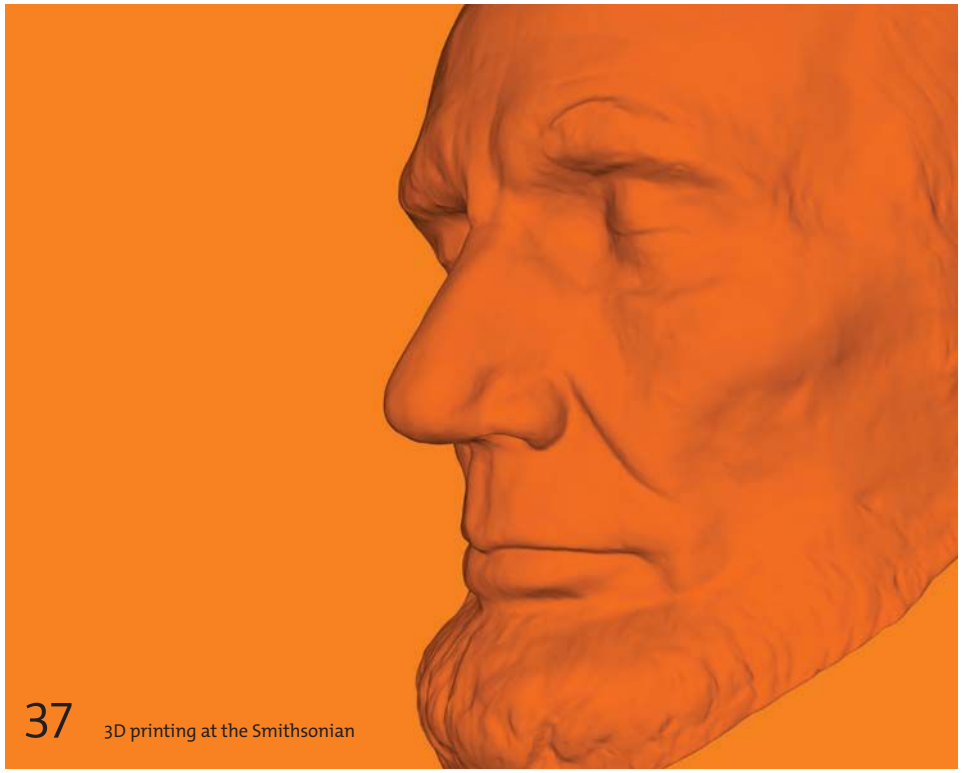
67 Shigeru Ban's paper-tube Christchurch cathedral



37 3D printing at the Smithsonian

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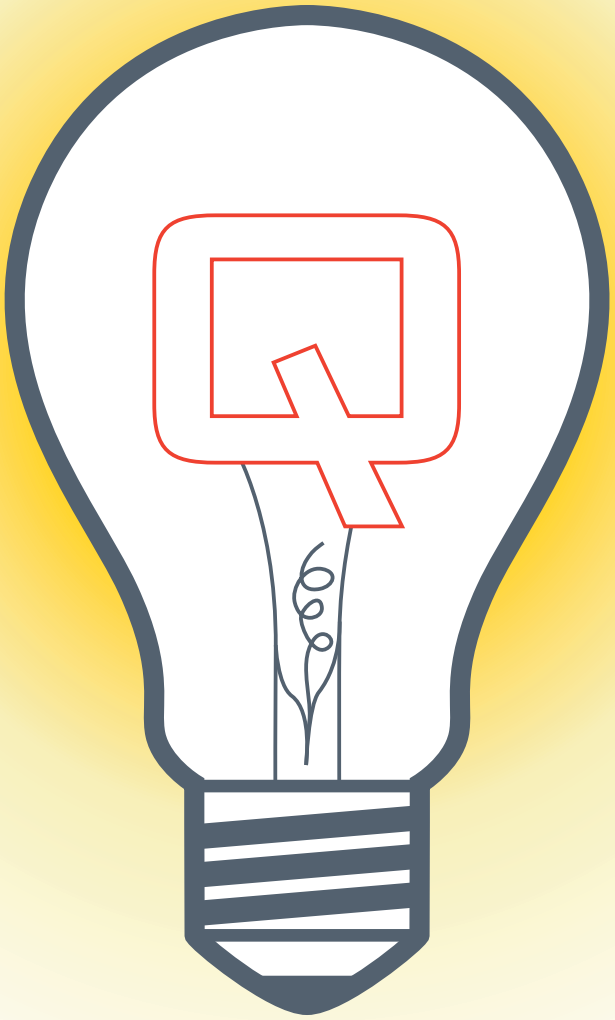

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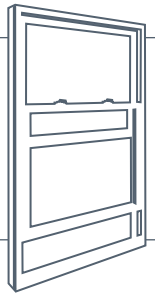

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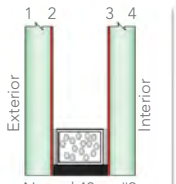

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SLANT ROUTES

Columbia University's new field house, the **Campbell Sports Center** by **Steven Holl Architects**, is designed to be a team player with facilities that foster balance between the minds and bodies of student athletes in a range of sports. Inspired by the slanting lines of field-play diagrams, the building's design relies on point foundations and a lightweight steel structure to achieve its diverse program on a sloped site. The university's first new athletics building since the mid-1970s, Campbell forms a gateway to the revitalized Baker Athletics Complex, and a new game plan for sports at Columbia.

Architect: Steven Holl Architects
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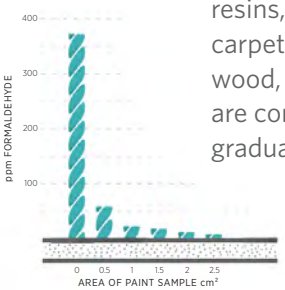

Aldehydes are emitted from carpet and other products over time.†

The science behind the technology.
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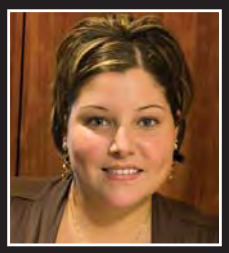
*Formaldehyde Reducing Technology is currently available in flat and eg-shel sheens. The length of time Harmony actively reduces odors and formaldehyde depends on the concentration, the frequency of exposure and the amount of painted surface area.

†Based on methods:
ISO 17226 Determination of formaldehyde content in leather by High Performance Liquid Chromatography
ISO 16000-3 Determination of formaldehyde and other carbonyl compounds in indoor air and test chamber air



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IIDA, ASID
Interior Designer
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POWER, AND THE POLITICS OF POOP

THE U.S. GOVERNMENT HAS TECHNOLOGY THAT CAN CONVERT HUMAN WASTE INTO LIQUID FUEL. SO WHY ARE WE STILL RELYING ON PETROLEUM IMPORTED FROM THE MIDDLE EAST?

AT A RECENT EVENT in New York City, on the same day that the federal government shut down, a friend grabbed my shoulders, shook me, and cried, "What's wrong with your city?" I laughed, then we sat down and commiserated on the state of affairs in my hometown of Washington, D.C. According to Rana Foroohar of *Time*, shutdowns "shave 0.2 percentage points off GDP growth per week," which is an economic hit the United States can ill afford—certainly not at our current anemic growth rate of 2 percent. Alas, the shutdown, and the accompanying tap dance about raising the debt ceiling, were just the latest manifestations of the extreme dysfunction that has become the norm here in the nation's capital.

I had taken the train up to New York for "The Future of Energy," a day-long conference organized by Columbia University's Graduate School of Architecture, Planning, and Preservation, and sponsored by Oldcastle BuildingEnvelope. Presenter after presenter shared ideas that could significantly help reduce our reliance on fossil fuels. (Buildings alone account for 65 percent of electricity consumption and 36 percent of total energy consumption in the U.S., according to the U.S. Environmental Protection Agency.)

With so many great minds and fine ideas on display, the conference had a surprise side-effect: It kept reminding me of the opportunities being lost as our elected representatives lurch from one manufactured crisis to another, with barely a moment to spare for the genuine problems that our nation faces.

A case in point: Jonathan Trent, the project scientist for NASA's Offshore Membrane Enclosures for Growing Algae initiative, also known as OMEGA, presented his scalable, sustainable, and financially viable system for the cultivation of biofuel. Conventional biofuels are made from corn and other agricultural products, potentially causing increased global demand for them and raising prices in local food markets. (This was a major cause, along with unchecked Wall Street speculation, of the food riots that swept dozens of poorer countries in 2007–08.) OMEGA, by contrast, makes fuel from algae that grows in wastewater. So basically, your poop could power a jet engine.

While Trent's preliminary research benefited from $10 million in government funding, now he is being forced to look abroad for the opportunity to implement the technology: "I'm not too optimistic about this happening in the U.S. anytime soon," he says. The political support simply isn't there, despite decades of rhetoric about the necessity of U.S. energy independence.

Keynote speaker Jeffrey Sachs, an economist and the director of the Earth Institute at Columbia, opened the conference by taking the broad view. A specialist in third-world markets, Sachs shifted his attention homeward when he concluded that the U.S. itself is faltering: "Not a day passes without more evidence of a prolonged jobs crisis; a growing inequality of income, wealth, and power; the corruption of national politics; and the lack of long-term planning on critical issues, such as the budget, energy policy, and education," he writes in his 2011 book *The Price of Civilization: Reawakening American Virtue and Prosperity* (Random House).

The failure to act on OMEGA biofuel exemplifies an absence of strategic thinking on the national scale. "Why don't we plan an energy policy when it is so manifestly evident that we need one?" Sachs writes. "Here, too, corporate power is the key reason." Not to mention willing politicians. Consider that the oil and gas industry spent $15 million on campaign contributions and $140 million on lobbying in 2012. That kind of money buys considerable resistance to change. Even environmentalists, blinkered by NIMBYism, are blocking low-carbon solutions such as solar and wind power—and, yes, algae biofuel. A more sustainable future will require accommodations by us all.

ELI KAPLAN

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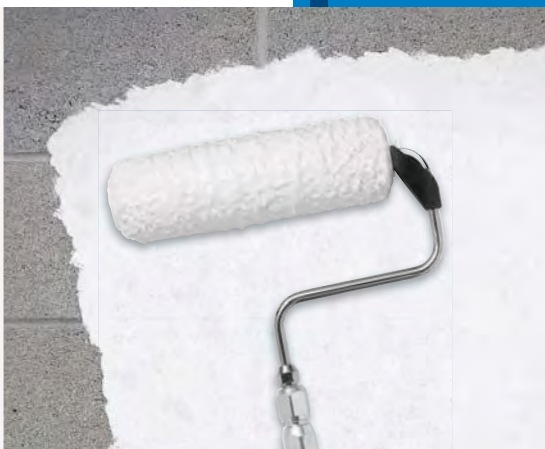

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CONTRIBUTORS

IAN VOLNER

IAN VOLNER dodged water buffalo, climbed through a city carved into a cliff, and bathed in freezing-cold and sulphur-stinking waterfalls to bring ARCHITECT readers this month's cover story on the work of Jürgen Mayer H. in the country of Georgia. The adventure, propelled by instant coffee and Georgia's famed chacha brandy, lasted seven days and took the Manhattan-based writer to nearly every part of the mountain realm.

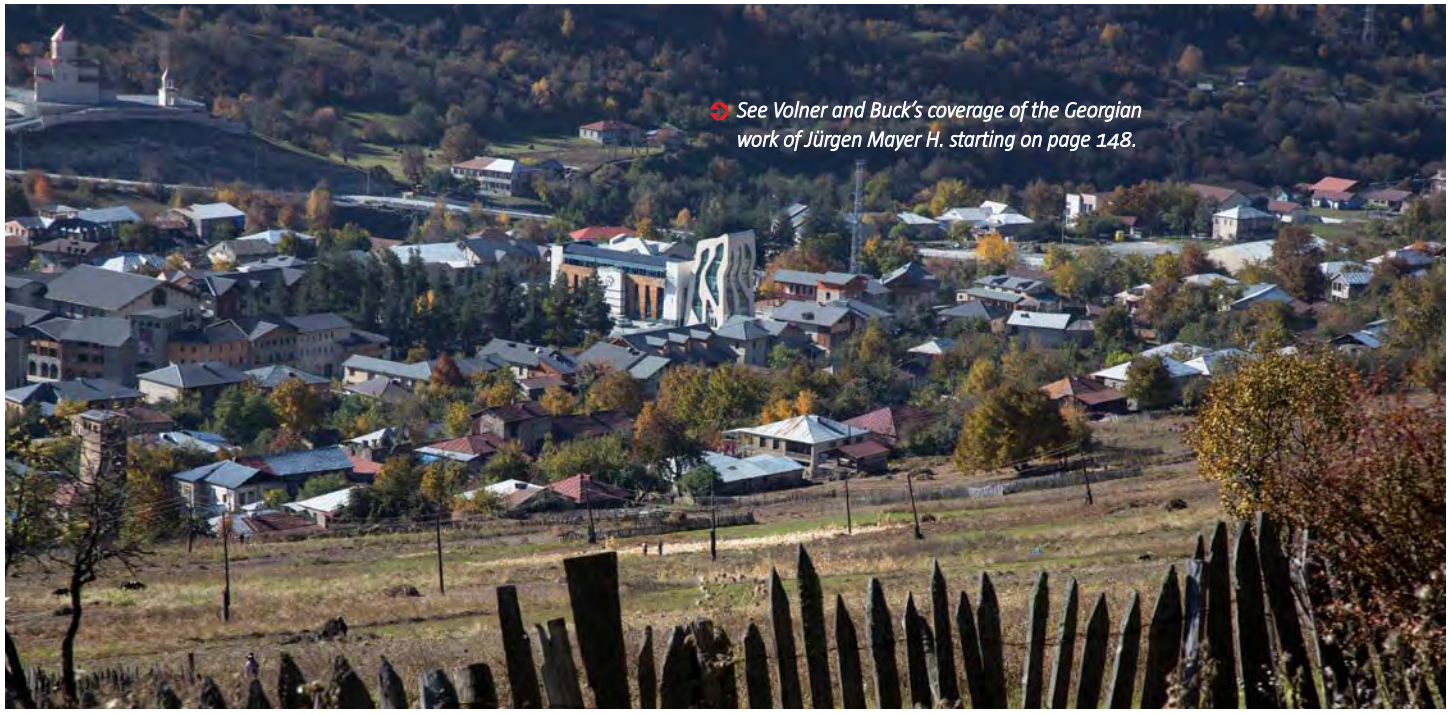
A contributor to *Harper's*, *The Wall Street Journal*, and *The New Republic*, among other publications, Volner was last seen abroad in the sunny south of France, writing about the *Festival des Architectures Vives* design exhibition for ARCHITECT online. He's currently working on his first book project, and looks forward to spending a little time with his cat Lulu and a series of hot showers.

MARCUS BUCK

MARCUS BUCK is an architectural photographer from Munich. His photography has been featured widely in architectural journals, including *A+U*, *Blueprint*, *De Architect*, and *Domus*. In 2008, he was commissioned to showcase the BMW automobile delivery center for the book *BMW Welt: From Vision to Reality* (teNeues).

Buck is the 2010 International Photography Awards Architectural Photographer of the Year and a 2011 Hasselblad Masters Award semifinalist. His series "Restarchitektur" ("Architectural Remains") received an honorary mention from the jury of the European Architectural Photography Prize in 2003.

At present, Buck is at work on two series: one about transmission towers and the other about abandoned gas stations.



See Volner and Buck's coverage of the Georgian work of Jürgen Mayer H. starting on page 148.

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FRONT

ON TO THE NEXT ONE

DOES THE DEMOLITION OF THE PRENTICE WOMEN'S HOSPITAL MARK A PENN STATION MOMENT FOR THE PRESERVATION OF MODERNISM?

MATTHEW CARBONE

Bertrand Goldberg's Prentice Women's Hospital (1975) in Chicago met the wrecking ball on October 11, after a lengthy and bizarre process, involving landmark status approved and revoked, a mayoral op-ed, and little kids in preservation t-shirts. They were born at Prentice, and in the hospital's destruction, they may have learned their first political lesson. It was a sad day for Modernism, and a sad day for common sense: Northwestern University's insistence that they needed that site and no other for a new biomedical lab never held up to scrutiny. It would be nice to think that Prentice would be the last structurally daring, imaginatively conceived concrete building clawed to rubble, but it probably won't be. Something more beautiful has got to go.

The demolition of Prentice hospital is not Brutalism's—or even Modernism's—Penn Station Moment, as architectural historian Michael R. Allen suggested in *Next City* in October. Unfortunately, it is going to take the sacrifice of another postwar landmark to create the kind of broad-based, politically connected, media-savvy preservation movement to support Modernism each time it is threatened. The modern preservation movement has had its victories. M. Paul Friedberg's Peavey Plaza (1975) in Minneapolis was saved from "revitalization" in October, after the Preservation Alliance of Minnesota and the Cultural Landscape Foundation won a lawsuit filed against the City of Minneapolis. Paul Rudolph's Orange County Government Center (1967) is still with us, but its future remains in doubt. Modern preservation is still niche. Maybe someone needs to start ModPAC.

Preservation in general is often cast as retrograde. Against progress, for example, in building an airport up to contemporary standards—as in the case of the Pan Am Worldport (1960), designed by Walther Prokosch and Emanuel Turano, for John F. Kennedy International Airport, and closed this spring. Against sustainability, in the closing of Josep Lluís Sert's Martin Luther King Jr. School (1971) in Cambridge, Mass., to be replaced by a new, "green" elementary school. That recycling is more sustainable, and that designers are trained to solve problems, including

YOU CAN TELL PEOPLE A BUILDING IS IMPORTANT AS OFTEN AS YOU LIKE, BUT UNLESS THEY FEEL IT, THEY WON'T CRY OVER ITS DESTRUCTION, AND THEY WON'T ORGANIZE SO THAT IT NEVER HAPPENS AGAIN.

those of retrofit and reuse, are notions often pushed aside. Modern preservation can also be seen as snobby: architects circling the wagons to the detriment of the people who teach or travel.

It is worth thinking about what Penn Station had that Prentice hospital did not. I can think of three essential qualities, all of which gave the station's demolition in 1963 an emotional content that reached beyond the architectural community.

The first quality is beauty. This is in the eye of the beholder, of course, but Brutalism tends to need a lot of explaining to the uninitiated. Penn Station's eagles, its marble, its top-lit spaces, its columns were all elements many of us agree are beautiful, or at least old and venerable. Its architectural quality was plain—so plain that I suspect New York–based SHoP Architects borrowed the mote-filled light from vintage Penn Station photographs for their Municipal Art Society–sponsored rendering of a new transit hub.

Prentice hospital was not beautiful. Its cloverleaf top is weird, even to an admirer like me. Its glassed-in bottom, as architecture critic Blair Kamin wrote in the *Chicago Tribune*, was "boxy" and "unremarkable." You can tell people a building is important as often as you like, but unless they feel it, they won't cry over its destruction, and they won't organize so that it never happens again. Preservationists (and architecture critics, myself included) can learn to tell better stories about buildings: their secret spaces, their best angles, their relationship to history and use. But experience might still tell a different story. It's dark. It's rough. It makes me feel small. It makes me want to run away.

Second is popularity, or at least populousness. Stations, stadiums, and parks can have millions of users whose nostalgia ties them to a place. I was educated in one Brutalist school and met my husband in another, but I think I am a rare case. At rallies to save Prentice, children wore "I Was Born at 'Old' Prentice" t-shirts, and that was exactly the right idea. Each leaf, in plan, held radiating maternity rooms, easily monitored from a central nursing station. Office designers of the late 1960s abandoned the endless corridor, and so did hospital architects: the idea was pods and communities, breaking down the anonymity of what could be seen as a seven-story baby factory. If anyone had a sentimental attachment to the building, it would be those parents, those children, and they turned out at hearings and protests. But the political fix—Mayor Rahm Emanuel wrote an op-ed arguing for demolition—overruled any argument. Penn Station met the wrecking ball because of real estate interests; the same was true for Prentice.

Third is history. Penn Station was emblematic of a kind of grand city-building that, in the 1960s, already seemed long gone. The theme of Ada Louise Huxtable's cutting 1963 "Farewell to Penn Station" (for *The New York Times*) is irrevocable loss, a sense that we can't have Penn Station because we are no longer, as a city, good enough: "Any city gets what it admires, will pay for, and, ultimately, deserves." As the railroads went, their glamour replaced by air travel, so did the architecture of railroad stations. More relevant to the Penn Station example, Eero Saarinen's TWA Flight Center (1962) sits empty, asbestos expensively abated, awaiting approval by the local Port Authority for its transformation into a hotel and conference center by André Balazs of André Balazs Properties. If TWA had been destroyed instead, would there be any debate about the urgency of saving Modernism?

Preservation's modern Penn Station will need to be beautiful without explanation, well-used by a wide spectrum of the public, and connected to history—a place where something happened, a space emblematic of its period. It will take a building with all those qualities to engender the kind of passionate preservation movement, one reaching beyond experts, to overcome a situation like the one Prentice found itself in, where the upholders of landmarks legislation are more worried about the mayor than history. ALEXANDRA LANGE

September 2013
Architecture Billings Index

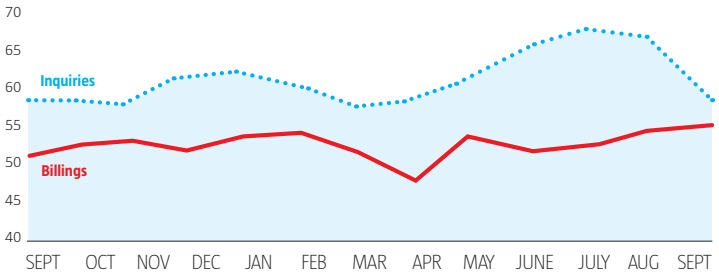
54.3 ↑ 0.5 pts from August

57.9 Commercial ↑

50.4 Institutional ↓

55.4 Mixed Practice ↓

55.6 Multifamily Residential ↑



U.S. Department of Labor's Bureau of Labor Statistics

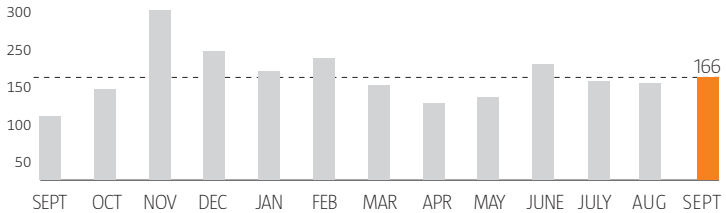
5,300 Residential Construction

2,500 Heavy and Civil Engineering

12,000 Nonresidential Construction

800 Architectural and Engineering Services

ADP National Job Growth (in Thousands)



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YOU CAN'T GO HOME AGAIN

Mobile Homestead is a pure distillation of artist Mike Kelley's work. A full-scale replica of the home in suburban Detroit where Kelley grew up—a one-story ranch with vinyl siding and blue shutters—Mobile Homestead is now on permanent exhibition at the Museum of Contemporary Art Detroit (MOCAD). Kelley, who left Michigan in 1976 for California and lived in Los Angeles the rest of his life, made a surprising return to the Midwest with this unusually personal exhibit, his final work. (He committed suicide in January 2012.) In its first months parked at MOCAD (when it isn't being hauled around Detroit), the space, which is free for the public to use, has stumped visitors and museum staff alike. Curators don't know what to do with it. Even though it is a replica of private space, Mobile Homestead is determinedly, and uncomfortably, public. ANNA CLARK

STEP UP, STEP DOWN

BIG MOVES ON THE CAREER LADDER

Katie Gerfen
Executive editor, design
ARCHITECT and *Residential Architect*

Ingalill Wahlroos-Ritter
Associate dean
Woodbury University,
School of Architecture

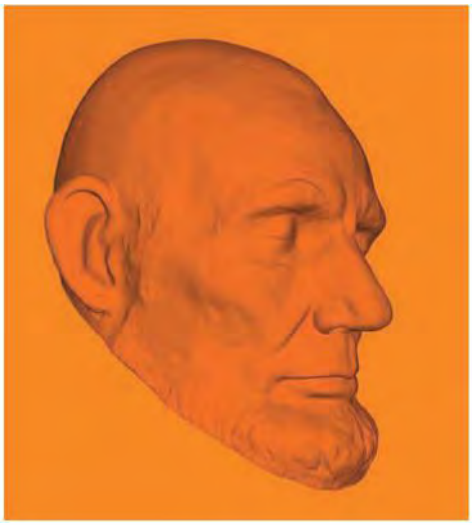
Ross Wimer, FAIA
Design partner
Skidmore, Owings & Merrill

Ross Wimer, FAIA
Architecture lead, Americas
AECOM

Terra Krieger Mazzeo
Design director
4240 Architecture

Peter Zumthor
Architecture mentor
Rolex Mentor and
Protégé Arts Initiative

Peter Zumthor is a busy man. With his design for the new Los Angeles County Museum of Art, he is remaking a bedrock L.A. institution. Nevertheless, he's taking time out of his schedule to help mentor a budding young architect. Zumthor is one of seven tapped for the 2014–15 Rolex Mentor and Protégé Arts Initiative. He joins an illustrious group of artists—Olafur Eliasson (visual arts), Alejandro González Iñárritu (film), Michael Ondaatje (literature), Alexei Ratmansky (dance), Kaija Saariaho (music), and Jennifer Tipton (theater)—proving that those who can, teach.



WHAT WE'RE 3D-PRINTING NOW: TREASURES

THE SMITHSONIAN INSTITUTION IS ENCOURAGING USERS TO PRINT THEIR OWN ART COLLECTIONS.

On Nov. 13–14, the Smithsonian Institution will host Smithsonian X 3D, a conference regarding the remarkable transformations that 3D-printing technologies are bringing to museum and research institutions. The two-day event includes talks by curators, computer scientists, graphic artists, mechanical engineers and other experts, who will discuss the implications of using 3D-scanning and -printing technologies to duplicate treasured artworks.

Yet aside from one presentation panel titled "3D Impact and Use," there is no indication that Smithsonian leaders are meeting in worry. Art replication is alive and well today, thanks in no small part to museum directors themselves. The world's largest museum is actually one of the biggest champions of digital replication: Last year, the Smithsonian announced that it had begun scanning its collection of 137 million objects, with the intent of making many of them public.

The absence of controversy is likely due to the fact that the Smithsonian—and other visionary institutions—privilege learning over rights-management. Except for cases in which intellectual property must be strictly observed, this is a welcome change within a field that has too-often restricted access to creative works for no reason. Digital technologies may transform the museum's primary function as a repository of prized works to a forum for creative communication. BLAINE BROWNELL, AIA

TOP LEFT: CORINE VERMEULEN, COURTESY OF MOCAD; TOP RIGHT: COURTESY OF THE SMITHSONIAN

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A MESSAGE FROM MICHAEL ARMSTRONG, THE CHIEF EXECUTIVE OFFICER OF THE NATIONAL COUNCIL OF ARCHITECTURAL REGISTRATION BOARDS.

On my travels to visit licensing boards, state and local AIA chapters, and schools of architecture, as well as on other speaking engagements throughout the United States, I have had the opportunity to hear lots of stories from practicing architects about how it was when they pursued their license. Chances are, if an architect has not engaged with the National Council of Architectural Registration Boards (NCARB) in the past five years, there's a story there too, and it's likely to be a negative one. While we can't change the past, the current NCARB team is hoping to earn another chance to create a more positive impression.

Let's start with basic services. Through an internal business process re-engineering effort, a new focus on customer service, a change in department leadership, and the emergence of a strong in-house technology team, our record-keeping services are now delivered in days rather than months, with many services processed online instantaneously. Interns are now able to post hours through a simple online timesheet. We are even resolving customer service issues through Twitter.

We have updated our strategic goals to focus on facilitating licensure. This means that we are actively engaged in growing our programs to keep pace with the profession, while still protecting the public. Many are still unaware that internships can begin immediately after high school graduation and that examination in 47 jurisdictions can start before completion of the Intern Development Program (IDP). Academic internships, construction work, volunteer activity, and community projects all now qualify for IDP credit. More than half of IDP enrollees are finishing in less than five years and more than half of candidates for the Arcitectural Registration Examination (ARE) are completing their exams within 2.5 years.

But our progress must accelerate. With each well-intentioned change to an NCARB program, an unintended consequence has occurred—an added layer of unnecessary complexity. One analogy that's frequently drawn is to the U.S. tax code. So we must now urgently, but carefully, simplify the process without removing the elements demonstrating competency to practice.

To this end, we have set several initiatives in motion, cumulatively addressing the licensure path's key elements, known as the "Three Es"—education, experience, and examination.

New ARE Direction. Going in reverse order and starting with examination, we are well on our way to a new format for the ARE. In 2016, we will launch ARE 5.0, moving from graphic representation elements to performance-type questions. These revisions will empower the examinee to focus on questions and case studies that more realistically reflect the practice of architecture rather than learning outdated software tools. The new approach to ARE 5.0 will increase the agility and efficiency of future ARE development and allow for quicker release of exam scores as well as position NCARB to hold the line on fees.

IDP Reinvention. Regarding experience, a reinvention of IDP is now in development with the encouragement of Blake Dunn, AIA, NCARB's first president to have gone through IDP. Fast-track as well as overhaul options are being readied for review by the NCARB Board and the IDP Advisory Committee (IDPAC). The IDPAC is composed of outside organization representatives, interns, and practicing architects, including some who were recently licensed. Final concepts with implementation plans will be ready in time for our Annual Meeting in June 2014.

BEA/BEFA Simplification and "Licensure at Graduation" Pilot Development. We are addressing the education element of the path to licensure through programmatic revision and blue-sky discussion.

- Special project initiatives dedicated to major redesign of the Broadly Experienced Architect (BEA) and Broadly Experienced Foreign Architect (BEFA) programs are underway. As a first step, we have simplified and capped the BEA fee schedule. We expect Phase I of this effort to conclude sometime next summer.

- Perhaps the most dramatic sea change for NCARB is contained in the launch of the Licensure Task Force (LTF) to explore alternative paths, including licensure at graduation. This effort was prefaced by the NCARB report to the Accreditation Review Conference, submitted in January to the National Architectural Accrediting Board (NAAB) and posted on the NAAB and NCARB websites. The LTF is composed of distinguished leaders from diverse segments of the architectural community including two current deans of architecture schools, two former AIA national presidents, representatives from other architectural organizations, intern and emerging professional representatives, and several jurisdictional board and NCARB Board members. Chaired by immediate past NCARB president Ron Blitch, FAIA, the charge for the first year is to develop a concept that repurposes the existing Three Es into a program which occurs while in school and would be accepted by a jurisdictional board.

The current licensure path has been designed by architects through decades of volunteer work on jurisdictional boards and NCARB committees. It has been ratified by state legislatures and looked upon as a model by other professions and countries. Whole industries have emerged around testing for licensure, and historically the concept of internship as a licensure requirement emerged as the role of the academy and the expectations of practitioners changed. And now, through the work of our practitioner volunteers bolstered by data and industry expertise, we have been building the foundation for reimagining and reconfiguring each step.

We know this work will be challenging and will necessitate close coordination with the licensing boards and the profession. Most importantly, the public still needs to be assured that a license protects their health, safety, and welfare.

Meanwhile, the marketplace and technology are not waiting for us. Demands and opportunities continue to evolve—and so we must as well. Today's NCARB is prepared and eager to convene, coordinate, and facilitate this critical discussion.

Michael Armstrong became NCARB's chief executive officer in June 2011.

Read more about licensure on page 52.

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SHoP ARCHITECTS SLIMS DOWN IN MANHATTAN

THE NEXT TALLEST TOWER IN NEW YORK CITY WILL ALSO BE THE SKINNIEST SKYSCRAPER IN THE WORLD.

New York City has a skyscraper complex.

Once the undisputed leader in producing buildings of that type, the city has fallen far behind. There's little hope of ever matching the heights reached regularly now overseas, and even the city's contender for Tallest Building in the Nation—the recently structurally complete One World Trade Center—is unlikely to overtop its rival in Chicago since its transmission tower was stripped of its planned white radome by some cost-cutting chicanery.

So it was with some relief last week when New York City's Landmarks Preservation Commission gave final approval to the design of a new tower planned for 105–111 West 57th Street. At 1,350 feet, it's no slouch—that height, in fact, will put it higher than the roof of the Empire State Building (sans mooring mast) and, at present, a respectable number 26 on the list of tallest proposed buildings anywhere in the world.

But the metric in which 105–111 West 57th may beat all-comers (for a time) is not height. As designed by New York City's own SHoP Architects, the all-residential tower has a slenderness ratio of about 1:23. At its widest, the building will measure only 58 feet. When it is completed in 2016, the SHoP design will have a strong claim on being the skinniest tall building in the world.

Given the preponderance of narrow building sites on the Manhattan grid—the default dimensions of a typical lot are only 25 by 100 feet—perhaps this will become a new mark for the city's developers to shoot for (if not aspire to). Indeed, another very slender tower has already been proposed for a site down the street at 217 West 57th. Will New York become a city of Skinny Minnies, the fat trunks of eras past surrounded by a fresh field of tall reeds? It could be quite beautiful. Particularly if other aspects of the SHoP design are taken to heart.

The tower's short walls will be finished with low-iron glass (to the north, overlooking Central Park) and various sun-beating systems (to the south). But the side walls, incorporating the lion's share of the concrete and steel structure, are a new take on something old. And they will also be very New York: a system of terra-cotta blocks, to be supplied by craftsmen at venerable Boston Valley Terra Cotta in 26 distinct profiles, ranging in shape from the nearly traditional to the almost-futuristic. The blocks will be stacked in strips between tall windows to create a kind of wavering, rippling effect—a challenge to the lingering blobitectural impulse still seen in so much new construction. I'm looking at you, Frank Gehry. PHILIP NOBEL

Restoring a Mies Gem

ONE OF TEN TEAMS WILL GET A CHANCE TO RESTORE THE MIES-DESIGNED CENTRAL LIBRARY IN WASHINGTON, D.C.

Although the central library in Washington, D.C., is a Mies van der Rohe–designed building, it's overlooked and neglected. Former D.C. Mayor Anthony Williams tried unsuccessfully to expel the memorial library from the building, in hopes of leasing it to a private owner, and even suggested painting it white.

Meanwhile, Ginnie Cooper, the chief librarian—and winner of the 2013 AIA Thomas Jefferson Award for Public Architecture—has prioritized the spokes over the hub, commissioning noteworthy architects such as David Adjaye to build an array of classy new neighborhood libraries.

In her last act as chief librarian (she's retiring before the year's end), Cooper has returned her attention to the Mies-designed Martin Luther King Jr. Memorial Library. The 2014 D.C. budget devotes $100 million to the central library's renovation. The D.C. Public Library system has shortlisted 10 firms to submit proposals to do the job.

The firms and project teams are Cunningham Quill Architects/1100 Architects; Ennead Architects/Marshall Moya Architects; Leo A Daly/Richard Bauer; Martinez and Johnson Architects/Mecano Architects; OMA/Quinn Evans Architects; Patkau Architects/Ayers Saint Gross; REX/Davis Carter Scott Architects; Shalom Baranes/Davis Brody Bond; Skidmore, Owings & Merrill; Studios Architecture/the Freelon Group.

Twenty-six firms responded to a request for qualifications in August to do the renovation—the scope of which remains undecided. Three firms or teams from the shortlisted 10 will be picked in mid-December to submit design proposals and concepts for the scale of work to be performed.

Library patrons also face a decision. An assessment performed in 2011 by the Urban Land Institute recommended a number of dramatic changes, including a mixed-use program. D.C. Public Library has launched a new platform seeking input from library users on what, if any, of these suggestions they'd like to see included in the renovation. KRISTON CAPPS

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DESIGN OF OLYMPIC PROPORTIONS

JAPANESE ARCHITECTS ARE OUTRAGED BY THE SIZE OF THE NEW STADIUM PLANNED BY ZAHA HADID FOR TOKYO'S 2020 OLYMPIC GAMES, ITS DESIGN NOTWITHSTANDING. EVERYONE SHOULD BE CONCERNED.

The talk in Tokyo is all about the new Olympic Stadium. Designed by Zaha Hadid, Hon. FAIA, for the 2020 Olympic Games, it will accommodate 80,000 spectators in a lozenge-shaped behemoth. But the discussion is not so much about the design, which everybody here claims to like, as much as about its size: At more than 3 million square feet, it will be almost three times as large as the Olympic Stadium in London.

It will also swallow up the surrounding park in Shinjuku, a ward in Tokyo, necessitating the demolition of nearby apartment buildings—evicting some relocated there by the construction of Kenzo Tange's National Gymnasiums for the 1964 Olympic Games. "We do not blame the design," opposition leader Fumihiko Maki, Hon. FAIA, says, "but the program, which is much too large."

Instead, he and others opposing the plan call for a much smaller facility, perhaps located somewhere else, that could be temporarily expanded for the Games in the manner in which stands were added to Hadid's Aquatics Centre for the 2012 Olympics. Though this was not a very elegant solution—the temporary stands ruined the design's fluidity exactly when millions were watching on television, and site lines were not very good in the upper seats—it did prevent the building from becoming an over-scaled white elephant once the Games were over.

This, in general, is the problem with the Olympics: the Games galvanize their host cities, create a festive atmosphere, spur economic development—and then they are gone. Olympic Villages usually turn into housing, parks and infrastructure remain, and smaller facilities can even be of use, but the major monuments that the Games apparently necessitate rarely serve their cities well. The Bird's Nest by Herzog & de Meuron has sat largely empty since the 2008 Games in Beijing.

This is but a special version of a general situation: Sports facilities are among the least efficient investments you can make. American football stadiums are the worst. Used about a dozen times a year, they sit largely empty for the rest of the time. Even baseball stadiums are in play for only about half the year, and then only a few times a week.

The shame in this case is that the design, at least from the renderings, looks quite beautiful to me. Hadid's fluid style seems appropriate in the way it melds together and molds the stands, their housing, and the open field into a whole, while exhibiting a grace that updates Tange's achievement in the same city. If Maki is right, and he is now in conversation with Tadao Ando, Hon. FAIA, who helped write the program, I hope that the design can be rightsized.

That still leaves the question of why we insanely invest so many resources into structures of such little use. Somebody should devise a competition that would do for sports what Burning Man did for festivals: build it for the event, and then take it down, leaving no trace. Or we should figure out how to reuse and reconfigure existing structures in such a way that such renovations are in turn reversible and adaptable.

Great architecture should not just be a beautiful gesture, but a sensible response to a need—something that celebrates the occasion without binding a place to that event for all time. AARON BETSKY

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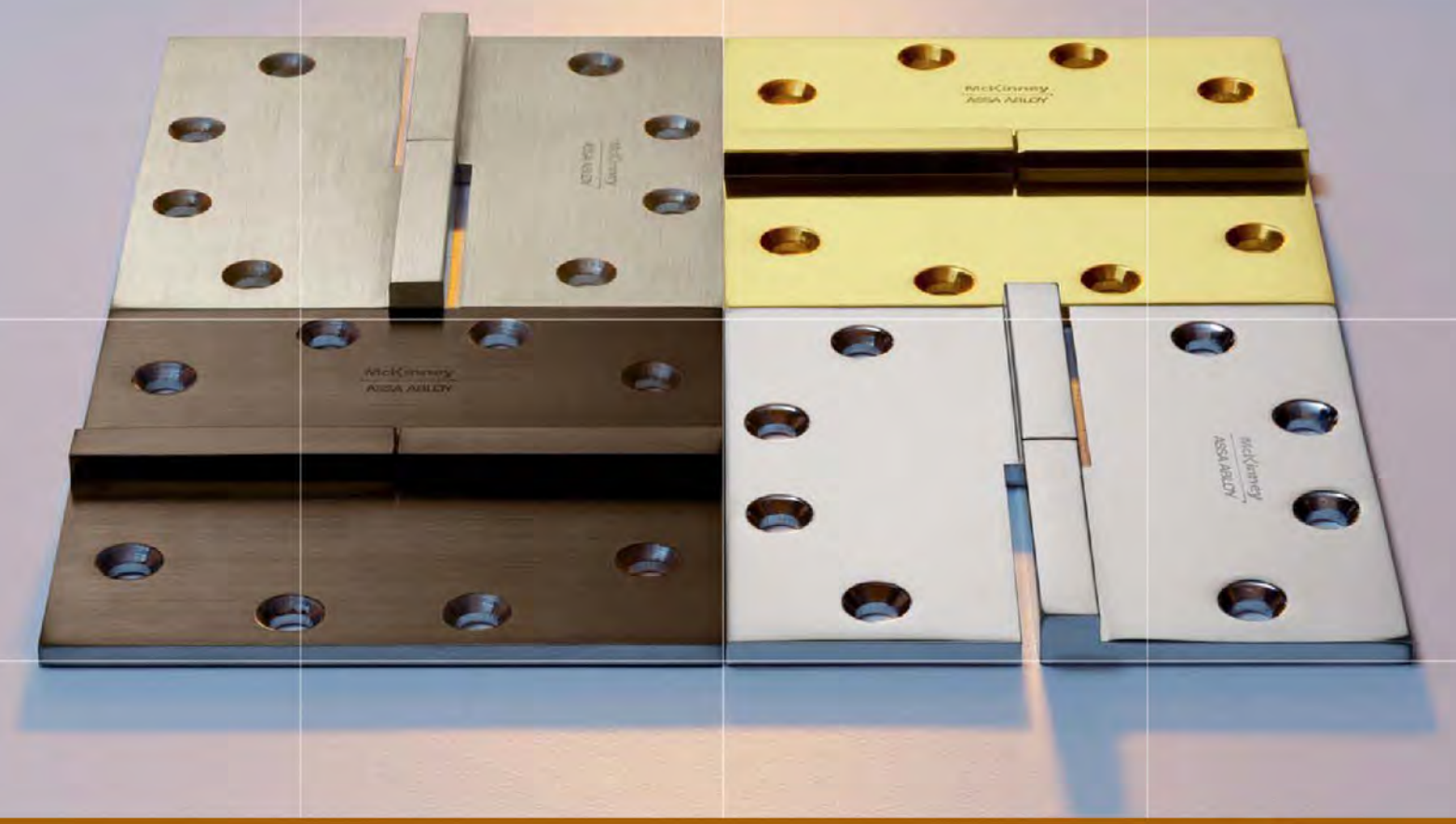

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DS+R

Diller Scofidio + Renfro—led by Elizabeth Diller, Ricardo Scofidio, AIA, and Charles Renfro, AIA—focuses on integrating visual and performing arts with architecture. DS+R poses questions about the nature of architecture as a viewing medium, be it to frame an ocean view in 1991's Slow House for North Haven, N.Y., or to observe the framing process within the sealed vault of the Broad, now under construction in Los Angeles. Upcoming projects for the New York–based practice include the Columbia University Medical Center in Manhattan, which boasts a transparent south façade to promote interaction between campus and city, and Rio de Janeiro's Museum of Image & Sound, sited along the coast so that image is both the content and the payoff. DEANE MADSEN

Columbia University Medical Center
New York City

Museum of Image & Sound
Rio de Janeiro

The Broad
Los Angeles

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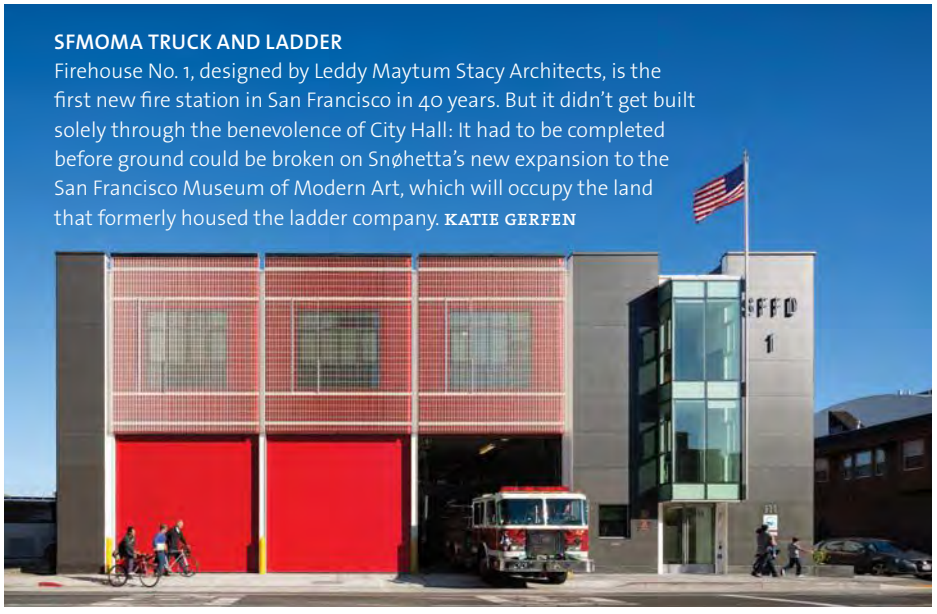
SFMOMA TRUCK AND LADDER
Firehouse No. 1, designed by Leddy Maytum Stacy Architects, is the first new fire station in San Francisco in 40 years. But it didn't get built solely through the benevolence of City Hall: It had to be completed before ground could be broken on Snøhetta's new expansion to the San Francisco Museum of Modern Art, which will occupy the land that formerly housed the ladder company. KATIE GERFEN



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A TALK WITH ...

IWAN BAAN, THE GLOBE-TROTTING ARCHITECTURAL PHOTOGRAPHER WHOSE PROWESS WITH HIS 35MM CANON CAMERA IS RIVALED ONLY BY HIS TOUCH ON INSTAGRAM.

Here's a basic question, how did you get interested in photography?
When I was 12 years old, I got for my birthday from my grandmother my first camera.

What were you photographing at 12?
Just the things around school, the things in school, the things you find on your way. I had to bike to school every day for an hour, so things you would see on the street.

Have you gone back to look at any of those photographs?
I had kind of a very strange accident a year and a half ago, my apartment studio in Amsterdam completely burnt out in a freak accident. My very old archives, my old teenage work, that is all gone.

I'm sorry to hear that.
Oh, it's kind of liberating at the same time. I was never there, since then I have been completely homeless, I sort of gave up on having a house. It's just my suitcase, that's it. It's interesting to live in this way.

