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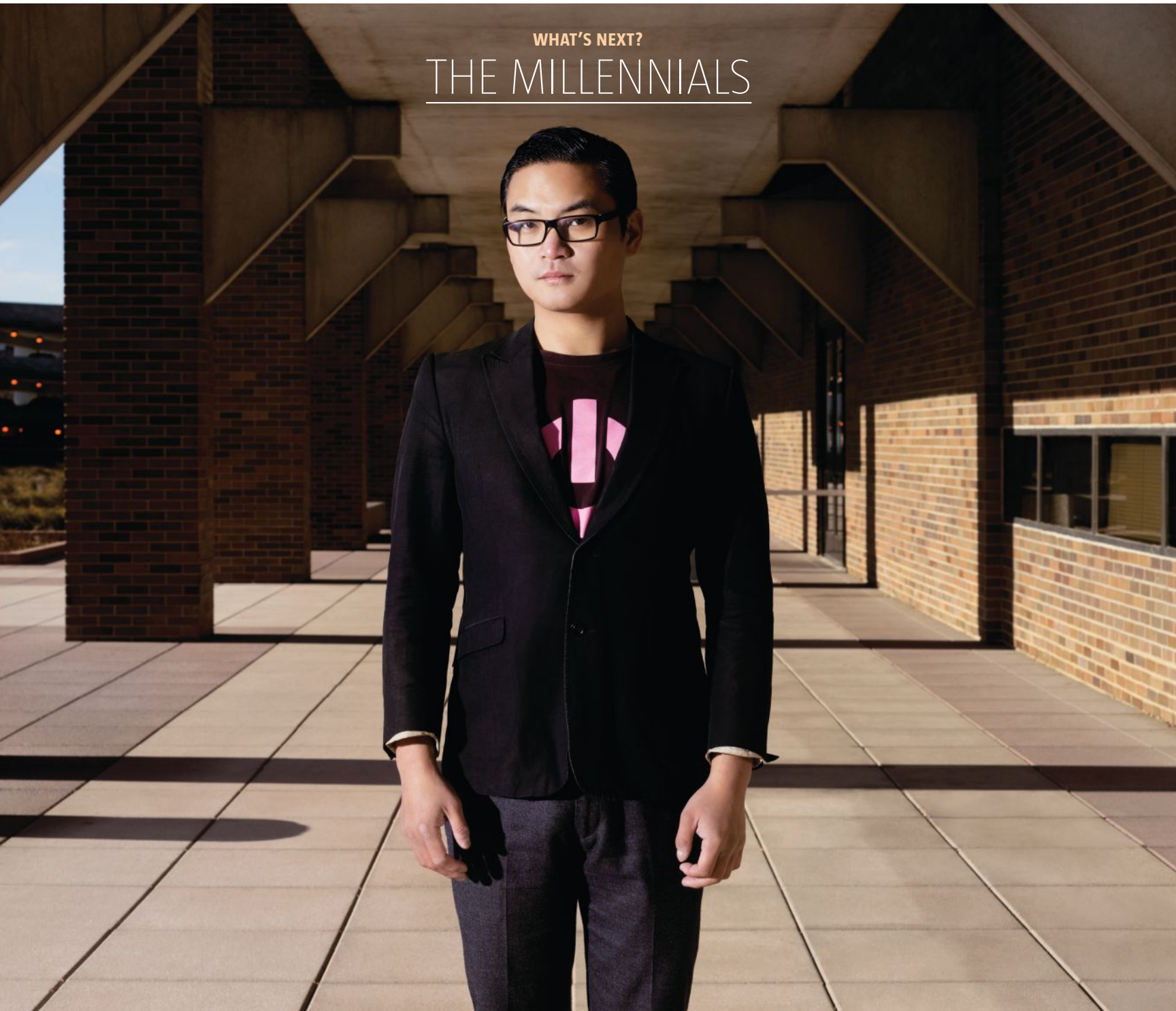
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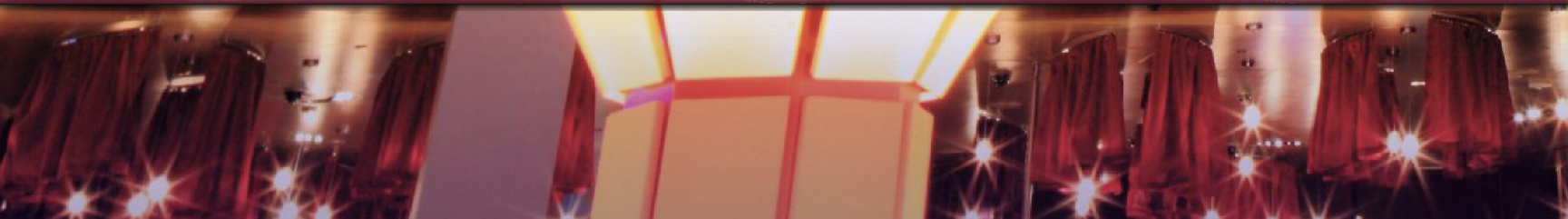
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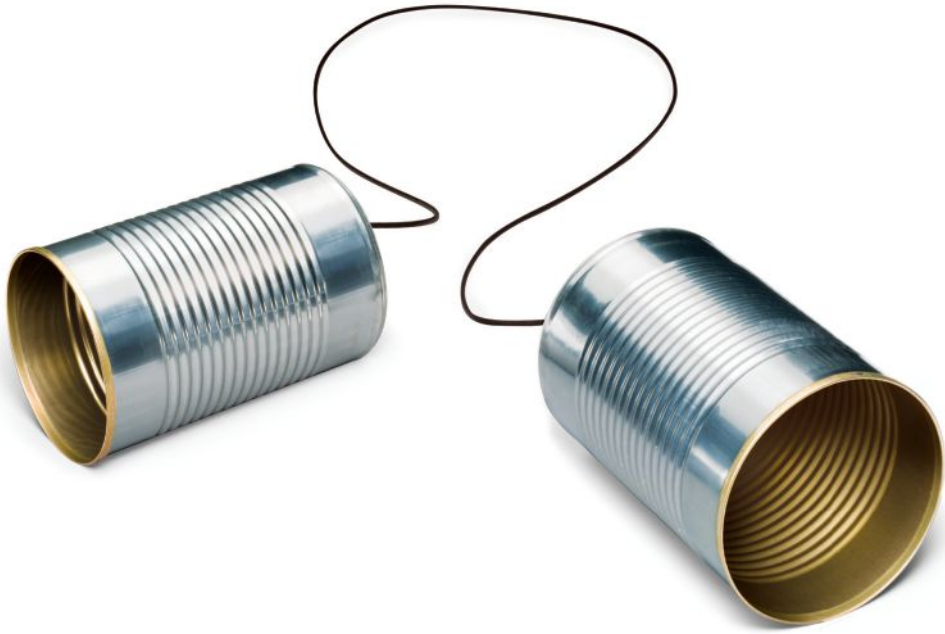