What's your favorite place that you've shot?
That's hard to say when you've traveled so much and you've seen so many nice places. I'm literally every two or three days in a place somewhere else, so there are many of these great places and I'm always looking for these very specific ways in how people make something, from the high-end architecture to the super specific ways people design something without any plan or architecture. SARA JOHNSON

Full interview at architectmagazine.com

ESTO GALLERY
The Walt Disney Concert Hall in Los Angeles, designed by Frank Gehry, FAIA, turns 10 this month. Visit www.architectmagazine.com for more images of the concert hall. D.M.

Fast Forward

THE UNIVERSITY OF MINNESOTA IS EXPERIMENTING WITH A FASTER ROUTE TO LICENSURE.

THIS YEAR marks the centennial anniversary for the University of Minnesota School of Architecture, but it's not the only milestone for the program. This fall, the school also began offering a M.S. in Architecture with a concentration in Research Practices (MS-RP), a post-professional degree that aims to allow graduates with a B.Arch. or M.Arch. degree and substantial internship experience to complete the National Council of Architectural Registration Boards' (NCARB) Intern Development Program (IDP), pass the architecture registration exam, and achieve licensure within six months of graduation.

As ARCHITECT reported in January, the average time for architecture graduates with a professional degree to attain licensure is 8.5 years. In recent years, NCARB has altered the licensure process to allow architecture students to earn 930 of the required 5,600 IDP hours by attaining an NCARB-approved post-professional degree, and earn an additional 1,860 hours for teaching and academic research.

Students enrolled in the one-year MS-RP program will not only take coursework in research methods and analysis, but they will also spend 25 hours a week in a research and practice (RP) internship, in which they are paired with a faculty member and design firm in the Consortium for Research Practices.

The university is currently waiting for the NCARB to open its 2013–14 application process so it can submit its MS-RP program to become an approved post-professional degree, thus granting graduates the 930 IDP hours for earning the degree. The school also recommends that MS-RP applicants enter the program with at least 2,800 IDP hours, or half of the required hours, under their belt. Students can then earn approximately 1,500 additional hours through the program's research-intensive curriculum, teaching, and the RP internship itself. The program, which only just received official approval from the university's board of regents in June, has already enrolled one official degree-seeking student. WANDA LAU

TOP: PETER ARKLE; BOTTOM: LARA SWIMMER | ESTO

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AIAVOICES

SHAPE SHIFTER | IN PURSUIT OF PROFESSIONAL BALANCE

Alissa Luepke Pier, AIA, a 2013 AIA Young Architects Award recipient, has spent the majority of her short career balancing practice, teaching, and public service. As a principal for Minneapolis-based A.D.L. Pier Design, she has designed two dozen buildings in four states, she has led design studios for hundreds of students as adjunct faculty, and as a commissioner for Minneapolis's Planning Commission and a past commissioner for the city's Zoning Board of Adjustment, she has steered policy decisions to keep Minneapolis growing in the right direction.

THE THING I TELL MY STUDENTS, OR EVEN THE HIGH SCHOOL KIDS I mentor, is get involved in something—anything—if you think you can make a difference. Community service and civil service aren't the areas I thought I'd be most engaged in as an architect. If someone told me 10 years ago that I'd be on a planning commission, I would have scoffed at them. And yet here I am touting the need for more architects to get involved and serve, too.

But it wasn't until I joined a neighborhood housing committee that I really took the plunge. I went to my first meeting, and a question about a vacant lot came up. So I suggested that we have a design charrette to find out what the neighborhood should have on that lot. This ended up with me recruiting some of my fellow University of Minnesota graduates to spend the next year and a half working with this neighborhood in our free time and to ultimately come up with a master plan for an entire block-and-a-half of the city.

That led to being invited to serve on a larger steering committee for a quadrant of the city, which led to being recruited to serve on the Board of Adjustment, and then to be recruited by the mayor's office to serve on the Planning Commission, which deals with land-policy issues on a grander scale but still centers on what's best for the city. I know from working in communities—on commissions, in schools, and in practice—the value of design has to come through as the architect's contribution. And design has to be responsive.

A lot of people think the term "young architect" just means "young." It's a deceiving phrase, in the same way that "intern" is deceiving. That said, I definitely see myself as a young architect. When I think about the term in light of the AIA Young Architects Award, I see how different my colleagues are who also received the award.

Architecture is a profession—not just a job. Whether I'm teaching professional practice, interior detailing, or a course on AutoCAD, I tell the students that the public holds great expectations no matter what kind of work you're doing. So the student's first job is to understand the ethical obligation they are taking on by pursuing a career in this profession. The student's second task is to understand that, if they are unwilling to get involved and use their creative talents to serve the greater good, they have to put forth the extra effort on the projects that impact those most in need. *—As told to William Richards* AIA

Learn more about the AIA Young Architects Award at aia.org/practicing/awards

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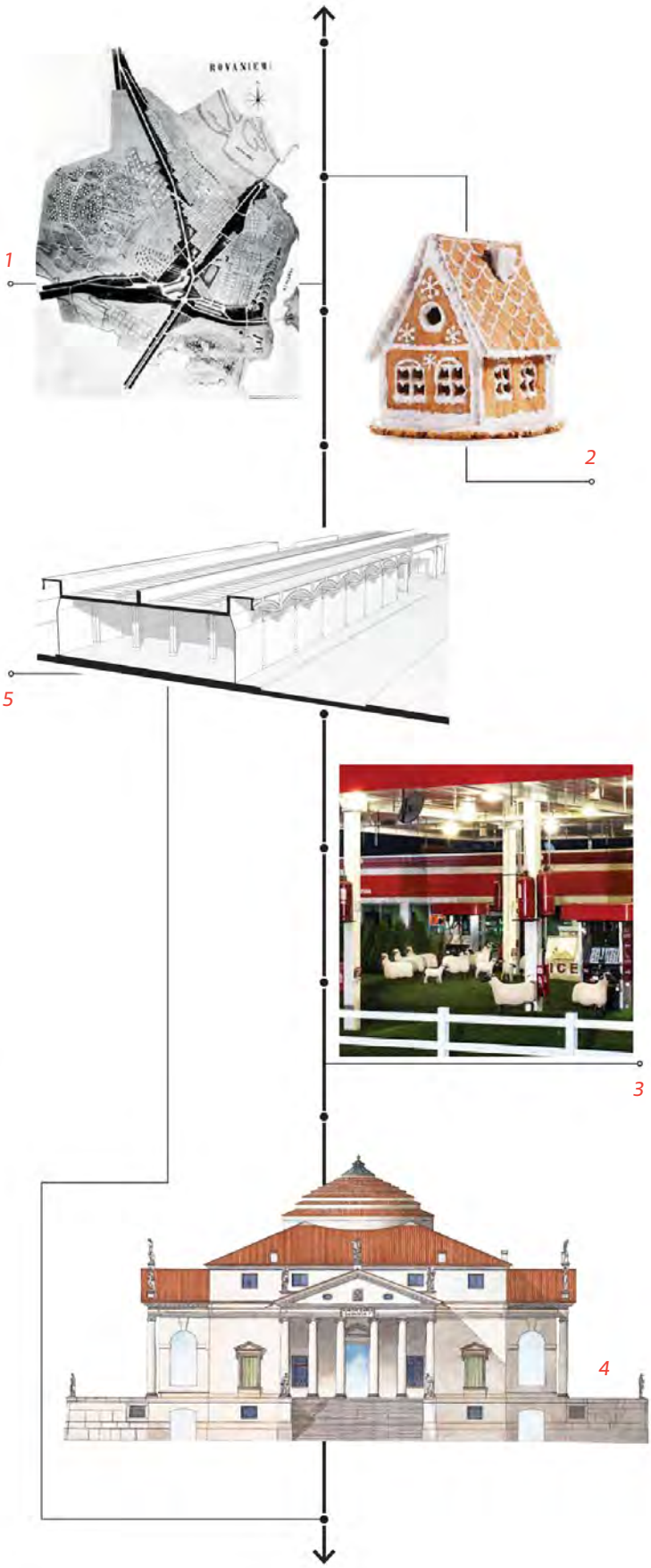
AIANOW

ACROSS THE INSTITUTE

Compiled by William Richards

1. About Aalto. The exhibition "Alvar Aalto in Rovaniemi" (Nov. 1–Feb. 2), at the Alvar Aalto Museo in Jyväskylä, Finland, commemorates the architect's post–World War II reconstruction plan for the Lapland capital, for which he also designed a town hall, the Rovaniemi City Library, and model houses for the Korkalorinne neighborhood. Aalto, who received the AIA Gold Medal in 1963 and worked across nearly every building typology, once claimed, "Nothing is as dangerous in architecture as dealing with separate problems." Rovaniemi, apart from the rest of his oeuvre, stands as a unique (if only partially completed) example of how one can resolve a series of urban problems with a single unifying gesture: the so-called "reindeer antler plan."

↗ See for yourself and learn more at *alvaraalto.fi*.



2 ***Snack Time.*** Studies have shown that the average American gains between 1 and 7 pounds between Thanksgiving and New Year's Day. So, embrace the bell curve and taste the difference that design/build makes at AIA Houston and Architecture Center Houston's fifth annual Gingerbread Build-Off. More than 20 teams will descend on Hermann Square at City Hall to compete for Grand Prix de Show, Best Architectural Icon, and other categories. Winning structures will be exhibited at the architecture center Dec. 16–20—if they're not eaten first.

↗ Learn more at *aiahouston.org*.

3 ***Used and Reused.*** In "The Big Idea" (ARCHITECT, June 2013), we covered the Fentress Global Challenge, an annual ideas competition run by Denver-based Fentress Architects, which has asked students to consider the workplace of the future (2011) and the airport of the future (2012). This year's topic, "Upcycled Architecture," centers on adaptive reuse as a more measured approach to urban redevelopment. Registration closes Dec. 19.

↗ Learn more at *fentressarchitects.com*.

4 ***A Classic of the Genre.*** Country houses (and their landscapes) have always been design laboratories for architects who could, with budgets both healthy and modest, probe historical precedents and vernacular traditions. For five weeks this fall, the Institute for Classical Architecture & Art in New York City will offer a course covering some of the best examples of "The Architecture of the American Country House." The course will emphasize the continuum of architectural style—from early-19th century pattern books to the ways in which technology and building codes have been incorporated in the 20th and 21st centuries.

↗ Learn more at *classicist.org*.

5 ***Queensway Concepts.*** When the first phase of James Corner Field Operations' and Diller Scofidio + Renfro's High Line in Manhattan's Chelsea neighborhood opened in 2009, the project set a new standard for how design and civic engagement can repurpose urban infrastructure. It's a good thing the bar is so high—there are hundreds of miles of abandoned rail lines in U.S. cities, including one 11 miles to the east of Chelsea, between Ozone Park and Rego Park, Queens. AIA New York and its Emerging New York Architects Committee (ENYA) are calling for proposals to remake the abandoned 3.5-mile Long Island Rail Road Rockaway Beach Branch into a greenway—aptly called the Queensway. Entries are due Jan. 6.

↗ Learn more at *enyacompetitions.org/2014*.

IMAGE 1: © ALVAR AALTO FOUNDATION, FINLAND. COURTESY ALVAR AALTO MUSEUM. IMAGE 3: PHOTO © BILY FERRELL. IMAGE 4: VILLA ALMERICO CAPRA "LA ROTONDA." WATERCOLOR BY GIOVANNI GIACONI. IMAGE 5: ENYA.

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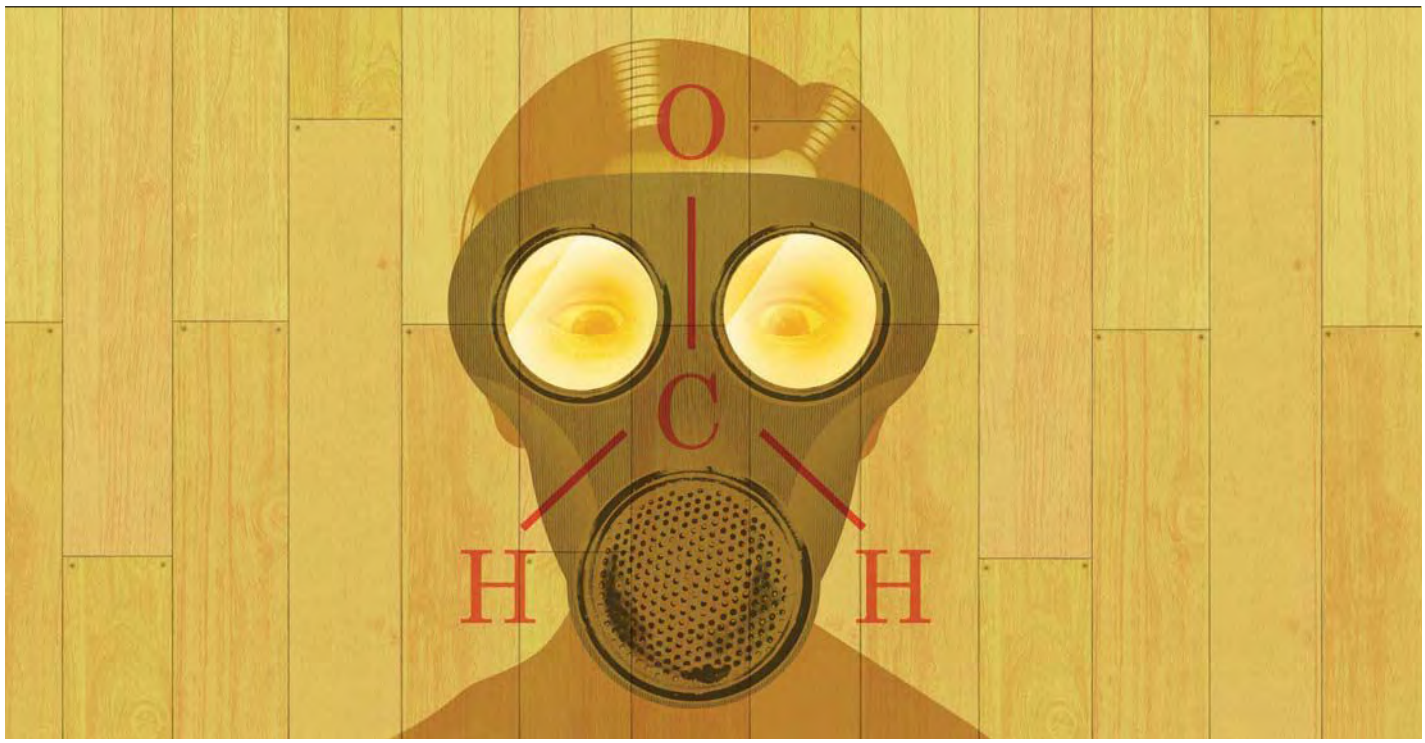


ILLUSTRATION: BRETT RYDER

FORMALDEHYDE'S DESIGNATION AS A HUMAN CARCINOGEN HAS caught the attention of both consumers and workers in plants where engineered wood products are made. This heightened awareness makes it critical that architects and others in the building industry understand the facts about formaldehyde-based resin systems. There are some other details to consider first, however, about the fundamental characteristics of widely used manufactured wood products such as hardwood plywood, oriented strand board (OSB), particle board, and medium-density fiberboard (MDF), including their composition, assembly, and manufacturing processes.

Hardwood plywood used for furniture, cabinets, paneling, and engineered wood flooring is primarily made with oak, poplar, maple, and cherry veneers bonded by an adhesive. The outer layers surround a core made of veneer, particle board, or MDF. A multistep process turns logs into hardwood plywood. First, logs are carefully debarked without damaging the wood. They are then heated to facilitate cutting the veneers, which can be sliced thinner than 3 millimeters. The veneers are then dried at temperatures up to 400 F. When they reach their specified moisture content, the veneers are conveyed to a layup operation, where a thermosetting resin is spread on them. This laid-up assembly of veneers is then sent through a hot press, where the resin is pressed into a thin layer between each sheet of veneer and the thermoset resins are activated. Finally, the finished hardwood plywood panel is cut and sanded.

In contrast, OSB, particle board, and MDF are made from a variety of finely ground woods called "furnish." Adhesive is sprayed on the furnish, which is compressed as it moves through a hot press to form the panel. These finished products are then cut and sanded.

These manufacturing processes are now receiving increased scrutiny because many of these wood products for building and furnishing homes and offices are made with adhesives that emit formaldehyde. In mid-2011, the U.S. government designated formaldehyde as a known human carcinogen, following the lead of other governments around the world.

Several factors determine the amount and rate of formaldehyde emissions from wood-bonding adhesives. Formaldehyde resins react with moisture in the air to release free formaldehyde. Emissions increase with higher temperature and humidity levels. Also, the higher the concentration of formaldehyde-based adhesive in a product, the higher the emission levels will be. Finally, a "scavenger"—most commonly urea—may be present in the adhesive system, which amplifies formaldehyde emissions.

Because adhesive providers have been diligent in reducing formaldehyde emissions from their products, a range of adhesive options are available to manufacturers. At one end of the spectrum are highly efficient and effective adhesives that add no formaldehyde to the environment. Among them, soy-based adhesives represent the latest resin technology, on top of being based on a renewable resource.

At the opposite end of the spectrum are widely used urea-formaldehyde adhesives, which release higher rates of formaldehyde than other adhesives and do not qualify for LEED points. Mid-spectrum are no-added-urea formaldehyde resins made with phenol-formaldehyde or melamine-formaldehyde. Unfortunately, the term "no-added-urea formaldehyde" can be easily misinterpreted to mean there is no formaldehyde of any kind in the adhesive when, in fact, these adhesives do contain and emit formaldehyde.

Knowing the origin and composition of common construction materials, including but not limited to engineered wood products, is a critical advantage to architects. Armed with the facts about the DNA of these products, they can ease client concerns about sustainability issues and make the most informed decisions possible about the products they specify from the standpoints of indoor air quality and sustainability. *—Melinda Burn and Richard Hayes, AIA* AIA

Melinda Burn is global business director of sustainable building and construction at Ashland. Richard Hayes, AIA, is director of knowledge resources at the AIA.

Higher Standards

Public architects vastly improve how we engage the civic realm and impact how capital is invested in the long term.

BY DOMINIC MERCIER

HELPING TO SHAPE THE BUILDINGS THAT WE ENCOUNTER ON A daily basis—even those we would rather not visit, like police stations and hospitals—public architects take a unique seat at the table while serving as the client or owner's representative. Their direct influence may often go unsung, but the impact their guidance brings to the design process has far-ranging effects throughout the profession.

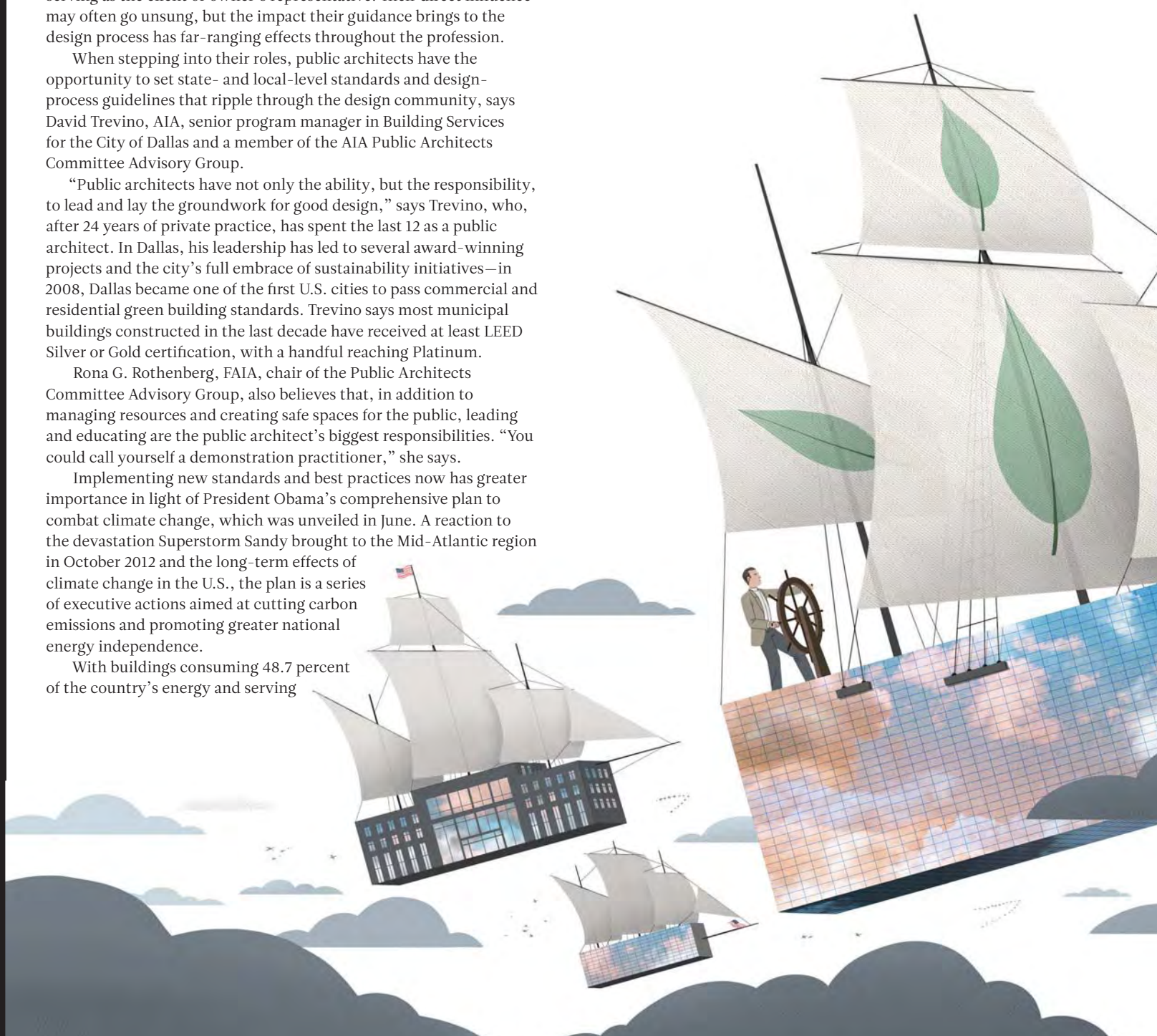
When stepping into their roles, public architects have the opportunity to set state- and local-level standards and design-process guidelines that ripple through the design community, says David Trevino, AIA, senior program manager in Building Services for the City of Dallas and a member of the AIA Public Architects Committee Advisory Group.

"Public architects have not only the ability, but the responsibility, to lead and lay the groundwork for good design," says Trevino, who, after 24 years of private practice, has spent the last 12 as a public architect. In Dallas, his leadership has led to several award-winning projects and the city's full embrace of sustainability initiatives—in 2008, Dallas became one of the first U.S. cities to pass commercial and residential green building standards. Trevino says most municipal buildings constructed in the last decade have received at least LEED Silver or Gold certification, with a handful reaching Platinum.

Rona G. Rothenberg, FAIA, chair of the Public Architects Committee Advisory Group, also believes that, in addition to managing resources and creating safe spaces for the public, leading and educating are the public architect's biggest responsibilities. "You could call yourself a demonstration practitioner," she says.

Implementing new standards and best practices now has greater importance in light of President Obama's comprehensive plan to combat climate change, which was unveiled in June. A reaction to the devastation Superstorm Sandy brought to the Mid-Atlantic region in October 2012 and the long-term effects of climate change in the U.S., the plan is a series of executive actions aimed at cutting carbon emissions and promoting greater national energy independence.

With buildings consuming 48.7 percent of the country's energy and serving



as the greatest source of carbon dioxide emissions, according to the U.S. Energy Information Administration's 2011 figures, the plan's success depends in large part on how the country is designed and built—and retrofitted.

The federal government carrying the flag of sustainability is nothing new. In 2006, 16 federal agencies signed a memo of understanding committing them to high-performing federal buildings. A year later, Congress passed the Energy Independence and Security Act authorizing the creation of the Office of Federal High-Performance Green Buildings, whose website reveals 65 of the government's best-performing buildings. They range in size from the 1.14 million-square-foot Internal Revenue Service Kansas City Campus to a comparatively microscopic 160-square-foot solar-powered guard post for the National Renewable Energy Laboratory's Wind Site Research Area in Golden, Colo.

While the success of these past initiatives was driven by public architects, the fate of the president's plan now hinges on their embracing it—bridging the gap between the public and private sectors will be invaluable. But as scientific evidence and political discourse continue to diverge on the issue of climate change, the president's plan undoubtedly faces an uphill battle.

Rothenberg, senior manager of the statewide design and construction team for the Judicial Council of California Administrative Office of the Courts, has spent her long career as an architect for large institutions serving as the owner's representative for capital and facility programs and projects. She notes that the green building concept is already hard to sell to some owners and developers, who see the additional first costs but need to be shown the initial capital investment needed and associated long-term operating benefit. Even in the notoriously forward-thinking and innovative state of California, she says, they are "fighting for the lives" of sustainable initiatives because many outside the design environment do not place as high a priority on green institutional buildings as do architects.

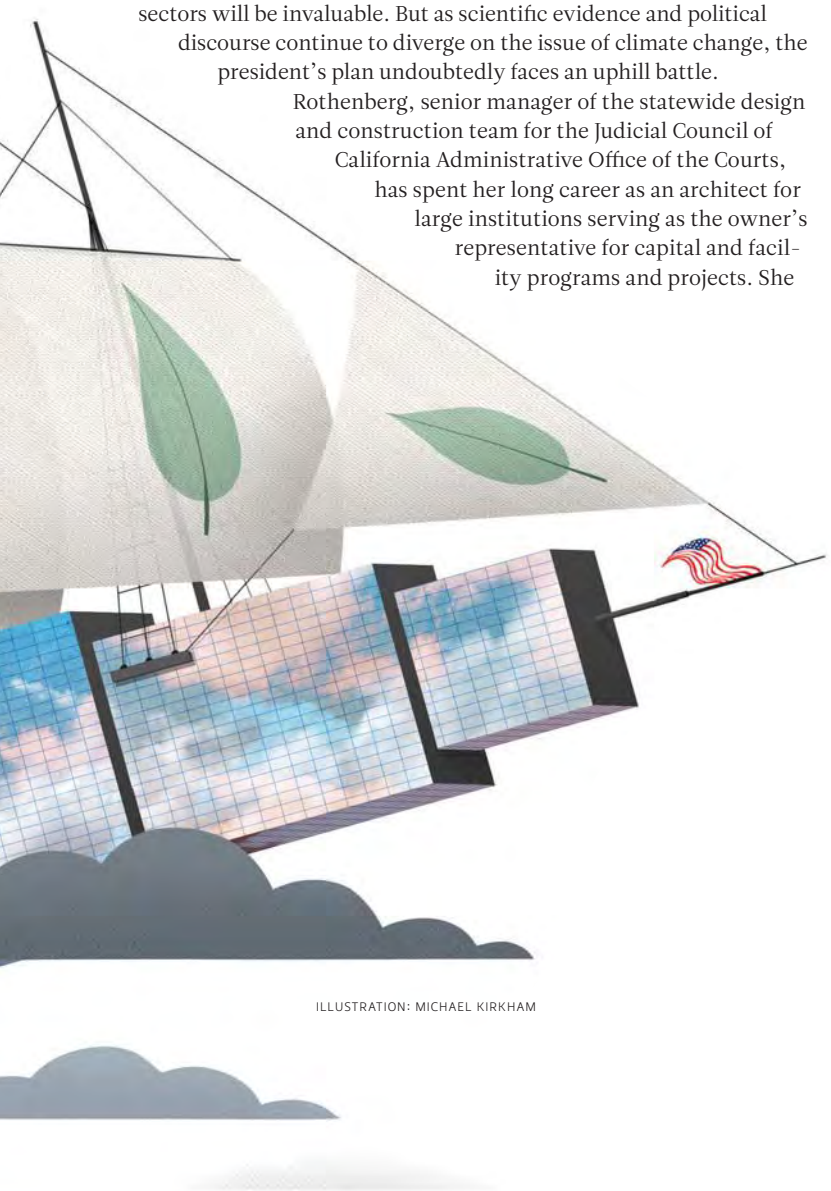


ILLUSTRATION: MICHAEL KIRKHAM

"To implement the president's vision, you need to start with yourself and your community," says Rothenberg, suggesting that practicing even simple low-cost sustainability measures, such as instituting a basic recycling program or installing low-energy lighting fixtures, can have a lasting impact and put owners on the path to grander plans, such as turning to the International Green Construction Code or striving for LEED certification.

"Owners don't want to do it if it's just to get a certification or a plaque," Rothenberg says. "But when you get your first rebate check after you replace the windows or install an energy-efficient HVAC system, that is such a big win."

While the bottom line will always be one of the driving factors in private sector-architecture, the duty of public architects beholden to a much more significant and diverse board of directors is to sway official and public opinion.

"If you're looking at the building process as a football game, public architects have the ability to set the rules of how the game is played," says Edmond Gauvreau, AIA. As a supervisory engineer with the U.S. Army Corps of Engineers, Gauvreau faces perhaps the most imposing board of directors: the U.S. Congress. However, while he and his colleagues are in charge of the rulebook, the Corps solicits and welcomes stakeholder input for all of its projects.

While talk of government guidelines and strict, comprehensive building standards sounds like it would lead to nothing but dreary designs, that's not the case, says Gauvreau, who is also one of Trevino's and Rothenberg's colleagues on the Public Architects Committee Advisory Group. The installation of such rules, coupled with collaboration between public architects and private practitioners, often winds up aesthetically pleasing—sometimes even astoundingly so.

Gauvreau illustrates his point by citing the Corps' collaboration with ZGF Architects. ZGF designed—with input from the Corps—the Food and Drug Administration's Pacific Regional Laboratory and Los Angeles District Office in Irvine, Calif. The building became one of the ZGF's cornerstone projects and incorporated sustainable design features well before LEED certification became a commonplace goal.

"They came up with a lab building that didn't look like a government building," Gauvreau says with a laugh, noting that the project was selected for *R&D Magazine's* Laboratory of the Year Award in 2004.

By reaching across to private practice, public architects vastly improve the way we move through public space and have a significant voice in how capital is invested in the long term—collaborations with private practitioners can only strengthen the built environment. Their seats are often invisible but they are powerful, and the success of the president's climate change plans rests largely in their embrace of it. "That's the power of being a public architect," says Rothenberg. AIA

AIAPERSPECTIVE

PEOPLE MAKE PLACES

PHOTO: WILLIAM STEWART

I HAD THE PRIVILEGE OF ATTENDING LAST MONTH'S REMAKING Cities Congress in Pittsburgh, where more than 300 global leaders from North America, the U.K., and Europe gathered to collaborate on an agenda for the healthy, sustainable, and prosperous future of cities. The event, chaired by Charles, Prince of Wales, represented a historic moment: This broad group of international participants discussed and shared ideas for the post-industrial challenges facing cities on both sides of the Atlantic—places as diverse as Bilbao, Spain; Germany's Ruhr Valley; Manchester and Liverpool; Rotterdam; and Turin, Italy. Case studies in the United States included Detroit, New Orleans, Milwaukee, Buffalo, and Pittsburgh.

The decision to host this event in Pittsburgh was no accident. This year's congress marked the 25th anniversary of the groundbreaking Remaking Cities Conference in 1988, which was held in Pittsburgh and also chaired by Prince Charles. One of the greatest legacies of that conference was the replication and adaptation of a bold idea pioneered by the AIA, the innovative Regional/Urban Design Assistance Team (R/UDAT) process.

Begun in 1967, the R/UDAT process was built on a simple but powerful idea: Architects and other design professionals should be invited into a community not to dictate, but to listen. In this act of listening, they should lead a forum for ideas generated by the people of the community. With R/UDAT, the AIA did something no other professional body had ever done—we affected the way citizens perceived their capacity to generate change from within.

The first Remaking Cities event included an unprecedented R/UDAT project featuring a binational team of architects and designers from the United States and the U.K. who were focused on the shuttered industrial communities clustered along the Monongahela River—specifically the small town of Homestead, Pa. When the R/UDAT team arrived, they met a community that found it difficult to look beyond the prosperity of a vanished past. After a presentation of the team's findings, based on their intensive engagement with the community, something extraordinary happened: Engaged citizens, inspired by the collaborative process, enthusiastically explored new ideas. Homestead then took charge of its own future.

As a result of this Remaking Cities Conference experience, international participants began to implement the R/UDAT process when they returned home. Called "Community Planning Events" or "Planning Weekends," these events took place in more than 100 communities across the U.K., Germany, and other European countries, leading to a host of publicly driven community transformations.

And like that gathering in Pittsburgh 25 years ago, last month's congress was defined by an era of shrinking public resources and thus was focused on strategies that leverage a whole community's assets with the realities of having to "do more with less." Delegates shared an urgency to build practical solutions to the pressing issues that are facing our cities, with architects needing to take a leading role in convening communities and developing innovative strategies that are place-based. Delegates found much to be optimistic about, particularly the hope that comes from designers and citizens working together to reimagine the future of their communities.

And there was more than talk; there was action. The spirit of partnership during the congress was captured in the signing of a formal agreement between the AIA and HUD to collaborate on efforts to promote and support the vision to design and build more-sustainable cities. Two decades from now, when we look back at this Remaking Cities Congress, I hope it offers a similarly inspirational legacy: Citizens, in partnership with architects, charting a better, more-sustainable, healthy, and productive future for their communities—all because of the bold vision of architects who dared to be leaders. AIA

Mickey Jacob, FAIA, 2013 President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PRODUCTS

ADRIAN GAUT

THE WASHINGTON COLLECTION, KNOLL

British architect David Adjaye, Hon. FAIA, combines a cantilever with geometric lattices in his inaugural line of chairs for **Knoll**. The Washington Collection's Skeleton chair features a perforated die-cast aluminum frame in a black, green, or gray powdercoat finish as well as a copper-plated finish (shown) designed to patina. The collection's Skin chair applies the same pattern in an envelope of reinforced nylon and comes in seven colors. Both can be used outdoors and are Greenguard certified for indoor air quality. *knoll.com* Circle 100

A Glimpse of Greenbuild

PREVIEW THE ECO-FRIENDLY PRODUCTS THAT WILL HIT THE EXPO FLOOR IN PHILADELPHIA NOV. 20 TO 22.

Text by **Hallie Busta** and **Jennifer Brite**
Edited by **Wanda Lau**

AA 5450 SERIES

Increasingly stringent energy codes require ever-more-efficient buildings. **Kawneer**'s AA 5450 Series window in its OptiQ line features an aluminum frame with a polyamide break. The 4⅞"-deep frame can accommodate double or triple glazing. The architectural-grade window is designed for commercial spaces.
kawneer.com Circle 101
GREENBUILD EXPO BOOTH NO. 2818

NEW SLIM

Hand dryers in commercial bathrooms limit paper waste but risk stalling foot traffic and adding noise. **Mitsubishi Electric** has updated its Jet Towel hand dryer with the New Slim, which has a wave-shaped nozzle that cuts drying time by about 1 second from its predecessor and reduces noise by 1 dB, according to the manufacturer. A lowered front panel offers easier access for users.
mitsubishijettowel.com Circle 102
GREENBUILD EXPO BOOTH NO. 3209

ECHOPANEL

Kirei's EchoPanel turns acoustical panels into elements of green design. Made from up to 60% recycled PET plastic bottles, the low-VOC panels can achieve a noise reduction coefficient of up to 0.75 in residential and contract spaces. Available as flat panels, molded tiles, and peel-and-stick and die-cut tiles in more than 30 colors and prints (Wave shown).
kireiusa.com Circle 103
GREENBUILD EXPO BOOTH NO. 1437

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NOCO2

Furniture designer **Peter Danko** looked beyond the typical recycling waste stream when sourcing materials for his NoCo2 chair, which repurposes salvaged die-cut automobile tires in four connections linking the seat to the legs and that adjust to a user's movement. The seat and back come in molded, FSC-certified ash-veneer cores with six matching face veneers. They can also be stained or upholstered. *peterdanko.com* Circle 104

GREENBUILD EXPO BOOTH NO. 2317

HARMONY

Designed to reduce indoor VOC levels due to off-gassing from building materials such as insulation and carpet, **Sherwin-Williams**' Harmony paint also resists moisture and mildew. The VOC-free latex paint is Greenguard certified. *sherwin-williams.com* Circle 105

GREENBUILD EXPO BOOTH NO. 2137

ECOTOUCH

Made of plant-based compounds and 50% recycled glass, **Owens Corning**'s EcoTouch comes in thicknesses ranging from 3½" to 12" and respective insulation values between R-11 and R-38. Available plain, with a kraft facer, or with a foil vapor retarder, EcoTouch can be used in exterior walls, roofs, and ceilings. *owenscorning.com* Circle 107

GREENBUILD EXPO BOOTH NO. 2937

HEXAGON

A fresh take on modular carpet takes shape in **Shaw Contract Group**'s Hexagon collection. The Cradle to Cradle Silver-certified series comprises six-sided tiles in beveled, linear, linear shift, and plane patterns. The collection's 29 colors and four patterns can be combined in groups of three to help demarcate zones on a floor. *shawcontractgroup.com* Circle 106

GREENBUILD EXPO BOOTH NO. 3413

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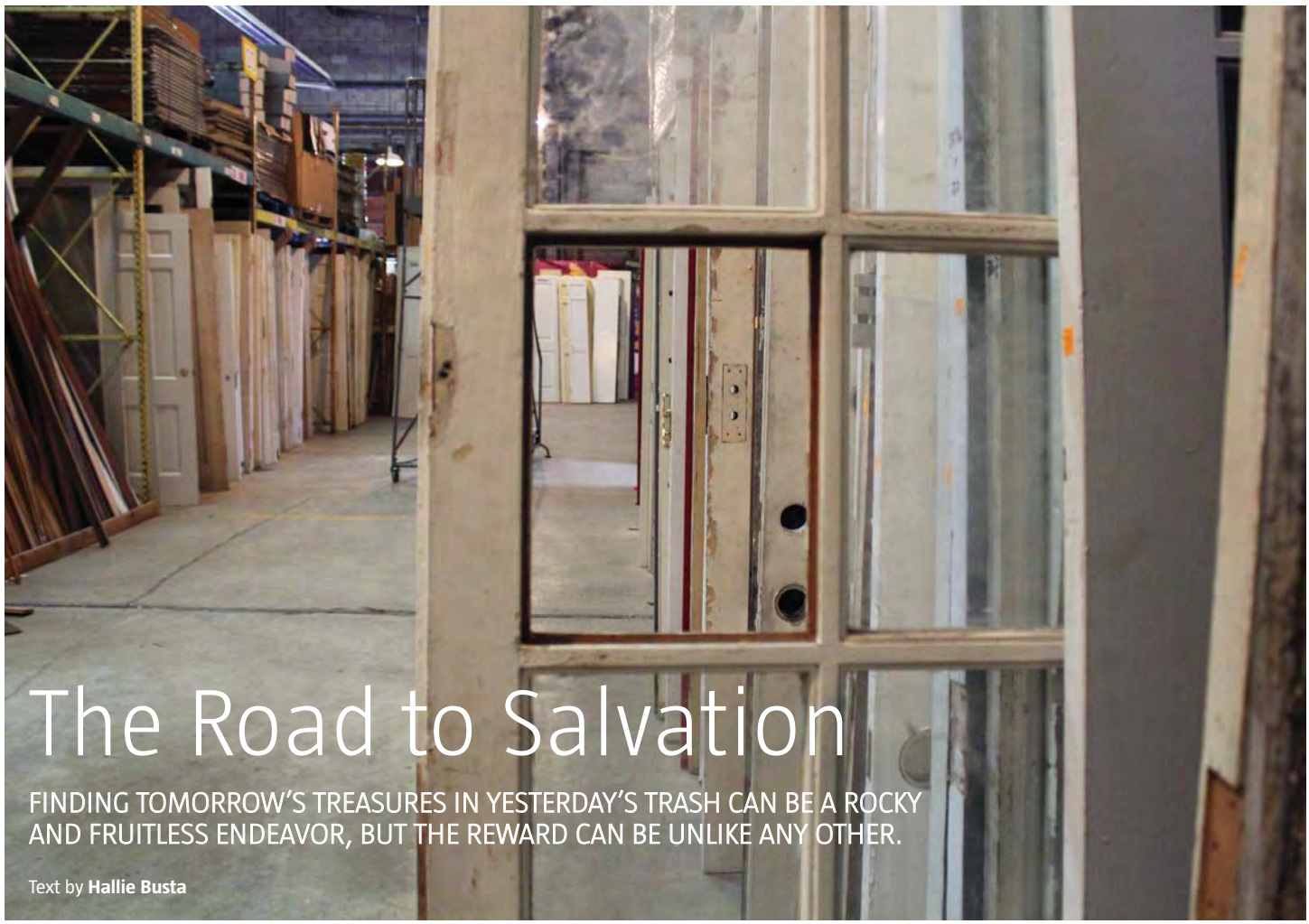


The Road to Salvation

FINDING TOMORROW'S TREASURES IN YESTERDAY'S TRASH CAN BE A ROCKY AND FRUITLESS ENDEAVOR, BUT THE REWARD CAN BE UNLIKE ANY OTHER.

Text by **Hallie Busta**

Community Forklift (shown) caters to those looking for hard-to-find wares while offering more common building materials at below-market prices. The nonprofit sorts and displays items at its warehouse by category, including cabinets, doors, flooring, hardware, tile, and windows.

SKIMMING, CHERRY-PICKING, PROSPECTING. Removing building materials from one structure and repurposing them in another isn't a novel practice. But it is gaining traction among architects willing to venture out on scavenger hunts in the hopes of finding the right item to perfect a project.

The process begins at the jobsite of a structure scheduled for renovation or demolition. "We're the first people in," says Dave Bennink, who has scoured more than 3,500 projects in the last two decades with his Bellingham, Wash., firm, RE-USE Consulting. By volume, most of what his teams save is old-growth wood found in framing, siding, and paneling.

Unlike demolition, deconstruction requires finesse instead of sheer force. Reusable items such as cabinets and flooring can lose their value if they are damaged during the salvage process. To recover a window, for example, workers must remove its interior and exterior trim, cut fasteners in the frame, extricate the window, and store it safely on site until it is transported to a salvage yard.

Products removed from jobsites or deemed surplus by manufacturers often end up being donated to retailers such as Community Forklift, a nonprofit in Edmonston, Md., which offers both materials at below-market prices and obscure high-end pieces. At the firm's 34,000-square-foot warehouse, products such as windows, doors, cabinets, and kitchen and bath fixtures are cleaned, priced, and sorted by category.

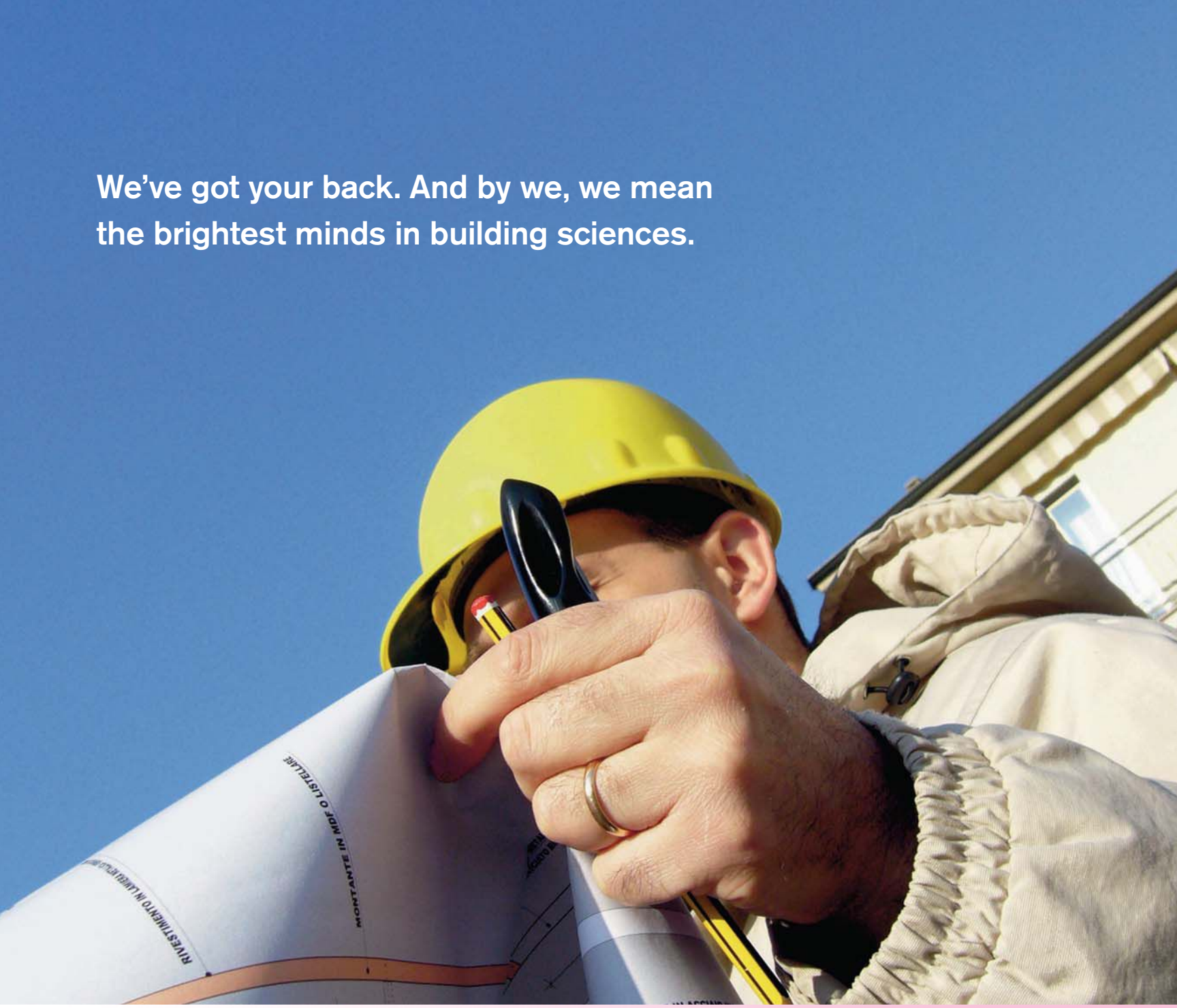
Merchandizing salvaged products is an exercise in organized chaos. "We're selling quality, but to some people, it looks like junk," Bennink says. "[That's] because of the way it might be displayed, or the fact that you go down an aisle and every door is a different color and different size, and the paint might be chipped a little or there might be a scratch."

Salvaged materials are more often used as finishes than they are in a project's structural assemblies. Warranties don't carry over to the new applications, and individual components such as bricks and dimensional lumber lose their grading. Lumber can be re-graded, a service that the ReBuilding Center in Portland, Ore., provides and that executive director Shane Endicott says is good business: Salvaged and refinished old-growth, clear-vertical-grain 2x4s can sell for up to $6 per linear foot, he says, while new boards can retail for as little as less than $1 per linear foot.

Below-market prices and the opportunity to practice environmental conservation may entice DIYers and architects working on smaller projects, but the salvage market's unpredictable inventory keeps most architects at bay for all but the rarest of goods. "What they need and what we have don't often coincide," Bennink says. "If an architect says, 'I need 10 doors exactly like this,' I would probably say, 'I've got nine and a half doors that are almost like that.'"

Watch a salvage job at architectmagazine.com

LAUREN HONESTY



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Text by **Brian Libby**

Hometown: Medina, Washington
BikeLid, BikeLid, LLC • Manufactured in Idaho from post-consumer recycled polyethylene and steel, these lockers protect bicycles from theft and weather, and they have been used in many LEED-certified projects. *bikelid.com* GREENBUILD EXPO BOOTH NO. 4240

Hometown: Homer, New York
Pounce Systems, Cortland Research • Made in the neighboring city of Groton, N.Y., this system of wireless electrical switches and outlets has built-in metering and can remotely control energy usage, as well as room temperature based on occupancy. *cortlandresearch.com* GREENBUILD EXPO BOOTH NO. 3953

Hometown: Cambridge, Massachusetts
Aluminum windows, Yaro Window + Doors • Though it employs the window profiles developed by manufacturing partner Schüco, a German company, Yaro makes its Passive House Uf 0.18 aluminum window system in nearby Northampton, Mass. *yarowindows.com* GREENBUILD EXPO BOOTH NO. 1524

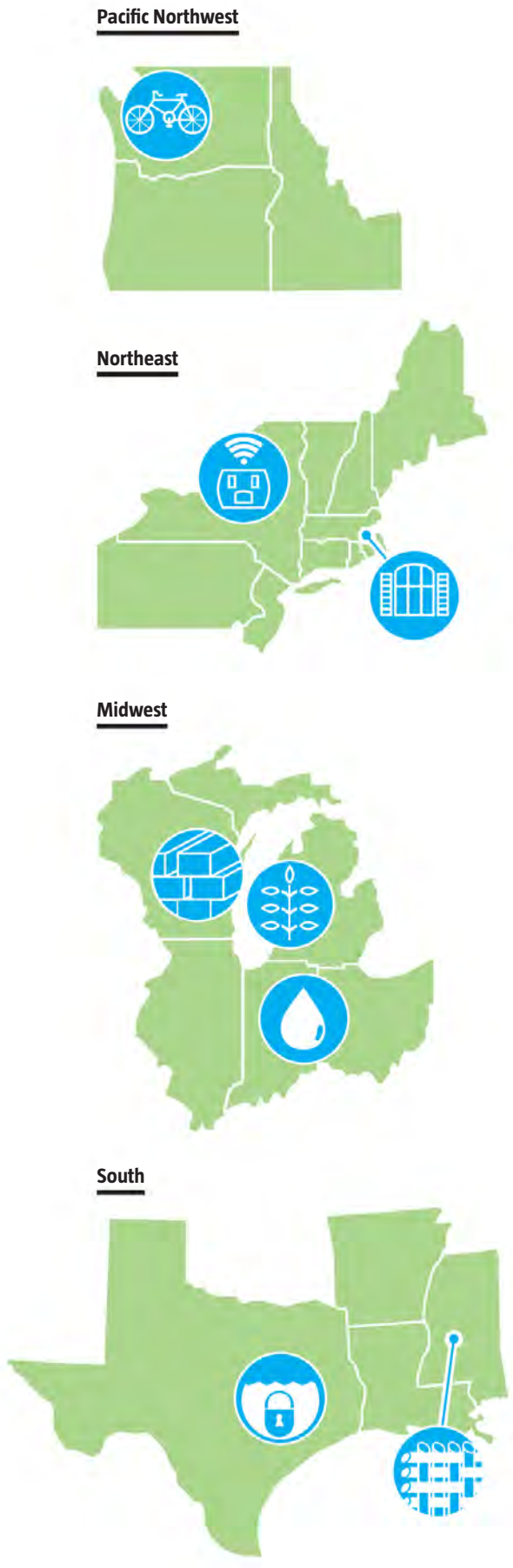
Hometown: Racine, Wisconsin
Thru-Wall bricks, CalStar Products • Comprising 37 percent recycled content, CalStar's bricks contain 81 percent less embodied energy and generate 84 percent less carbon dioxide in their manufacture than do conventional bricks. They do not use Portland cement or need to be kiln fired. *calstarproducts.com* GREENBUILD EXPO BOOTH NO. 3015

Hometown: Spring Lake, Michigan
LiveWall, LiveWall Green Wall Systems • Plants can clad building façades or become freestanding installations using LiveWall's track-mounted planters, which are made from recycled, architectural-grade plastic. *livewall.com* GREENBUILD EXPO BOOTH NO. 1049

Hometown: Fort Wayne, Indiana
Environmentalist/Zero-Bleed 2000, Superior Manufacturing Corp. • This chemical-free water treatment system uses magnetic fields to prevent hard-water lime-scale buildup in HVAC equipment. *superiorwaterconditioners.com* GREENBUILD EXPO BOOTH NO. 1448

Hometown: Conroe, Texas
Flowtite water storage tank, Containment Solutions • Made right in the company's headquarters, the underground fiberglass tank can store rainwater, graywater, and potable water, as well as separate oil and other contaminants from water for irrigation use. *containmentsolutions.com* GREENBUILD EXPO BOOTH NO. 3043

Hometown: Tuscaloosa, Alabama
SheerWeave Infinity2, Phifer • Recyclable and PVC-free, this window shade fabric is woven from a pre-consumer byproduct from another manufacturer (in Atlanta) and made at Phifer's Alabama headquarters. *phifer.com* GREENBUILD EXPO BOOTH NO. 2054



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INDUSTRY NOTES

Returning to LEED

MORE THAN FOUR YEARS AFTER ITS PREDECESSOR, AND ONE YEAR LATER THAN ORIGINALLY PLANNED, LEED V4 WILL BE LAUNCHED AT GREENBUILD 2013. WAS THE WAIT WORTH IT?

Text by **Wanda Lau**
Illustration by **Noma Bar/Dutch Uncle**

AFTER A HIGHLY PUBLICIZED one-year postponement, LEED v4 will make its official debut this month at Greenbuild 2013 in Philadelphia. The increased rigor in the sustainable building rating system, notably in its Materials and Resources section, generated much debate and outcry throughout the six public comment periods held by the U.S. Green Building Council (USGBC). But in the end, the USGBC announced in July that 86 percent of its voting body gave LEED v4 the go-ahead.

Design teams will have time to test the waters themselves. The USGBC built in an overlap period, until June 1, 2015, in which projects can be registered to become certified under LEED 2009 or LEED v4. Then there's no wading back.

Scot Horst, USGBC senior vice president of LEED, says that the updated rating system emphasizes building performance as well as integrated design. Whole-building energy and water metering are prerequisites in LEED v4. "You'll have to have a meter in your building, you'll have to know what's happening there, and then share that information with us to do the rating system," Horst says. Though LEED 2009 technically required building metering and performance data for five years, some in the industry felt that these minimum program requirements were rarely enforced.

Other changes include: the switch to *ANSI/ASHRAE/IES Standard 90.1-2010* from version 2007 as the referenced energy performance standard; credits for the use of products with Environmental Product Declarations, material transparency, and ingredient reporting through third-party certification programs such as the Health Product Declaration Open Standard (see sidebar) and Cradle to Cradle Certified Product Standard; and compliance paths for more market sectors, such as data centers, warehouses and distribution centers, and hospitality.

Though Horst cites improvements throughout the rating system, one of his favorite amendments is a credit for an integrative, holistic approach to buildings from design to occupancy. The promotion of collaboration and big-picture thinking goes beyond the project site. "What LEED v4 starts to do is really envision a global system that allows us to collect best practices from around the world and share them with each other," he says.

With more than 55,000 LEED-registered or -certified commercial projects in more than 140 countries and territories, the USGBC may seem to be in a pretty good position to do so. But developing a universal language for sustainability also requires some heavy tinkering back home, starting with improvements to LEED Online, the website well known by architects managing a project's LEED documentation process. "We don't have a great record of making people happy relative to our support tools," Horst admits. But the USGBC is striving to ease the certification process. "We keep working on uncomplicating it," he says.

CLEAR INTENTIONS

The Health Product Declaration Open Standard was drafted by the Health Product Declaration Collaborative, an ad hoc group of building professionals seeking a standard format for reporting content and associated health information of building products. After a pilot phase, the first official version was launched at Greenbuild 2012.

A growing number of architecture firms are now issuing variations of a template letter requesting product and material transparency from manufacturers. Failure to comply with their disclosure requests may change how a firm interacts with a manufacturer, or even ban a manufacturer's products from the firm's library and projects. **KATIE WEEKS**

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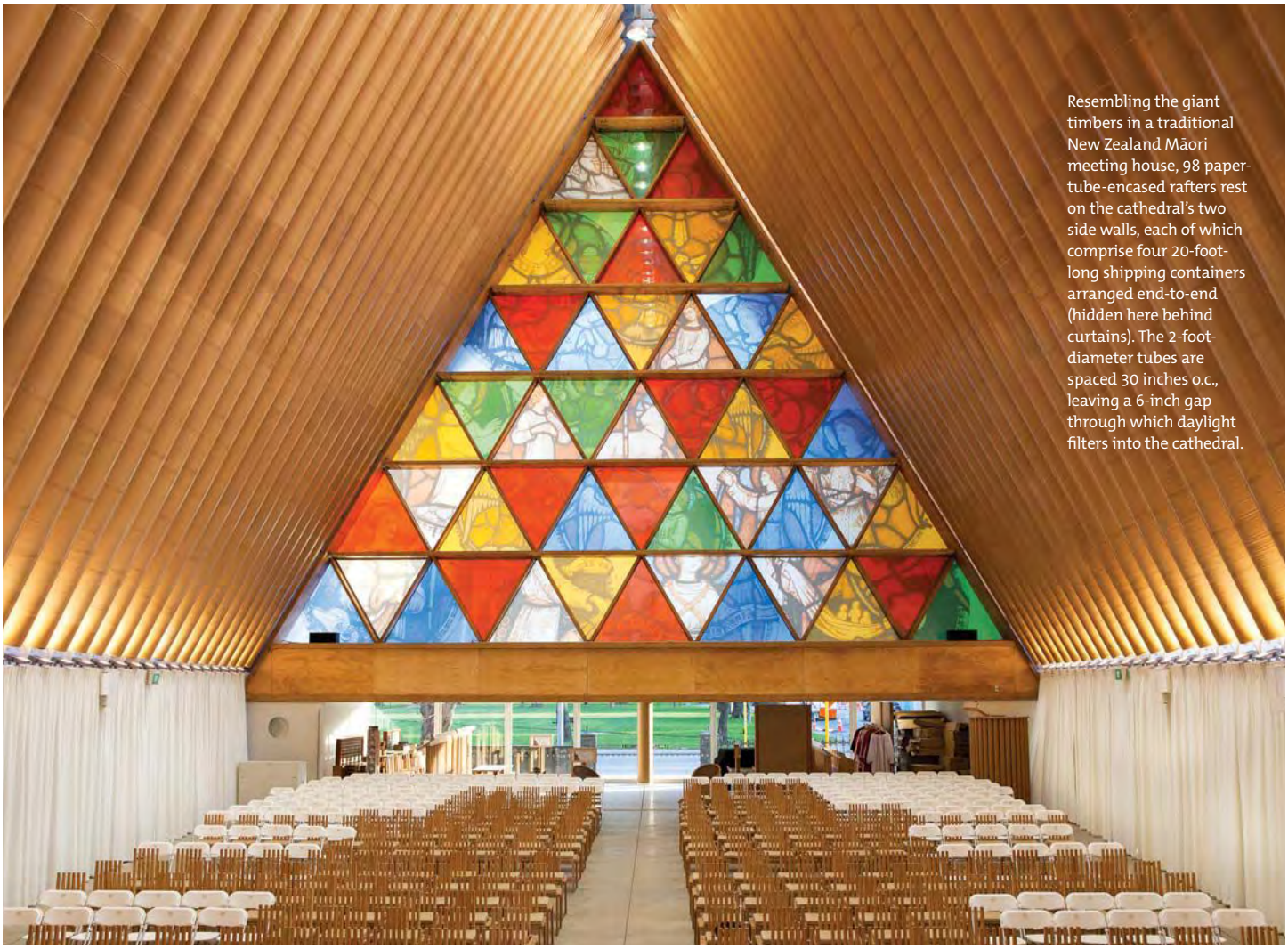
AFTER A MAGNITUDE 6.3 EARTHQUAKE DEVASTATED CHRISTCHURCH, NEW ZEALAND, SHIGERU BAN ARCHITECTS ERECTED A PAPER-TUBE STRUCTURE TO REPLACE A BELOVED, BUT FALLEN, STONE CATHEDRAL.

Text by **Logan Ward**



Resembling the giant timbers in a traditional New Zealand Māori meeting house, 98 paper-tube-encased rafters rest on the cathedral's two side walls, each of which comprise four 20-foot-long shipping containers arranged end-to-end (hidden here behind curtains). The 2-foot-diameter tubes are spaced 30 inches o.c., leaving a 6-inch gap through which daylight filters into the cathedral.

BRIDGIT ANDERSON

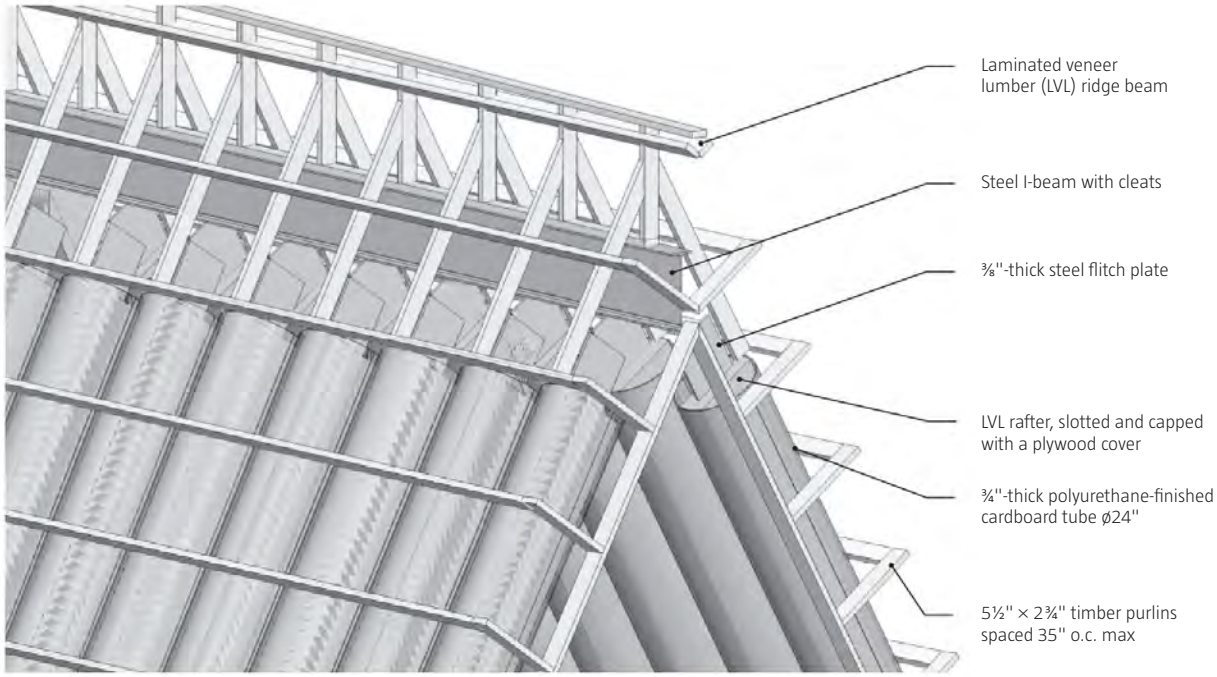
THE DEADLY EARTHQUAKE that hit Christchurch, New Zealand, in February 2011 also destroyed the city's most recognizable architectural landmark: a 19th-century Gothic Revival stone cathedral. Desperate for worship space, the church leaders at Christchurch Cathedral contacted Shigeru Ban Architects at the suggestion of a congregant familiar with a paper-tube church that Ban, Hon. FAIA, designed after the 1995 earthquake in Kobe, Japan. Working pro bono, the firm designed a transitional cathedral that opened in August 2013.

From the outset, visitors understand the cathedral's ephemerality from the A-frame structure of rafters wrapped in paper Sonotube concrete forms and anchored into a foundation of decommissioned steel shipping containers. The cathedral is the first of Ban's paper structures to feature the tubes at an angle. The steep, six-story-tall roof caps a trapezoidal floor plan that seats up to 700 people and retains most of original nave, central transept, and altar geometries.

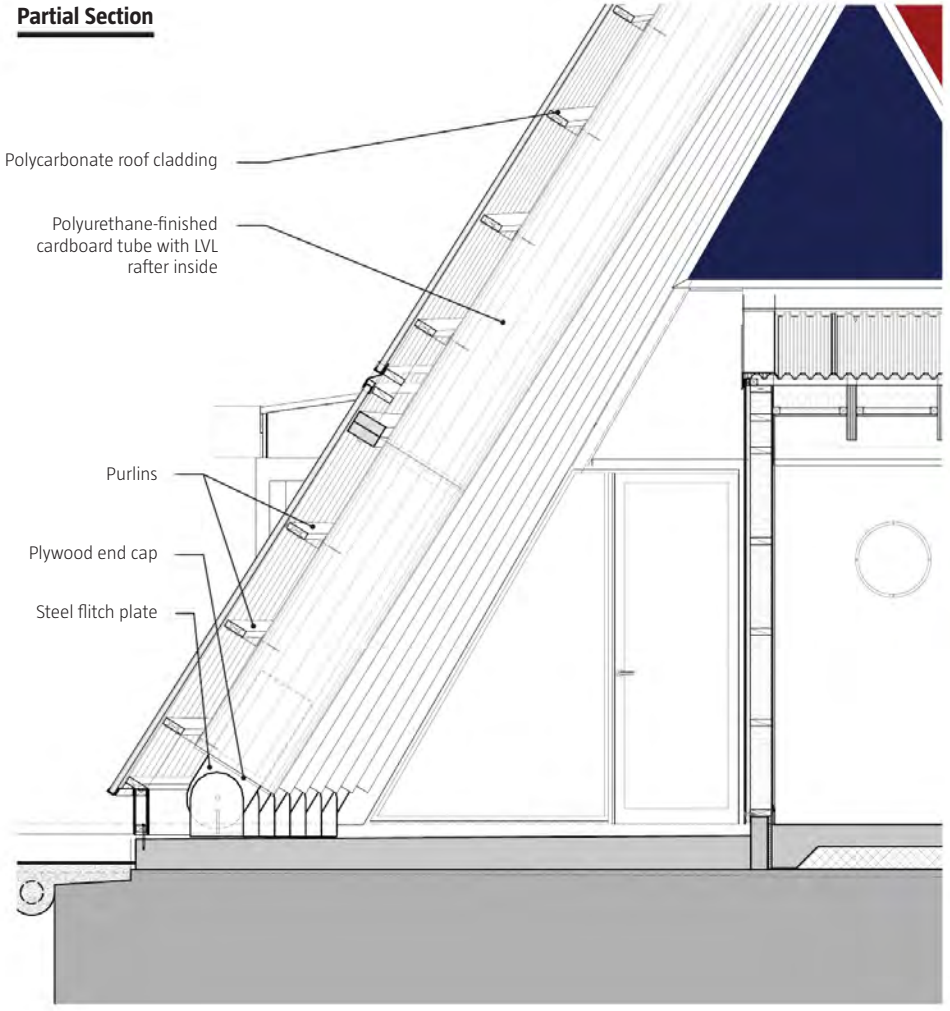
Ban's original design called for paper tubes sturdy enough to structurally support the A-frame. Unfortunately, the tubes manufactured by the Sonotube plant in Christchurch couldn't provide the stiffness to withstand New Zealand's high winds. Concluding that it would be more cost effective and socially responsible to source local materials, Ban and his project team added locally sourced laminated veneer lumber rafters inside each of the cardboard tubes comprising the A-frame.

Though originally envisioned as an emergency and, therefore, temporary structure, the $5.9 million church meets New Zealand's 50-year seismic codes. "This was the first public building built after the earthquake," Ban says. "I hope it will help to revitalize the city."

Perspective, Ridge Framing



Partial Section



The 98 rafter assemblies were made with 55- to 70-foot-long LVL rafters stiffened with plywood gussets at 23-foot intervals and slotted with a machine router. Workers then inserted a ⅜-inch-thick steel connection plate at each end, and slid the ¾-inch-thick, 2-foot-diameter paper tubes around the entire assembly.

To maintain the original cathedral's proportions, the laminated timber ridge beam rises vertically more than 16 feet from front to back, changing the roof pitch from 55 degrees to 70 degrees and creating a slight twist in the roof. The 98 tube-encased rafters connect to cleats welded to a steel I-beam that runs below the ridge beam.

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Present Time

GIFT BUYING CAN BE A TRICKY TASK. WHAT DO YOU BUY FOR AN ONEROUS ENGINEER, A DEMANDING CLIENT, OR A SNARKY COLLEAGUE? WE CHECK IN WITH THREE ARCHITECTS AND A DESIGNER.

Text by **Ali Morris**

More gift ideas at architectmagazine.com

1. MESSENGER NO. 1, MOOP

FOR: Architects PICKED BY: Adam Zimmerman, AIA, Zimmerman Workshop Durable and stylish, the Moop Messenger No. 1 by the Pittsburgh-based bag designer is made from waxed canvas or brushed cotton canvas and lined with water water-resistant Cordura fabric. *$137–$187; moopshop.com*

2. A:LOG NOTEBOOK, A:LOG

FOR: Design managers PICKED BY: Emily Putas, AIA, Stantec "Some of the most beautiful or fantastic things sketched out never make it to construction," Putas says. "Capture all those tidbits into a fanciful reminder of one's own creativity" in something like A:LOG notebooks, which are designed by architects for architects. *$25; projectalog.com*

3. TRAVEL CHECKERS, FREDERICKS & MAE

FOR: Architectural interns PICKED BY: Brooks Atwood, founder and principal of POD Design Encourage reports to spend time away from the monitors and more time contemplating. "This is a classic, like you!" Atwood says. "Over time, all things will become clear. Just like chess!" (Or, err, checkers.) The portable game includes a silkscreened playing surface and 30 playing pieces. *$160; fredericksandmae.com*

4. COIL LAMP, CRAIGHTON BERMAN STUDIO

FOR: Design managers PICKED BY: Adam Zimmerman This luminaire by Chicago-based Craighton Berman Studio will make a design statement on anyone's desk. It consists of just a single 100-foot extension cord wrapped around an acrylic armature. *$69 (DIY kit), $199 (assembled); craightonberman.com*

5. SCENT CANDLE GIFT SET, TOM DIXON

FOR: Engineers PICKED BY: Brooks Atwood Those colleagues who ensure your designs will work will appreciate these candles for their heavenly aromas as well as their handspun brass, copper, and nickel vessels. "Engineers will love the metals and weight to these amazeballs scented candles," Atwood says. Amazeballs, indeed. *$120 (set of three); tomdixon.net*

6. J.A. FÄLLMAN BUCKSAW, SANBORN CANOE CO.

FOR: General contractors PICKED BY: Colin Brice, cofounder of Mapos This hickory wood bucksaw from the Winona, Minn.–based company speaks to the outdoorsman in every contractor. "It's an old-school tool that transcends simple use and brings beauty back to craft," Brice says. *From $75; sanborncanoe.com*

7. CUBE TERRARIUM, SCORE + SOLDER

FOR: Landscape architects PICKED BY: Brooks Atwood Landscape architects can create their personal tabletop Eden with this cubic terrarium. "Warped landscapes—need I say more?" Atwood asks. "What else can't you do with these? They are perfect. Landscape whatever you like—there's no client!" *$110 (small), $130 (large); scoreandsolder.com*

8. BAGUETTE BOARD, MICHELE VARIAN

FOR: Clients PICKED BY: Brooks Atwood Instead of the ho-hum crystalware, consider a chopping board. "To all of my longtime clients, please accept this amazing cutting board because the one you're using is hideous," Atwood says. The boards hang from a leather strap and are handmade in the USA from sycamore wood. *$95 (small), $145 (large); michelevarian.com*

9. TIFFIN FOOD BOXES, MODULE R

FOR: General contractors PICKED BY: Adam Zimmerman Though jobsites can be 24-hour hubs of activity, nearly all workers will break for food. Give your favorite contractor a stackable, reusable, and "cool" lunch box, Zimmerman says. These containers come in an array of bright or rugged colors. *$32; module-r.com*

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Natural Advantage

THOUGH MODERN TECHNOLOGIES MAY SEEM INCREDIBLE, HUMANITY CAN LEARN A LOT FROM NATURE, WHICH HAS EVOLUTION ON ITS SIDE.

Text by **Blaine Brownell, AIA**

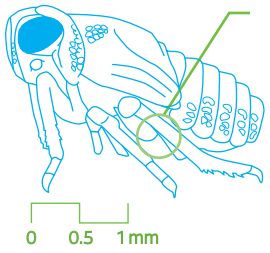
NATURE HAS CREATED many miraculous things, but humanity has added a few inventions of its own. Or has it? Scientists at the University of Cambridge recently discovered something unexpected in nature: a cog mechanism with an observable function. The gears appear in the issus nymph, the adolescent stage of the European hopping insect with opposing cogs and interlocking teeth in its hind legs. The intermeshed joints allow the insect's legs to synchronize when jumping; thus, "the skeleton is used to solve a complex problem that the brain and nervous system can't," said lead author Malcolm Burrows in a university press release.

Called the "first observation of mechanical gearing in a biological structure" by the university, the issus reminds us that what might appear to be humankind's most original ideas probably lurk somewhere in nature's archives. We simply need to look more vigorously. "We usually think of gears as something that we see in human-designed machinery, but we've found that that is only because we didn't look hard enough," said Gregory Sutton, who coauthored the study published in *Science*.

The issus cog follows a line of technologies—electricity, self-illumination, and computing—that humankind developed, only to discover their prior existence in nature. Even nanotechnology predates human invention: Exoelectrogenic microbes—which developed in anaerobic environments and evolved to react with oxide minerals instead of breathing oxygen—have been discovered creating nanowire attachments between materials potentially for cellular respiration or cell-to-cell communication purposes. Stanford University researchers are exploring how to employ these microbes, which generate energy from organic waste to power their own biological systems, to produce electricity. Because excess electrons are transferred extracellularly, these microbes could provide power as they filter wastewater.

As scientists discover more nature-made technology, perhaps they will continue to work closely with biological systems to achieve outcomes that are environmentally and economically superior to traditional methods. Whatever device, material, or process researchers seek, it likely already exists in nature, waiting to share its secrets with us.

INSPECTING THE ISSUS

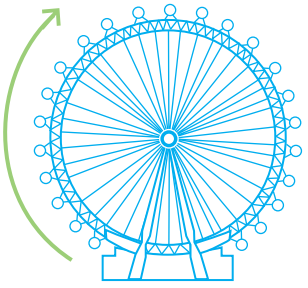


Approximate location of the gears on the nymph's hindlegs

0.2 mm

The radius of the issus gear, which is roughly 15 times smaller than a gear in a wristwatch.

SOURCE: UNIVERSITY OF CAMBRIDGE



556

The number of rotations per second of an issus gear, about 1 million times faster than the London Eye.

SOURCE: UNIVERSITY OF CAMBRIDGE

TOP: MALCOLM BURROWS

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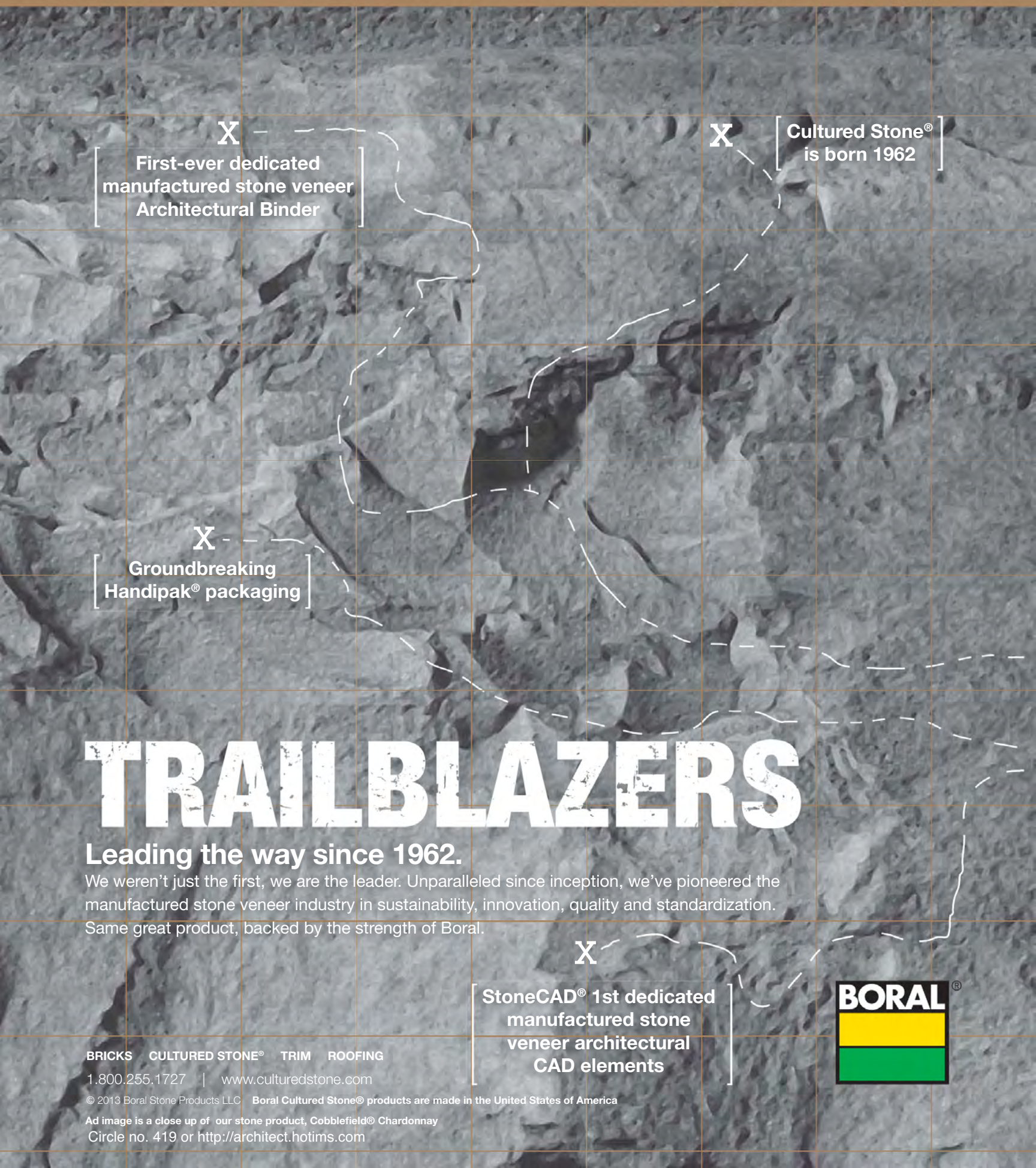

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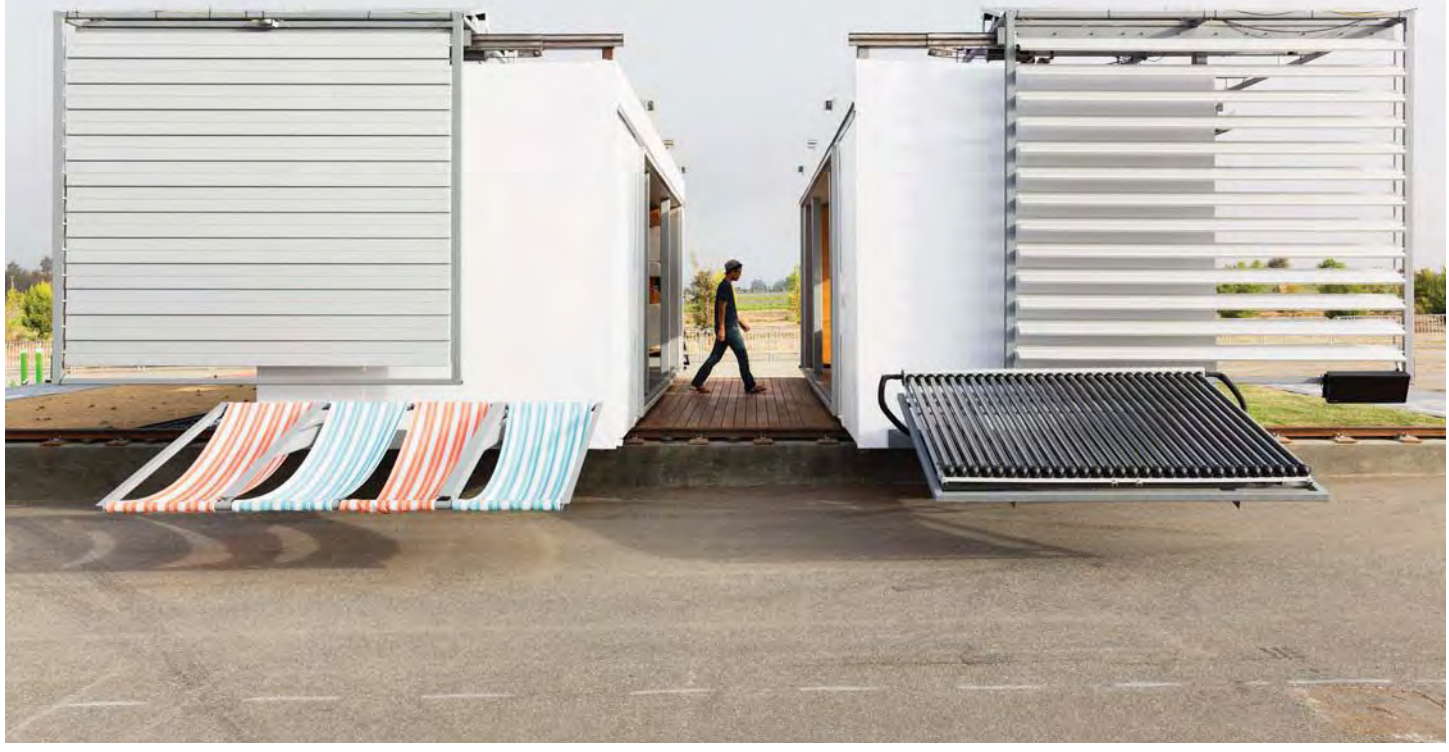
CENTER

The Irvine, Calif., sun-powered Solar Decathlon entries included DALE (shown), by the Southern California Institute of Architecture/California Institute of Technology team. The project's two modules were mounted on reclaimed railroad tracks and could be moved apart to create an open-air courtyard.



POST OCCUPANCY

BEHIND THE FAÇADE

CRITICS HAVE BLASTED POUNDBURY'S AESTHETICS. BUT AS WITOLD RYBCZYNSKI, HON. FAIA, DISCOVERED, SOME FORWARD-LOOKING PRINCIPLES ARE DRIVING THIS ENGLISH TOWN'S DESIGN.

Photos by **Ed Reeve**

POUNDBURY IS "the town that Prince Charles built." Not surprisingly, given His Royal Highness's vocal campaign against modern architecture, British critics have been merciless in their ridicule of Poundbury's perceived shortcomings. "[A]n embarrassing anachronism as the new century dawns," wrote Hugh Aldersey-Williams in the *New Statesman* in 1999, when the project was still in its infancy. More recently, writing in *The Observer,* Stephen Bayley found Poundbury "fake, heartless, authoritarian and grimly cute," and Andy Spain, blogging on *ArchDaily,* characterized it as "an over sanitised middle-class ghetto that has a whiff of resignation that there is nothing positive to live for so we must retreat to the past." Snide judgments made on the basis of seemingly fleeting visits.

What's the town really like? I spent six days there in September, frequenting its eateries, wandering its streets, and generally trying to experience the place as a resident might. Construction started 20 years ago, and while two decades is a short time in the life of a town, it's long enough for the newness to start to rub off. As I discovered, there is a lot more to Poundbury than meets the modernist critic's jaundiced eye. The place is neither anachronistic, nor utopian, nor elitist. Nor is it a middle-class ghetto. In fact, Poundbury embodies social, economic, and planning innovations that can only be called radical.

What struck me first was the unusual layout, a rabbit warren of dog-legged streets and crooked lanes, interspersed with many small squares—none of them actually square. Although confusing at first, after a day or two it's easy enough to find one's way around—much like navigating the center of a medieval town. Instead of a main street, shops, cafés, and a pub are scattered here and there. I had a beer at The Poet Laureate, which is named in honor of Ted Hughes. The outdoor tables spill out onto a square dominated by a market hall with fat columns shaped like milk bottles.

This particular village square is part of the first phase of Poundbury's construction, which was completed in 2001. The scale becomes larger and denser in the newer sections, which have rows of terrace houses, small apartment buildings, and office blocks. Poundbury is built on a hill, and the highest spot is occupied by Queen Mother Square, named in honor of the Prince's grandmother. The partially complete plaza is lined by four- and five-story office and residential buildings, and will soon

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Poundbury, about half finished today, is scheduled to be completed in 2020. The first phase of the town's construction included this village square (bottom), which is dominated by a market hall that was designed by John Simpson and that features an open undercroft and milk-bottle-shaped columns. Across the square sits The Poet Laureate, a pub.

TOP: DUCHY OF CORNWALL

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have a 120-foot-tall *campanile*-like tower. But the impression of a small market town is maintained in the higgledy-piggledy street layout and in the resolutely traditional—that is to say, not-modernist—architecture.

The bright blue electric bus that swings by the square, on the other hand, is very modern indeed. POUNDBURY VIA TOWN CENTRE reads its destination board, a reminder that Poundbury is not a stand-alone community—this is not Celebration or Seaside—but an extension of Dorchester, a small county town of 20,000, set among the gently rolling hills of Dorset in southwest England.

For Dorchester residents, Poundbury is a new appendage on the edge of town, but for designers it is a demonstration of Prince Charles's ideas about architecture, which he first detailed in a 1988 BBC documentary, *A Vision of Britain*. That film, which was followed by a book of the same name, came four years after he had delivered the first of his anti-modernist broadsides, characterizing a proposed extension to London's National Gallery as a "monstrous carbuncle on the face of a much-loved and elegant friend." In his book, Charles threw down the gauntlet: "We *can* build new developments which echo the familiar, attractive features of our regional vernacular styles," he wrote. "There *are* architects who can design with sensitivity and imagination so that people can live in more pleasant surroundings." Whence Poundbury.

HOW DID THE HEIR APPARENT become a real estate developer? You can blame Edward III. In the 14th century, the king established the Duchy of Cornwall, a land trust to benefit his eldest son, Edward, known as the Black Prince. The king cannily prevented the prince and his successors from touching the capital, and over the centuries the Duchy has done well, with a current worth of more than $1 billion.

In 1987, Dorchester's local planning authority determined that the only open land that could accommodate the future growth needs of the town was 400 acres belonging to the Duchy. Under ordinary circumstances, as it had done in the past, the Duchy would have sold the land to be developed in a conventional manner. But because Charles, the 24th Duke of Cornwall, had such an interest in urbanism, with the town's consent, the Duchy took a more active role.

In 1988, after several false starts, Charles appointed the urban theorist and planner Léon Krier to prepare a master plan for an "urban village," a dense (15 to 20 dwellings per acre, instead of the usual 10 to 12), walkable, sustainable model for suburban development. Following a public consultation process, the local planning authority approved the concept, and five years later construction began.

The work is being carried out by a variety of regional builders working with local and London-based architects, each of whom has been given a restricted number of dwellings in any one contract to promote architectural variety. Peterjohn Smyth was the coordinating architect for the project's first phase, and Ben Pentreath is managing the current phase. Architecturally, there is nothing here that would be out of place in the pre-war center of any provincial British town: Brick and stucco boxes with slate or clay-tile roofs and occasional flint panels, a scattering of Georgian and Regency revival townhouses, the occasional larger classical pile, and many buildings that are what one can only call "generic traditional."

The market hall with the milk bottle columns was designed by the prominent classicist, John Simpson; the office blocks on Queen Mother Square are the work of Quinlan and Francis Terry; and an Arts & Crafts nursing home is designed by James Gorst. I liked Simpson's market hall; and the Terrys' classical

These upscale Georgian revival terrace houses in Woodlands Crescent in Poundbury were designed by Ben Pentreath and strike a good architectural balance, just hinting at their 18th-century influences.

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Quinlan and Francis Terry Architects' office building in Queen Mother Square also includes a supermarket, affordable housing, and underground parking.

office building, while a little standoffish, has a marvelous cupola. On the other hand, the fire station struck me as particularly heavy-handed; Mey House, designed by Barbara Weiss Architects, is altogether too self-important for an office building; and some of the larger residences veer dangerously close to McMansion territory.

Of course, the last is a relative judgment: The largest house at Poundbury is smaller than the *median* size of new houses in America (2,400 square feet), and an upscale Georgian revival terrace house in Woodlands Crescent squeezes four bedrooms into only 1,400 square feet. This particular crescent of 38 virtually identical houses, designed by Pentreath, merely hints at its 18th-century roots, and seems to me to strike exactly the right architectural note.

Despite the picturesque street layout, Krier's approach is not simply scenographic: It embodies the theories of the 19th-century Viennese architect and planner, Camillo Sitte. Sitte believed that the old cities which people admired were not happy accidents but were in fact designed according to principles no less specific than in the other arts. In *Der Städtebau nach seinen künstlerischen Grundsätzen* (1889), translated into English as *The Art of Building Cities*, Sitte provided a detailed urban design analysis of streets and squares in old Italian and northern European cities. "Modern city planning completely reverses the proper relationship between built-up area and open space," Sitte wrote. "In former times the open spaces—streets and plazas—were designed to have an enclosed character for a definite effect. Today we normally begin by parcelling out building sites, and whatever is left over is turned into streets and plazas."

Poundbury's Sitte-esqe roots are visible in its compact plan. Only 250 of the 400 acres are to be urbanized; the unbuilt space is concentrated at the edges, a green swathe of playing fields, allotment gardens, and pastures with grazing sheep. Krier has learned another lesson from Sitte: the value of accidental events. "We set up rigid systems, and then grow fearful of deviating from them by as much as a hair's breadth," Sitte wrote, bemoaning that city planning had become a branch of engineering in which formulaic solutions were rigorously applied. For Sitte—and Krier—planning is an art, and in art rules may be broken.

For example, in Poundbury, buildings generally come up to the sidewalk, but some have projecting stoops. Occasionally there are planting beds between the building and the sidewalk; sometimes a narrow garden, occasionally a deep garden. In a few cases, a building projects over the sidewalk to form an arcade. Simon Conibear, Poundbury's development manager, characterized Krier's planning to me as "80 percent harmony and 20 percent discord."

In Poundbury, the layout of the buildings predetermines the road pattern, not vice versa. Roads are merely a way of getting around, not an armature within which buildings must tightly fit, as is the case with most planned communities. The first time I heard Krier lecture, many years ago, he talked mainly about parking. Krier's point was that whereas the principles of sound urban design were all known long ago—and did not need to be reinvented—the great challenge for the modern city planner was how to accommodate the automobile.

POUNDBURY IS NOT A MIDDLE-CLASS GHETTO: MORE THAN A THIRD OF THE DWELLINGS QUALIFY AS AFFORDABLE HOUSING.

This is as true in Britain as elsewhere: More than 77 percent of households currently own at least one car, and the ownership rate continues to increase. Krier's solution is not to banish cars to the periphery, or to separate them from pedestrians. In Poundbury, automobiles are everywhere: The interiors of the blocks have parking courts with open-air stalls, car ports, and garages; there is parallel and head-in street parking, and some of the apartment buildings integrate on-grade protected parking. But it didn't feel as if the cars had taken over. For example, although several cars were parked in front of The Poet Laureate, the little square didn't resemble a parking lot. There were no white lines, no signage—people parked willy-nilly, where they wanted. On Saturday night the square was full of cars, but on Monday morning it turned back into an empty plaza.

Poundbury may not have a "pedestrian zone," but in a real sense the entire town is a pedestrian zone. It's up to the drivers to adjust to the built realm, not vice versa, for Poundbury calms traffic with a vengeance. In fact, there have yet to be any accidents, Conibear told me. "The street layout is deliberately chaotic," he said. "There are blind bends, no signage, not even stop signs. We also use the '70-meter event' rule—that is, every 70 meters something happens to slow the cars down."

POUNDBURY IS less than half-finished, with a current population of about 2,000 residents. Forty percent are retirees, typical for this area since southwest England is Britain's Arizona. Flats and small houses sell for £100,000 to £200,000 ($160,000 to $320,000), while large freestanding houses command in excess of £500,000 ($800,000). These are high prices in a region where the median gross annual pay is £25,000 ($40,000).