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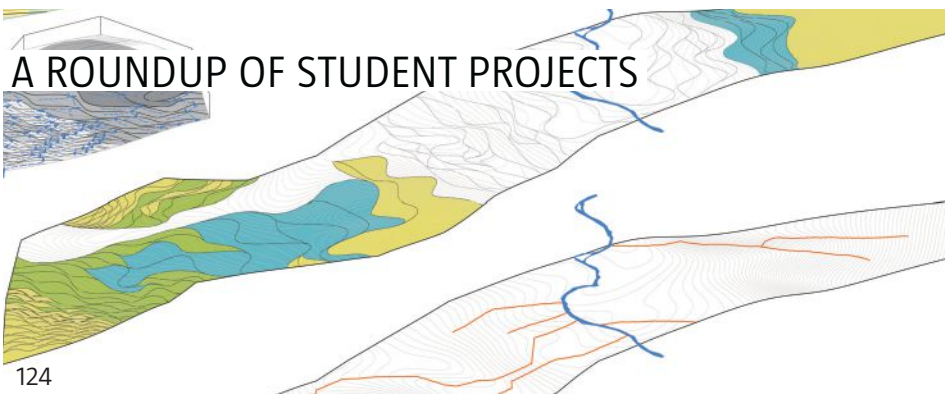
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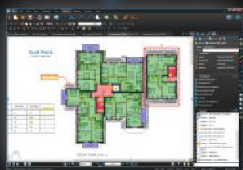
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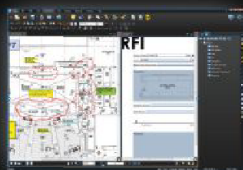
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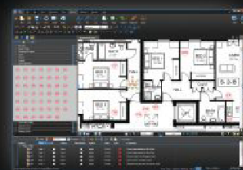
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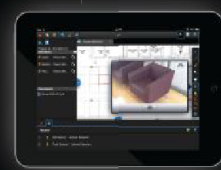
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DIALOGUE



IT'S HARD TO BLAME MILLENNIALS—AND GEN XERS AND BOOMERS—WHO GRIPE ABOUT ARCHITECTURE'S CUMBERSOME INTERN DEVELOPMENT PROGRAM AND AN EDUCATIONAL SYSTEM THAT TOO OFTEN PROVIDES INSUFFICIENT PREPARATION FOR THE REALITIES OF PRACTICE.