Yet Poundbury is not a middle-class ghetto: more than a third of the dwellings qualify as affordable housing. The majority is social housing, owned by charitable trusts and rented to low-income tenants, but there is also shared-equity housing, which allows qualifying buyers to purchase a share in a home, even if they cannot afford a mortgage on the full market value. What is unusual in Poundbury is that the affordable housing is "pepper potted"—that is, scattered, and it is similar in appearance to its neighbors. It's hard to get a complete picture of how well this works during a brief visit, although by all accounts, there is little social mixing between the two groups.

Another innovation at Poundbury is the embrace of mixed use, which is more extensive here than in most planned communities I've visited. Not only are the ground floors of many residential and office buildings devoted

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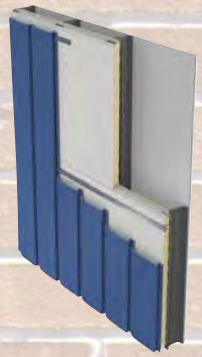

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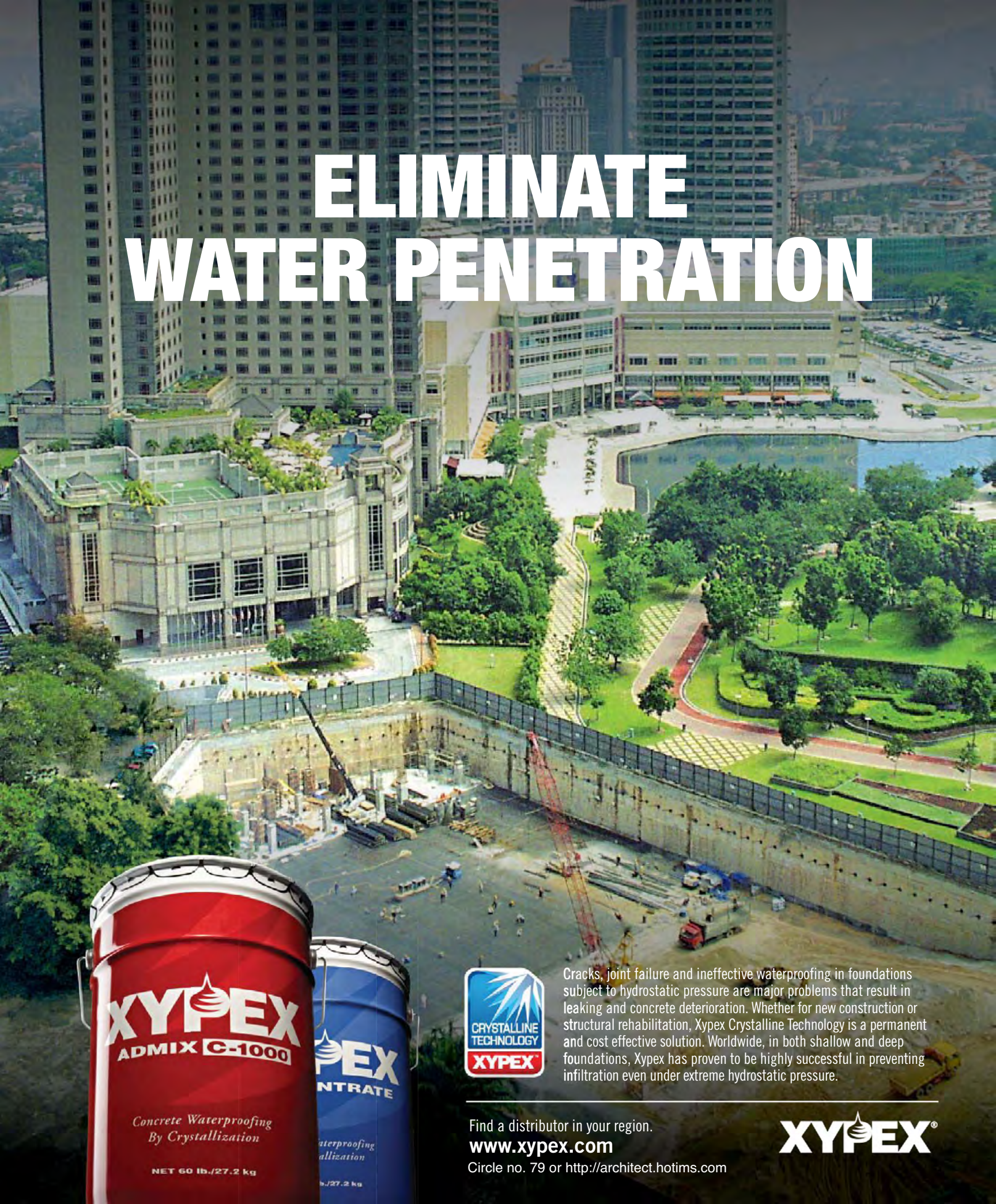
An octagonal building in the middle of Bridport Road, the chief east–west artery through Poundbury, forces drivers to awkwardly skirt the structure—one of many "events" that the town's planners use to slow the pace of traffic.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to commercial uses such as shops and cafés, there are medical clinics, professional offices for lawyers and accountants, garden centers, veterinarians, travel agents, and even a funeral home. There is also light industry: a large shed-like building at the bottom of a village green is a chocolate factory; a breakfast cereal manufacturing plant stands across the street from elegant townhouses; a low brick building with arched windows was until recently occupied by an electronics factory. The key to introducing industrial buildings on residential streets, says Conibear, is to make sure that they are built before the housing; residents accept a fait accompli, but they strongly resist the introduction of nonresidential uses after the fact. In all, Poundbury currently has an impressive 136 businesses generating 1,600 jobs—nearly one per resident.

I ASKED MY LANDLADY what her neighbors thought about Poundbury. "Not everyone likes it," she said. "Some people think it looks like a movie set." Although Poundbury is a commercial project—the Duchy is emphatically not a charity—the execution is of high quality: tight graphic control over signage, crunchy pea gravel instead of expanses of bare asphalt, granite blocks not paint stripes to denote parking stalls. Walking about town, I am also struck by what is missing: intrusive commercial signs, gimcrack construction, and the plastic vulgarity that pervades even the historic center of Dorchester. I suppose to some that makes it a movie set. But the allusion is surely also prompted by the revivalist styles of the architecture, the very thing that sets off the critics.

In an article in *Building Design* in which he excoriated the traditional appearance of the architecture, Crispin Kelly asked: "If Poundbury's 1759 date stamp is not to our taste, do we have better pattern books of our own to promote to the punters ... ?" I think the date stamp is more like 1940, but it's a good question. What would be a modernist pattern book?

The stylistic free-for-all that has produced Dubai and Doha is surely not the answer. On the strength of 1920s-era neighborhoods I've seen in Oslo and Tel Aviv, I can almost imagine an International Style–revival Poundbury, although, as Los Angeles' Getty Center decisively shows, white walls and pipe railings only get you so far. Individual modernist buildings have always looked good in the natural landscape—Fallingwater, the Glass House, the Sydney Opera House—or when surrounded by traditional buildings—think of Paris' Pompidou Centre, Lloyd's of London, the Bilbao Guggenheim Museum. But modernism has been notably deficient in creating an urban fabric. The modernist palette is simply too restricted—or perhaps not restricted enough. There is either too much repetition or too much variety, too much standardization or too little.

It seems to me that Poundbury could quite happily absorb a wider stylistic range, although neither Krier nor any of the architects I spoke to mentioned this possibility. But for the moment the imposition of an architectural code that favors tradition is understandable. The reason for "leaning on the past" is not nostalgia or lack of imagination, but rather the recognition that the established vernacular offers the best chance for creating the nuanced variety and shadings of difference that produce a coherent urban environment and a recognizable sense of place.

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NEXT PROGRESSIVES

POLITICAL ANIMAL

SPANIARD ANDRÉS JAQUE IS SHAPING A NOVEL APPROACH TO PRACTICE, BASED ON LESSONS FROM THE ECONOMIC BUST.

Text by **Christopher Hawthorne**
Photo by **Luis Díaz Díaz**

SINCE THE ECONOMIC CRISIS, one question has dominated all others in architecture: How should the profession remake itself? From that question flow several others. Does architecture bear any responsibility for the overbuilding and false confidence that spread across the United States, Europe, and much of Asia before 2008? If so, is some kind of penance required for the damage done by the resulting collapse, or some radical re-imagining of the architect's role in society? Or it is simply enough to pick up the pieces and get back to the business of designing buildings, perhaps ones that are slightly less flashy and oversized than before?

There has been no shortage of meaningful, persuasive answers to those questions in the last five years. Most of them have included one or more of the following words and phrases: bottom-up, tactical, temporary, user-generated, makeshift, ad-hoc, social, sober, anonymous, communal, or open-source. In addition to adding new language to the architectural lexicon, many of those responses have provided attractive new models for making cities, not to mention for doing more with less. Still, virtually all of those answers have shared one major liability: They haven't really qualified as architecture. They have had a lot more to do with urban design, technology, planning, politics, or transportation.

All of that probably explains better than anything else why I find the work of the 42-year-old Spanish architect Andrés Jaque so significant. Jaque, who runs a Madrid firm and teaches for much of the year at Columbia University in New York City, is deeply interested in analyzing the ways architecture went wrong before 2008. Of course, few countries have paid a higher price for financial hubris or speculative construction than Spain, where according to recent estimates nearly

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Next Progressives is a monthly section that looks at an emerging designer or practice.

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PARSONS THE NEW SCHOOL FOR DESIGN

The Diocesan Clergy House in Plasencia, Spain, an abandoned seminary transformed into a residence for priests.

4 million houses sit vacant and unemployment among adults under 25—the country's so-called Lost Generation—hovers near 55 percent.

What makes Jaque's response to those familiar statistics unusual, and important, is that it is fundamentally and unapologetically architectural. Though his work is steeped in subjects like interior design, opera, the movies, punk rock, and surfing, he wants to use architectural tools to find his way through the rubble of the crisis and toward a new way of working. He is not marginalizing architecture in an effort to save it. He thinks architecture is perfectly capable of saving itself.

I FIRST MET JAQUE—pronounced "HA-kay"—in 2010, at the Venice Architecture Biennale. He'd been invited by Kazuyo Sejima, the director that year, to contribute an installation to the large first room of the exhibition, inside the Italian Pavilion. On the first preview day I came into that room and saw him standing there, a short, smiling figure with thinning hair, wearing skinny green pants with a Thom Browne hem. His piece for the Biennale was called "Fray Foam Home." It was a huge wall hanging, made of wire covered with colorful bits of fabric, plastic flowers, and tiny paper umbrellas, that represented, among other things, the carbon footprint of a single apartment shared by five people, in Madrid.

At its base, this was an attempt to turn a series of measurements and diagrams into an object that could be hung on the wall—to make a chart beautiful. But it was also a commentary on sustainability and the way that in a networked age there is no realm more politicized than the domestic one. The shared space of a city apartment, and the daily decisions its residents have to make about how to get along with one another and how their own behavior might affect the water supply or global warming—this for Jaque is the heart of the political sphere, rather than a neoclassical parliament building or town square. "There are no agoras any more," Jaque wrote in a description of "Fray Foam Home." By which he meant: The agora is now inside our apartments and houses, in our living rooms and kitchens, and on our iPhone screens.

When I spent a few days with Jaque in Spain earlier this year, I discovered that those principles have continued to shape his output. One afternoon I took a cab to his firm's office, located on a quiet street 3 miles northeast of the center of Madrid. On the windowless metal door were painted two names: Andrés Jaque Architects and Office for Political Innovation. In general, Jaque does architecture work under the first name and research and art-world projects under the second. But the lines between the two parts of the firm often blur.

A half-dozen young employees were sitting at computers when I walked in; around the edge of the office were models of projects at various stages of completion, including a restaurant and art-fair campus for Madrid and a low-income housing block for Stockholm. Like "Fray Foam Home," Jaque's models are colorful and delicate, and look more Japanese than Spanish. Jaque and I walked into his modest office and sat down to talk, a conversation that wound up stretching more than three hours.

Born in 1971 to a wealthy and well-connected family—his father, descended from a long line of prominent naval engineers, was an executive for the Renault car company—Jaque grew up in Madrid. As a teenager he had a range of somewhat eccentric hobbies, including studying bonsai, the Japanese art of growing and pruning miniature trees. He spent the last two years of high school, in the late 1980s, as an exchange student in Cape Elizabeth, Maine.

When he returned to Madrid to study architecture, Jacque found that the legacy of well-known Spanish and Portuguese architects like Rafael Moneo, Álvaro Siza, and Eduardo Souto de Moura loomed large. He found suffocating their interest in precision and tectonics—in the craft of building raised to a kind of holy perfectionism. Though he excelled as a student, he also executed a series of minor rebellions, producing work that was willfully, even stubbornly, imperfect. His senior thesis project was exuberant and brightly colored: more Cedric Price or Charles Moore than Moneo or Louis Kahn, who was also exalted in the department. "Believe it or not, this was the first time someone had ever used bright colors in the school of architecture in Madrid," Jaque told me. "I was called into the director's office. He said, 'I don't understand why you have such good marks and then you present this kind of funny, not serious project. What you're doing is not architecture—it's painting.'"

A fellowship took him to Dresden, Germany, for 18 months after graduation. When he returned he worked briefly for established Madrid firms and started entering design competitions on his own time with two school friends, Enrique Krahe and Miguel de Guzmán. They were shocked when they won one of them, to design a retirement home for priests and nuns inside a renovated seminary in the Spanish town of Plasencia. Finished in 2004, the project is full of neon lighting and spaces painted cherry red and fluorescent green. The bright colors are meant to bring some youthful energy to the interior as well as provide way-finding for aging clergy through the building.

JAQUE'S BEST-KNOWN BUILT WORK is the "House in Never Never Land," a vacation retreat on the island of Ibiza. The day after we met in his office, Jaque and I made the short flight to Ibiza. Joining us was Miguel de Guzmán, who has become a successful architectural photographer and often shoots Jaque's work.

Ibiza is a mixture of new wealth and the vestiges of 1960s counterculture and hedonism. "House in Never Never Land," finished in 2009, reflects that combination. Perched on a

MIGUEL DE GUZMÁN

Top: "Fray Foam Home," displayed at the Venice Architecture Biennale in 2010. The exhibit documents the network of resources and landscapes connected to a single apartment in Madrid. **Above:** A detail from "Fray Foam Home." **Left:** A diagram from Jaque's exhibit at Los Angeles's Roy and Edna Disney/CalArts Theater. It explored how L.A. residents incorporate political activity into their residential spaces.

TOP, RIGHT: MIGUEL DE GUZMÁN

downslope hillside lot with a view of a wide bay below, it is made of a steel frame filled in with corrugated metal, glass, and rubber. The main house is raised on spidery steel legs emerging from the sloping ground; a pair of guest rooms occupy separate small wings near the bottom of the site. The color scheme is familiar Jaque: placid blue, light purple, and fluorescent green. The architecture owes more than a little to Southern California. There are echoes here not only of Frank Gehry, FAIA, but earlier hillside projects by Albert Frey and John Lautner.

Like a lot of work by young, media-savvy architects, the house looks fantastic in photos. It is more impressive in person. The qualities that make it work—the balance between private spaces and dramatic views, and between the upper house and the lower guest rooms in particular—grow from a generous, even old-fashioned belief in architectural technique.

In September, Jaque flew to Los Angeles for the opening of "Different Kinds of Water Pouring into a Swimming Pool," an installation he'd designed for the REDCAT Gallery, an outpost of the California Institute of the Arts. The installation takes its name from a drawing by David Hockney, long a favorite artist of Jaque's. The product of several months of research that the architect conducted into L.A.'s residential spaces, it takes the form of four fountains festooned with plants and made mostly of ordinary objects from the kitchen and garden: plastic cups, strainers, laundry tubs. Each fountain represents a household whose members he interviewed over several visits. The central idea is that these residential spaces make room for all kinds of negotiation and political activity. The installation is meant to commemorate that activity, to create a series of everyday Trevi Fountains made of the kind of household goods you can find at Target.

Walking through it, I was reminded of something Jaque had told me in Madrid: "Most of the time when you see a public square there's not much that could actually happen there. But when you see a house, you see that the possibilities are far greater: You could watch TV, you could cook, you could read, you could listen to music, you could talk to people or argue with them, you could swim in the swimming pool."

Ruth Estévez, who became director of the REDCAT Gallery earlier this year, told me she chose Jaque as the subject of her first show primarily because of the social and theatrical nature of his work. "Andres belongs to a generation of Spanish architects that is proposing platforms for public participation," she wrote in an email. "A generation that is more interested in process than in product."

When I called Mark Wigley, the outgoing dean of the Columbia School of Architecture, he was even more effusive. He said he'd hired Jaque as a visiting professor in large part because he is "one of the least boring architects around." Wigley said that Jaque's first Columbia studio was on the nail salons and funeral parlors of New York City and how those spaces, threaded though every part of the city, organize the social lives of many of their employees and patrons. "That was typical Andrés," he said. "He has fantastic peripheral vision. The best people in any field always pay attention to the things that get overlooked. When you go to the margins a whole kind of garden emerges."

Importantly, Wigley said, "None of this implies that he's not an architect. If this was all a kind of escape from the world of building or from the world of decisions, it wouldn't have the same political impact. The political impact comes from the fact that he's saying, 'No, I make buildings, and here is where I see the energy.'"

I asked Wigley what role he imagined Jaque playing as his career progressed. "I think he has the potential to be a pied-piper," Wigley said. "To play some strange sort of music and lead architecture somewhere more interesting."

The "House in Never Never Land," located on the island of Ibiza. Jaque incorporated existing pine trees at the site into the design.

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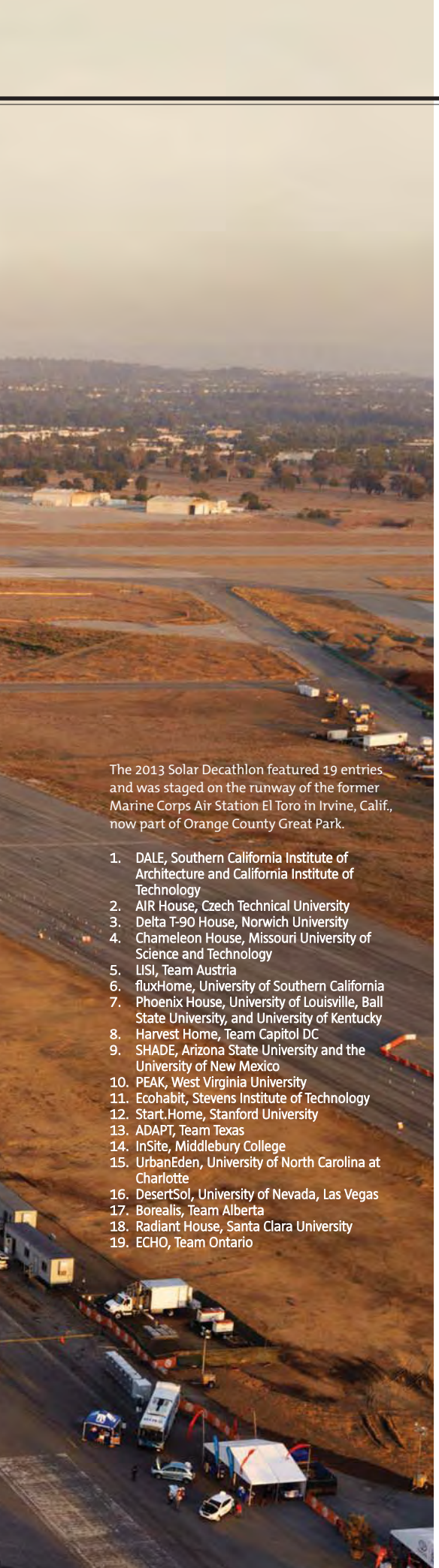
SUSTAINABILITY

PROJECT RUNWAY

THE EUROPEANS ENJOYED THEIR DAY IN THE SUN AT THIS YEAR'S SOLAR DECATHLON IN IRVINE, CALIF. BUT DOES THE COMPETITION NEED A REBOOT TO MAINTAIN ITS INFLUENCE ON SUSTAINABLE DESIGN?

See photos for all the Solar Decathlon entries in the project gallery at architectmagazine.com.



The 2013 Solar Decathlon featured 19 entries and was staged on the runway of the former Marine Corps Air Station El Toro in Irvine, Calif., now part of Orange County Great Park.

1. DALE, Southern California Institute of Architecture and California Institute of Technology
2. AIR House, Czech Technical University
3. Delta T-90 House, Norwich University
4. Chameleon House, Missouri University of Science and Technology
5. LISI, Team Austria
6. fluxHome, University of Southern California
7. Phoenix House, University of Louisville, Ball State University, and University of Kentucky
8. Harvest Home, Team Capitol DC
9. SHADE, Arizona State University and the University of New Mexico
10. PEAK, West Virginia University
11. Ecohabit, Stevens Institute of Technology
12. Start.Home, Stanford University
13. ADAPT, Team Texas
14. InSite, Middlebury College
15. UrbanEden, University of North Carolina at Charlotte
16. DesertSol, University of Nevada, Las Vegas
17. Borealis, Team Alberta
18. Radiant House, Santa Clara University
19. ECHO, Team Ontario

Text by **Mimi Zeiger**
Photos by **Thomas Prior**

THE SOLAR DECATHLON took place in early October in spite of the government shutdown that furloughed all but the most essential employees at the U.S. Department of Energy (DOE), which organizes the biennial competition. Fortunately, the decathlon was funded during the previous fiscal year and is also supported by private donors. But there was another reason the fiscal battle in Congress barely cast a shadow over the proceedings: For the first time since its founding in 2002, the decathlon wasn't held on the National Mall in Washington, D.C., but rather at the Orange County Great Park in Irvine, Calif.

Much as in the 2011 competition, judges evaluated the entries not only for their energy efficiency, design, and affordability, but also for their livability. Which is why students mock-inhabited the houses: cooking, doing laundry, and washing dishes. In that respect, the decathlon reinforces the values of domestic life and the American Dream of the single-family home. So it may come as a surprise that two of the three top overall finishers hailed from Europe—first-place Team Austria and third-place Czech Republic—with projects that, in this context, challenged the conventions of typical United States housing.

Team Austria's entry, named LISI, was a joint project by Vienna University of Technology, St. Pölten University of Applied Sciences, Salzburg University of Applied Sciences, and the Austrian Institute of Technology. With large retractable sliding glass doors by the manufacturer Josko on the north and south sides, the house opens itself up to the elements, taking advantage of passive cooling. With all of the living functions contained in one big room instead of being subdivided, the interior feels like a covered exterior courtyard. The bedroom, by contrast, is tiny—a cave-like, wood-lined room.

The Czech Technical University's AIR House is similar to the Austrian entry: A single loft-like space with a sliding door that opens directly onto an outdoor living room. It's an L-shaped structure shrouded in a wood canopy and façade: a "house within a house" according to the team. The main living space is located in the long leg of the L, and the short leg houses the bathroom and equipment for the radiant chilled ceiling system, rooftop solar panels, and graywater collection system. The house is marketed not to first-time homeowners but to empty nesters as a vacation retreat that can be transformed into a retirement home.

Comfortable and livable, AIR House and LISI are far from radical. (For radical, check out DALE house, the SCI-Arc and Caltech entry that was composed of two modules on railroad tracks that could be motored open and closed for ventilation.) But the Austrian and Czech entries are a departure from the more conventional designs proposed by many of the North American teams. Both the Czechs and Austrians maximized single living areas and minimized auxiliary rooms, which streamlines passive heating and natural ventilation. And typical of the European climate, both designs are more concerned with heating than they are with cooling. Heating demands for LISI in Vienna are 9.7 kWh/m² per year and cooling is 5.6 kWh/m² per year. In sunny Irvine, the loads skew much more to cooling—10.6 kWh/m² per year—while heating is 2.7 kWh/m² per year.

By comparison, consider DesertSol, the entry from the University of Nevada, Las Vegas (UNLV), which finished second overall in the competition. You can't argue with the house's strong metered-energy performance. Like all 19 teams, UNLV scored a perfect 100 out of 100 for the Energy Balance Contest—meaning that solar energy production exceeded the house's total consumption. DesertSol splits into two modules of roughly equal size: one for living and dining and another for sleeping and bathing, with a large shade structure over the back of the house. Neither space feels particularly generous. And like many entries, there was a tendency to partition functions and program areas rather than explore how they might come together in new ways.

That conservative approach may be tied to construction. The UNLV entry employs factory-built modules, each mounted on an axle and chassis, so manufacturing criteria and towing regulations set the building's proportions. Although the modular design allows for quick site construction and a lighter impact on the ground, the house does depend on the use of fossil fuels for delivery and would mean new housing stock on virgin land in Nevada, an area hit hard by the financial crisis. According to research firm RealtyTrac, the state had the highest foreclosure rate in the country in August, with one in every 359 housing units filing. It would seem that retrofits, rather than new construction, would ultimately be a more responsible and holistically sustainable option for Las Vegas. Or even in Irvine, for that matter.

All of these specific issues raise a larger question about just how effective the decathlon is at advancing the message of sustainability. Founded as the real estate bubble was starting a decade ago, the competition remains beholden to the notion that the single-family house is the best vehicle to reach homeowners and mentor the next generation of designers.

Moving the competition from the Mall to suburbia only underscores this continued

disjunction between ethos and actuality. The Orange County Great Park occupies the site of the former Marine Corps Air Station El Toro, and its master plan was designed by New York–based landscape architect Ken Smith. The park is only half-finished. Construction stalled because the developer FivePoint Communities "shelved plans for building the thousands of homes that were supposed to surround the park and generate tax money to fuel its growth," the *Los Angeles Times* reported last year. To add insult to injury, the state government seized the property taxes that were supposed to fund the project in order to offset California's massive deficit.

All of which is to say that the Solar Decathlon demonstration homes built by this year's bright and creative students were staged at a site where a similar model of homeownership had failed. (In late October, FivePoint floated plans to finance and build much of the park if the city allows it to almost double the number of houses it can construct on the site, to a total of 9,500.)

However that proposal plays out, the lessons of green building need to address more typically urban issues: multi-unit and multi-generational housing, transportation, and infrastructure. The house is rapidly becoming a luxury item, and cities like New York and San Francisco are experimenting with microunits. Los Angeles, meanwhile, just an hour drive from Irvine, was listed in the most recent census as the densest city in the U.S.

For real innovation to occur, the DOE should revamp the 2015 decathlon to address more than energy loads and curb appeal. In terms of sustainability, the conventional single-family house, even a solar one, may have already had its day in the sun.

Top: Team Austria's LISI house was the competition's overall winner. A decorative, laser-cut curtain wraps the exterior, adding an extra level of privacy and shade from the late afternoon sun. **Clockwise from middle left:** A student waters the vertical garden in UrbanEden, UNC Charlotte's house; visitors stroll down Decathlete Way; visitors voted on their favorite feature of UrbanEden; UNLV's DesertSol house; 63,000 visitors attended the 10-day event; an exterior of the AIR House, which was designed for empty nesters nearing retirement.

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Text by **Ed Leibowitz**
Photo by **Austin Hargrave**

ONE FINE SPRING AFTERNOON in 2009, on a routine prospecting run through Sunnyvale, Calif., a rather glamorous young real estate agent named Monique Lombardelli drove her Volkswagen sedan into a better, bygone world. Lombardelli had spent her first several months as a Realtor in the midst of the worst economic downturn since the Great Depression. Nevertheless, based as she was in Silicon Valley, there were still plenty of potential clients in the market for an ersatz Spanish mission or an overblown ranch home that made up in bonus bathrooms and surround-sound theater seating what it lacked in restraint.

In the neighborhood she had stumbled into, she discovered a street rippling like a wave, along which stretched late 1950s tract homes. Their geometry of rectangles and triangles had much more in common with the post-and-beam monuments of midcentury architecture than it did with the gimcrack plaster and stucco of Levittown, or certainly the nouveau-riche glitz erupting through the surrounding Silicon Valley. "You know when you play a sport," Lombardelli says, "and something happens where out of blue, out of nowhere, you hit a home run or you catch a ball, and you say to yourself, *Oh my God!* It was that kind of euphoria, an instant feeling."

Pulling her Volkswagen to the curb, she approached a gray-haired man, probably in his 60s, out with his little dog. He told her he had been living in the subdivision most of his life, and soon enough he revealed himself as a design fanatic. "You see this," he said, frowning down at the ridge of a foundation that some neighbor in their insolence had slathered with gray. "Mr. Eichler had these painted black, and he wanted us to keep these black, but some people don't do it."

Mr. Eichler was Joseph Eichler, who spent the first half of his professional life in the wholesale dairy and poultry business, during which his artistic ambitions seemed to go not much farther than bespoke suits and a fondness for Fred Astaire. In middle age, Eichler, based in the Bay Area, found a new calling—to bring midcentury modern living to the common man. Eichler Homes, which he founded in 1949, sold 11,000 of these post-and-beam residences, most of them in the vicinity of America's future tech capital. The earliest Eichlers were priced at $9,600 for just over 1,000 square feet, and though the models increased in price and square footage during the company's late 1950s heyday, a vet could still purchase one with $800 down. Among the architects Eichler hired were Los Angeles–based

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An Eichler in Lucas Valley, Calif., circa 1962.

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A. Quincy Jones—who designed media mogul Walter Annenberg's mansion in Rancho Mirage, Calif., and actor Gary Cooper's estate in L.A.'s Holmby Hills—and Robert Anshen, co-founder of San Francisco–based firm Anshen + Allen, which was acquired by Stantec in 2010.

Until Lombardelli stumbled into that Eichler tract, her career had been mostly shaped by parental expectations and her appearance. After college, she interned at MTV, and though she never managed to get on air, a Hollywood agent was impressed enough by her reel to take her on as a client. In Los Angeles, her roles tended towards eye candy—a Budweiser ad here, a music video there. "I was just doing commercials, delivering stupid little one-liners." She headed north to Silicon Valley, where she began in software sales before switching to real estate.

Lombardelli returned to the Sunnyvale tract the day after her epiphany. She knocked on doors, trying to find someone who would grant her a glimpse inside. One lady opened up and showed her into the living room. Absorbing the narrow earthen brick of the fireplace, the beams of Philippine mahogany soaring above, the glass wall that bathed the room in velvet sunlight and dissolved the boundary with nature outside, she experienced a sense of liberation. "It was just like coming out of a cage," she recalls. "It was a sort of a space that would allow you to be bigger than you were, expanding your thoughts,

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Nightime dining in a Terra Linda, Calif., Eichler, circa 1960.

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ON A RECENT SATURDAY MORNING, on the ground floor of the duplex that serves as both the headquarters of her real estate firm and her home, Lombardelli confers with Thomas Sylvia, a 26-year-old designer from New Hampshire. Together, they are evaluating a few of the tract home plans that Lombardelli unearthed in the University of California at Berkeley archives, or requested from Anshen + Allen. Sylvia is explaining some updates he'll make to these plans so that they conform to current California safety and environmental codes.

With his mop of side-parted hair and smart sport-coat recalling a young Burt Bacharach, Sylvia scrutinizes the newly computerized blueprints of a Claude Oakland–designed Eichler. "Personally," he says, "on the passive environmental scale, I'd like this one to have a [Home Energy Rating System Index Score] of 88." (The lower the rating, the better. According to the U.S. Department of Energy, a standard new home has a rating of 100.) Recently, Sylvia did a little work on an original Eichler whose rating spiked at 250. "So what they [originally] did is use a whole house fan for air circulation," he says. "I mean, there's crap being blown up from all kinds of corners."

Lombardelli seems confident that Sylvia will find a better solution. "Everybody else was saying, this was going to cost me $50,000 or $60,000 to do," she says. "Their fees were astronomical. And then Tom was basically just this angel that came out of nowhere—he's the reason that this is happening."

Lombardelli has defined herself as an Eichler specialist who represents only clients

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ICF construction is often *less expensive*. The easy installation is less labor intensive and requires fewer trades. Because ICFs can be erected during the winter, they offer significant savings on hoarding and heating costs.

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intent on preserving or restoring midcentury modern architecture, and not those seeking a teardown or base material for a McMansion graft. In 2012, she poured a chunk of her earnings into an Eichler documentary called *People in Glass Houses*, which she produced and briefly appears in. Though the film had modest DVD sales, it made her into perhaps the most recognizable Eichler Realtor in America, which had to be good for listings. Now she is taking her most counterintuitive step yet. While not in the position to finance spec Eichlers of her own, she's hoping developers and at least some Eichler fanatics will purchase her updated blueprints at $5,000 apiece—80 percent working drawings ready to take to a site builder.

In January, Lombardelli paid a pilgrimage to 83-year-old Ned Eichler, Joseph's son, at his Bay Area home. She asked for his blessing to market these long-forgotten blueprints under the Eichler name, and for his advice on how to compensate the heirs of the architects. "She thought she needed legal clearance to sell the plans or alter the plans," Ned recalls. "Totally absurd. Who is there alive who cares?"

If Ned Eichler had only been able to get through to his intransigent father, perhaps Lombardelli would not need to resuscitate the long-dead brand. Back in the day, Ned's innovations in Eichler construction, and his analyses of the company's strengths and vulnerabilities, were more fundamental to its success or very survival than his father recognized, or at least publicly conceded. When the redwood beams and siding material used in early Eichlers proved too dark and dent-prone, Ned, as head of procurement, located Philippine mahogany as a replacement. When Philippine lumber mills couldn't maintain consistent quality, he shipped the logs to mills in Japan—for the time, a deft act of global materials sourcing. It was Ned's decision, as head of sales, to break down the color barrier imposed in much of the tract-home industry, embracing black home buyers redlined out of other projects.

In the early '60s, Ned warned his father against moving into luxury high-rise residential development. Joseph dismissed the advice, and his 32-story Summit tower on San Francisco's Russian Hill lost $2 million and pushed the company towards insolvency. Eichler tracts relied on a tight rotation of a handful of labor crews skilled in post-and-beam construction. They remained under close supervision as long as the company limited its developments to the future Silicon Valley region. Ned pleaded with his father not to expand into Southern California, or if he did, to at least allow him to relocate there to oversee operations. Joseph's answer? No on both counts. The company's tracts in Orange County and Los Angeles were plagued by lax quality and cost control, and were undercut by competitors unencumbered by union labor. Profits suffered accordingly.

From their inception, Eichler homes featured radiant heat coils embedded in the concrete foundation, precluding central air conditioning. Ned conferred with Jones, who worked out a solution for a below-surface duct system that didn't affect the home's profile, but Joseph Eichler would tolerate no such desecration of the modernist ideal. "It's ironic about my father," says Ned, who served as an executive for other real-estate companies after the family business collapsed. "He was probably more of a purist than the architects were."

IN EICHLER'S TIME AND PLACE, conditions for making affordable tract housing were about

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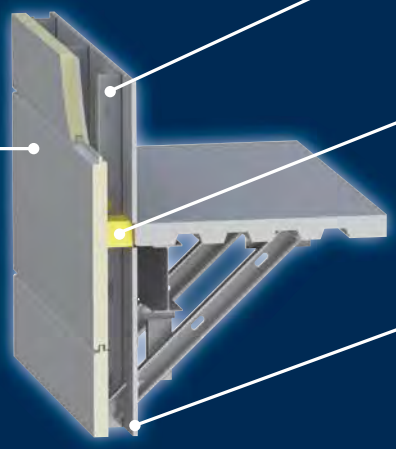

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"MODERNISM IS OFTEN LESS ABOUT AESTHETIC IMPRESSION AND MORE ABOUT LIFESTYLE, EFFICIENCY OF LIVING, SUSTAINABILITY." —LEO MARMEL

as favorable as they'd ever be—strong postwar suburban demand; abundant, relatively cheap natural materials; undeveloped land; and plenty of middle-class workers who would have laughed in your face had you told them 23-year-old self-made tech multimillionaires would someday chase people like them out of the local housing market. In an era where the modern aesthetic was the darling of Madison Avenue, there was space for a developer like Joseph Eichler intent on building Case Study jewel-boxes in miniature.

Today, in some high-end areas of the housing market, the modern aesthetic commands a premium that neither of the Eichlers would ever have predicted. Troy Kudlac, a developer who has restored post-and-beam homes around Palm Springs, Calif., purchased one of Lombardelli's A-frame blueprints, and plans to follow up with a flat-roof one. Not only does he appreciate the design, but his decision was also a result of simple arithmetic. "In our area," he explains, "a midcentury home will sell for more than the traditional Spanish house next door, even though it's much smaller."

Leo Marmol, FAIA, managing principal of Marmol Radziner in L.A., has been conferring with Lombardelli about bringing new Eichlers into the world, though he doesn't consider himself to be the project's consulting architect. "I would more use the term, 'advising,'" he says. "I'm casually looking over her shoulder, giving guidance." Marmol, who led the restoration of Richard Neutra's celebrated Kaufmann House in Palm Springs, Calif., doubts a modernist home can be constructed for the same price as comparably sized homes heavy on stucco and sheetrock. But he does believe that costs can be controlled by retaining the modest footprints of the original designs, by implementing new energy efficiencies, by substituting some costly materials for cheaper ones, and by accepting a level of finish that may fall short of Eichler's exigencies but remains true to the ideal.

"We should appreciate that Modernism is often less about the aesthetic impression and more about lifestyle, efficiency of living, sustainability," he says. "What she's doing takes a certain boldness and audacity that is within the Eichler tradition."

Marmol says he would be thrilled to help buyers of Lombardelli's blueprints with overall strategies, and would consider working closely with them to make her vision of the 21st-century Eichler a reality. "Our firm," he says, "stands poised to help Monique in any way possible."

EICHLER WAS NEVER EFFUSIVE about what made him tick, but he did talk to one researcher at length about the Bazzett House, a Frank Lloyd Wright design from the architect's Usonian

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An Eichler in Lucas Valley, Calif., in the early 1960s.

period, located in the Silicon Valley town of Hillsborough. Eichler moved his family into the Bazzett House in 1943 and rented it for the next two years. "Each day," he told the researcher, "offered new experiences that were a revelation to me." It was there that Eichler began to dream of building homes that radiated that kind of spare beauty and transformative power.

Lombardelli met the current owner of the Bazett house while filming her documentary, and she came back in June to tell him that she just had to inhabit this chrysalis that apparently had transformed a middle-aged poultry executive into the most prolific modern home builder of his age. As it happened, the owner was about to embark on a three-month business trip. "He went away to Africa," Lombardelli recalls, "and then I got to experience it every day when I woke up. ... Living there was sort of like living in a vortex of energy. There's something not from this world that you feel. It's like an alien presence."

More recently, Lombardelli embarked on a pilgrimage to another Hillsborough residence. The elderly owner welcomed her into the backyard. She didn't need him to tell her that one of Eichler's architects had designed this home for the builder, or that he had lived there with his family in the '50s, at the apex of his career; she already knew what she was in the midst of—the purest expression of an Eichler ever commissioned. "I love this house," Lombardelli said to the owner.

The old man sensed right away what she wanted but wasn't about to ask for. "Oh, when I die, you can live here," he told Lombardelli, smiling at his own joke. "Give me your card, and I'll let you know when I'm going to pass away."

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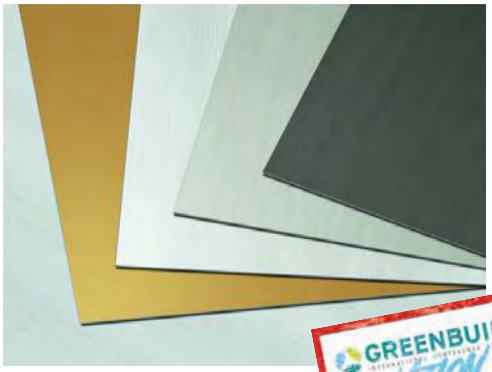

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BIM for Emerging Firms

No matter the greatness of a firm's building designs, if the firm is not profitable, it will not survive. Credit: B9 Architects

LEARNING OBJECTIVES

By the completion of this educational unit, you should be able to:

- Explain how the efficiencies from building information modeling (BIM) software greatly enhance production
- Describe how the fundamentals of BIM aid in improved coordination
- Define how firms can harness BIM to accelerate design
- Identify how BIM helps emerging firms work within larger teams through smarter integration

CONTINUING EDUCATION

CREDIT: AIA/CES 1 hr

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

To earn credit and obtain a certificate of completion, visit http://go.hw/net/AR1113Course1 and complete the corresponding quiz. If you are new to ArchitectCEUniversity, create a free learner account; returning users log in as usual.

By Jared Banks, AIA

Whatever its size, an architecture office is either emerging or it's not.

It is either rising to the challenge of change or ignoring the evolving landscape of the 21st century.

An emerging architecture firm is dedicated to design excellence. It is interested in innovation and in being an author of change for the built environment. Focused on maintaining competitiveness and relevance in the industry, an emerging firm is willing to right-size itself and take risks. These firms can be small, medium, large or extra-large.

What common thread connects a thriving one-person operation, a growing office of 20 and a prosperous mega firm? What allows each of these vastly different operations to pursue the work they want and continue year after year?

The firms that survive understand that profitability is key to a successful business. A firm can make the greatest buildings in the world, but if it is losing money, failure is inevitable.

One answer is building information modeling, also known as BIM. This software can provide streamline design processes while improving coordination and integration with team members. Using BIM can help keep a firm relevant and competitive.

What's more, BIM is quickly becoming a prerequisite. According to *The Business Value of BIM in North America: Multi-Year Trend Analysis and User Ratings* (2007–2012) by McGraw-Hill Construction, 71% of Architecture Engineering & Constrution AEC firms were using BIM in 2012. Of those firms, 81% factor BIM expertise into their decision-making process when choosing companies to team with (28% require BIM expertise, while the remaining encourage it).[i] The AEC industry has reached a tipping point: Lack of BIM knowledge is now a handicap to securing work.

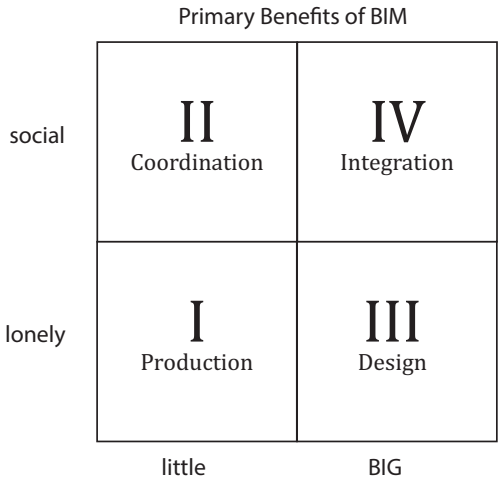
There is, however, a difference between getting work with BIM and using BIM to make work profitable. If a firm jumps on the BIM bandwagon, but fails to implement correctly, they can find themselves on a path towards bankruptcy.[ii] Fortunately, with an understanding of the value BIM provides, and a focus on how best to direct a firm's efforts, BIM can open many paths to profitability and the expansion of services.

UNDERSTANDING THE BASICS OF BIM

The successful implementation of Building Information Modeling in an emerging firm requires some basic knowledge about BIM.

For the best results, everyone in the company—from intern to principal—needs to start with the idea that BIM is not a monolithic product or process add-on that can be simply overlaid upon the existing firm. BIM usage is not an all or nothing proposition. Instead, the adoption of BIM should incorporate an understanding of its various aspects, and firms should prioritize those functions that are most beneficial to the health and success of their own evolving business.

BIM is often described by juxtaposing BIG BIM and little bim. This concept was first laid out in Finith Jernigan's book *BIG BIM little bim*. BIG BIM deals with business process changes and data integration that can affect decision making, while little bim is about the replacement of CAD with advanced intelligent modeling software and analysis tools.



BIM can also be viewed by comparing social BIM and lonely BIM, i.e. whether or not you are sharing your data with others outside of your silo. These two conceptions of BIM are critical to understanding how a firm can enhance their core business and profitability. Combining the pairs of BIG/little and social/lonely we get Four Flavors of BIM. Each highlights a primary benefit of Building Information Modeling: **improved production, coordination, design** and **integration**.[iii]

Many proponents and detractors of BIM would argue that social BIM is the only true BIM. This is a misleading claim and something that emerging firms adopting and expanding their BIM capabilities would be best to question. A firm can gain much by utilizing BIM software and strategies to enhance their internal work, regardless of whether they share that data with a broader team. In fact, an inward focus is a good way to see early gains from BIM, as these benefits are fully in the control of the firm's employees.

By focusing only on lonely BIM solutions, however, a firm runs the risk of viewing lonely BIM as the only BIM. Instead, lonely BIM solutions should be viewed as part of the larger context of what BIM has to offer.

Again, it's important to remember that firms aren't static entities. A firm's current partners (contractors, owners, product suppliers, etc.) might not have many BIM capabilities, but the data shows that BIM adoption continues to rise across all firm types and sizes.[iv] Future partners will be BIM enabled and current partners will learn—or want to be taught. Internal team members must buy into the bigger paradigm shift that BIM represents; external team members will need to make similar adjustments.

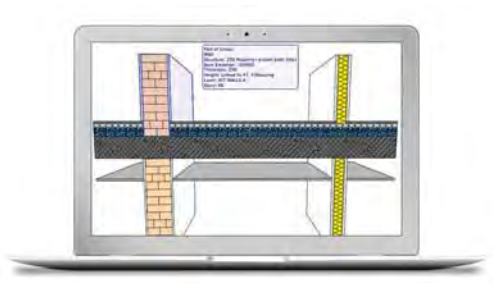
WHAT'S THE COMPETITION DOING?

According to the 2012 AIA Firm Survey Report[v], BIM software is most commonly used for design visualization (91% of responders), coordinated construction documents (74%) and sharing models with consultants (55%).

PRODUCTION

For the foreseeable future, architects will be required to document their designs via the traditional drawing types of plan, section, elevation, and detail along with notations, schedules and specifications. BIM often creates printed documentation similar to pre-BIM production methods; however, these documents have greater fidelity. When plans, sections, schedules and other representations of the design are generated from the same database—which is essentially what BIM is—inconsistencies are reduced.

Beyond that, each of these drawing and data types can be advanced through BIM. One could do colored plans and axonometric details with ink and velum, but it is now much easier and more realistic (and not cost prohibitive) to add these and other variations into a typical construction set.



Inconsistencies are reduced when plans, sections, schedules and other representations of a design are generated from the same database.

One of the most common entry points into BIM is using BIM software to improve production. This is not surprising, as the architects surveyed by McGraw-Hill listed three of the five top benefits of BIM as relating to documentation and production. In fact, 57% of those surveyed cited reduced document errors and omissions as a top benefit of BIM, while 45% cited reduced rework and 44% named reduced cycle time of specific workflows.

> Lonely little bim allows a firm to do what it used to do, but faster and better.

The object-based nature of BIM means virtual modeling is faster than drawing lines and circles to represent building elements. For instance, instead of drawing marks in empty space and noting it as a door, the designer places a door object that contains all the relevant data (3D massing, 2D projections, scheduling information, etc.). This one object then shows up in every necessary view (view is a BIM term for drawing to be placed on a sheet). Changes made to the object propagate throughout the documents, so there is no need to retype or draw information over and over again.

Automatic generation of views also means a well-built model reduces the time required to finish subsequent views. With each cut section or elevation, tweaks made to the model to fix that view—whether those alterations are for design purposes or drawings aesthetics—propagate throughout the model. As a result, the complexity of the model rather than the number of views required to describe that information on the page becomes the driver for time and fee calculations.

The origin and reusability of objects needed for BIM highlights their function. They might come with the software (either as part of a library or as a tool that creates the elements, such as a wall or slab tool), or be developed by third parties, or be created by the designers. Jon Buerg, AIA, LEED AP, of Wilkus Architects out of Eden Prairie, Minnesota, says:

Most of the work we do is prototypical in nature so we focus on building and then

The more complex a design, the more opportunity for errors and complications. Rather than keeping all designs simple, the better solution is to employ BIM to streamline the process. Credit: Wilkus Architects

"Clash detection" to help teams coordinate is one of the most helpful benefits of building information modeling.

maintaining robust templates with as much automation and "smart" components as possible. These templates get refined down to tedious details over time, all in the name of efficiency… BIM creates a lot of "smart" linkages since it is really just a big database.

Everything in BIM is a manifestation of some extremely complex connections within the software; a lot of computer code lies behind all the 3D models and 2D views. Production benefits when a firm finds where those connections can be exploited and used to make better and more complete drawing sets.

Beyond improving document consistency and speed of creation, BIM also provides the emerging firm with the ability to have multiple people working on the same file at the same time. This aspect of BIM allows firms to share the workload more effectively within the company, and to maximize the value of the production staff.

Today there are BIM applications with work-sharing capabilities that allow a design team to fluctuate in size, work locally or remotely and dynamically own and modify various elements within the BIM. David Jefferis, LEED AP, the owner of Grayform Architecture, a fairly young firm, has found the ability for multiple users to work in the same BIM file to be a boon to his business. Thanks to work-sharing functionality, he is able to easily plug in to another local firm's projects when his own work is slow.

Beyond allowing this architect to easily take on contract work with another firm (essentially adding manpower to the firm's lonely little bim solutions), it has also allowed him to pursue larger projects himself. When the opportunity arose to design a townhouse in Houston with a very constrained timeline, the firm was able to team up with a remotely located partner to provide more production firepower. Team members separated by over 1,000 miles were able to work unimpeded on various parts of the BIM simultaneously.

The work sharing aspect means BIM is more than just models and data. It represents a paradigm shift in the way the AEC industry works. Using BIM, designs being produced are more robust. At the same time, how one engages with the work, and shares it with others, is vastly improved. The same teamwork functionality that improves internal production can also be harnessed to bring in more team members from other disciplines, and to connect the various silos of architect, engineer and contractor.

COORDINATION

While lonely little bim makes documents more consistent (an improvement for a single silo of A, E or C), social little bim helps the AEC team coordinate activities.

Clash detection, the process of comparing multiple disciplines' models for conflicts between elements, is the most visible form of social little bim coordination. Clash detection can be automated through various software packages, including both expensive enterprise and free solutions.

For the emerging firm exploring clash detection, the free solutions offer a range of options. For companies focused on mastering their primary BIM authoring tool, manual inclusion of consultants' data (either through model imports or rebuilding the elements) and visual inspection is often a viable route, especially if it is a smaller scale project. Not all potential clashes are examined; only possible conflicts involving primary elements (major structure and rigid mechanical ducts for instance) or elements visible to future users of the spaces are inspected. Although this solution is not feasible for large-scale projects, for small commercial work and residential projects it can be tackled, especially if many of the elements will be modeled for other reasons—expression in documentation, context for 3D visualization and walk-throughs, verification of shop drawings.

While clash detection primarily focuses on spatial coordination, it is useful to remember that BIM is about more than just 3D models. Often BIM users talk of 4D, 5D, 6D and nD models. These incorporate other 'dimensions:' time, cost, energy usage, water usage, facilities management data, etc.

But the value of BIM is not solely based on adding the biggest number before the letter

…it is useful to remember that BIM is not just about 3D models.

D. Incorporating smarter 1D (text), 2D and 3D information into a BIM can provide just as many efficiency and coordination improvements as chasing the larger numbered Ds.

Combining shop drawings into a BIM file is an easy way to enhance coordination. Here, one is not exporting data directly from the BIM to create shop drawings, fabrication drawings and other forms of direct production communication. Instead, one focuses on taking an old method—shop drawings prepared by a fabricator or assembler, sent via PDF to the architect to review and mark-up and then return—and moving it into the BIM paradigm.

Stephanie Millet, AIA, a partner at Natalye Appel + Associates Architects, LLC in Houston describes a method they regularly use:

By placing PDFs directly into the BIM file, in the same tree structure as our architectural drawings (which are all live views from the model placed on sheets), we can easily keep track of what we have marked up. By doing all our notes digitally there is no worry about messy handwriting or poor copies. All the documentation tools we are accustomed to using (dimensions, text, leaders, cloud bubbles, detail markers…) are available to us. And if we need to reference an existing drawing in a markup, we can create a live link to it. This link works both within our BIM for future reference and if we print sheets as PDFs and send them back to the subs. Before this, marked up shop drawings might get easily missed in a box. Ideally we update the model as well, so as to create an as-built model during construction. But there isn't always time or fees. Keeping the marked up shop drawings in the main model file is a great intermediate solution.

This article continues at http://go.hw.net/AR1113Course1. Go online to read the rest of the article and complete the corresponding quiz for credit.

QUIZ

1. True or False: BIM is only valuable to firms working in multi-disciplinary teams on large budget projects.

2. The most common usages for BIM are:
   a. Design Visualization, Energy Modeling and Quantity Takeoffs
   b. Client Engagement, Estimating and Clash Detection
   c. Design Visualization, Construction Documents Model exchange with Consultants
   d. Construction Sequencing, Energy Modeling and Estimating

3. IFC stands for:
   a. Ideal For Collaboration
   b. Industry Foundation Classes
   c. Integrative Format Category
   d. Independent File Channel

4. Objects in a BIM are created by:
   a. Architects and BIM Consultants
   b. Manufacturers
   c. Software Developers
   d. All of the Above

5. True or False: A BIM file or object must contain 3D data.

6. With regards to BIM…
   a. the more data the better.
   b. data should be primarily from manufacture's content.
   c. data should not dictate design.
   d. all data needs to be shared.

7. Emerging firms are architectural practices…
   a. with less than ten employees.
   b. run by architects under the age of 40.
   c. less than five years old.
   d. evolving in a variety of ways to stay relevant and competitive.
   e. all of the above.

8. True or False: BIG BIM is focused on business process changes while little bim is primarily concerned with advanced software solutions to replace more traditional CAD.

9. Of firms with high engagement levels of BIM, only 6% saw a negative or break-even ROI. What percentage saw a very positive ROI?
   a. 12%
   b. 24%
   c. 46%
   d. 67%

10. The primary difference between social and lonely BIM is:
   a. Lonely BIM is inwardly focused; social BIM is externally focused.
   b. Lonely BIM is done via email, not social media.
   c. Social BIM doesn't increase consistency of documentation.
   d. Lonely BIM is only 2D and 3D information. Social BIM includes additional data dimensions: 4D (time), 5D (cost), etc.

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Digital Technology and Design Tools

LEARNING OBJECTIVES

- Investigate the recent history, current state and possible future of digital tools, and how they do and can support AEC practice
- Consider variety of tools available, across various phases of a project's lifespan/lifecycle
- Gain insights into how to utilize digital tools to support a more integrated process for projects
- Ask questions that will help identify the right tools for your firm

CONTINUING EDUCATION

Credit: : AIA 1 hr LU

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

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By Max Zahniser

Architect, engineering and construction (AEC) professionals have a new technology platform to support the old-fashioned notion of planning ahead. Building Information Modeling (BIM) is bringing a sea change to the industry's workflow by facilitating a previously impossible degree of planning, coordination and communication. Integrating the professions through digital processes like BIM supports better buildings and happier owners and occupants.

TECHNOLOGY AND CULTURE

The pace of technological change has been accelerating for centuries, and is now at a point where we sometimes reflect and say "*Remember before we had X a few years ago? I don't know what we did without it!*" Many readers will insert computer-aided drafting (CAD), BIM or other building-related technology in that sentence.

Today we are experiencing massive changes in the building industry, driven at least in part by a new generation of BIM technologies. BIM has emerged in the context of a relentless increase in building performance focus, arguably driven by the green building movement. And that movement has been propelled in part by the environmental crises and the risks associated with certain energy sources.

FROM CAD TO BIM

Design and construction professionals experienced an evolutionary, if not revolutionary, industry-wide shift in building documentation practices starting at a meaningful scale in the mid/late 1980s and extending through the 1990s by switching from hand drawings to computer-based documents and digital 3D design. The use of CAD tools is now a nearly universal practice among A/E firms and many builders. Over the last ten years, CAD tools have likely evolved to their full potential.

As CAD approached this optimization, investment of creative energy in the AEC segment of the software industry shifted to developing the next evolutionary leap. That leap has landed at a set of tools that can be categorized under BIM. The fundamental nature of BIM applications is completely different from CAD, aside from functioning as computer-based design and documentation tools. Most CAD applications deal strictly in geometry, color and pattern. So CAD is really just a faster way of drawing.

BIM VISUALIZATION

BIM, however, is an entirely different way of thinking about representing a building. In fact, using a BIM tool is really a process of producing a virtual building. Whereas CAD forces one to squeeze spatial ideas into 2D representational views of a building, BIM enables designers to create the building as a building.

BIM tools can be considered simply 3D graphic interfaces for BIM files, which are really just databases. These databases relate specific, identified objects (e.g. a wall) to attributes, like

"A change anywhere is a change everywhere."

material type, connections to other objects, etc. A BIM-based rendering are 3D virtual constructs of buildings, in which data related to each component of that building is imbedded.

When drawing a building in a CAD application, one simply draws the same building from multiple views. Each time a change is made, one must determine which views are impacted, and modify each individually. Coordination across disciplines, of course, is also an important issue.

CHANGE ANYWHERE, CHANGE EVERYWHERE

Conversely, in BIM applications, because each view is rendered from a single database, a change made from any view modifies the virtual building itself. Thus coordination across views is not necessary. A quote used commonly in training for these tools is "a change anywhere is a change everywhere." Additionally, when using interoperable BIM tools across design disciplines (architecture, structural, mechanical, etc.) most BIM tools are capable of some level of clash detection. This means that the BIM application can determine when structure, ductwork, pipes, etc. conflict and alerts the user. This alone can radically reduce time spent on coordination for larger projects.

Like CAD, BIM technologies crossed over from automotive and aircraft design. Also, like CAD, BIM faces similar market push-back challenges related to change-management issues among its potential consumers. Despite these organizational change hurdles, BIM's industry adoption appears to be much more rapid than CAD's was, and even LEED's adoption, though the destinies of LEED and BIM are becoming more intertwined.

SEMINAL SOURCES

The automobile and aviation industries have repeatedly been the seminal sources of technological and even design process innovations that later arrive in the building industry. Not only do the key design and documentation tools tend to migrate to the building industry from those other two, but processes whose genesis reflects an understanding of system interdependencies in cars and planes have also made their way across to the building design and construction trades.

The flow of innovation in this direction is likely because the building industry was never as integrated as these other industries or its products. One could argue that cars and planes are necessarily more integrated than buildings.

With cars, color and a few other features are customizable. But a Honda Civic is unmistakably a Honda Civic. Private planes are similarly customized. Some building types approach similar levels of product consistency, but some of those are blurring the lines between buildings and vehicles; for example trailer homes. However, city row homes are an example of the same building being churned out repeatedly. Customized prefab construction also bears mentioning. Sometimes entire buildings are produced in factories, then sent to a site for some relatively simple assembly. These however actually allow for projects to gain the benefits of factory production, without the product itself necessarily being identical.

BUILDING UNIQUENESS

Although some headway can be made to standardize buildings further, and in ways that enhance them, it's fair to say that buildings will remain primarily very customized. For good reason—every unique set of adjacencies, every topography, across every possible massing and orientation of the forms, means a different set of solutions are optimal. This level of variance demands customization for the sake of operational efficiency, not just production efficiency. This key difference between the building industry and the vehicle industries further emphasizes the importance of collaboration. Despite the highly custom nature of the product, building design processes have for the most part failed to produce situational optimization in its products. This is because the priorities been focused elsewhere (aesthetics and program function only), and the method of design is still less collaborative than that of vehicle design processes (i.e., the customization that necessitates collaboration has somehow actually led to less collaboration).

Consistent with these observations is the fact that some of the earliest conversions of aviation and automobile design technology to make its way into BIM tools were not drawn from those industries in the name of higher performance, or deeper understanding of building functions and impacts. An architect was designing undulating forms, and his firm had a hard time turning the forms into actual buildings. The greatest structural and architectural minds were needed to make this man's visions buildable and functional at a real building scale. Technology allowed this firm to digitize this architect's models, and begin to layer into them engineered system designs for their construction.

If the solution is not beautiful, I know it is wrong.

WHY NOT BOTH?

Another choice we're so often faced with can be characterized in oversimplified terms with "beauty or performance, you can't have both." To the contrary: Beauty and high performance can, and often do, coexist. One need only look to millions of examples in nature. Many of the most beautiful buildings ever built are exemplars of energy, water, air, material and even living systems performance. Buckminster Fuller, the patron saint of functional performance, said "When I have finished, if the solution is not beautiful, I know it is wrong."

BIM has emerged as the answer to opening up not only greater opportunities at form generation and manifestation, but also in decision-time (fast enough to make decisions with it) analysis of performance throughout the lifespan of a building.

TECHNOLOGY AND COLLABORATION

Synergy refers to attributes and behaviors of a complex system that do not logically follow from the sum of the system's parts.

Synergy is a great word for what can be a very desirable dynamic we sometimes observe in complex systems. In system theory, this same concept is referred to as *strong emergence*.

The idea of synergy as presented here, applies to ideas emerging from a group of professionals that no individual could have brought forth on their own. This concept often triggers skepticism and makes some scientists and philosophers uneasy. It sounds a bit like magic. But if the goal is to consistently yield this "magical" strong emergence in the context of building projects, then integrative design is analogous to best-practice spells or potions. The potency of that magic is strengthened when information technology is part of the recipe.

It is perhaps obvious that a software application, like any tool, in and of itself does not fundamentally shift a process or enhance its product. Like any tool, you have to learn the skill of using that software tool well.

THE HIERARCHY OF COOPERATION

The following is a hierarchy that translates each word for the building industry. These are sequenced from lowest to highest order cooperation.

- **Coordination.** To be made aware of and provide some input into one another's decisions
- **Collaboration.** To participate in developing ideas and making some decisions together
- **Integration.** To develop strategies and make each other's decisions together

Sometimes synergy happens when we don't expect it. Sometimes something brings us together and usually fueled by excitement about unveiling potential we end up diving into the details together; like a string of pearls or a series of dominos one idea from one person triggers another idea from another, and so on. Removing even one pearl or domino would mean a substantially different and probably less preferable outcome. Collaborating produces ideas and results that embody shared ownership that we could not have expected in a divide and conquer environment.

CAMPFIRES

These things that bring us together, and sometimes unexpectedly draw us into collaboration and our innate drive to seek synergy, we'll call "campfires." In building design there are several campfires; the center points around which team members have gathered, and without which some collaborative conversations would not happen at all. The buildings themselves could be considered campfires because they bring the teams' members together, or at least force some coordination. Owners' project requirements, various building codes, and more recently LEED (and many elements of it) and other comprehensive rating systems have all served to drive higher levels of at least coordination, if not also collaboration, on projects that would not otherwise tend to that form of cooperation. And surprisingly late to the dance, technology has begun to function as a strong campfire as well. CAD may have even driven team members apart because it simply radically increased the pace of documentation production. But with the increased capabilities of BIM, it at least *enables* far greater collaboration and potentially even integration.

SYSTEMS INTEGRATION

An important differentiator between LEED and technology versus all of these other campfires, is that they tend to drive the collaborative conversations toward higher levels of systems integration. However, the simple employment of these alone does not do nearly enough to lead to cost-effective high-performance. Only when embedded in a truly integrative process do new levels of performance become attainable. That said, BIM carries the potential to better enable those integrations. In so doing, they open up higher performance to more teams.

Predictive modeling is generally employed when there is some significant benefit or at least desire to predict outcomes in complex systems. What is happening now, with BIM

as the backbone, is increased opportunity for realistic simulations. There is more realistic data about the attributes of the modeled systems, and the underlying rules. The physics are better reflected by the model. Simply put, both the environment the modeling is happening in, and things we're modeling in it, are more accurate.

DOCUMENTATION AND ANALYTICAL STRENGTHS OF BIM

If implementation of a technology process—even BIM—is not well planned, its use could actually hurt the quality of output. Much like the LEED rating system, there is still a hidden benefit, even when forced upon a project team via mandates or company policy decisions. Even in the absence of an integrative process, BIM and LEED can reveal integrating forces. Using LEED likely delivers a better building than the same project team would have achieved without using LEED. But like LEED, BIM is forcing project team members to have conversations that may not have happened otherwise.

That said, the cost effectiveness and quality of the product (the building) will climb **enormously** by understanding both LEED and BIM as tools that require an integrative process. When woven into an integrative process, both of these tools have the potential of delivering an even better building project along with cost savings.

THE FUTURE IS ALREADY HERE

Several years ago, a team from Autodesk and the U.S. Green Building Council (including this author) collaborated to produce a video. The aim of the video: Envision an idealized design tool of the future. Built upon a BIM platform and intertwined with simulation engines and a digital building product marketplace, the tool would be capable of giving users near real-time feedback on the building performance impacts of design changes. Despite having been created in 2007, it is still a pretty long reach from current software. This was a vision of the future; a tool that would not hit the shelves the next day. As science fiction writer William Gibson aptly put it, "The future is already here. It's just not very evenly distributed."

QUIZ

1. When did CAD emerge as a strong trend in the building industry?
   a. 1950s
   b. 1960s
   c. 1980s
   d. 2000s

2. What does BIM stand for?
   a. Building Interpretation Massing
   b. Building Information Modeling
   c. Best In Market
   d. Bold Intervention Methodology

3. What industries did both CAD and BIM come from?
   a. Toy and Ride Manufacturing
   b. Film and Television
   c. Aviation and Automobile
   d. Defense and Surveillance

4. What is digital fabrication?
   a. Lying to others over email or social media
   b. Creation of software code, usually by way of use of a keyboard
   c. Producing by hand objects or images sourced from computer software or the internet.
   d. Generation of 3D, fully formed objects from software on one's computer and via robotics-based "printers" or other fabrication machinery

5. What is biomimicry?
   a. Life rejecting certain species
   b. Species that pretend to be a different species
   c. Innovation/design inspired by nature
   d. Clear-cutting a site before construction

6. What word or phrase means instances in which attributes and behaviors of a complex system do not logically follow from the sum of the system's parts.
   a. Algorithm
   b. Synergy
   c. Strong Emergence
   d. Both B & C

7. What does lidar stand for?
   a. Light Radar
   b. Lidia Darrow
   c. Line Drawing
   d. Dark Laser

8. What word is used to represent a technology, process, tool, or other element that brings a team together and drives at least some coordination, if not collaboration and even integration?
   a. Tent
   b. Campfire
   c. Missile Command
   d. Parade

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Underfloor Service Distribution:

A KEY STRATEGY FOR GREEN BUILDINGS IN A RAPIDLY CHANGING WORLD

Sponsored by: Tate®

An office space with an underfloor service distribution system looks like a standard space but has many benefits, including energy efficiency, comfort and added flexibility to reconfigure the space as needed.

By Kathy Price-Robinson

It's often said that change is the one constant, and our fast-changing world bears that out.

As we are unable to slow this breathtaking rate of change, so we must adapt to it, creating buildings that adapt easily to change.

The ability of a building to change for an occupant's shifting needs must meet the same three main criteria as green buildings themselves: high performance, sustainability and cost effectiveness.

This article examines the growing popularity of underfloor service distribution (UFSD) as a key strategy for green buildings. This is achieved by creating buildings that can be retrofitted when companies or institutions come and go, when they expand and contract, when they rethink, refocus and renovate.

A raised floor that provides easy access to wiring, cabling and air distribution provides that solution.

The U.S. General Services Administration (GSA)—developer of the LEED Silver-rated 1.5 million sq. ft. U.S. Census Bureau building in suburban Washington, DC—wanted a raised-access flooring system to make reconfiguring space easier as it gears up and down every 10 years for the national census.

"We frequently use, and I mean almost always use, raised-access floors in buildings where there's a lot of churn or where there is significant electronic equipment involved," said

Raised floors with service distribution underneath steel panels allow for simpler changes to workstation configuration when compared to traditional overhead, wall and column-delivered systems.

LEARNING OBJECTIVES

By the conclusion of this educational unit, you should be able to:

- Explain the concept of underfloor service distribution (UFSD) and where and why the system is used.
- Discuss the connection between green buildings and UFSD, including the high performance, sustainable and cost benefits of the system.
- List the various components of an underfloor service distribution systems and best design practices for worker health, comfort and energy efficiency.
- Discuss three case studies of buildings using underfloor service distribution to enhance the health and comfort of workers, as well as the bottom line of the owners.

CONTINUING EDUCATION

CREDIT: AIA 1 hr HSW/LU

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

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High-performing buildings must perform well on all levels: for the environment, for the occupants, for the owners.

A data center from the 1960s to 1970s

William Holley, Chief Engineer in the Office of the Chief Architect at the GSA.

With wire and cable placed on the sub-floor platform beneath raised-access panels, distributing power and data to any number of locations throughout the room becomes simple and convenient. The addition of an underfloor air distribution system allowed for the placement of individual air diffusers anywhere a new workstation might be installed.

This course reviews the three main requirements of green buildings. Then we'll look at how raised-access floors work and how they tie into the goals of green-building designers. And then we'll discuss the best design practices for underfloor distribution systems.

The DNA of green buildings.

The three attributes of a green building are:

Sustainability. This means a focus on reducing energy and material consumption. Improving the overall sustainability of a building conserves water, materials and energy.

High Performance. Strategies that improve indoor air quality, comfort, flexibility, quality of light, building amenities and energy efficiency help lift the performance of a building and its occupants. That helps with employee recruitment, retention and attendance.

Financial Performance. This includes both first-cost competitiveness and a focus on increasing lifecycle cost savings and ROI.

WHERE AND WHY UNDERFLOOR SERVICE DISTRIBUTION SYSTEMS ARE USED

A raised-access floor is a system comprising an understructure and welded steel floor panels clad with lightweight cement. The understructure provides positive positioning and lateral retention, assuring that the floor is soundly supported on all contact points. The 24-inch square floor panels are typically raised 2 1/2" up to 18". A height adjustment leveling device ensures the floor is level, even if the underlying concrete slab is not.

Under the panels, an underfloor pathway or plenum provides housing for any type of service distribution system: modular wiring, passive or active zone cabling, heating, ventilation and air conditioning (HVAC) service.

To better understand UFSD, it is worth looking at the history of raised-access flooring and how it was initially used, how it has been used over the last 50 years and most importantly how it is being used today.

1960s to 1970s. Initially, underfloor service distribution was used primarily in data center environments to manage power and cabling needs as well as provide a plenum space to supply the conditioned air to the "occupants," specifically computers.

1980s to 1990s. The evolution of the computer main frame to smaller personal computers changed power and cable needs: The infrastructure was now broadly distributed to the individual workplace. A study performed by Ellerbe Beckett for the GSA studied all methods of distributing power and cable to the workstation. The result of the study found that using access flooring with modular power and voice data cabling in conjunction with non-powered

> The main benefits for the underfloor air distribution system for the BP Working Our Way (WOW) building in Houston are to "reduce energy costs, lower the cost of the clients' churn rate and provide better air quality to the space."
>
> Marvin Leach, LEED AP, I.A. Naman + Associates.

The underfloor air distribution system used in this BP Amoco building in Houston—dubbed BP WOW (Working Our Way) not only helped earn the building a LEED certification, but also makes future renovations easier and more cost-effective.

furniture systems was the best value for the GSA. This helped start the evolution of access flooring in commercial office applications.

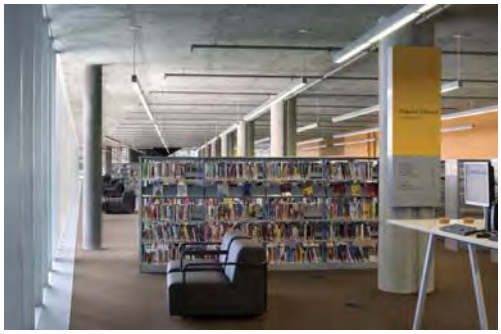
2000 and Beyond. The USGBC's LEED rating system helped promote the benefits of underfloor air distribution (UFAD) for improved indoor air quality, energy performance and comfort. It has become one of the more popular strategies to achieve LEED rating points and has helped push the concept across multiple building types.

These benefits have quickly advanced UFAD as a key strategy for creating a green building. Today, approximately 25 percent of all office buildings in the United States are built with raised floors. In many Asian and European countries, where raised floors have experienced much wider adoption, this percentage is higher. However, 25 percent is significantly higher than the 12 to 15 percent adoption rate that raised floors experienced in the United States during most of the last decade.

In commercial structures across the country, designs vary inside and out according to owner preference and occupant requirements. But with increasing frequency, even disparate structures reflect a common and growing interest in green construction and its impact on environmental quality. The desire to improve indoor air quality, increase energy efficiency and reduce carbon consumption is bringing building owners in every business sector—healthcare, education, manufacturing, entertainment and retail—to the sustainability table in search of cost-effective solutions to the "go green" challenge.

Architects and engineers recognize that universities and K-12 schools are exceptional building types, suitable not only for green building design, but also including UFSD as a key strategy within the building design. The learning environment is especially receptive to better IAQ, comfort and increased natural day lighting, improving the quality of the learning environment.

Education. Example: Pleasant Ridge School, Cincinnati, 50,000 sq. ft.



Libraries. Example: Des Moines Public Library, Des Moines, IA, 145,000 sq. ft.

An extension of the learning environment application is libraries. UFSD has become the basis of design for many libraries in the United States. UFSD allows the architect to create a more open plan with higher ceilings and better daylighting strategies without the need for ceilings and noisy overhead ducted HVAC systems. The floor plenum delivers power and data to where it's needed, as well as a more comfortable HVAC system that is both flexible and quiet.

Underfloor air distribution is a popular strategy for casinos, especially where smoking is permitted. Studies show that UFAD provides a more effective HVAC system for removing pollutants from the air space when compared to traditional overhead HVAC systems.

UFSD can be an intelligent design decision for renovating and upgrading older buildings. Converting older warehouse and Class B office space into Class A office design can be achieved from both a design standpoint and first-cost perspective while providing the benefits associated with UFSD. Class A office space is defined by the Building Owners and Managers Association as having "high quality standard finishes, state of the art systems, exceptional accessibility and a definite market presence." Class B office buildings are defined as those that have "adequate systems" and finishes that "are fair to good for the area" but do not compete with Class A buildings on price.

Coming full circle, UFSD remains the most effective way to deliver conditioned air to today's date center servers. UFSD is also key to managing the dense cabling requirements found in telecom centers.

THE CONNECTION BETWEEN GREEN BUILDINGS AND UNDERFLOOR SERVICE DISTRIBUTION

Thanks to LEED and other green building rating systems, the number of green building solutions continues to climb. However, determining which are the most beneficial to use in a major renovation or new construction project can be challenging. While many products offer green benefits, some offer more than others.

UNDERFLOOR AIR DISTRIBUTION

UFSD is being used in some high-profile projects from all building types:

Owner Occupied Commercial Office. Example: Great River Energy, Maple Grove, MN, 166,000 sq. ft. of space

Developer Speculative. Example: Koll Intellicenter, Atlanta, 150,000 sq. ft. (one of 10 to be built around the U.S.)

Education. Example: Kroon Hall, Yale School of Forestry & Environmental Studies, New Haven, CN., 60,000 sq. ft.

The graph above shows the benefits of a number of beneficial strategies for green building. All offer some benefits, but underfloor service distribution offers the most.

As the graph illustrates, raised-access floors offer building owners an integrated, cost-effective approach to the distribution of power, voice, data and HVAC services. They also provide interior space flexibility, improved indoor air quality and enhanced life-cycle material savings, as well as other benefits.

Daylight/Views

In many cases, raised access floors provide more access to windows and daylight, thanks to the absence of traditional overhead HVAC ducts and nonstructural columns that hide wiring. The more open floor plan gives building occupants additional line-of-sight access to windows and enhances the aesthetic value of the facility, adding significant worth to a business in terms of image and attractiveness for visitors and staff.

This article continues at http://go.hw.net/AR1113Course3. Go online to read the rest of the article and complete the corresponding quiz for credit.

SPONSOR INFORMATION

Tate is a leading manufacturer of raised-access floors and in-floor cooling systems, with over 600 million square feet of underfloor service distribution systems installed. Tate products provide high performance and sustainable service distribution solutions in libraries, laboratories, casinos and in office, education, data center and clean room facilities. Tate is headquartered south of Baltimore, in Jessup, MD, and is a member of the Kingspan Group of companies.

QUIZ

1. An underfloor service distribution system was used in the 1.5 million sq. ft. Census Bureau in suburban Washington, D.C. What LEED rating did that building earn?

a. LEED
b. Silver
c. Gold
d. Platinum
e. No LEED rating

2. Which service distribution material typically included in a traditional overhead cavity can be significantly reduced or eliminated in an underfloor service distribution system?

a. Power wire
b. Voice cabling
c. Data cabling
d. HVAC ductwork
e. None of the above
f. All of the above

3. An underfloor air distribution system improves indoor air quality and ventilation effectiveness by:

a. Supplying fresh air directly to the occupied zone
b. Creating a one directional airflow to remove contaminants
c. Supplying warmer air temperature allowing more economizer
d. None of the above
e. All of the above

4. An ASHRAE study found that dust particulates were 3.5 million to 4.5 million per cubic foot in overhead distribution systems. How many were in underfloor air distribution systems?

a. 3 million per cubic foot
b. 2 million per cubic foot
c. 1 million per cubic foot
d. ½ million per cubic foot

5. Underfloor air distribution systems can earn LEED points in which categories:

a. Energy & Atmosphere
b. Materials & Resources
c. Indoor Environmental Quality
d. Innovation
e. All of the above
f. None of the above

6. A white paper published by Building Design & Construction magazine, based on surveys with 953 AEC industry professionals and building owners/developers, found what percentage of those surveyed were either already implementing an underfloor air distribution system or were planning to implement it in the next 2 years:

a. 13%
b. 23%
c. 33%
d. 43%

7. True or False: When used in casino construction, an underfloor service distribution system removes pollutants like cigarette smoke from the air space better than traditional overhead systems.

a. True
b. False

8. The slab-to-slab height, per floor, on a multi-story building can be reduced by what amount by implementing a UFSD system rather than a traditional overhead system?

a. 1”
b. 4”
c. 6”
d. 12”

9. After an underfloor service distribution system was included in the 102,000-sq. ft. commercial building that houses the Podiatry Insurance Company of America, what are the benefits of the system cited by the facilities manager?

a. 38% savings on HVAC costs
b. Ease of moving walls to reconfigure the space
c. Worker satisfaction with personally adjustable air controls
d. Fresher air and less employee sickness
e. None of the above
f. All of the above

10. Lower fit-out and operating costs with a USFD system over a traditional system can be attributed to:

a. Reduced cable run lengths
b. Reduced voice and data installation costs
c. Reduced air distribution infrastructure
d. Quicker time to occupancy
e. All of the above
f. None of the above

Designing with Metal

MATERIAL CAPABILITIES AND CONSIDERATIONS FOR SUSTAINABILITY, EFFICIENCY AND AESTHETICS

Oakland Community College in Southfield Mich., is clad in approximately 28,000 square feet of single skin architectural metal panels. Photo credit: Copyright Robert J. Eovaldi

LEARNING OBJECTIVES

- Understand the overall qualities of metal as it relates to design and sustainability objectives.
- Examine the qualities inherent in metal roof installations and ways these systems can complement things like solar PV and cool roofing.
- Discuss how metal can be used in roof retrofit applications.
- Consider the concept of above sheathing ventilation and how it can be used in metal roof retrofits.
- Learn about the different types of metal wall systems and how they can contribute to the overall aesthetic and performance goals of a building.

CONTINUING EDUCATION

CREDIT: AIA 1 hr LU

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

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By Henry Burke

When designing a building, an architect must serve many masters. The owner has a set of needs and wants. The community surrounding the building has its own pre-existing identity that this new or rebuilt structure must fit into and enhance. The end users have health, safety and comfort requirements. National and local codes must be met, and in some cases, additional certifications like LEED from the U.S. Green Building Council must be achieved.

In addition to all these outside forces shaping the work of the architect, he or she must also serve his or her own personal expectations for performance and aesthetics. In both form and function, a building is an expression of the choices made by its designer. In the end, a building is a series of choices. It is components and systems working together, either in tandem or in counterbalance, to achieve a set of goals.

Material selection is just one of the many decisions an architect makes in project design, but it is one that can carry a great deal of weight. Many of the choices made throughout the design process will be impacted by choice of physical materials that make up the skeleton and skin of the building. Every material behaves differently and comes with its own set of physical qualities, attributes and considerations. Whether considering concrete, metal, wood, brick or others, the key is in weighing the end goals of the project with the qualities a given material or component choice can deliver toward those goals.

When used in the appropriate manner, metal can be a powerful tool for designers. Whether in primary or complementary roles, it is a material whose durability and flexibility can play a useful role in numerous ways on all kinds of building types. No single material or component is a solution unto itself, but as a team player, metal can be a useful arrow in an architect's quiver.

This article will discuss a number of specific applications where metal components are well suited to particular building systems or project goals. It will examine the behavior and qualities of the material and share design considerations and tips for effective utilization of metal.

METAL BASICS

This article examines metal cladding (roofs and walls) rather than structural metal. This includes things like standing seam metal roofs, single-skin metal wall panels, insulated metal wall panels (IMPs), metal composite material (MCM) wall panels and rainscreen systems.

Most metal components are made of steel coated with zinc (galvanized steel) or steel coated with zinc and aluminum (also known

as Galvalume). Aluminum, copper and tin are also commonly used.[i] Each different component has its own specific properties and traits, but there are a number of qualities inherent in metal as a building material. Some of these attributes include:

- **Durability.** Metal components have a long usable life and can endure tough weather and other environmental conditions.
- **Recyclability.** Unique to metal among major building materials is its ability to be recycled at the end of its useful life. Metal is 100 percent recyclable and its value as a building material keeps it out of landfills.
- **Recycled material.** Metal components contain a high level of recycled content. This means less use of virgin materials and helps designers working within sustainability programs like LEED.
- **Reflectivity.** Painted and unpainted metal provide high degrees of solar reflectivity and emittance.
- **Flexibility.** Relatively lightweight and malleable, metal can be used in many different applications to accomplish an array of performance and aesthetic goals.

With these basic attributes in mind, let us explore some ways architects can use metal's strengths to achieve optimum design results.

ROOFS

There are many reasons to use metal roofs. Metal roofs are particularly common in areas where extreme weather is an issue and strength and durability are vital in a roofing system. Metal roofs are also good complements to a number of sustainable strategies, such as solar power generation, cool roofing and building retrofits.

Solar

As energy costs continue to rise, more owners are looking to solar energy to mitigate their electricity and hot water heating costs. Metal roofs have several advantages when considering solar photovoltaic (PV) installations.

The cost proposition of PV solutions has improved in the past decade. While PVs still carry a notable up front cost, the savings come when you examine the long-term operation of an array. For an owner to realize a reasonable return on investment, the PV system must operate over an extended period of time. The longer it operates, the better the cost equation becomes.

The decades-long service life of standing seam metal roofs makes them ideal for rooftop solar installations. Whether with crystalline photovoltaic arrays or thin film laminates (as pictured here), metal allows PV systems to be installed without creating roof penetrations. Photo Credit: Drexel Metals

Most PVs have an expected service life of at least 25 years and in some cases (where state and local tax incentives may be lacking), a fair percentage of that timeframe may be needed to reach a break-even point. Many roof systems need extensive repair or sometimes total replacement in less than 20 years, and in some cases as few as 10 years. This puts owners in the undesirable situation of being forced to uninstall a PV array in order to re-roof the building and then reinstall the PV for a second or even a third or fourth time.

This type of effort generates a great deal of additional cost in terms of labor to take down and reinstall the array, as well as service time lost during the period when the PV isn't operating. Metal roofs have an established service life of more than 25 years, which substantially decreases the probability of having to repeat the PV installation. This makes a metal roof system an effective complement to solar PV installations.

"PV panels come with a 25-year mandatory warranty, so you want to put them on a product you don't have to remove and reinstall five or ten years from now," explains Tony DeLoach, CEO of WES Industries, an energy management and solar installation firm in Sarasota, Fla. "That would make the whole project cost prohibitive. So metal roofs are probably the only things out there that have the proper life cycle to allow us to put a one-time application of installation and see it go from first-cost phase to a break-even point in a reasonable amount of time."[ii]

According to the Chicago-based Metal Construction Association (MCA), there are metal roofs still in operation that date back to the turn of the last century. With today's durable paints and coatings, a 50-year service life on metal roof panels is a very reasonable expectation. For projects considering a PV system installation, a metal roof is best.

In addition to the service life equation, metal also offers installation advantages for solar arrays. In most roof systems, installing the brackets that support crystalline PV panels often means penetrating the roof. A metal roof with standing seams offers alternatives to that approach.

"A good first rule about any rooftop mounting is to avoid penetrating the membrane whenever possible," explains Rob Haddock, director of the Metal Roof Advisory Group and founder of Colorado Springs, Colo.-based firm S5!. He continues, "While this may seem obvious, the tenet is often violated with standing seam metal. The norm for attaching things seems to involve anchoring the item to the structure through the roof. When this happens, it not only threatens weather integrity, but also violates the membrane's thermal cycling behavior by inadvertently pinning the panel to the structure. Such a point of attachment will fatigue and fail from forces of thermal expansion within a short time. Fortunately, scores of items and equipment can be securely mounted to metal rooftops without any penetration whatsoever."[iii]

One connection method possible with standing seam metal roofs is to affix the necessary hardware to the roof with clamps. "In terms of mounting ancillaries, metal roofing can use special seam-clamping hardware that grips the standing seam without puncturing the membrane," Haddock says. "Unlike many other types of roofing, metal is a rigid, high-tensile material.

The seam area creates a beam-like structure that can provide convenient anchorage for solar arrays without harming the roof 's weathering characteristics. Mechanicals can be safely and cost effectively secured to these seam clamps, leaving the roof membrane penetration free. Using seam clamps when possible for ancillary mounting will eliminate unwanted holes and other potential and unnecessary problems."

Another increasingly viable option for rooftop solar is thin film photovoltaic panels. These laminate panels don't require rack mounting of their crystalline PV cousins. Instead, they are attached using peel-and-stick butyl adhesive backing. The flexible strips lay down between the 16-inch seams on a standing seam metal roof and are easily adhered without creating any roof penetrations.[iv]

While thin film panels are generally not as efficient in generating electricity as crystalline PVs and more surface area is required to produce the same amount of energy, these panels also tend to be less costly to purchase and install up front. Each system has its own qualities and strengths, and any given project may find itself better suited to one or the other.

Many factors come into play when choosing which solar PV approach to take. Climate, available sunlight, orientation, available space and cost are just some of the considerations to examine before choosing between crystalline and thin film PV. If, for example, you are working with a limited roof space in a climate with plenty of direct sunlight, crystalline PV might work best and deliver the best return on investment. If the project in question has a larger roof space, like a warehouse or industrial facility, and is an area with more shade or less direct sunlight, then thin film laminate might be a more effective choice.[v]

In either case, the long service life of a metal roof means the PV system will only need to be installed once. The fact that it doesn't require penetrations also maintains the integrity of the building envelope, which contributes to the overall energy efficiency of the structure.

Cool Roofs

Another way metal roofs can contribute to a building's sustainability and energy-efficiency goals is by bouncing sunlight away. Many roof surfaces naturally absorb and hold onto the heat of the sun. Cool roofs redirect that heat energy away from the building and back into the atmosphere.

This strategy has a number of benefits. First, it helps minimize urban heat island effect, a phenomenon that produces higher temperatures in urban areas due to a high concentration of dark, thermally attractive materials that absorb and store heat energy for long periods of time. By reflecting that energy back, cool roofs prevent solar energy from being stored as heat.[vi]

The Lawrence Berkeley National Laboratory in Berkeley, Calif. speculates that worldwide implementation of reflected roofing in urban areas can produce a global cooling effect equivalent to offsetting 24 gigatons of CO2 over a 20-year period. That is equivalent to taking 300 million cars off the road and amounts to $600 billion in energy savings.[vii]

On an operational level, cool roofs have the capability to save 10 to 30 percent of a building's cooling energy. If one were to break down the solar spectrum, approximately 57 percent of the solar energy that strikes a building is infrared, which is felt as heat. Redirecting solar energy away from the building minimizes heat gain through the roof and thereby means less energy is needed for cooling the building.

Two main concepts are at play with cool roofs: solar reflectance and thermal emittance. These are measured with two main metrics, total solar reflectance (TSR) and thermal emittance (TE). TSR is the percentage of all solar radiation that is immediately reflected from a given surface. Any energy not reflected is absorbed by the surface material and some of this is transferred to heat. Some of that heat can be re-emitted to the night sky in the form of infrared wavelength energy. This phenomenon is represented by the TE metric. The combination of solar reflectance and thermal emittance properties of a material determine the surface temperature of a roof.[viii] The solar reflectance index, or SRI, is a calculation that combines TSR and TE into one simplified value. The higher the value, the cooler the roof.[ix]

Metal has good TE and TSR qualities in general, but these do vary with the condition of the material. Unpainted, a metallic surface has a low TE but a relatively high TSR. When paint is applied, the TE is high regardless of the color, but the TSR may vary depending on the color and pigmentation used.[x]

While darker colors naturally absorb more infrared radiation than lighter colors, new pigmentation technology has allowed the use of darker paints with cool roofs. IR reflective pigments enable darker colors to reflect more total solar energy. This allows architects to specify a cool metal roof without sacrificing color selection. Cool colored coatings feature light-reflecting pigments that increase solar reflectance by reflecting light in the infrared spectrum. There can be a price premium for these products, so lighter colors may provide a little more cost efficiency, but options are available.[xi]

The durability of metal as a material, as well as the newer paints and pigments, means the reflective qualities of such a roof can stand the test of time. An Oak Ridge National Laboratory (ORNL) study showed differences in metal roofing compared to other types of roofing materials for durability and degradation of TSR over time. Prepainted metal roofing was found to retain its initial TSR values by 95 percent over as much as 30 years of exposure. This same research showed some membrane products lost 40 percent of its TSR after only three years as a result of dirt retention.

The Clubhouse at Bay Forest at Bethany Beach in Ocean View, Delaware, sports a metal cool roof, which reflects rather than absorbs the heat of the sun and reduces cooling costs for the building. Photo Credit: Petersen Aluminum

Retrofit

A growing application for metal roofs is in building retrofit projects. In many cases, a building with an existing flat roof in need of repair or replacement can have a sloped metal roof actually installed over it. There are many advantages of installing metal roofs over old roofing material. It eliminates the need to deposit the old roofing material in a landfill. This technique also can improve problematic roofs, fix maintenance issues and quickly and cost-effectively update a building's appearance. Thermal efficiency and energy savings are also potential benefits of a retrofit metal roof.

The cavity between the old and new roofs can be used to add insulation. Photo Credit: Roof Hugger

Owners looking to replace their existing sloped metal roof can do so without the expense of removing the original roof. This type of retrofit can be done with metal by positioning a light-gauge structural member that is notched to span over the original roof's ribs or corrugation directly over the building's framing system. The member is attached to the roof purlins through the bottom flange of the structural member and the existing roof sheet. A new standing seam metal roof can then be attached to the new member.

This article continues at http://go.hw.net/AR1113Course4. Go online to read the rest of the article and complete the corresponding quiz for credit.

QUIZ

1. Which of the following is NOT an inherent physical quality of metal as a building material?
   a. Reflectivity
   b. Thermal mass
   c. 100 percent recyclable
   d. Durable

2. Which of these describes Galvalume?
   a. Aluminum coated with steel
   b. Steel coated with zinc
   c. Steel coated with zinc and aluminum
   d. Zinc coated with aluminum

3. Which of the following do NOT describe ways a metal roof contributes to a rooftop solar array?
   a. Metal draws and absorbs higher levels of sunlight
   b. A metal roof 's service life is longer than that of a PV array
   c. PV can be attached without penetrating the roof
   d. Thin-film laminate PV can be attached between the seams of a standing seam metal roof

4. An unpainted metal surface tends to have:
   a. Low TE and low TSR
   b. High TE and high TSR
   c. Low TE and high TSR
   d. High TE and low TSR

5. The following is true about above sheathing ventilation (ASV)
   a. It is a potential side benefit of a metal roof retrofit on a building with an existing flat roof
   b. It is a potential side benefit of a metal roof retrofit on a building with an existing sloped roof
   c. It increases energy efficiency through natural convective cooling
   d. A and C
   e. B and C

6. Oil-canning is a phenomenon to watch for on:
   a. MCM wall panels
   b. Exposed fastener single skin panels
   c. Concealed fastener single skin panels
   d. IMP wall panels
   e. B and C
   f. None of the above

7. Which of the following wall panel types have a sandwich-type configuration?
   a. Single skin metal panels
   b. MCM panels
   c. IMP panels
   d. Rainscreens
   e. A and B
   f. B and C
   g. All of the above

8. Insulated metal panels are built with which of the following?
   a. Vapor barrier
   b. Air infiltration barriers
   c. Water barrier
   d. Thermal breaks
   e. All of the above
   f. None of the above

9. The primary goal of a rainscreen wall system is:
   a. To keep water out of the wall assembly
   b. To manage water that enters the wall assembly
   c. To allow unlimited water into a wall assembly
   d. To collect rainwater that enters a wall assembly

10. True or false: Hybrid rainscreen systems using both D/BV and PER concepts are recommended to architects.
    a. True
    b. False

SPONSOR INFORMATION

Design Considerations for Vegetated Permeable Pavement

CREATING OPEN, MULTIFUNCTIONAL SPACES AND PROVIDING GREEN BENEFITS

Photo courtesy of Soil Retention Products, Inc.

LEARNING OBJECTIVES

After reading this article, you will be able to:

1. Define permeable pavement including vegetated permeable pavement types, applicable government regulations, and best management practices for their use.
2. Recognize the environmentally friendly attributes of vegetated permeable pavement systems.
3. Identify basic design considerations of vegetated permeable pavement.
4. Contrast the attributes of the four main types of vegetated permeable pavements.
5. Apply sustainable design considerations for vegetated permeable pavements to project types, including their application to LEED® and SITES® credits.

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By Angela D. Dye, FASLA, LEED AP

Permeable paving systems, in general, continue to grow in scope and practicality as we search for ways to reduce our carbon footprint, improve water quality, diminish flooding and erosion, reduce the "urban heat island" from reradiated (building and pavement) heat in our cities and environment, and add attractive open space to building sites and neighborhoods. The current varieties of permeable pavements are permeable asphalt, permeable concrete, permeable interlocking concrete pavers, and vegetated permeable pavements. Most research on any permeable pavement considers all these types to "substantially and significantly" reduce stormwater runoff.[1] Results from a study in 2007 at the North Carolina State University (NCSU) Permeable Pavement Research Lab showed that "all permeable pavements significantly and substantially reduced surface runoff volumes and peak flow rates when compared to standard asphalt…"

Vegetated permeable pavement will be the focus of this article, exploring some of the current environmental regulations, codes, and guidelines that incorporate their application, design considerations, modular options, and sustainable landscape benefits to help you make an informed decision. The main types of vegetated permeable pavements are flexible concrete mats, concrete grid slab, concrete grid paving units, and plastic geocells, each of which can be planted with turf or groundcover, or filled with aggregate or crusher fines.

DEMONSTRATING ENVIRONMENTAL LEADERSHIP

Using permeable pavement, whether vegetated or not, is one of several strategies within a comprehensive site design and green infrastructure approach to creating more functional and sustainable landscapes. The Environmental Protection Agency (EPA) considers "stormwater runoff in urban and developing areas to be one of the leading causes of water pollution in the United States."[2] Since 2007, using Section 438 of the Energy Independence and Security Act, EPA has required federal agencies to reduce stormwater runoff from federal projects, compelling agencies to "lead by example" to clean up water resources by using "green infrastructure and low-impact development"

techniques. In 2011, the EPA compiled a list of green infrastructure case studies nationwide. As part of a national rule-making process to create an EPA program to reduce stormwater runoff, 47.3 percent of the 479 case studies used some type of permeable pavement system, with just over half of the projects being retrofits of existing properties. Various projects are represented, from commercial, institutional/education, open space/parks, and transportation. The EPA's website Green Infrastructure provides information on each case study, its location by region, and research associated with infrastructure types.

WHAT IS PERMEABLE PAVING?

Permeable paving is a range of sustainable materials and techniques for permeable pavements with a base and subbase that allow the movement of stormwater through the surface. In addition to reducing runoff, this effectively traps suspended solids and filters pollutants from the water.[3]

"The primary motivation for using permeable pavement," according to Neil Weinstein, executive director of the non-profit Low Impact Development (LID) Center in Washington, D.C., "is that it doesn't eat up the land (like surface retention basins, bioswales, and filtration basins do). This is especially important in urban areas where sites are smaller and must meet stormwater regulations." The LID Center works with many government agencies including the EPA, various universities, and the National Academy of Sciences to set standards of practice for use of permeable pavement of all types. Weinstein goes on to point out, "since stormwater regulation is so prevalent, use of permeable pavement is becoming much more known and used more often as a matter of course (to meet national pollution and stormwater requirements). It's available and has become more attractive." LID finds the largest users are commercial properties such as offices and shopping centers with large parking areas. However, transportation and residential applications are also becoming more commonplace.

Main types of vegetated permeable pavements. Graphic courtesy of Soil Retention Products, Inc.

REDUCING FLOODING AND EROSION WHILE CLEANING OUR WATER

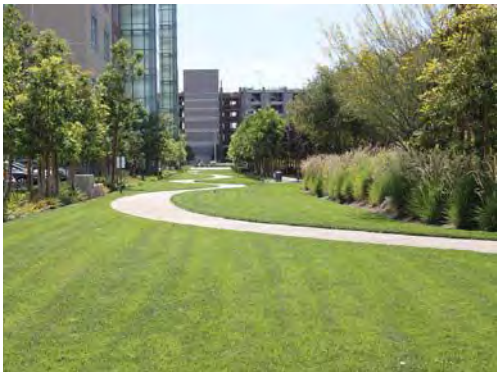
All permeable pavements have shown their ability to clean polluted urban runoff water before it reaches local streams and rivers by filtering out heavy metal contaminants such as lead, zinc, cadmium, and copper as well as acid rain and phosphorus. Individual projects, whether public or private, can potentially use them to meet local and federal flood control and stormwater pollution regulations under the Clean Water Act's National Pollution Discharge Elimination System (NPDES). According to EPA's website, "the NPDES permit program controls water pollution by regulating point sources (pipes and ditches) that discharge pollutants into waters of the United States. Industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters." Cities with separate stormwater systems, known as MS4s (Municipal Separate Storm Sewer Systems), are now required to control the quality of what flows off parking lots and other sites into their stormdrains. The value of permeable pavement systems to mitigate the flow of this type of pollution has increased its role in green infrastructure design, helping cities and private landowners alike to comply with these regulations. These pavements are strong enough to carry the loads from vehicles yet allow for rainfall infiltration through the pavement surface. This infiltration quality lessens the potential for flooding and erosion as well as cleaning stormwater.

Following on EPA's leadership in green infrastructure, many of the most recent and developed handbooks for best management practices (BMPs) and stormwater regulations are at the municipal level, in locations near bodies of water—streams, rivers, lakes, and coastal areas. This is where permeable pavement has seen its greatest public benefit—the cleaning of urban runoff into fisheries and water supplies. Areas with BMPs, guidelines, and regulations include the East Coast seaboard around Chesapeake Bay, Virginia; North Carolina; Washington, D.C.; and Maryland; the Great Lakes region especially around Lake Michigan; the City of Chicago; and the West Coast cities of Seattle, Portland, San Francisco, and San Diego, to list a few.

Research on the use of permeable pavement for stormwater and erosion control is extensive and compelling. Non-profit organizations such as LID Center and American Rivers tout permeable pavement and green infrastructure investment as important to the rebuilding of our aging national infrastructure. Several examples exist in the United States where local and state governments have adopted regulations, codes, BMPs, and guidelines specifying the use of permeable pavements.

The North Carolina Department of Environment and Natural Resources (NCDENR) guidelines adopted in 2008 consider permeable pavement as a stormwater design feature, giving credit for pollution prevention for runoff reduction. For NCDENR, permeable pavement is now considered equal to the permeability of turf, requiring 20 percent of parking lots be permeable pavement (or a suitable, environmentally friendly, alternative stormwater management practice).

The City of Santa Monica, California, recently adopted a municipal code to reduce stormwater volume and improve water quality from existing properties and new development into Santa Monica Bay. Developers must now reduce by 20 percent any projected runoff through an Urban Runoff Mitigation Plan, achieved by increasing



Photos courtesy of Soil Retention Products, Inc.

permeable areas such as parking lots and driveways, while also increasing the percentage of green space. This is a perfect application for vegetated permeable pavement. A source for stormwater BMPs is the Stormwater Managers Resource Center (SMRC), a website established by the Center for Watershed Protection through an EPA grant. The SMRC is "designed specifically for stormwater practitioners, local government officials, and others that need technical assistance on stormwater management issues."

BENEFITS OF VEGETATED PERMEABLE PAVEMENT

When permeable pavement is vegetated with turfgrass or groundcover, the overall effect can be stunning, and serves to integrate a project into its environment. Vegetation over pavement has the ability to absorb carbon dioxide, emit oxygen, and biodegrade pollutants. As a living plant material, its evapotranspiration naturally makes it cooler than inert surfaces such as concrete, reducing albedo and the Urban Heat Island (UHI) effect. The turfgrass surface reduces glare and absorbs noise, while adding to green open space on a developed site.[4] In addition to this comfort factor, there is a distinct design advantage to vegetated permeable pavement systems since hardscape can be disguised and better integrated into the project's environment and ecology. Using vegetation or "soft" materials such as sand, gravel, or decomposed granite, for instance, the otherwise overwhelming effect of parking lot concrete or asphalt can be mitigated. Another advantage is that valuable space can now be considered multifunctional, creating a better aesthetic appeal and often a better neighbor without sacrificing buildable land (see photo 1 above).

Suitable for a variety of scales, vegetated permeable pavement is typically not used for major streets, except perhaps for parallel parking spaces. These pavements' ability to add vegetation into the voids, and even to cover the paved area, creates site area that becomes more a part of the landscape. Many applications are perfect for site areas infrequently used, such as fire lanes, utility easements, and drainage ways. Areas like these which use large amounts of space, but are seldom used, leave an under-utilized vacant area in a project. Vegetated permeable pavement is especially helpful to the designer and developer when site design or city code dictates accommodating these facilities. Critical when site area is limited, vegetated permeable pavement can add green space, giving additional landscape and usable area back to the project (see photo 2).

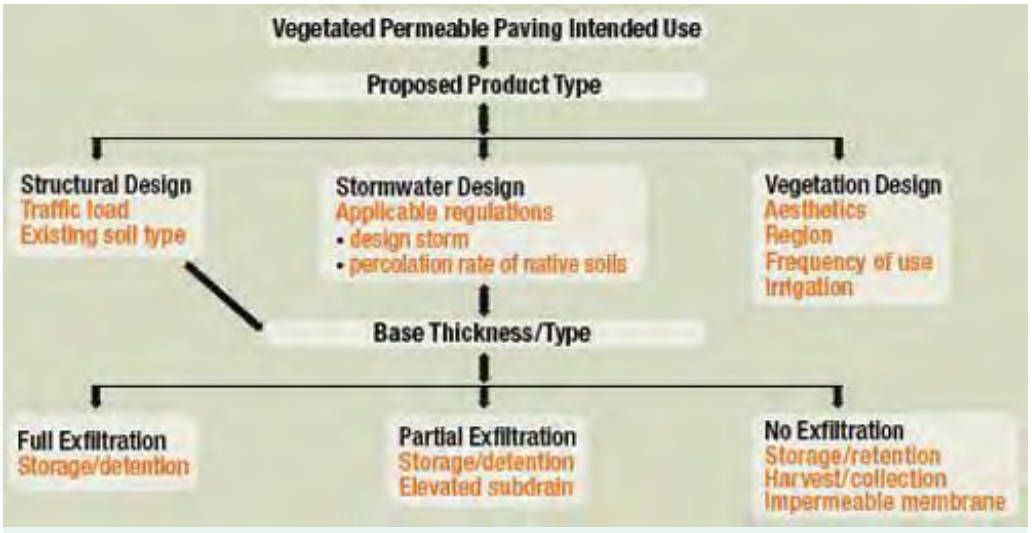
In one of the most recent examples of the effectiveness of vegetated permeable pavement, a 2008 study responded to the need to clean up beachfront runoff. An Oceanside, California, fire station tested the viability of using vegetated permeable pavement for washing fire trucks. The fire station is near one of the most polluted beach outlets in southern California. The test was prompted by a mandate of the San Diego Regional Water Quality Control Board to clean runoff from the washing of fire trucks several times a day. The trucks were washed on the asphalt driveway in front of the station, which drained directly into the San Luis Rey River just upstream. The installation of a vegetated flexible concrete mat was used to resolve both polluted runoff and sustain daily truck loads. Placed over a bed of granular infill and base material, the site experiences no runoff, storing up to 0.40 inch of water at the surface and infiltrating at a rate of more than 3.0 inches per hour (see photo 3).

DESIGN CONSIDERATIONS FOR VEGETATED PERMEABLE PAVEMENT

Design of a vegetated permeable pavement system for any site is a multidisciplinary effort. Once a project is envisioned, important site planning factors must be considered for building layout, access, circulation, and parking, not to mention federal, state, and local code requirement compliance. Vegetated permeable pavements can satisfy several objectives for stormwater management, while adding value and aesthetics to the project.

Structural and Stormwater Design

In one of the most concise summaries to date, a 2008 Australian conference paper, by engineering professors at the Universities of New South Wales and South Australia, lays out several distinct objectives to ask early on: "Flood mitigation/stormwater retention or detention? Water quality improvement, whether filtration or retention? Water conservation for collection and reuse? And ability to carry the intended site traffic." In the chart below, a design decision flowchart clearly illustrates the process for designing a vegetated permeable pavement. A key design consideration is the composition



of the subgrade (native soils below the paving section) and their infiltration rates. Depending on the composition of the subbase (structural base material), in some cases enough rainfall can be collected to offset and store a percentage of the increased runoff from site development. For some projects, this may eliminate an expensive and separate "hard" drainage system. For other projects, with native soils with low infiltration, excess water could be detained and stored. Use of this excess stored water may have to be considered. For example, this excess water could be harvested for reuse, or alternatively, piped away with an elevated underdrain. The paper points out another key design question, in addition to pavement system design life, rainfall absorption, infiltration, and retention: how thick the pavement should be to carry the intended traffic. Permeable pavement thickness may be slightly thicker for managing stormwater than for load bearing, but there is usually an associated economic benefit for its use.

Turfgrass Considerations

Vegetation, specifically turf, is commonly used as a surface for applications with light pedestrian traffic, such as parks or ballfields. For it to be a viable cover under vehicle traffic, the pavement design fundamentally needs to prevent soil compaction so that the living root zone for these plants is both porous and permeable to both air and water. Vegetated permeable pavement has void spaces between a load-bearing pavement material, which distributes the imposed load to the underlying base and/or bedding materials. "A reinforced turf surface bears traffic equally directly, …(and) assists the turf in resisting wear and compaction."[5] This support condition allows the plants the ability to stand up to increased traffic weight and volume. Root zone areas for vegetated permeable pavements vary by type of pavement, but the more access to root space, the more likely the turfgrass will survive.

The soil area between cells is also an important factor to turfgrass health. Vehicle tires are flexible, so when void spaces are too large and overfilled, soil compaction will occur, which cuts off the air and water needed for plant growth. For example, choosing sod to top the permeable pavement for a fire lane (hopefully never used) may be an appropriate design choice. However, if the use is daily parking, applying turf by seed, and not over-filling the void space, is likely to give greater protection to the emerging root system. Choosing the appropriate method of turf establishment for the intended use can be especially critical when the pavement is saturated. With heavy and/or constant traffic, significant compaction in the void space can occur along with turf damage.

Another aspect of turf establishment and maintenance is to realize that the width of the load-bearing portion of any vegetated permeable pavement system is important to retaining turfgrass as well as carrying the traffic load. The greater area of contact between the pavement and the vehicle tire, the better the pressure is distributed and the root zone is protected. A relevant ingredient for healthy turfgrass is a bedding course, defined as the underlying sandy material between the pavement and its often heavily compacted base, which allows for a continuous symbiotic root zone and moisture for the plants. The depth of pavement can also have an impact on the ability for roots and moisture to spread along with similar-sized materials for infill and bedding course. That is because root zones are complex systems, with physical, chemical, and biological components. Each of these components together determines the quality of the turfgrass. Pavement systems which maximize the root zone area, while allowing for filtration and aeration, are likely to result in the best long-term vegetative cover.

This article continues on http://go.hw.net/AR1113Course5. Go online to read the rest of the article and complete the corresponding quiz for credit.

TILE OF SPAIN

Presents:

Modern Ceramics: An Ancient Industry's Surprising Embrace of Technology

By: Kathy Price-Robinson

Modern tile arches the span between the earliest history of humankind to today's and tomorrow's technologies that solve design, energy and comfort challenges with astonishing grace. Innovative solutions from Spanish manufacturers lead the way.

CONTINUING EDUCATION

Credit: 1 learning unit, AIA

Use the learning objectives to the right to focus your study as you read this article. To earn credit and obtain a certificate of completion, visit **http://www.hanleywooduniversity.com/files/upload/Architect_Mag/june%202013/tile_of_spain_arch.pdf.** and complete the quiz for free as you read this article. If you are new to Hanley Wood University, create a free learner account; returning users log in as usual.

LEARNING **OBJECTIVES**

By the end of this educational unit, you will be able to:

1. Identify and assess the four types of tile.
2. Discuss specification opportunities presented by new technologies.
3. Explain emerging technologies in tile for walls.
4. Discuss new technologies in tile for floors and counters.
5. List uses for architectural ceramic as a building material.

You can sum up today's architectural ceramics with three terms – **innovative, versatile, and high performance.**

Few other building materials so gracefully span the era from antiquity to the future with such groundbreaking potential — from glazes that turn ceramics into touch screens for switchless walls, to façade tiles that neutralize harmful nitrogen oxides, to inkjet printing of a precision unimaginable just a couple of years ago, and to increasingly strong and thin ceramics tiles ideal for retrofits over existing tile as well as fine furniture veneers.

Here's how one architect sums up modern ceramics: "It's just mind boggling," says Steve Trott, AIA, of Hnedak Bobo Group in Memphis.

"Unlike other materials and crafts steeped in history, modern ceramics are an industry on the cutting edge of innovation," notes ceramic consultant Ryan Fasan.

"Rather than resisting change, these manufacturers fully embrace emerging technologies," he adds. "They are, in fact, redefining the industry."

And while the industry redefines itself, it also impacts specification options in the design world.

"Porcelain products in the interior built environment are key to providing solutions that can be of high aesthetic, high value, high performance and meets sustainable solutions," says Aneetha McLellan, director of interior architecture at HDR Architecture in Omaha.

Ceramics is one of civilization's oldest and most venerable forms of art. Ceramics have been used to protect and beautify our environment since the cradle of western civilization in Mesopotamia and quite possibly before. Much of the world's early history would be lost forever but for the remains of fired clay objects. Ceramic tile production dates back to before the 9th Century.

For all its technological innovations, modern ceramics still begin with three basic ingredients: clay (right), sand (bottom left) and feldspar (top left). These ingredients are found in nearly limitless supply on our planet. They are classified as "perpetual resources" and react in a white-hot kiln to create an inert piece of ceramic tile.

Modern inkjet decoration allows Spanish tile manufacturers to take inspiration from diverse sources like this vintage wood from a tiny French fishing village.

In this modern era of breakthrough technological advances in all areas of life, new opportunities arise in the field of ceramics for design professionals to embrace and expand the choices of their specifications. With a strong foundation of knowledge in the basics of ceramics today, specifiers can push the proverbial envelope of functional and durable design into new frontiers with progressive emerging ceramic innovations.

CERAMICS 101 – FOUR CATEGORIES OF TILE

The vast world of ceramic tile becomes quite simple when broken down to its most fundamental aspects. Tile is a completely natural building material comprised of three ingredients – clay, sand and feldspar. Just as a master pastry chef finesses the chemical reactions between flour, yeast and eggs, a ceramicist controls the reactions of tile's three components.

Those three basic ingredients, found in nearly limitless abundance (classified as "perpetual resources") combine in the white-hot heat of a kiln to create an inert piece of ceramic tile.

Manufacturers have millennia of experience behind them to understand that we require tiles to perform in four distinct environments. And that is exactly how many different types of tile bodies they must produce to ensure their tile provides the lifelong performance it should in any environment. This is the foundation upon which a successful ceramic specification is built.

The measure for classifying the types of ceramic is straightforward– it's based on the density of the body, and therefore its porosity or ability for water absorption.

In the first category, the most porous modern tile produced is above 7% and is normally found at around 10% to 12% water-absorption. This category is the best specification for interior wall applications. The high porosity makes sense primarily for two reasons:

1. Available porosity makes the tile adhere easily and quickly to vertical surfaces with the most common and inexpensive mortars or adhesives.

2. The lower-density body can be fired at lower temperatures, allowing for the use of the broadest range of minerals and frits (fused particles) in the glaze for the widest range of decorative options.

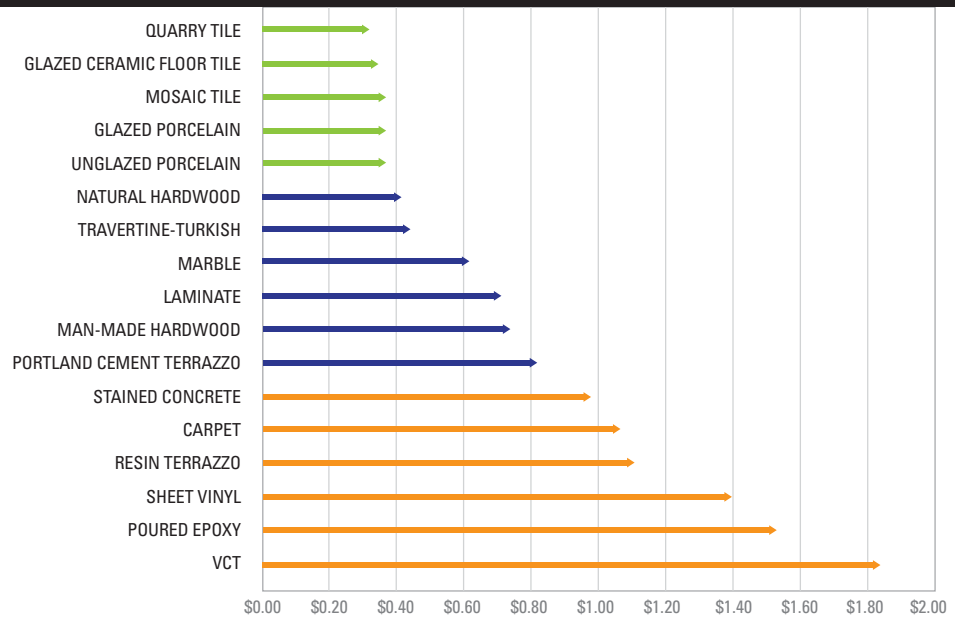
For the second category, driving the water-absorption capabilities of the body below 7% to around the 3% range gives tile the ability to withstand foot traffic in a dry environment. This is the most sweeping category of specifications and as such, a range is offered to give the broadest variety of options for specifiers to choose from, based on client needs. The lower the traffic of the environment, the higher porosity material will be acceptable.

In the third category, increasing the density so that water absorption is below 3% to 0.5% opens the possibilities for the tile to survive on floors in occasionally wet environments and in exterior applications where freeze-thaw or thermal shock may be an issue. Sometimes calling this category Gres or Stoneware, quality manufacturers test this category of material for suitability and provide data if they recommend it for exterior installations.

Properly specifying the appropriate type of tile for the area will minimize economic, environmental and installation burdens while maximizing design options.

And in the final category, the densest tile body produced provides water absorption of less than 0.5% for the

Floor Coverings Comparison: Life Cycle Cost Per Square Foot Per Year



Life Cycle Cost Study by Scharf-Godfrey, division of Phoenix Engineering for TCNA

Initial cost is a poor indicator of value. The high durability and low maintenance of ceramic tile makes them the lowest cost choice.

most demanding environments like submerged, high humidity or areas of wheeled traffic. This material, often described as porcelain, can be, and often is, specified in the previously mentioned areas but always at a cost either in aesthetic options or in the cost of material or installation.

Technical characteristics increase as porosity declines, with each subsequent category, but at a cost. The denser a tile's body becomes, the more resources are used in production, shipping and installation. Properly specifying the appropriate type of tile for the area will minimize economic, environmental and installation burdens while maximizing design options.

Understanding and utilizing the four types of tile appropriately allows a specifier the broadest range of options to satisfy client design goals while ensuring a lifetime performance solution. Explaining selections to clients in easily understood terms, namely the area of use and demands of environment, creates tacit acceptance of the fact that you are providing them a solution that will offer maximum performance for maximum value.

LIFECYCLE COSTS

For a client or specifier today considering ceramics as a preferable material for the 21st century, data suggests a good return on investment. In today's economy, and for the foreseeable future, ROI remains a major concern. A study commissioned by The Tile Council of North America indicates that ceramic tile is the lowest-cost option for cladding when amortized over the average lifespan of a building (40 years).

Thin yet durable tiles bring benefits on may levels. They require fewer materials to manufacture, are lighter to transport, easier to fabricate on the job, and have many innovative uses, from furniture veneers to tile-over-tile retrofits.

The study factors in replacement and maintenance costs of a comprehensive range of materials – from quarried tile to vinyl composition tile (VCT) – and demonstrates the reduced value of low upfront-cost materials over the lifespan of a building. While upfront costs nearly always remain a deciding factor, this study argues that tile reduces the cost of an even more valuable commodity for most people today – time. Lower maintenance costs, less replacement hassle and inconvenience, mean less time spent on maintenance of a building and more time spent living or working in it.

Other benefits for specifiers to consider include: tile is non-conductive but provides a high thermal mass; it is inert and unaffected by fire or floods; it is one of the few mediums that can be rendered in color and unaffected by UV exposure, and it is inorganic and so naturally inhibits the growth of bacteria and other health risks.

NEW TECHNOLOGIES BUILT ON THE FOUNDATION

When modern ceramics are factored into the conceptual stage of design, they often provide more than simple surface solutions as they become an integral part of building performance as well as the design program.

Today, according to tile expert Fasan, "Creativity and innovation are the backbone of the modern ceramics industry." The goal for many manufacturers is providing performance-based solutions for modern design and lifestyle challenges. Highlights of these solutions include thin formats, inkjet decoration, advanced chemistry in glazes, and innovative installation technologies. Let's look deeper into each of these.

THIN FORMATS

Emerging en masse around 2008, minimal thickness porcelain and ceramics continue to provide creative solutions to North American designers and open up new areas of specifications beyond the traditional backsplash and tub surrounds.

Traditional thickness of porcelains is 10mm and newer production processes have created 4mm to 6mm varieties. Large format ceramic wall tile has also been reduced in thickness by many manufacturers from 13mm down to 7mm or 8mm. Depending on the production process involved, many of the thin porcelain products are offered in sizes up to 36" x 120".

Earlier this year, the revolution of ceramic technologies astonished architects attending Cevisama, the international tradeshow hosted annually in Valencia, Spain.

"I was totally amazed at the advancements our group witnessed being made in the ceramic and porcelain tile industry of Spain," says architect Trott. "Of particular interest to me was seeing first hand thin-ceramic technology and understanding new possibilities for its application in the practice of architecture."

Noting the use of thin ceramics for countertops, sink, and even stovetops, Trott believes this emerging technology

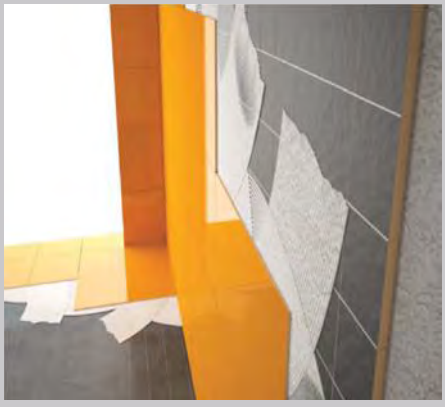
The blending of diverse ceramic styles creates an urbane yet grounded environment. This room includes flooring radiating the personality of wood but with the practicality of ceramic, a vanity shining with innovative thin ceramic veneers, and a backsplash exuding a riot of inkjet complexity.

"is just beginning to scratch the scratch the surface of design possibilities for the modern world."

This reduction in thickness and weight comes with substantial environmental benefits. One of the prime criticisms of ceramics by competitive industries is the high embodied energy associated with production and shipping. Reducing the thickness by half effectively reduces the embodied energy and raw material requirements by the same factor.

This weight reduction offers the benefits of porcelain to areas of specification once impossible with the traditional, heavier material. In fact, ceramic manufacturers now approach furniture and cabinetry designers to offer slim porcelain as a veneer material, competing with traditional laminate veneers. This gives

This article continues on http://www.hanleywooduniversity.com/files/upload/Architect_Mag/june%202013/tile_of_spain_arch.pdf. Go online to read the rest of the article and complete the corresponding quiz for credit.



Tile over existing installations saves time, resources and waste.

SUSTAINABLE IDEA: INSTALL THIN PORCELAINS AND CERAMICS OVER EXISTING TILE INSTALLATIONS:

Another solution provided by thin porcelains and ceramics is the ability to install them directly over existing tile installations. This method of renovation offers an environmentally preferable option for specifiers today. Along with reduced embodied energy in the thinner material, tiling over an existing installation saves the substrate and tile from the landfill or recycling stream. Plus, this program requires no new or virgin substrate material for the new installation. Possibly more importantly for the client, a renovation of this type takes less time, creates less disruption for the occupants, and prevents fewer indoor air quality issues that tile demolition activity brings to a space.

As an example, hotels have been able to renovate a guest room in a single day, minimizing loss of revenue. Retail spaces can complete a flooring change without closing their doors for an extended period of time.

J. MAYER H. ARCHITECTS IN GEORGIA

IN 2009, THE BERLIN-BASED ARCHITECT BEGAN DESIGNING A BEVY OF PROJECTS IN THIS CAUCASUS COUNTRY. WITH NINE COMPLETED TO DATE, AND MORE UNDERWAY, ARCHITECT LOOKS AT THE HOW, AND THE WHY.

Text by **Ian Volner**
Photos by **Marcus Buck**

"THIS IS A COUNTRY just of three things," groused Levan Jangirashvili. "Cows, police, and Ford Transits."

Jangirashvili, known to his friends as Leo, was driving fast down a country highway somewhere between the Black Sea and the village of Anaklia in Georgia, a country nestled in the Caucasus Mountains on the southern border of Russia. Roads there are rarely more than two lanes, and for the previous five hours Jangirashvili, a native Georgian and sometime tour guide, had proven himself fairly adept at circumnavigating a variety of obstacles—both bovine and vehicular—by whipping his not-quite late-model Nissan Serena into and out of the oncoming traffic. On each occasion, these maneuvers elicited shrill pleas for divine protection from his passenger and client, a 30-something American design journalist not typically known for his deeply held religious convictions.

Now Jangirashvili was caught behind yet another Transit, a cargo van in widespread use as a rural workhorse and inter-city bus. But this time, as the Nissan overtook the Ford coming around a hairpin curve, something different happened: Instead of the dreaded tanker trailer or puppy, the road ahead revealed nothing, running dead into beachy coastline. This is what the driver and his charge had come here for.

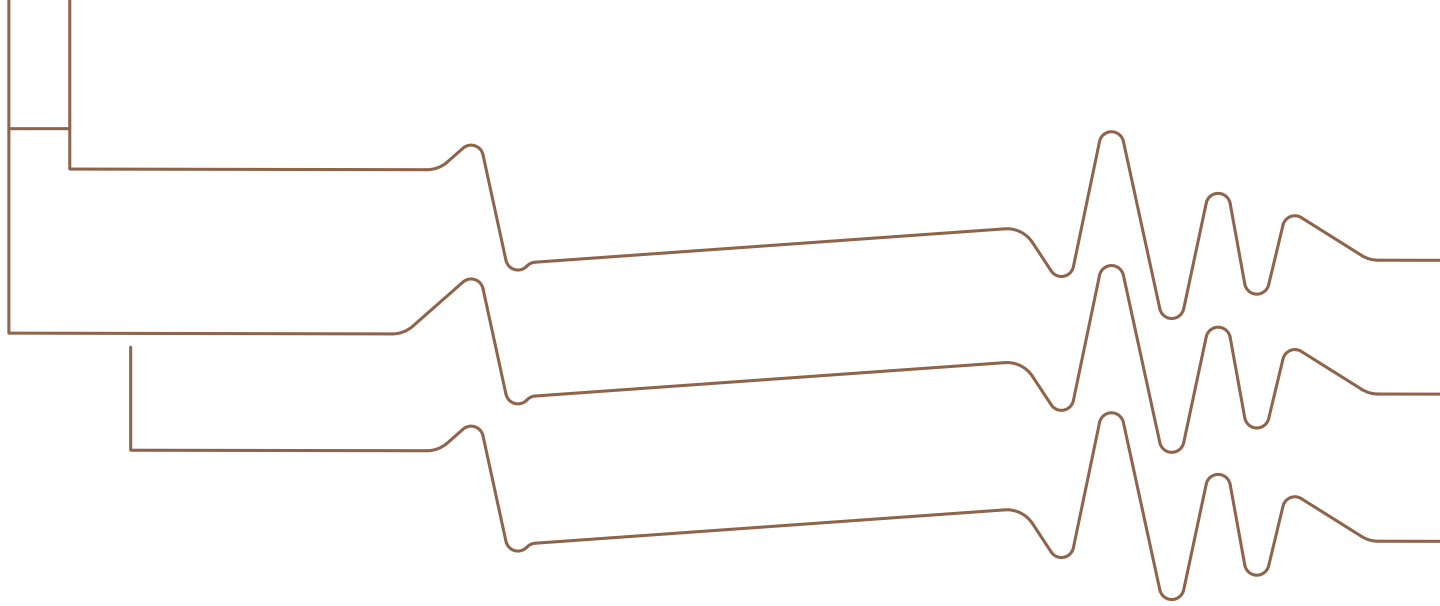
There, rearing up against the horizon and the sun setting into the tideless sea, stood a huge, anthropomorphic white form on a pier 60 yards into the water. Jangirashvili stopped the car and gaped.

"So what is this?" he said.

"It's a frozen splash of sea water," said architect Jürgen Mayer H. several days later, sitting in his office in Berlin. "Or a smoke signal. Some people say it looks like Mickey Mouse with an erection. I don't really care. Any meaning or association might be wrong or not: the more you find, the better." Mayer—his middle name is Hermann; the initial-switch was largely a matter of branding—is the designer of the seaside installation, which is composed of a series of steel fins hanging from an interior skeleton. Within the bulbous, filigreed mass there's nothing but struts and girders (though Jangirashvili had a look, just to check). "We thought maybe there should be a way to walk up, or a pavilion downstairs," Mayer says, "but they were always clear about not using it programmatically. It's just a sculpture with lights, a lighthouse for the city."

Back in Georgia, this last aspect of the brief was difficult to grasp, as the "city" to which Mayer refers is nowhere in evidence. Stretching southward down the beach from the sculpture and pier is nothing but a vast construction site: Welcome to Lazika, a planned community for 500,000 people, which was announced in 2011 by Georgian President Mikheil Saakashvili, Mayer's nominal client for the pier project. The town takes its title from the name that Jason and the Argonauts gave the ancient Georgian seacoast when they went hunting for the Golden Fleece almost 3,000 years ago. If and when the new town is completed, Mayer's sculpture will be the urban mascot of Georgia's second largest city and biggest seaport, a new commercial and recreational hub connecting Europe to Central Asia. It's a bold initiative—and it's just one piece of a still bolder scheme by the government to reinvent Georgia for the 21st century, a scheme to


Russia
Mestia
House of Justice
Police station
Airport
Lazika
Pier sculpture
Gori
Wissol rest stop
SOCAR rest stop
Tbilisi
Private residence
SOCAR rest stop
Batumi
Café and pavilion
Seaside pavilion
Black Sea
Sarpi
Border checkpoint
Akhalkalaki
Railway station
Azerbaijan
Turkey
Armenia
Nakhchivan
Iran



which Mayer, 48—who was born in Stuttgart, Germany, and studied at the University of Stuttgart, the Cooper Union, and Princeton University (where he has since taught)—has become a key, if somewhat unlikely, accessory.

THE LAZIKA COMMISSION is only one among a clutch of new structures that Mayer has realized in the country over just the last three years. He's not the only Western designer who's responded to the architectural gold rush in Georgia: Holland's Ben van Berkel, Hon. FAIA, just completed a new airport in the country's central plateau, and Italy's Massimiliano Fuksas, Hon. FAIA, has both a new concert hall and government building in the capital city of Tbilisi. Though younger than either of his colleagues, Mayer has done the largest volume of work in Georgia, with 11 public and commercial projects—from gas stations to civic centers—either finished or just wrapping up. There's also an impressive villa for a private client underway, to say nothing of several unexecuted proposals that might yet be built depending upon which way the political winds blow.

"All this happened in a very short amount of time," Mayer says. "There's just an urgency that we [Westerners] don't quite understand." Mayer was drawn into this whirlwind process beginning in early 2009. His Metropol Parasol, an urban portico started in 2004 and completed in 2011 for the city of Seville, Spain, had brought the designer's practice into the international spotlight; among its admirers were representatives of the Saakashvili administration, just entering its second term at the time. Saakashvili, elected following his country's pro-democratic Rose Revolution in 2003, had presented himself as a liberal reformer who could open the country up to the West and to the world. A renewed national infrastructure on par with Europe was a major component of that program from the outset, and to find designers equal to the task the government decided to look beyond its own borders. From Mayer's first meeting with the president on his very first visit to the country, the architect was impressed by Saakashvili's willingness to use design as a vehicle to bring his country into the global age. "He's experienced Georgia as this very gray place," Mayer says, "and he wants things that are colorful, moving, and have a dynamic impact." Using the bully pulpit to argue for quality design, Saakashvili has not only put Mayer in charge of a slew of high-profile public work, but has also talked corporate sponsors and developers into taking on the architect for several privately funded projects. The line between the two spheres can blur: For his organically inspired café-pavilion in the waterfront city of Batumi, Mayer was asked by the government to design a public building for a public park—but his client was a large company that had donated the funds for the construction at the administration's behest. "The park is kind of a plaza for Batumi," Mayer says, and Saakashvili persuaded the local patron that daring new design could be a prop to civic pride.

The Batumi project also points at some of the other, singular aspects of working in a still-developing country where the norms of the building trade as we know them don't apply. Mayer's proposal for the café, calling for a curving, open façade to create a strong connection to its leafy surroundings and nearby beach, met with a positive reaction at first—until the donor-client abruptly broke off communications. Six months later, Mayer was slightly shocked to find himself invited to the project opening. "I said 'I've never heard anything about this,'" recalls the architect, who did eventually manage to provide some additional design input and receive proper recognition for his work. But that oversight aside (and it was never repeated, Mayer claims, by his other Georgian clients), it's not clear that the building has been effectively managed since its completion: When seen in October, its gleaming white façade had developed a greenish growth in the moist sea air, and it sported a banner reading "For Sale."

That, in a very real sense, is a sign of the times. A decade after being swept into office, the Georgian public has turned substantially against Saakashvili, and that's threatening to leave Mayer's buildings as something like cultural castaways from a shipwrecked political project. Despite sustained growth, unemployment in Georgia remains stubbornly high, and in 2008 a long-simmering dispute with Russia exploded into a conflict that's left two of the country's northern provinces under military occupation by its neighbor to the north. At the time of writing, it was expected that Saakashvili's party (the president is limited to two terms) would not be returning to power, leaving the future of development in Lazika and much else in doubt. [Note: Giorgi Margvelashvili, of the Georgian Dream party, won the Oct. 27 presidential election, marking a shift from the leadership of Saakashvili's United National Movement party.]

Making matters worse, widespread allegations of corruption have tainted the reputation of a man once seen as the new face of Georgia. And while none of the allegations specifically touch any of Mayer's projects, they certainly color the public's view of them. Georgians might well wonder why there's a gleaming new border-station-cum-conference-center resembling a gigantic seabird—created by Mayer for the town of Sarpi at the Turkish border—in a place where some of the roads leading to it are nearly impassable at six o'clock, when the farmers are driving the herds home for the night. There's simply something inherently jarring about such high-design projects in such rural, underdeveloped environs.

Or as Jangirashvili put it succinctly, gazing up at the Lazika sculpture: "What is the point?"

Detail of the Akhalkalaki Railway Station roof canopy, from above.

SAAKASHVILI HIMSELF EXPLAINED the point this past May, when he was in New York to receive the A+ Award from design website Architizer. "We are this poor, destroyed, destitute former Soviet country trying to come out of nowhere, out of the cold, to become one of the most exciting building sites in today's diverse world," the president said. "We want more architecture to come to Georgia because we as a country are out shopping for people who are interested in ideas—for their business." Saakashvili was among friends at the tony Manhattan gala, being himself a graduate of Columbia University and a fluent English-speaker. This was precisely the crowd that Saakashvili had meant to appeal to when he reached out to Mayer: The kind of people who could appreciate the audacity of bringing a relatively untried, avant-garde designer to Georgia; the kind of people, possibly, with the money to make the dream of Lazika a reality.

Whenever Jangirashvili stopped to ask for directions to Lazika, old women and bored young men along the roadsides fell into fits of laughter: It was as though he'd asked them if they knew the way to El Dorado. But joking aside, Georgia is a country so in need of economic stimulus that almost any *grand projet*, however fantastical, might not be a bad idea. "I like to compare it to postwar Germany," reflects Mayer. "People have to have bus stations, to have basic infrastructure." Seen from this perspective, the architect's projects have the potential to do double duty, serving both as down payments on that new infrastructure and as striking advertisements for the international investment necessary to build more of it. Mayer's roadside rest stops in Gori, completed in 2011 and 2012, are essential economic armatures, providing gas stations for a brand-new stretch of highway as well as spaces for local artisans to sell their wares. They're also—in their sweeping, quasi-Brutalist grandeur—stirring declarations of Georgia's beguiling otherness, its mountainous beauty and boundless potential.

Much the same could be said of Mayer's arresting airport in Mestia, a smartly minimalist composition of black and white, and of the design for his largest project to date, a sleek train station in the southern city of Akhalkalaki that will function as a conduit for rail passengers from Turkey to Azerbaijan starting next year. But there are other, still more vexing imperatives behind these projects than those of nation-building and a bit of good PR.

If one looks north from the pier sculpture at Lazika, scarcely a couple miles to where the coast juts out slightly, one is looking into Abkhazia, one of the occupied territories. In Gori, the rest stops are within shouting distance of occupied South Ossetia; the 2008 conflict's worst battle was fought nearby. So too the Sarpi border crossing, though not near Russia, is located in an autonomous region that has had a strained relationship with the central government, and the Akhalkalaki station, which will reroute commercial traffic away from Georgia's sometime adversary Armenia. All of these projects, in one way or the other, reflect complex geopolitical considerations, and act as an extension of Saakashvili's longstanding vow to crack down on separatism and foreign interference in his fractious republic. The Lazika pier sculpture isn't just a "marker," as Mayer puts it. It's a fluttering flag, a signal of defiant nationalism.

Whether or not one thinks it's a good idea to use progressive architecture as an instrument to bind the Georgian people closer to their government—and to twit Russian President Vladimir Putin—may depend largely on one's view of Georgia, of Putin, and of architecture. But Mayer's architecture, in particular, tends to bring the intrinsically fraught nature of Saakashvili's commissions into high relief: even when they emerge fairly intuitively from the program, the gestures and abstractions of the designer's highly developed formalism make the buildings seem all the more like set pieces in someone else's drama. At the very least, they certainly engender some odd juxtapositions. As Jangirashvili drove back from the coast towards his home in Borjomi (where he runs a very commendable guest house), he pointed out the largest recent public works projects in the country, a series of sprawling housing developments, squat boxes with pitched red roofs. These are refugee camps for the displaced families from the north who fled the Russian invasion. Needless to say, they aren't the work of an edgy designer from abroad.

To contrast them with the glittering private villa that Mayer is designing near Tbilisi—or with any of his new buildings in the country—is to suffer a moment of parallax, the disorienting concurrence of new and old, of high ideals and challenging realities. In this environment, the feeling voiced by many Georgians that Mayer's buildings "don't fit" (a familiar enough complaint to architects at the forefront of the profession) is all the more understandable; yet it's also unfortunate, since Georgia deserves good contemporary architecture. Perhaps, as the architect himself observes, there are different ways that design like his can be of use: His buildings, as he sees them, are there to "wake up local architects," presenting them with "a vision for the future that may only be useful for the next 20 or 30 years, before the country comes to normal development." Mayer's architecture might not be the right thing at the right time. But Georgia, with 3,000 years behind it, still has time on its side.

CAFÉ AND PAVILION

BATUMI, COMPLETED 2010

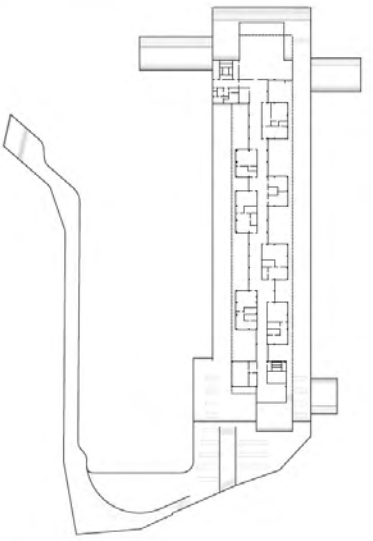
A kind of 18th-century garden folly redone for the 21st, the Batumi café-pavilion is somewhat out of step with Jürgen Mayer H.'s other projects in Georgia, more of an architectural sketch than a fully realized building. Its clover-like plan—represented vertically by the tall standing sculpture outside of it—is vaguely (if only vaguely) suggestive of a seashell, one more case of the designer flirting with a figurative architecture. The interior design, including the floor-to-ceiling curtains that block off some of the openness Mayer had intended for the glazed-in structure, wasn't his own work, having been carried out by a young local firm. But that demonstrates how the German designer's activity might yet have a lasting influence on the Georgian design scene for years to come. "An outsider can become a catalyst to generate opportunities for locals," Mayer says—and already a few native firms with a similar, contemporary sensibility have received commissions for public projects around the country.

SARPI BORDER CHECKPOINT

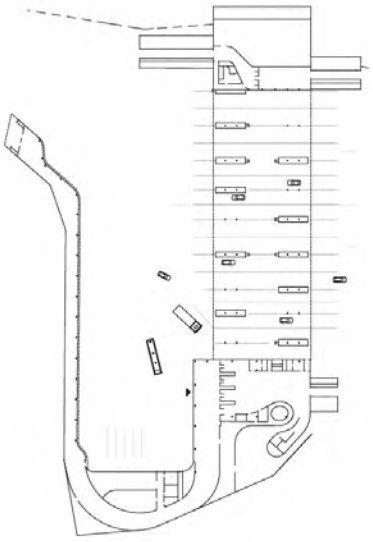
SARPI, COMPLETED 2011

As a barometer of Mayer's architectural intentions, one could hardly do better than the Sarpi border station near Turkey, along a rocky stretch of the Black Sea coast. In profile, the building looks distinctly figurative—the observation tower a head, the checkpoint gates a tail—or perhaps like the prow of a ship, Sarpi being near the spot where the Argonauts went looking for the Golden Fleece. But that wasn't the architect's objective. "If it allows you to have these ideas, all the better," he says. "I'm not trying to give you one way to look at these things." Rather, Mayer says the building simply emerged from his highly analytical approach to program and site. "The design idea was it creates overlaps and pockets, terraces and undulating curves," he says—each curve and pocket accommodating the various meeting rooms, outdoor terraces, and lower-level public spaces outlined in the brief. Mayer's formmaking was aided by a building culture in Georgia that was surprisingly accommodating: "We were surprised at how easy it was to build," he says. "They don't have the regulations we have here in Germany."

Upper-Floor Plan



Ground-Floor Plan



PIER SCULPTURE

LAZIKA, COMPLETED 2012

Perched on a long pier (also designed by Mayer) and standing just a shade under 101 feet high, the Lazika sculpture can be seen from far up the beach, an uncanny mirage framed by the sea and the southern Caucasus range. Visually, its precision-cut, intersecting plates recall Mayer's breakthrough Metropol Parasol project in Seville, Spain—both reflecting the architect's preoccupation with "the way the real and virtual is coming together," and how space and structure can be used to explore "negotiations between public and private, inside and outside," he says. In yet another instance of the architect abjuring a literal or representational approach, the sculpture is meant as an abstract icon of its as-yet unfinished city, an architectural metonym on the order of St. Louis's Gateway Arch. Whatever becomes of President Mikheil Saakashvili's dream city, Mayer feels the sculpture will stand as a compelling argument for a particular vision of Georgia. "It's a trailer of a possible future," he says.

POLICE STATION

MESTIA, COMPLETED 2012

In Mestia, Mayer's office completed three projects over the course of two years, including the city's main police station. The building's tower-like form in its context of low-slung houses and commercial structures is an homage to the historic defensive towers of the region. And Mayer's office looked to other local vernacular elements to inform the design as well: "In Mestia, [there are a lot of] pitched roofs and stone, so the police station has stone," Mayer says. "Some references are not so direct. They are loose interpretations of what we find could be interesting." The police station's textured precast concrete panels reference the local masonry, and the curvaceous window openings offer maximum transparency into the three-story structure. The vocabulary used here speaks directly to the House of Justice project, which was completed just down the street.

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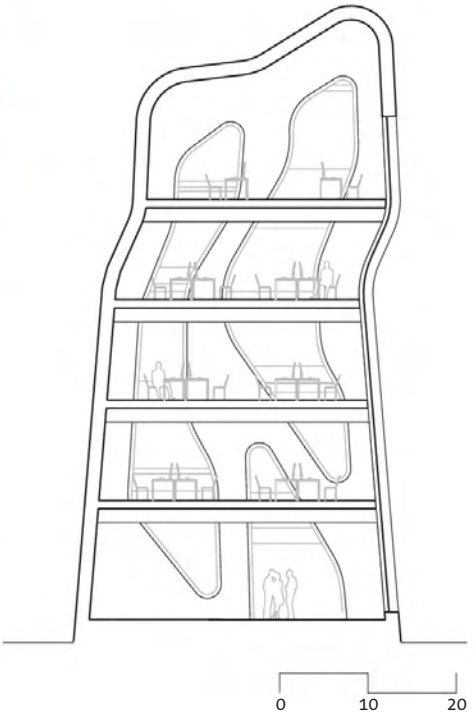
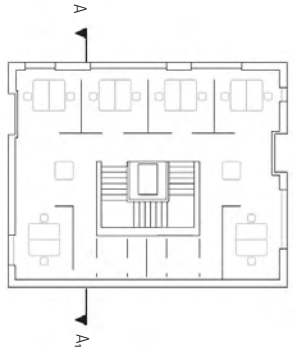
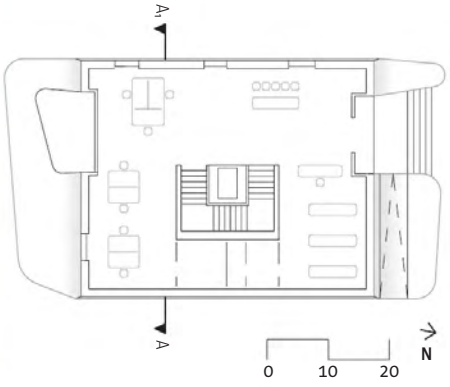


Second-Floor Plan



Ground-Floor Plan

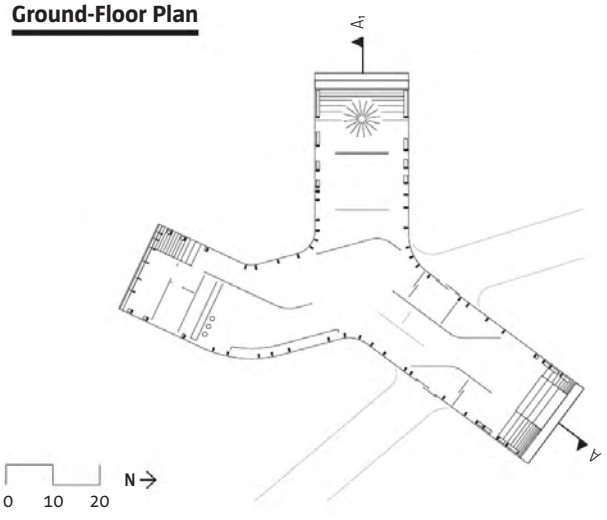


AIRPORT

MESTIA, COMPLETED 2010

"It's beautiful in Mestia," Mayer says. "It's a fantastic mountain town; a [UNESCO] World Heritage site with old stone buildings and towers—they'd hide there when other tribes came through." The small airport building designed by Mayer's office is clad partly in glass, but still, "our little airport somehow references these towers," he says. In Mayer's modern interpretation, the tower rises from one end of a tripartite, Y-shaped ground floor, which houses check-in and waiting areas and other services. The structure was designed and built within the span of three months, and is part of a concerted effort to bring more tourism to the mountain region—especially during the ski season in the winter months.

Ground-Floor Plan



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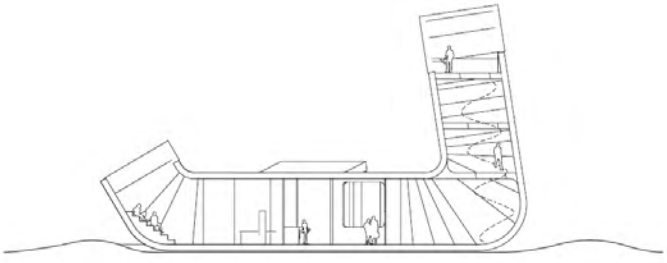
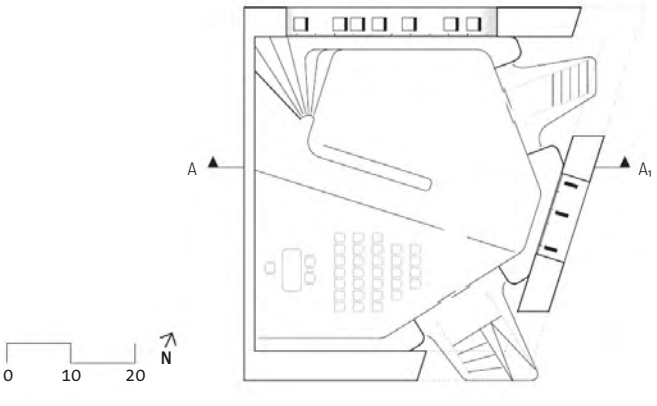


HOUSE OF JUSTICE

MESTIA, COMPLETED 2012

Located down the street from the police station, the House of Justice opened in the same year, forming the anchor of a new civic campus for the town of Mestia. Also formed from textured concrete, this time in a structural frame, the two-story House of Justice features large window openings to frame the mountain views, and to offer transparency into the workings of local government. For Mayer, the approach to the suite of projects was two-fold: "What are we, as an office, interested in doing for architecture, and what is right for the place?" he says. "I don't see each project on its own—looking back over the last four or five years, the projects are these acupunctural interventions. They are activators for certain places, and tickle or tease in certain places."

Ground-Floor Plan



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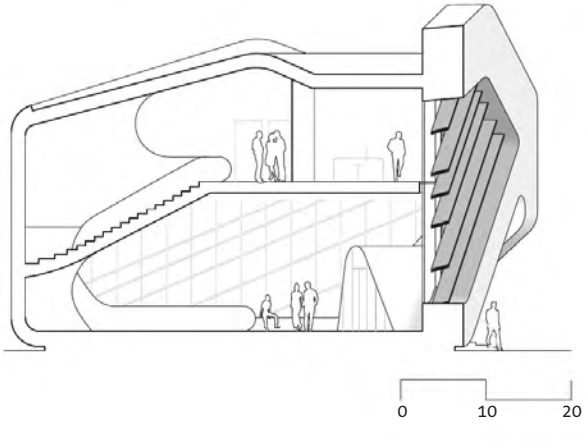



TRABZON

WISSOL AND SOCAR REST STOPS

GORI, COMPLETED 2011 AND 2012

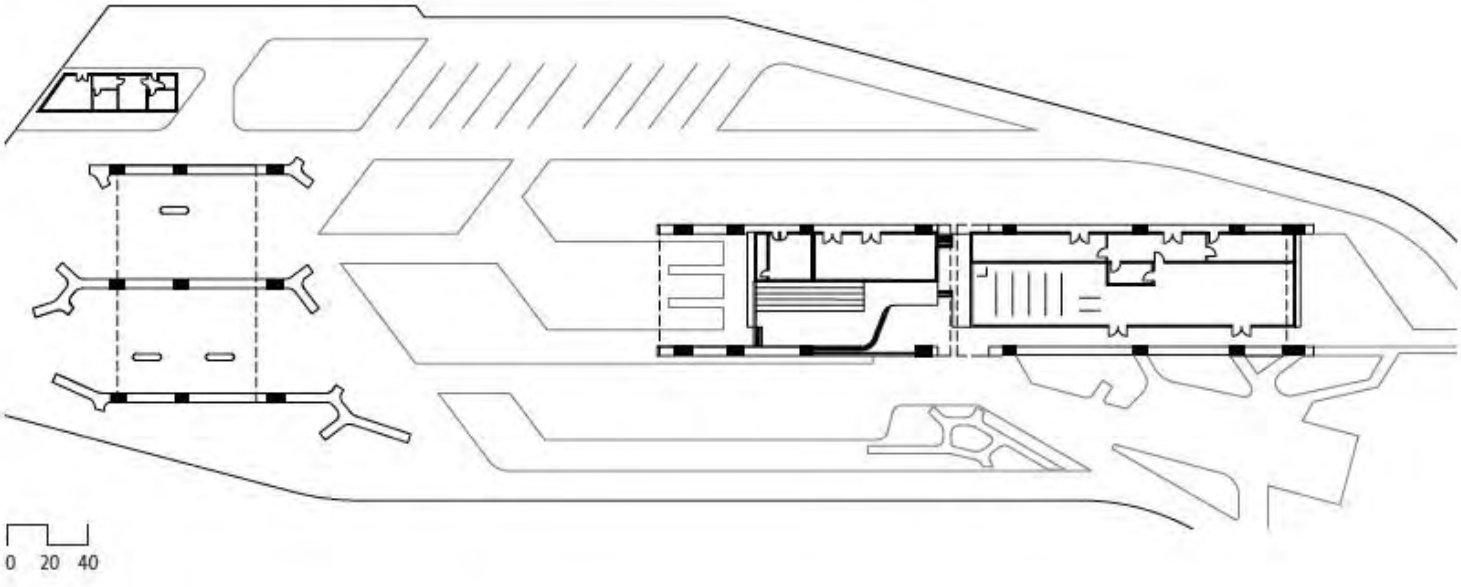
One of the most distinct features of the Georgian countryside is its gas stations: Almost all of them follow the same Soviet-era typology, a simple space-frame awning perched atop a boxy volume. With such a deeply entrenched (not to mention incredibly cheap) building mode already in place, it took a little doing to get the oil companies (such as Wissol Group and the State Oil Co. of the Azerbaijan Republic, or SOCAR) who funded the previous rest stops to see the wisdom of a new approach. "The idea was to be more specific and create unique designs for different sites in Georgia," says Mayer; it's easy to see the Gori buildings' peaks and valleys as reflections on the Caucasus ridge that surrounds them, though as in other projects, Mayer had a more nebulous analogy in mind. "We thought of them more as of driftwood sitting next to this new river," he says, "the highway, that runs through the country." Log or landscape, the two structures are intended to be part of a sequence of as many as 20 such stations throughout Georgia.

SOCAR Rest Stop

Wissol Rest Stop

SOCAR Rest Stop Typical Section

SOCAR Rest Stop Site Plan



Wissol Rest Stop

SOCAR REST STOP

LOCHINI, COMPLETED 2013

The third rest stop in the series is located outside Tbilisi and was completed earlier this year. Still following the typology of creating a sculptural awnings over the main volumes, which house gas pumps, a cashier, and a small store, this newest iteration is far lighter-toned in material and more curvaceous in form than the articulated massing of the rest stops found outside Gori. There may be regional inflections or other circumstances at play in the change in the design, but the basic vocabulary is the same, as is the overarching architectural premise: The design language of the various stations is the first step in establishing "a kit of parts" that can be made to suit any location along Georgia's highways.

WC

RAILWAY STATION

AKHALKALAKI, ESTIMATED COMPLETION 2014

It may seem strange that the train station at Akhalkalaki is as big as it is, since the southern Georgian town has a population of only about 60,000. It may seem stranger still given that the station is not, in fact, in the town at all, but a good 10-minute drive south, surrounded by nothing but high desert. But that's because the station will be a key transfer spot where trains coming from Istanbul will switch to the Russian-built tracks headed east to Baku, Azerbaijan—those trains operate on a different gauge from European ones, and so passengers will have to alight here and go through a passport check. "It's an extrusion project," Mayer says, one whose low cantilevers and emphasis on the horizontal intimate the motion of the passengers being processed from one end to the next. The feeling it imparts, as Mayer suggests, is one of "endlessness."

SEASIDE PAVILION

BATUMI, ESTIMATED COMPLETION 2014

Mayer's second pavilion in the seaside town of Batumi is currently under construction. Sited along the New Boulevard, a 2010 extension to the walkway that lines the city's beachfront, the two-story structure will be used as an event venue when it is completed next year. The petal-shaped cantilevered concrete terraces that line the perimeter were designed to offer views out over the Black Sea and over the town itself, which has been seeing a huge rise in tourism (the number of annual visitors doubled between 2006 and 2010). Some aspects of the pavilion's design, specifically on the beachfront façade, have been altered from Mayer's design, but the pavilion will still incorporate party rooms (including a rooftop venue), restrooms, a kitchen, and storage.

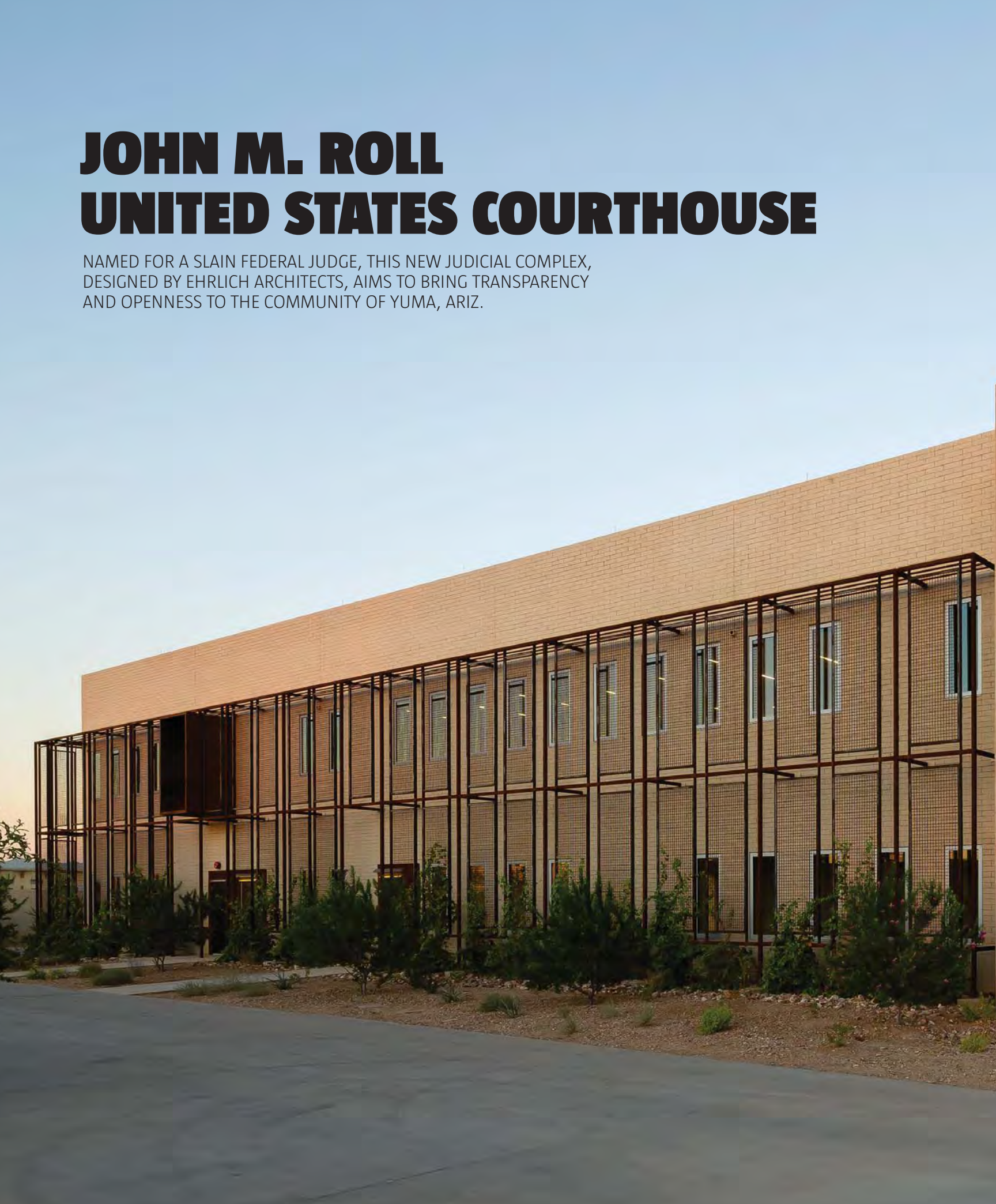
PRIVATE VILLA

NEAR TBILISI, ESTIMATED COMPLETION 2014

Saakashvili was looking to redevelop a stretch of land overlooking the capital city, right around the same time that a portion of the property was purchased by a wealthy individual as the site for a new house. When Mayer was suggested as the architect, the client was not keen on the idea. "At the beginning, the client was a little puzzled," Mayer says. As the villa nears completion, however, the client seems to be more enthusiastic—about the vast interior courtyard, the complex three-floor arrangement (accommodating three branches of the family), and the enormous, irregular apertures that give this villa sweeping views of the city, the presidential palace, and the hills beyond.

JOHN M. ROLL UNITED STATES COURTHOUSE

NAMED FOR A SLAIN FEDERAL JUDGE, THIS NEW JUDICIAL COMPLEX, DESIGNED BY EHRLICH ARCHITECTS, AIMS TO BRING TRANSPARENCY AND OPENNESS TO THE COMMUNITY OF YUMA, ARIZ.



Text by **John Gendall**
Photos by **Lawrence Anderson**

IN JANUARY, delegates from Washington, D.C., will head out to Yuma, Ariz., to cut the ribbon on the new John M. Roll United States Courthouse. This latest addition to the roster of federal buildings has become a flagship project of sorts, not only for its distinctive design, by the Culver City, Calif.–based firm Ehrlich Architects, but also because it is the last project funded through the American Recovery and Reinvestment Act (ARRA). But it has also become a commemoration, named as it is after the federal judge killed in the 2011 attack at a supermarket parking lot in Tucson that critically injured then-U.S. Representative Gabrielle Giffords (D-Ariz.).

With so many layers of significance, it is only fitting that the idea behind the design was equally nuanced: Founding principal Steven Ehrlich, FAIA, and his team set out from the start to design a project that was a contemporary translation of traditional and vernacular precedents. Inspired by so many other courthouses, the architects devised a tripartite massing strategy—a central portico flanked by two solid masonry volumes. Symmetrical and stately, the structure picks up cues from history, but its execution is undeniably contemporary in both aesthetics and technology.

In southwestern Arizona, where thermometers are accustomed to registering triple digits, protection from the sun was paramount. But, at the same time, the architects wanted to avoid sealing off the building's perimeter to create an opaque, air-conditioned box. The courthouse is a public building, after all, and as such, the team wanted to allow for lines of sight between inside and outside, inviting the public in via visual transparency. Not to mention, for the sake of those people spending full days inside the courthouse, they wanted interior spaces to have access to natural light. Their design task, then, was to balance the solid with the permeable.

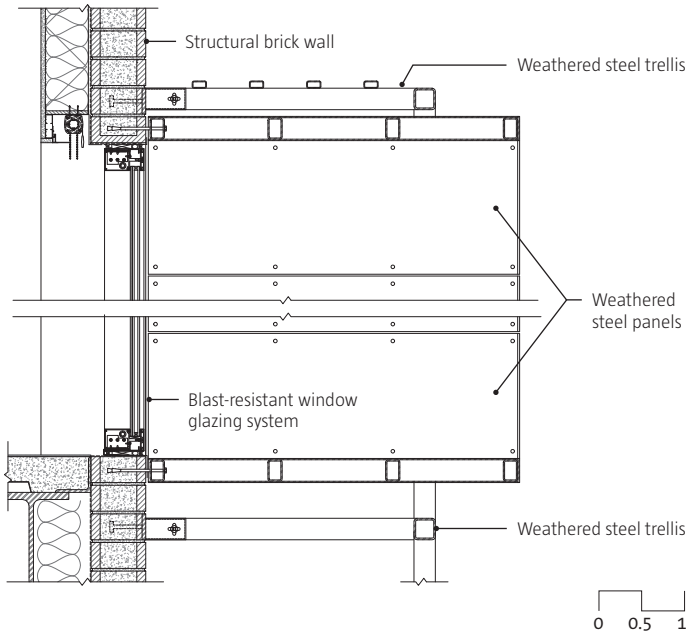
Previous spread: The John M. Roll U.S. Courthouse marries contemporary design with historic precedent in its masonry exterior, formed in part with buff-colored brick from Interstate Brick. **Above:** The glazed curtainwall at the center of the largely sandstone tripartite south façade is from Arcadia Group, and allows daylight to penetrate into the lobby. **Opposite:** The public plaza, set in a landscaped arroyo, is shielded by a canopy formed from photovoltaic panels.

A–A₁ Section

1. Front entry
2. Lobby
3. Courtroom
4. U.S. Marshals Service
5. Mechanical
6. U.S. Marshals Service parking

Top: A weathered steel trellis provides a framework for fast-growing vines that will shade the windows on the east and west façades, minimizing heat gain.
Above: The north façade, which faces train tracks, is more austere: It holds the prisoner entrance and shields the maximum security detention areas.

Wall Section



On the most public elevation, the south-facing façade along Yuma's First Street, the architects included an expansive double-height glass curtainwall. "The transparent wall contrasts with the solidity of the walls around it," Ehrlich says, "and it expresses the openness of our democracy."

But, in the desert, transparency also means solar heat gain, so the architects had to design a way out of that problem. They did so by including a canopy to shade the curtainwall, and this both prevents the sun from hitting the interior lobby and provides dappled shade across the entrance plaza outside. "In this climate, people need shade, and this plaza will provide shaded public space," Ehrlich says. The canopy is formed from a series of photovoltaic panels, which provide more than 20 percent of the building's energy. "It's a technical device, but, really, we're making shade," he adds.

This approach, marrying technology with place-based vernacular traditions, is a trademark of Ehrlich Architects. Back in 1969, right after graduating from Rensselaer Polytechnic Institute in Troy, N.Y., Ehrlich decamped to Morocco after joining the Peace Corps. "I spent six years living in desert climates," he says. "I understand the need to be protected from the sun."

On the east and west façades, punched openings in deep wall recesses let natural light into the interior. But here, as with the canopy, the architects modulate the light to cut down on heat gain and glare. A weathered steel trellis is mounted 3 feet from the building envelope, and will support vines that, once they grow in, will provide a screen against the harsh sunlight. Even deep within the building, in the two courtrooms, daylight is brought inside—in this case, through clerestory strips that are equipped with automated shades.

But the broad public plaza and steel trellis do more than just provide shade: As a federal building, the design must consider blast protections. With that in mind, the steel trellis protects the windows while the plaza provides the mandated 50-foot blast perimeter. The architects defined this perimeter using the plaza's retaining walls and benches as subtle security barriers.

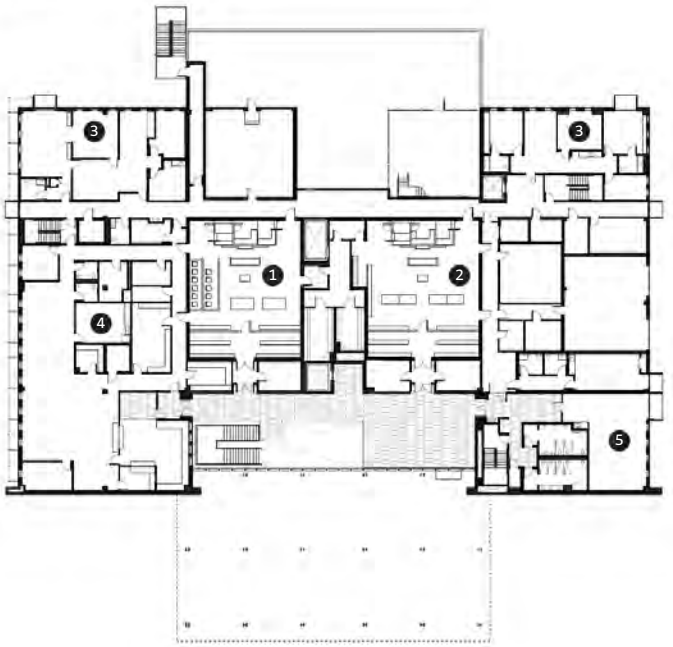
Yuma sees a paltry 3 inches of rain each year, but when that comes, it typically falls in brief, intense storms, which tend to result in flash floods. Working with Ten Eyck Landscape Architects, a Phoenix, Ariz., and Austin, Texas–based firm, the architects developed a site strategy that would work with this desert climate. The front plaza is, in fact, a bridge-in-disguise, spanning a xeriscaped landscape below. Acting like a desert arroyo, this sunken garden can flood without causing damage to the building or plaza; it captures rainfall and lets it percolate back into the ground.

The project negotiates not only these climatic complexities, but programmatic challenges as well. As a federal courthouse, it is meant to engage with the public life of the city around it, but it also needs to accommodate privacy and security. Ehrlich Architects designed distinct circulation routes through the 60,000-square-foot building as a way to parse out these programmatic needs.

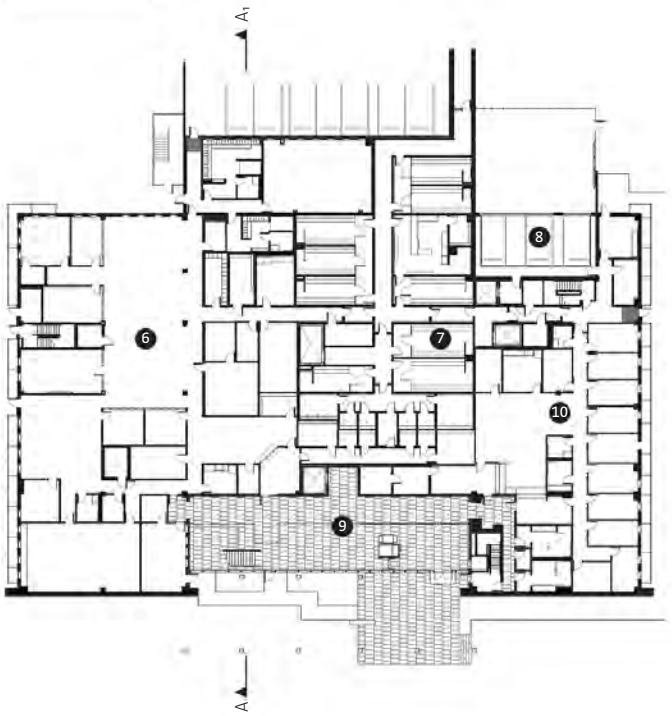
"The circulation works with intuitive wayfinding," says Ehrlich Architects principal Patricia Rhee, AIA. Detainees are brought into the building through the rear, northern side of the courthouse, adjacent to the facility's maximum-security area. On the southern, public side, the open lobby links with a pre-trial services office and a second-floor waiting area. Subtle cues orient visitors: Walls in the east–west direction, for example, are finished with a buff-colored sandstone, while those in the north–south direction have a reddish hue.

Carried out as a design/build project, with Phoenix-based Sundt Construction, and as part of the ARRA, the courthouse went from commission to completion in just shy of three years. This timeline included a rigorous peer review process as part of the U.S. General Services Administration's Design Excellence Program. But when all is said and done, and as people begin to gather on the benches on the front plaza, the project's success will speak for itself. "We wanted to develop a project that would give something back to the community," Ehrlich says.

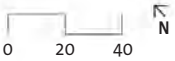
Second-Floor Plan



First-Floor Plan



1. Jury courtroom
2. Multidefendant courtroom
3. Judges' chambers
4. District clerk offices
5. Jury suite
6. U.S. Marshals Service
7. Maximum security
8. Judges' parking
9. Lobby
10. Probation offices



Right: The double-height lobby provides a public gathering place for visitors to the courthouse. Furnishings by Herman Miller accommodate people waiting to attend trials and hearings.
Above: The courtrooms receive natural light through clerestory windows, which can be shielded by automated blinds. Ceiling panels from Architectural Components Group modulate the acoustics.

CAYAN TOWER

THE ARTISTRY OF THE WORLD'S TALLEST TWISTING TOWER, DESIGNED BY SKIDMORE, OWINGS & MERRILL FOR DUBAI, IS ENABLED BY SOMETHING THAT FEW PEOPLE WILL EVER SEE: THE STRUCTURE.

Text by **Gideon Fink Shapiro**
Photos by **Tim Griffith**

THE WORLD'S TALLEST twisting tower—the 75-story, 1,010-foot-tall Cayan Tower in Dubai, which rotates a full 90 degrees from base to top—is a monument to rational thought in the service of art and commerce. Rational thought, because the architects and engineers at Skidmore, Owings & Merrill (SOM) worked systematically to construct the building with regular components and repeating floor plans. Art, because the building presents itself as a freestanding sculpture visible from across the Dubai Marina. And commerce, because the greatest virtue of repeating floor plans is that they streamline the process of selling the building's 495 condominium apartment units, which range from studios to four-bedroom duplexes.

Some other recent twisting skyscrapers, such as MAD Architects' Absolute Towers outside Toronto, rely on a conventional (non-twisting) column grid to support the rotated floor plates, resulting in sometimes awkward column locations and a welter of differing plans. But SOM's client, Cayan Investment and Developers, did not want to give up the economies of standard interior layouts and unitized curtainwall construction. No columns in funny locations, no irregular façade openings allowed. The tradeoff, however, was greater complexity in the structural design.

Each floor rotates 1.2 degrees around a cylindrical elevator and service core, which consulting partner George Efstathiou, FAIA, likens to a vertical "spindle" at the building's center. In order to keep the interior layouts consistent, the SOM team—led by design director Ross Wimer, FAIA, who recently left the firm—looked at several ways to rotate the reinforced-concrete structural columns of the Cayan Tower in tandem with the floor slabs. One option was to make all of the columns tilt and twist—like spiraling lines on a giant barber pole. That option was rejected, explains SOM's structural engineering partner William Baker, because, over time, it would have made the structure vulnerable to damage from additional twisting by gravity, known as "secondary twist." The other problem was that, "you can't have sloping columns and have mass-produced wall panels," Efstathiou says.

The team's solution was to differentiate between columns leaning to the side and leaning forward or back, relative to any given elevation

Previous spread: One of the main reasons for Cayan Tower's iconic twist was to maximize residents' views across the Dubai Marina and the nearby Palm Island. This image: The twist also creates a variable silhouette. From one angle, the tower appears hourglass-shaped, from another, the middle floors appear to bow outward.

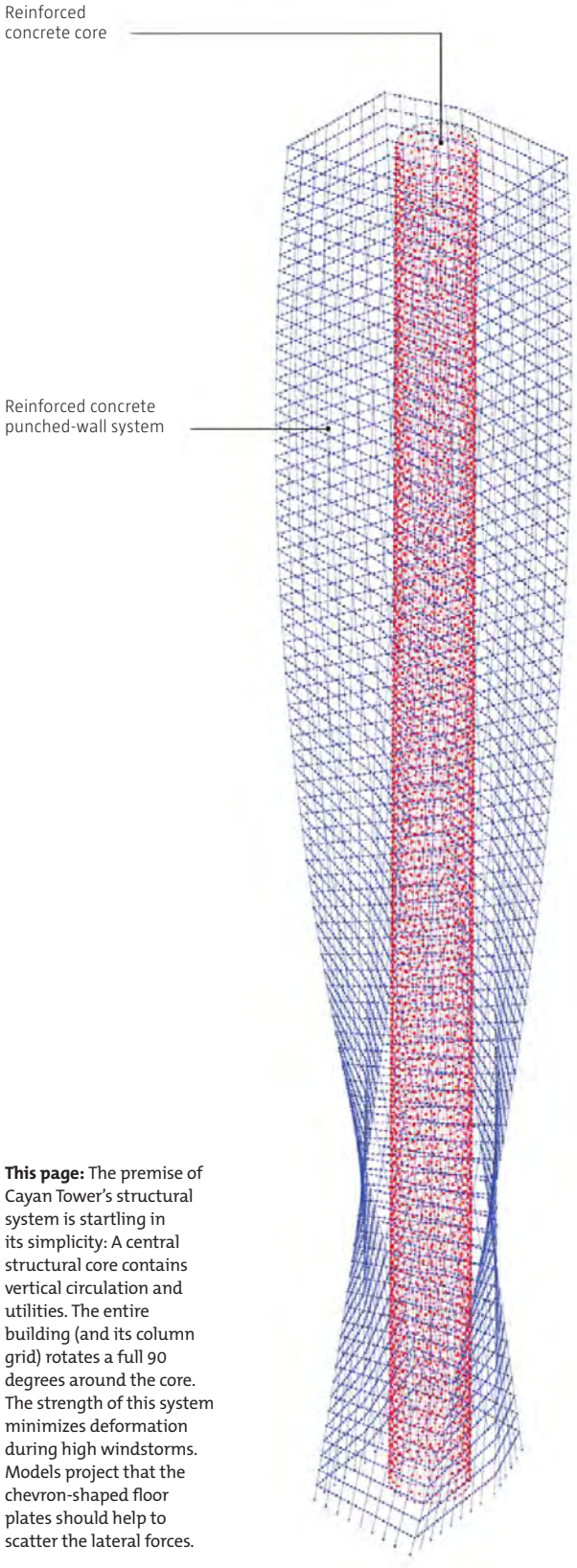
of the building. By eliminating sideways incline in all but the building's internal columns and corners, they gained greater stability and rectangular façade bays. The roughly 3,000 perimeter columns stand perfectly vertical—when seen from the front or back, that is—and "step" between 12 and 14 inches to the side with every floor level. The stepped columns transfer their load through a concrete slab that works like a pile cap. Seen in side elevation, however, the perimeter columns lean forward or back by as much as 10 degrees to meet the shifted floor slabs above and below. The width, angle, and spacing of columns looks the same from floor to floor, even as the floors themselves shift slowly, as they progress higher, around a quarter circle. In fact, the same formwork was used for the columns on each level, with only slight modifications to account for diminishing load toward the top. Such economy of means defines the tower's design and engineering, which, given its unusual structural needs, became an epic exercise in "simplifying complexity," Baker says.

The structure's movements were monitored before, during, and after construction to ensure that they stayed within expected limits, since the secondary twist problem was much reduced, but not eliminated, in the final design. Baker says that the Cayan Tower's wind performance will be at least as good as that of a comparably high, non-twisting tower. In fact, wind-tunnel tests predicted that the tower's twisting profile would scatter the flow of wind around it, reducing its sway during desert windstorms.

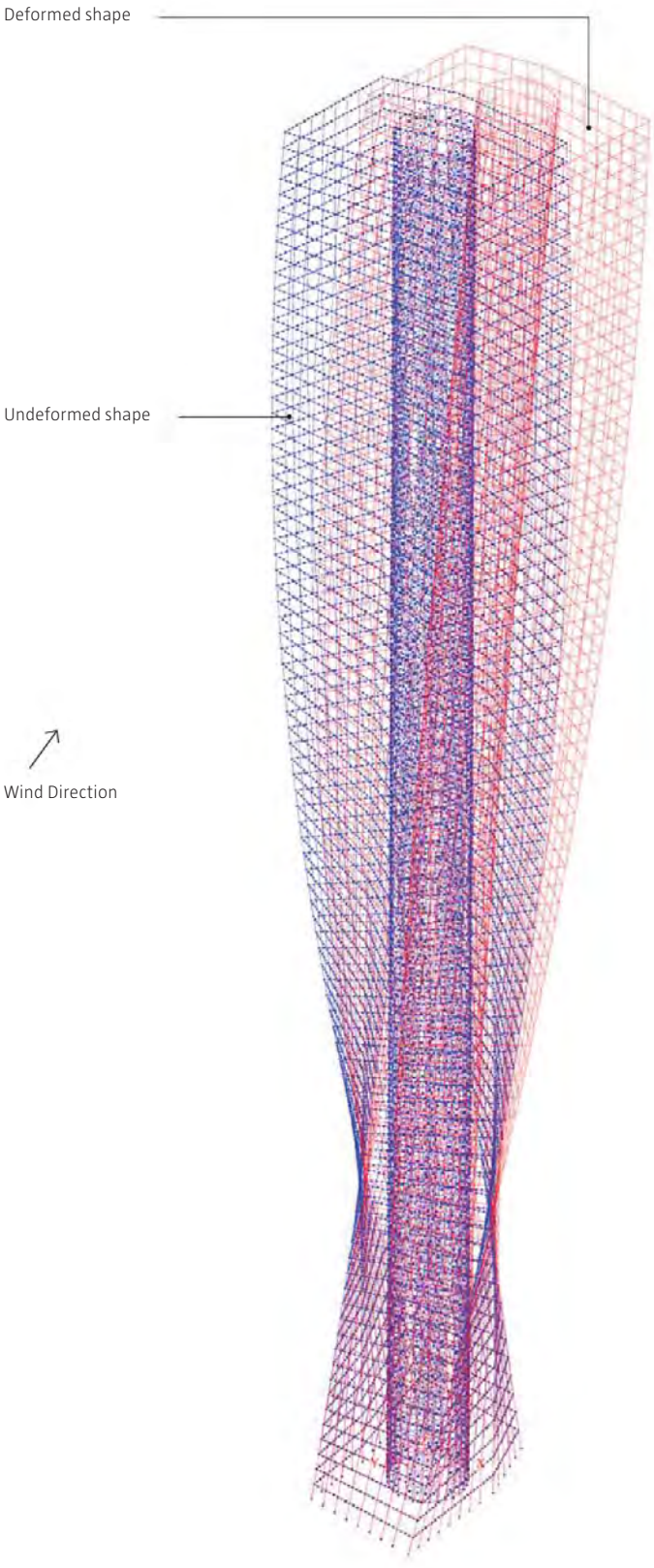
The tower's rotation also created a plumbing challenge for the M/E/P engineers Khatib & Alami (also the project's architect-of-record). How to organize the plumbing system when the bathrooms and kitchen keep moving? Water and sewer pipes run from each apartment to the outer ring of the building's central core, then run vertically down the few paths not obstructed by ever-shifting apartment doors.

Look closely, and you'll see that two sides of the Cayan Tower are subtly inflected, so that each floor plan reads not as a pure rectangle but as a faintly chevron-shaped hexagon. "There is a little bit of a kink put in just for architectural interest," Efstathiou explains, adding that the indents

Structural Concept Diagram



Wind Deflection Diagram



This page: The premise of Cayan Tower's structural system is startling in its simplicity: A central structural core contains vertical circulation and utilities. The entire building (and its column grid) rotates a full 90 degrees around the core. The strength of this system minimizes deformation during high windstorms. Models project that the chevron-shaped floor plates should help to scatter the lateral forces.

Diagram of Floor Plate Rotation From 18° North – 35° North

Apartment Configurations and Section

Type VI: Penthouse

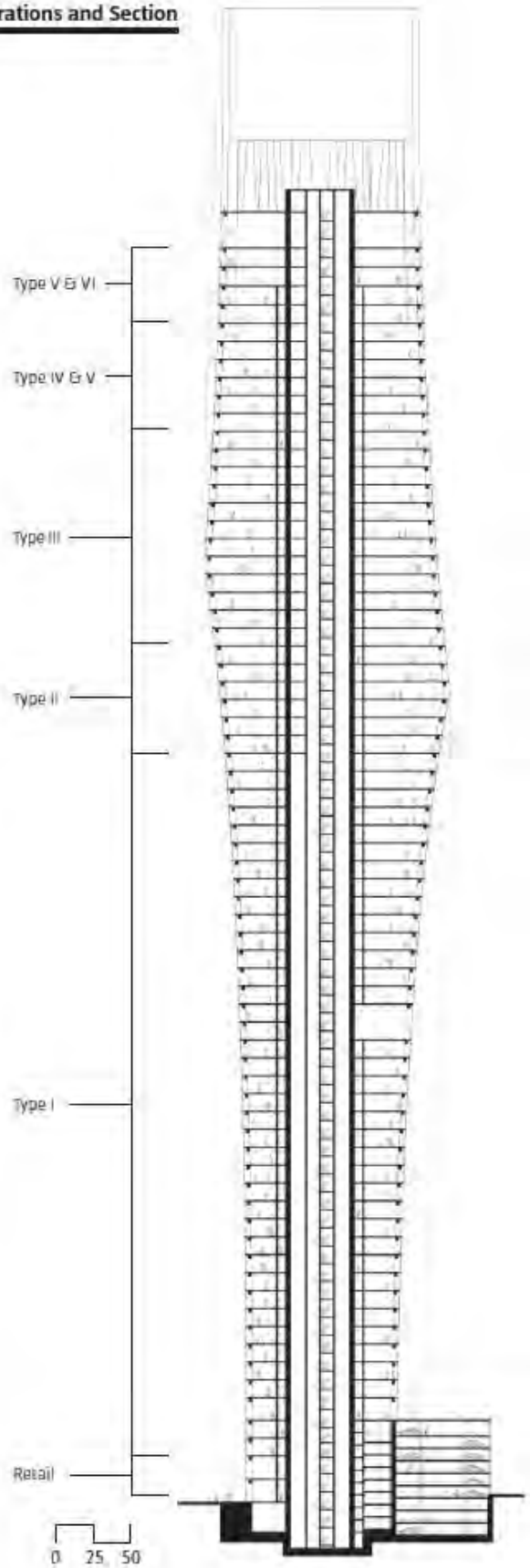
Type V: Penthouse

Type IV: Four-bedroom units

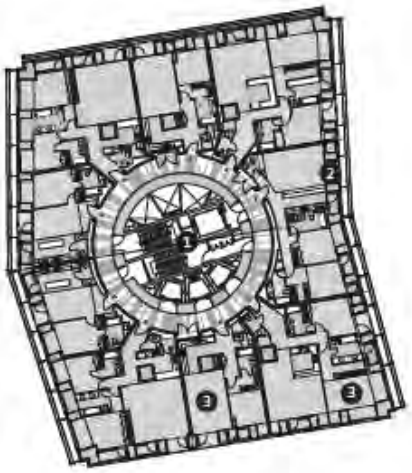
Type III: Two- and three-bedroom duplex units

Type II: Three-bedroom units

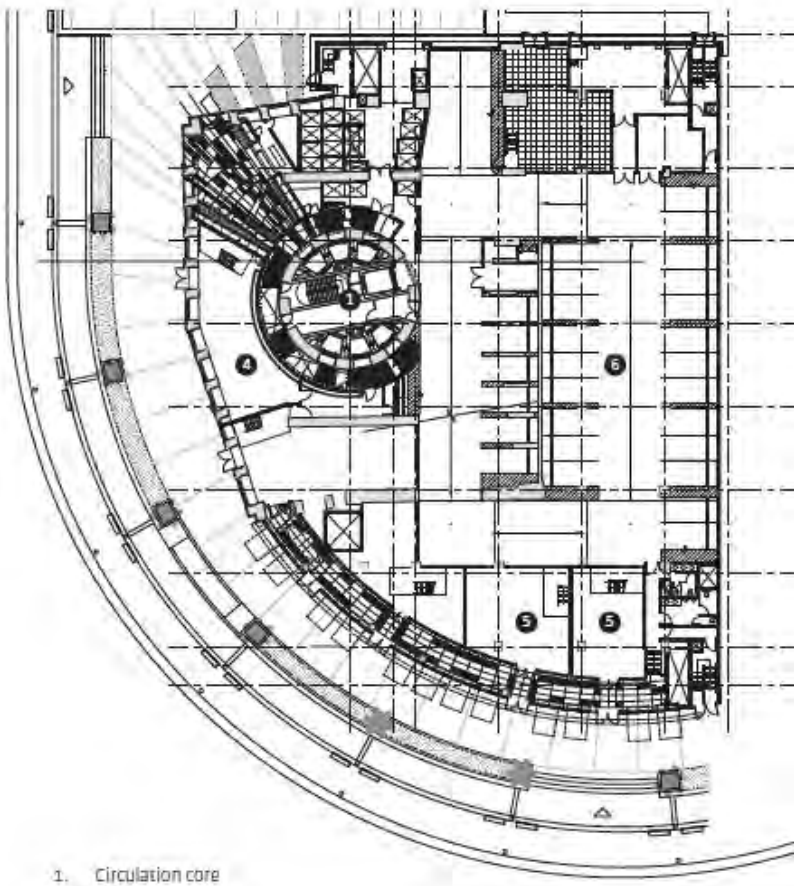
Type I: Studio, one- and two-bedroom units



Typical Type I Floor Plan



Site Plan



1. Circulation core
2. Balcony
3. Residential units
4. Tower lobby
5. Retail
6. Parking

0 16 32 N

Curtainwall Detail Rendering

enhance the apparent slenderness of the building from afar. The tower's contours seem to taper and swell depending on the angle from which it is viewed. From head-on, it displays a torquing bulge in the middle; seen from an oblique angle, the building takes the form of an hourglass.

There is nothing particularly innovative about the tower's glass-and-aluminum curtainwall system—but perhaps that is the point, since the use of standardized, rectangular components (measuring roughly 82 by 124 inches each) is an achievement in itself. Some of the relatively transparent low-E glass is veiled by perforated aluminum screens. These one-story-high, silver-painted panels stand 4 inches off the glass, come in two widths, and are 30 to 60 percent open. Taking a cue from traditional Arabic *mashrabiya* latticework, they defray the desert sun and give a nod to regional customs of privacy. However, the screens have been so thoroughly value-engineered since SOM won the 2005 competition—for what was originally called the "Infinity Tower"—that they little resemble the dancing pattern of solids and voids from the early drawings.

Still, the undistinguished surface qualities of the Cayan Tower are secondary to its powerful geometric presence, a mighty twisting prism. The purity of the building's sculptural profile is all the more striking when you consider that it has hundreds of balconies—all tucked stealthily into the recesses created by pulling the curtainwall back from the outer screens. Just another example of the hidden design work required in a project that began by twisting the rational, and ended by rationalizing the twist.

Opposite: The floor plates are not the only things that were optimized for regularity—because the floor plates are rectilinear, the curtainwall system was able to be unitized into repeatable modules over much of the 75-story building. This image: By the time the tower officially was opened in June, 80 percent of the units had reportedly been sold, though interior fit-outs were still in progress.

THE YALE HEALTH CENTER

MACK SCOGIN AND MERRILL ELAM OF ATLANTA DISCUSS THEIR NEW HEALTH SERVICES BUILDING AT YALE UNIVERSITY IN NEW HAVEN, CONN., AND THE INFLUENCES THAT SHAPED IT.

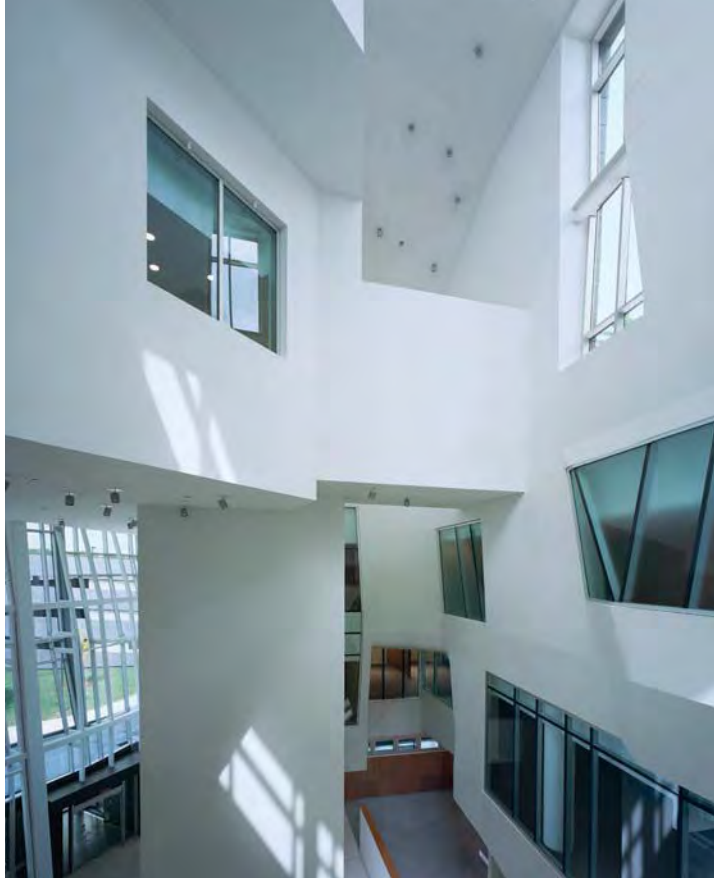
Interview by **Katie Gerfen**
Photos by **Timothy Hursley**

How did this project develop? Didn't it start as a planning exercise?
Mack Scogin, AIA: The project was a design competition for the site plan for this building. Yale gave us the site, a building program, and talked about their aspirations in terms of the site's location to the rest of the university—and that's about it. Right off the bat, it was obvious why they were concerned about the site—it was fairly small for the program. They wanted to build a health services building and substantial parking deck, and one of the stated goals was for the site to be a gateway when moving from east to west on the campus. But the site was also in the middle of two green spaces that would never change: a public park and a cemetery.

So you were really bounded by these green spaces.
Scogin: Yes. The site is an odd shape—when you put the parking garage on there, it became more of a triangle than anything else. So we understood why they were going through the site planning process, but there was a little bit of mystery because they seemed to have completely dedicated themselves to using this site in what seemed like a very odd spot at the back of the university. Once we got into it, we realized that in the near future, it will be almost at the center of the university, as Yale develops the eastern part of the campus. I think we probably were the only ones that went ahead and let the site be controlled by this geometry, and it led to a very odd shape for the building.

The Yale campus has such a strong architectural identity. How did you work with the context, but also put your own stamp on it?
Merrill Elam, AIA: I think we did that through the whole idea of the planning, using the inner space of the site. The tradition at Yale is to go from

Previous spread: The Yale Health Center is clad in courses of dark gray brick from Endicott Clay Products, a long-time collaborator on Scogin and Elam's projects. **This image:** The interior is composed of light-toned spaces, like this lobby atrium with its National Gypsum walls coated in paint by Sherwin-Williams. **Opposite left:** Pathways and corridors lead to various medical departments. **Opposite right:** Inpatient rooms for acute cases occupy the top floor.



the street, through a passageway, into an open area. Bringing the public circulation into the interior of the site, between this parking deck and the building itself, is a play on that idea, even if it's not a direct correspondence.

How did the form of the building develop?
Scogin: The aesthetic of the building is related to our observation of this place being about the human body and human frailty. It also didn't escape us that we were next to the cemetery—even the inpatient care rooms overlook the cemetery—and that side of the building has the most radical form to it. And you can read it as something that's being put together, or you can read it as something that is falling apart, which I think is a trait of the human condition. You never know if you're falling apart or coming together—basically, diapers to diapers, as they say.

A hallmark of your work has always been the exploration of materiality on the skin of your projects. How did design of the brick develop here?
Elam: In all of our drawings, we were using a series of horizontal lines to give some continuity across the façade, to hold it together—the structural idea of the horizontal line. And then, in order to get a scale that was meaningful in terms of the overall size of the building, we used bull-nosed brick alternating with flat brick, so that it would create another whole scale.
Scogin: It's fair to say, though, if you're really honest about it, that we've spent our whole careers trying to do architecture with no budget. We never had big-budget projects. This building had a pretty big budget, but it's a health building—a lot of it was spent on equipment. We spent almost 20 years doing nothing but really utilitarian architecture, and trying to make something out of it. The only thing we had to play with was that last layer. We couldn't play with form, that was a direct result of "form follows function."
Elam: The industrial engineer would hand us the plan!
Scogin: It was always a box; we did everything in the world that you could think of to try to make some kind of architecture. We never talked about materiality until the last minute—every model we made was white on white. It drove our clients nuts. One said, "No more fucking blank models."
Elam: But I think we are always searching for a solution that is specific to the project. Even when an idea may carry over from an earlier design process, it becomes different in terms of size, shape, and technical detail. It's just an abiding interest we've had for years.

You mentioned that there is a lot going on at this site. What were you contending with, programatically, with this project?
Scogin: There are 350 rooms—well, that's how many doors were on the door schedule—which is an enormous number for this site. The building contains all of the campus health services. You have doctors that represent all the different disciplines, and everybody goes to this service center, not just students—faculty, staff, family, people that have retired from Yale—so you get, essentially, everything that you find in a hospital. All the departments are in this building: eyes, ears, noses, unmentionable parts ... everything.
Elam: It's like a Whitman's sampler.

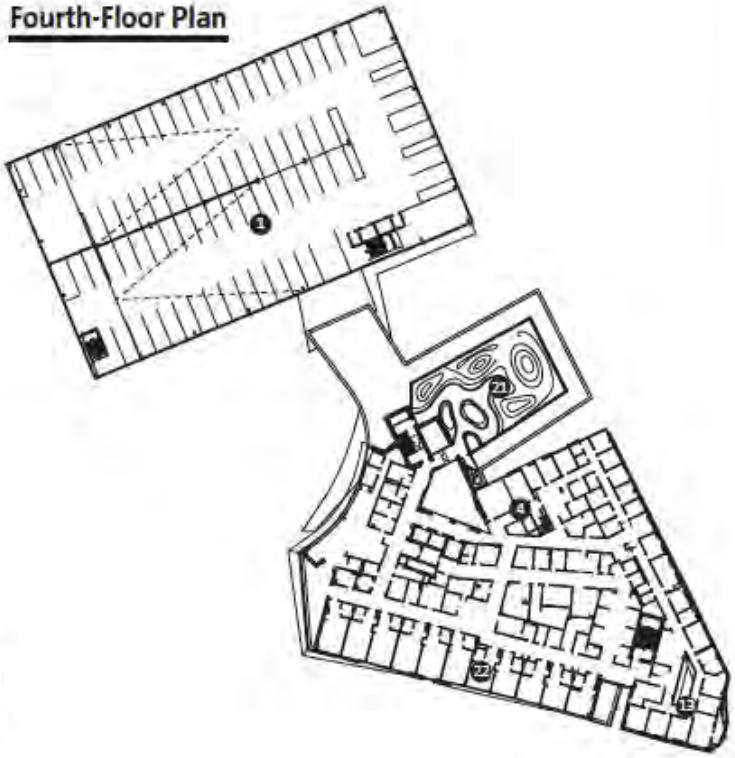
The dark exterior masonry is complemented by glass from Viracon and Oldcastle BuildingEnvelope.

Lower-Level Plan

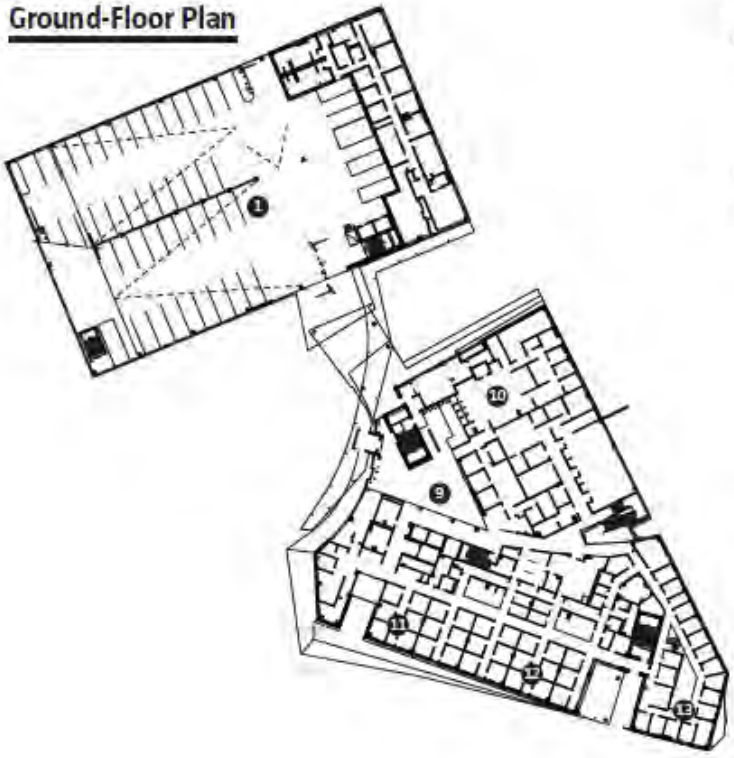
1. Parking
2. Loading dock
3. Ophthalmology
4. Administrative
5. Lab
6. Electrical
7. Mechanical
8. Radiology
9. Lobby
10. Pharmacy
11. Urgent care
12. Internal medicine
13. Offices
14. Physical therapy
15. Medical/surgical specialties
16. OB/GYN
17. Mental hygiene
18. Pediatrics
19. Student medicine
20. Call center/claims
21. Healing garden
22. Inpatient care

Third-Floor Plan

Fourth-Floor Plan



Ground-Floor Plan



Second-Floor Plan

This image: Public circulation paths, lined with pavers from Hanover Architectural Products, move through and around the structure, allowing it to act as a gateway to a new section of campus.
Opposite page: Each elevation responds to site conditions, resulting in a widely varied overall appearance.

With all of those departments, how did you choreograph the interior?
Scogin: It may look like there's a repetitive plan on several floors but there's actually not—there is no coordination between each floor, medically. We've privileged the patients, but we also privileged the doctors by giving them the best perimeter spaces in the building. What that allowed us to do is to separate out the departments, such that the closer you get to where you are going, the more private it becomes. That's a pretty big thing in a facility where you've got this awkward cultural ogling of people who know each other, coming in together at reception. The issue that is sensitive to most people is that when they are going to the doctor, they're not really keen on talking to people.

The bright interior spaces really contrast with the dark exterior.
Scogin: We're kind of anti-atrium architects, but we designed a large collective area when you come into the building. This brings light in right to the center. The most important thing for us was that if you work in that building, and more so if you are a patient, the minute you step in the door you feel like you're in a really beautiful, bright, reassuring, soft building—that you feel uplifted. There are very few signals that it is a institution—it's bright and filled with light—and the optimal way to achieve that was actually disassociating the exterior of the building from the interior, in terms of color and finish. The bottom line is that it's a very humane building. At first, you may not think so, because of its aggressiveness and weirdness on the outside, but it's incredibly peaceful on the inside.

THE ARC

IN DESIGNING A RIVERSIDE MÉDIATHÈQUE IN SOUTH KOREA, HANI RASHID AND LISE ANNE COUTURE OF ASYMPTOTE CREATED AN IMMERSIVE HIGH-TECH CELEBRATION OF THE VERY ANALOG LANDSCAPE.

Text by **Caia Hagel**
Photos by **Wan Soon Park**

IN FOLLOWING WITH its mission statement, which says "the architecture is the exhibition, the exhibition is the architecture," the River Culture Pavilion (or ARC) is a stunning silver-skinned ovaloid that seems to rise out of the semi-rural South Korean landscape on the outskirts of Daegu, a city of 2.5 million.

"We were inspired to make a statement about the power and beauty of the landscape, the light and water, the mountains, the stones," Asymptote principal Hani Rashid says of this cultural pavilion, commissioned by the local water board in celebration of its $18 billion Four Major Rivers restoration project. "This is a client who is not inherently interested in art but became euphoric about the building because of how it inspires an understanding of the powerful forces of nature," he says.

The ETFE-cushioned exterior reflects a hazy image of the adjacent trees and Nakdong and Guemho rivers in its complex four-layer quilts, and mountains and clouds reflect in shallow pools on the rooftop and at the base of the ARC. Inside, the natural gives way to an immersive media experience. Equipped on its main floor with a 360-degree video wall—where abstractions of the exterior landscape are projected from 32 high-resolution projectors—the ARC's design pushes for a potentially transformative visitor experience. The digitized images of water falling, gushing, and eroding are amplified by sound, light, and information, and they progress around the circle at the same speed as visitors walk. "I've always believed that architecture could have a deeper effect than that of merely occupying a space—like art, like music, we can be moved by a building," Rashid says.

The design of the interior pursues this agenda. Throughout—on mezzanines, the spiraling staircase, and in the high-ceilinged open spaces—the immersive virtual landscape pervades. "We have moved beyond the advent of technology as cold and hard into the idea of technology as a warm communal experience," Rashid says. "We wanted the ARC to reflect that, and to be a place that interacts emotionally with its visitors."

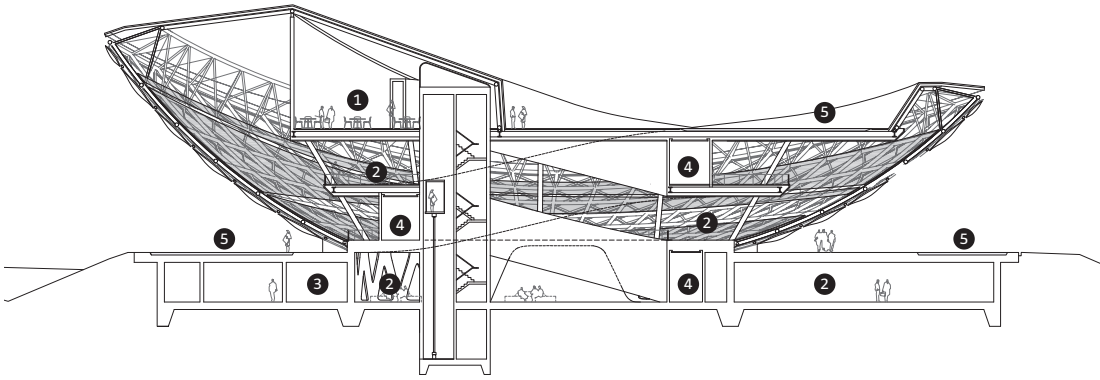
Previous spread: The quilted cladding lining the underbelly of the ARC is an ETFE pneumatic cushion system. This façade system is lightweight, exerting minimal load on the pavilion's steel structure. It also maintains a weathertight enclosure and provides a high-performance building skin with a high insulation value.

Top left: The unique "bowl" shape of the ARC provides consistent self-shading to much of the building's exterior envelope, helping to reduce thermal gain. The form also has the benefit of allowing the bulk of the building's form to be reflected in the shallow pool on the plinth below—that pool is echoed in a similar feature on the rooftop deck.

Left: The building's exposed faces use standard, cost-effective insulation techniques, such as rigid or sprayed insulation. But these are aided by pneumatic chambers within the ETFE cushions, which control the transmission of heat through the façade. Multiple chambers within each cushion prevent the transfer of heat through convection cycles that normally reduce the insulation value of standard ETFE cushions. Asymptote designed the cushions with a printed pattern on each ETFE layer—black dots on the surface and gray on the inner two—which produces a moiré effect across the surface.

Above: The exterior ETFE cushions are lit both from within as well as by fixtures around the building perimeter, giving the pavilion a bright, color-changing appearance in the landscape. Above the ETFE, lines in fiber-reinforced plastic-panel roof surfaces glow at night, highlighting the architecture's elegant curves and sinuous geometry. "The ARC was a test of our abilities," Rashid says. "We tested proof of concept, technologies, multi-office components, and could be pure about design because we were not being asked to include a hotel or a shopping mall – we focused entirely on creating a discreet, artistically relevant asymmetrical spherical elliptical ovaloid as a pure architectural expression."

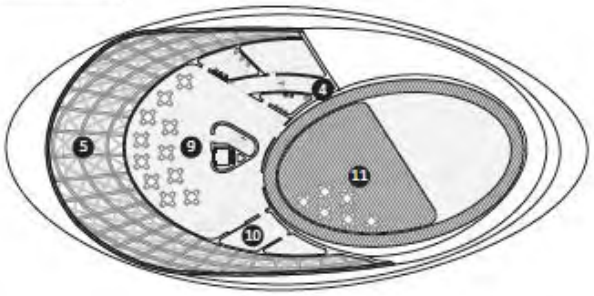
A–A$_1$ Section



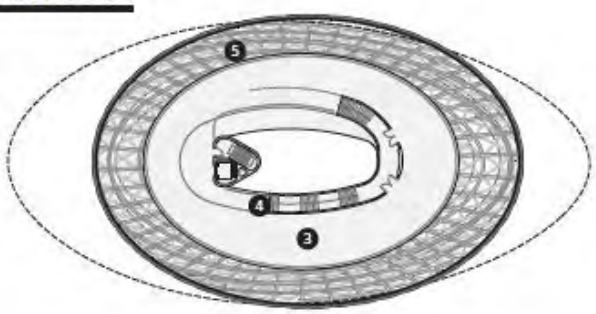
1. Café
2. Exhibition
3. Bookstore
4. Stair
5. Pool

The main exhibition floor's sweeping interior walls host large-scale digital projections, and the open stair that cuts through the space gives visitors different vantage points for viewing the animated multimedia events. Images cascade across streamlined exhibition screens, and are paired with matching auditory environments. The themes for the displays have their roots in the Four Rivers Project, where themes of "happiness," "culture," "economy," and "ecology" distinguish the different sections of the project. "One of the questions we asked ourselves in conceptualizing the ARC was 'How do we offer an architectural entity that meets the expectations of today's technology?'" Rashid says. "Our solution was to load the structure with absolute technological potential in order to allow it to be a canvas that both communicates with and reacts to its occupants in a way that reflects the human condition."

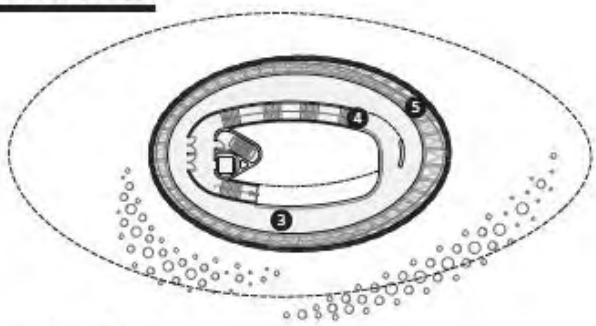
Roof-Level Plan



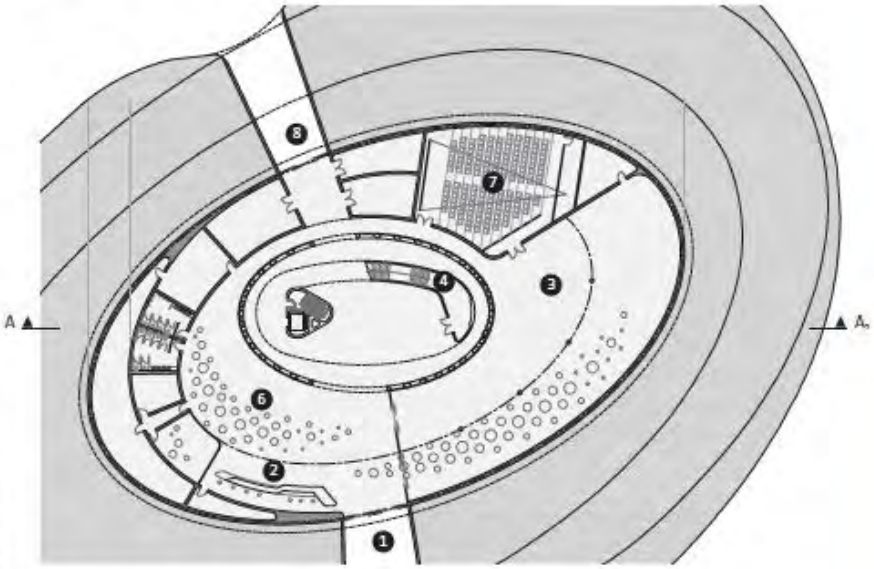
Third-Floor Plan



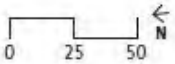
Second-Floor Plan



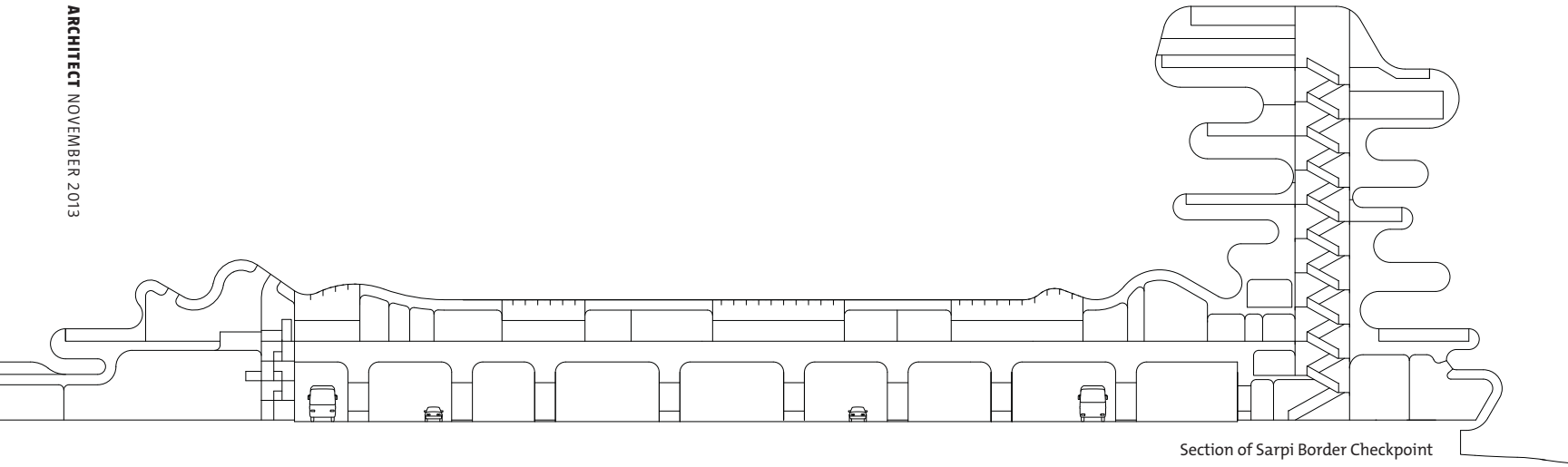
Ground-Floor Plan



1. Entrance
2. Ticketing
3. Exhibition
4. Stair
5. Projection wall
6. Book store
7. Lecture hall
8. Exit
9. Café
10. Kitchen
11. Roof deck



The visitor's experience of the ARC begins at the entry, where reception and ticketing are located. From there, the visitor takes an elevator to the top level, to visit the Pavilion Restaurant and roof deck, with its panoramic views. The main circulation path then descends along a trussed stair that cuts through the multistory rotunda, giving access to the multimedia galleries, and then to the ground floor. Visitors can wander through the large exhibition hall, browse in the bookstore, and finally exit into the landscape to view the merging of the Nakdong and Guemho rivers. Throughout the interior, lighting is provided by skylights, strip lighting along the edges of the floor plate and along the spiraling circulation stair, and light from the projectors reflected off the projection screens. In combination, these sources of illumination create an ambient atmosphere with medium-to-low-level lighting optimized for viewing the projections. Brighter task lighting for viewing nonprojected, physical exhibitions on the ground floor also filters into the rotunda.



Section of Sarpi Border Checkpoint

Georgia Portfolio, by J. Mayer H. Architects, Page 148

Project Café and Pavilion, Batumi, Georgia
Client Government of Autonomous Republic of Adjara
Architect J. Mayer H. Architects, Berlin—Jürgen Mayer H., Christoph Emenlauer
Cost Withheld

Project Sarpi Border Checkpoint, Sarpi, Georgia
Client Ministry of Finance of Georgia
Architect J. Mayer H. Architects, Berlin—Jürgen Mayer H., Jesko Malkolm Johnsson-Zahn, Christoph Emenlauer
Local Architect Beka Pkhakadze, Ucha Tsotseria
Building Company Transmsheni
Structural Engineering LTD BWC, Nodar Edisherashvili (tower)
HVAC LTD Ecocomfort
Size 4,443 square meters (47,824 square feet)
Cost $10.9 million

Project Pier Sculpture, Lazika, Georgia
Client State Construction Co.
Architect J. Mayer H. Architects, Berlin—Jürgen Mayer H., Paul Angelier, Hugo Reis, Mehrdad Mashaie
Structural Concept Knippers Helbig Advanced Engineering
Construction Metal Yapi
Cost Withheld

Project Mestia Police Station, Mestia, Georgia
Client Ministry of Internal Affairs of Georgia
Architect J. Mayer H. Architects, Berlin—Jürgen Mayer H., Christoph Emenlauer, Hugo Reis, Danny te Kloese
Cost Withheld

Project Mestia Airport, Mestia, Georgia
Client Tbilisi International Airport
Architect J. Mayer H. Architects, Berlin—Jürgen Mayer H., Jesko Malkolm Johnsson-Zahn, Hugo Reis, Mehrdad Mashaie, Max Reinhardt
Local Architect Beka Pkhakadze
Construction Anagi
Size 250 square meters (2,691 square feet)
Cost Withheld

Project House of Justice, Mestia, Georgia
Client Ministry of Justice of Georgia
Architect J. Mayer H. Architects, Berlin—Jürgen Mayer H., Jesko Malkolm Johnsson-Zahn, Danny te Kloese, Hugo Reis
Local Architect Alioni 99
Construction Anagi
Size 350 square meters (3,767 square feet)
Cost Withheld

Project Wissol and SOCAR Rest Stops, Gori, Georgia
Client Wissol Petroleum Georgia, SOCAR Georgia Petroleum
Architect J. Mayer H. Architects, Berlin—Jürgen Mayer H., Paul Angelier, Jesko Malkolm Johnsson-Zahn, Marcus Blum, Guy Levy
Local Architect Kobulieli and Partners, Alioni 99
Cost Withheld

Project SOCAR Rest Stop, Lochini, Georgia
Client PM Motors
Architect J. Mayer H. Architects, Berlin—Jürgen Mayer H., Paul Angelier, Danny te Kloese
Cost Withheld

Project Akhalkalaki Railway Station, Georgia
Client Marabda-Kartsakhi Railway
Architect J. Mayer H. Architects, Berlin—Jürgen Mayer H., Jan-Christoph Stockebrand, Jesko Malkolm Johnsson-Zahn, Christoph Emenlauer, Simon Kassner, Danny te Kloese
Local Architect Studio 2
Cost Withheld

Project Seaside Pavilion, Batumi, Georgia
Client Ilia Bagaturia
Architect J. Mayer H. Architects, Berlin—Jürgen Mayer H., Paul Angelier
Cost Withheld

Project Private Villa, Near Tbilisi, Georgia
Client Withheld
Architect J. Mayer H. Architects, Berlin—Jürgen Mayer H., Paul Angelier, Hugo Reis, Jesko Malkolm Johnsson-Zahn, Danny te Kloese
Cost Withheld

John M. Roll United States Courthouse, Page 172

Project John M. Roll United States Courthouse, Yuma, Ariz.
Client U.S. General Services Administration
Architect Ehrlich Architects, Culver City, Calif.—Steven Ehrlich, FAIA (design principal); Charles Warner Oakley, FAIA (principal-in-charge); Patricia Rhee, AIA (project architect); Laura Hudson, AIA (project manager); Dara Douraghi, AIA, Whitney Wyatt, AIA, Natalie May, Julia Martini, Oscar Nino, Niel Prunier, AIA, Matthew Moran, Rachel Atmadja, Guelsah Kuecuek, Won Jin Park (project team)
M/E Engineer and Lighting Designer LSW Engineers
Structural Engineer Caruso Turley Scott
Civil Engineer Psomas
Construction Manager ABACUS
General Contractor/Design-Builder Sundt Construction
Landscape Architect Ten Eyck Landscape Architects
Code Consultant Rolf Jensen & Associates
Blast Consultant Weidlinger Associates
Size 60,000 square feet
Cost $27.6 million

Material and Sources

Carpet Milliken *millikencarpet.com*
Ceilings Architectural Components Group (wood panel and slat ceilings) *acgiwood.com*
Exterior Wall Systems Alucobond *alucobondusa.com*
Furniture Herman Miller *hermanmiller.com*
Masonry and Stone Interstate Brick *interstatebrick.com*; Foley Masonry and Tile *foleymasonryandtile.com*
Millwork Western Millwork *westernmillworkaz.com*
Seating Keilhauer *keilhauer.com*
Wallcoverings Maharam *maharam.com*
Windows, Curtainwalls, and Doors Arcadia *arcadiainc.com*

Cayan Tower, Page 180

Project Cayan Tower, Dubai, United Arab Emirates
Client Cayan Investment and Development
Architect Skidmore, Owings & Merrill (SOM), Chicago—George J. Efstathiou, FAIA (consulting partner); Ross Wimer, FAIA (design director); Brett Taylor, AIA (project manager); Jo Palma (senior design architect); Anwar Hakim, AIA (senior technical coordinator); Daniel Salinas, Eric Zachrison, AIA, Hunsang Lee, Inho Rhee, AIA (design architects)
M/E, Civil, and Structural Engineer SOM, Chicago
Construction Manager Currie & Brown
General Contractor Arabtec Construction
Landscape Architect SWA Group
Lighting Designer Fisher Marantz Stone
Water Features AquaFountains International
Wind Tunnel Testing Boundary Layer Wind Tunnel Laboratory
Acoustics/Audiovisual/IT Cerami & Associates, Shen Milsom & Wilke
Architecture/Engineering Khatib & Alami
Vertical Transportation Lerch Bates & Associates, Van Deusen & Associates
Life/Fire Safety Engineering Rolf Jensen & Associates
Security Sako & Associates
Size 7.75 million square feet
Cost Withheld

The Yale Health Center, Page 188

Project The Yale Health Center, New Haven, Conn.
Client Yale University
Architect Mack Scogin Merrill Elam Architects, Atlanta—Mack Scogin, AIA (principal-in-charge); Merrill Elam, AIA (collaborating principal); Jennifer Pindyck, Bud Shenefelt (project managers); Michael Filisky, B. Vithayathawornwong, Christopher Agosta, AIA, David Karle, Anja Turowski, Clark Tate, Misty Boykin (core team); Christopher Almeida, Jonathan Baker, Bo Roberts, Mack Cole-Edelsack, Tim Do, Laura Edwards, Margaret Fletcher, Helen Han, Jason Hoeft, Carrie Hunsicker, Jeff Kemp, Trey Lindsey, Reed Simonds, Matthew Weaver, Rubi Xu (project team)
Interior Designer Mack Scogin Merrill Elam Architects
M/E Engineer and Lighting Designer Arup
Structural Engineer DeSimone Consulting Engineers
Civil Engineer Nitsch Engineering
Geotechnical Engineer Haley & Aldrich
Construction Manager Turner Construction Co.
Landscape Architect Michael Van Valkenburgh Associates
Health Services Design Consultant Perkins+Will
Landscape Architect of Record HM White Site Architects
Specifications Consulting Collective Wisdom
Environmental Engineer Atelier Ten
Façade Consultant Front
Façade Engineer Ryan-Biggs Associates
Parking Consultant Tighe & Bond
Food Service Consultants Stephen Bang Consultants
Size 147,000 square feet
Cost $78.6 million

Material and Sources

Acoustical System Armstrong *armstrong.com*; Hunter Douglas *hunterdouglas.com*; USG *usg.com*
Carpet Constantine *millikencarpet.com*
Ceilings Armstrong *armstrong.com*; Barrisol *barrisolusa.com;* Hunter Douglas *hunterdouglas.com*; USG *usg.com*
Exterior Wall Systems Oldcastle BuildingEnvelope *oldcastlebe.com*
Filter Fabric and Water Retention Mat American Hydrotech *hydrotechusa.com*
Flooring Precast Terrazzo *precastterrazzo.com*
Glass Viracon, *viracon.com*; Oldcastle BuildingEnvelope *oldcastlebe.com*
Guards, Rails, Bumpers C/S Acrovyn *c-sgroup.com*
Gypsum National Gypsum Co. *nationalgypsum.com*
Insulation Johns Manville *jm.com*; Owens Corning *owenscorning.com*; Roxul *roxul.com*
Masonry and Stone Endicott Clay Products *endicott.com*
Metal VM Zinc *vmzinc.com*
Paints and Finishes Sherwin Williams *sherwin-williams.com*
Pedestrian Pavers Hanover Pavers *hanoverpavers.com*
Wallcoverings ACGI *acgiwood.com*
Walls Oldcastle BuildingEnvelope *oldcastlebe.com*

The ARC, Page 196

Project River Culture Pavilion (ARC), Daegu, South Korea
Client Korea Water Resources Corporation (K-water)
Architect Asymptote Architecture, New York—Hani Rashid, Lise Anne Couture (design principals); Josh Dannenberg, John Guida (project directors); Brian Deluna, Duho Choi, Allison Austin, Rebecca Caillouet, Gabriel Huerta, Assoc. AIA, John Hsu, Susan Kim, Ryan Macyauski, Yun Shi, Penghan Wu, Hong Min Kim (design team)
Structural Engineer Knippers Helbig Advanced Engineering
Local Architect EGA Seoul
Size 3,200 square meters (34,445 square feet)
Cost Withheld

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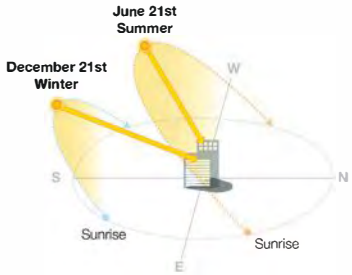

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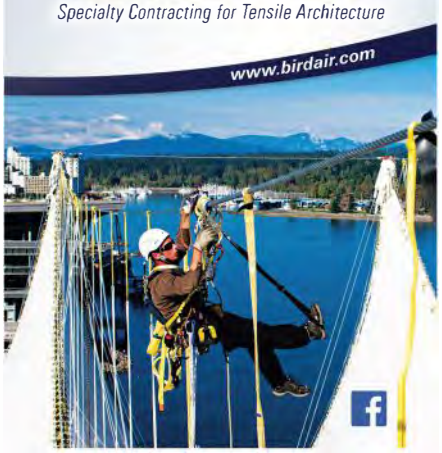

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1984 P/A AWARDS CITATION

Urbanism in Microcosm

THE PLAN FOR SEASIDE, FLA., BY ANDRÉS DUANY AND ELIZABETH PLATER-ZYBERK EPITOMIZED THE REVIVAL OF TRADITIONAL URBAN DESIGN.

by **John Morris Dixon, FAIA**

JURY

1984 P/A Awards Jury
John Cable
Sam Davis, FAIA
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James Stewart Polshek, FAIA
Roger Schluntz, FAIA
Julia Thomas
Oswald Mathias Ungers

TWO URBAN PLANNING honorees in the 1984 P/A Awards heralded a return to historical development patterns. The Battery Park City plan applied a traditional layout to a large, high-density extension of Manhattan. At a much smaller scale, the plan for Seaside, Fla., by Andrés Duany, FAIA, and Elizabeth Plater-Zyberk, FAIA, envisioned a second-home community with about 350 dwellings on an 80-acre beachfront parcel. Both projects were built almost entirely as proposed.

Seaside's master plan was intended to evoke the character of an old Southern town. It called for a network of walkable streets, with mid-block footpaths to serve outbuildings such as rental cottages. Detailed guidelines governed virtually every building—houses, for instance, had to have front porches and picket fences, which were subject, like all architectural features, to design review.

The goal of these guidelines was not imitation, but creative adaptation. Then-emerging architects such as Deborah Berke, FAIA, were tapped by developer Robert Davis to design updated versions of vernacular bungalows. Houses by Léon Krier and Robert A.M. Stern Architects displayed elegant Classical Revival features. Steven Holl Architects and Machado and Silvetti Associates each designed thoroughly modern commercial structures that fit Seaside's scale and relaxed atmosphere.

Some dismissed Seaside as an urban planning prototype because it was primarily a vacation community, yet it has served as a model for numerous year-round community plans, and Duany and Plater-Zyberk have continued to learn from Seaside, applying the same planning principles elsewhere as leaders of the New Urbanism movement.

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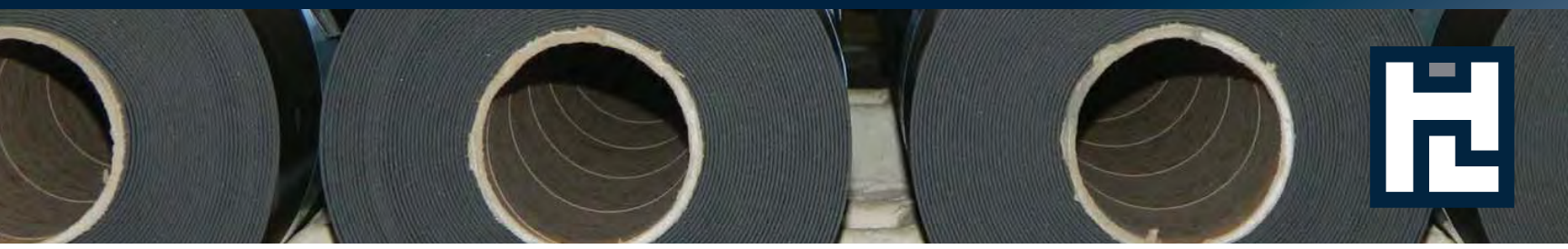

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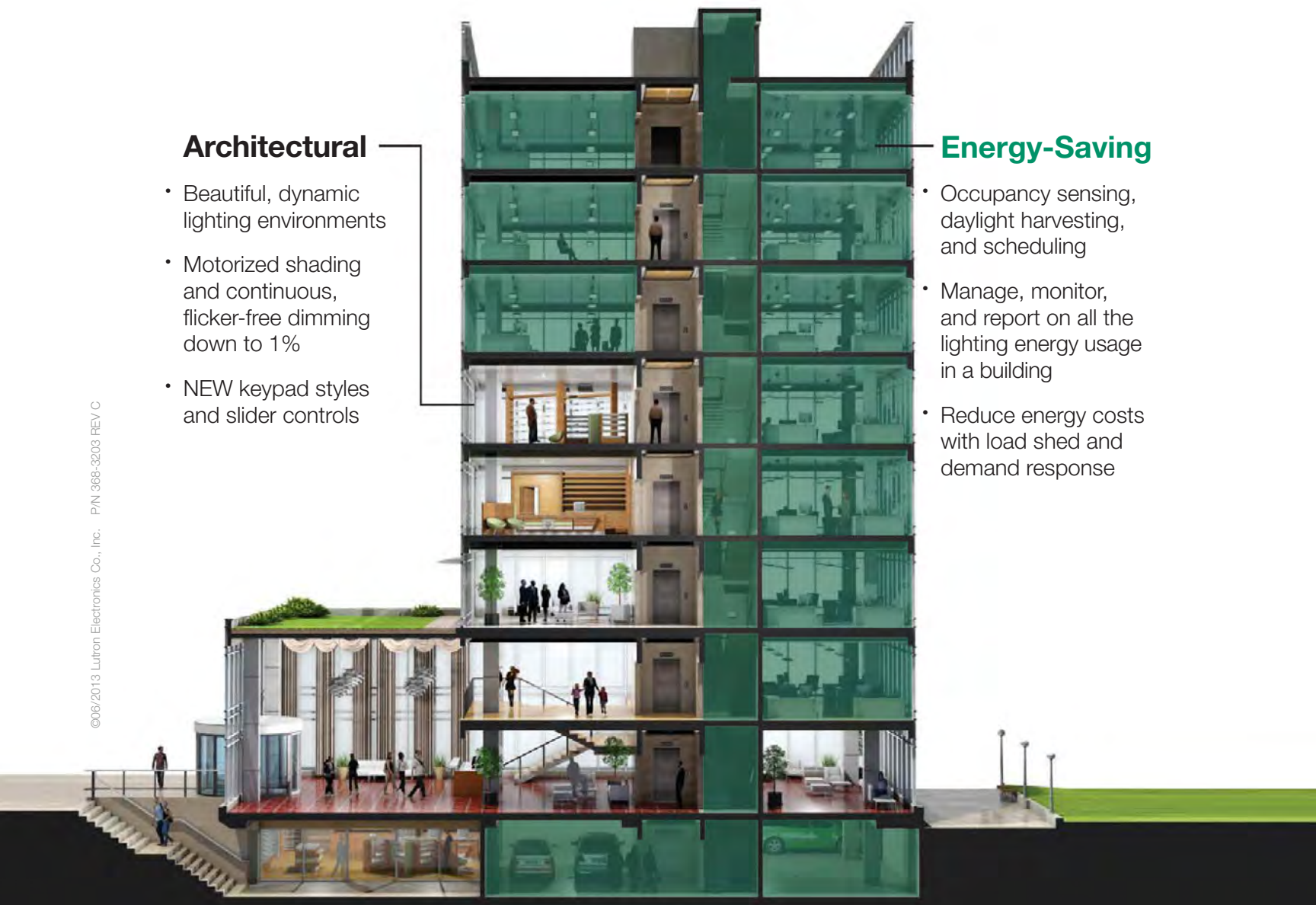

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