TOO MUCH OF A GOOD THING

THE CURRENT FORMULA FOR OBTAINING AN ARCHITECTURE LICENSE INCREASINGLY FEELS LIKE A RECIPE FOR ATTRITION. HAS THE PROFESSION FINALLY ARRIVED AT A TIPPING POINT WHERE REFORM IS POSSIBLE?

NOBODY GOES into architecture because it's quick and easy. There's no siren's call of money or power, and there's just a tiny mouse-squeak promise of fame. Instead, the discipline requires, well, discipline: an unflinching capacity for late nights, glacial career advancement, and low pay. Hardship is an integral part of the professional culture. Many architects take pride in the inflexible, boot-camp trek to full membership, and with good reason: The few, the proud, the licensed.

But while it takes 12 weeks of boot camp to make a Marine, it takes more than a decade to become an architect in the United States, from college matriculation to the final attainment of licensure. Year after year, schools produce a host of hardworking potential architects, eager to make their mark. How does the profession receive them? Not with an exam and a license for those who pass it, as law does, but with thousands of hours of work requirements and a degrading label: intern. That's not much of a welcome wagon.

It's hard to blame Millennials—and Gen Xers and Boomers—who gripe about architecture's cumbersome Intern Development Program (IDP) and an educational system that too often provides insufficient preparation for the realities of practice. The average time it takes in architecture to go from graduation to licensure is 8.5 years—that's an eternity compared to the one year it takes in law and the four years it takes in medicine.

Under the circumstances, it's no wonder that young designers increasingly question the value of licensure, that a third of those laid off during the Great Recession say that they will not be returning to architecture, and that the profession can expect to face a serious labor shortage in the not-so-distant future.

In other words, it simply won't suffice to ignore the situation. It's a matter of survival. The profession must come together, address its attrition problem, and make some difficult choices about academic curricula, internship,

and the Architect Registration Examination (ARE). Fortunately, the institutional powers that be—the ACSA, the AIA, the NAAB, and NCARB—are proving themselves increasingly open to the possibility of reform.

The 2013 AIA president, Mickey Jacob, is a particularly outspoken advocate of change; he provided *ARCHITECT* with the following statement on the subject:

Unless the industry leaders from all the collateral representative organizations come together to seriously address this issue, we will find ourselves facing a much more serious problem 10 to 15 years from now—a shortage of licensed architects unable to meet the demands of the marketplace.

Change is hard and in a lot of cases extremely uncomfortable. But if we as an industry do not commit the collaborative leadership necessary to address the changes to IDP and the licensing process that will solve the problems we now face, then I fear we will not be able to attract and keep the young talent so necessary to the healthy and prosperous future of the profession.

Taking advantage of recent changes to NCARB's regulations for IDP, proposals are already on the table for architecture curricula that would qualify students to take the ARE right after graduation (see page 118). These ideas, while now just thrilling experiments, hold the promise of architecture's future.

I don't believe anyone is suggesting that the profession compromise on the quality of knowledge and experience necessary to become an architect. But there must be a more effective, inclusive, and efficient process. It's time to design a better boot camp.

Mickey Jacob



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LETTERS



The November cover image should have been credited to Bruce Damonte. ARCHITECT regrets the error.

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Washington, D.C., 20005

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architectmagazine.com

Barclays Center, November

My family lives near Barclays Center. Now open, it is a great start to what we hope continues to be exemplar design for the site build-out. But I have been bewildered by what appears to be a singular flue that protrudes on the center's roof and can be seen along its Flatbush Avenue façade (but not on the magazine's pic on page 142). SUZANNE O'KEEFE, AIA, BROOKLYN, N.Y.

SHoP Architects responds: It is the boiler flue on the roof of the building. While not our favorite adornment, it should be hidden once the residential towers rise on the site.
GREGG PASQUARELLI, AIA, NEW YORK, N.Y.

Pierresvives, November

Architecture is concerned with a sense of place, human scale, elegant proportions, and details. Zaha Hadid's new building manages to ignore all of that. It reminds me of the streamlined buildings of Art Deco and Eric Mendelson, but without the latter's power and grace. The

inflated proportions of this building introduce a terrifying new scale to Montpelier. JAMES A. GRESHAM, FAIA, TUSCON, ARIZ.

Prison Break, November

If the moral dilemma is whether to confine criminals to solitary confinement or execute them according to their sentence, which they received after due process and a fair trial, why are we arguing about who designs the rooms in which a sentence is carried out? If the issue is moral opposition to the acts of solitary confinement and the death penalty, go fight with the lawmakers. SIMPLYBRINN

To say that architects can't design prisons is to say that architects stand in league with violators of human rights. To turn over prison design to nonarchitects will leave the prison population with even fewer protectors and likely lead to more psychological damage and recidivism. We all know what places look like when architects aren't involved. Let's not let prisons become one of those places. STEVEN BURNS, FAIA




#ThursQ: Architects, we know you're picky about this. What's your favorite pen?

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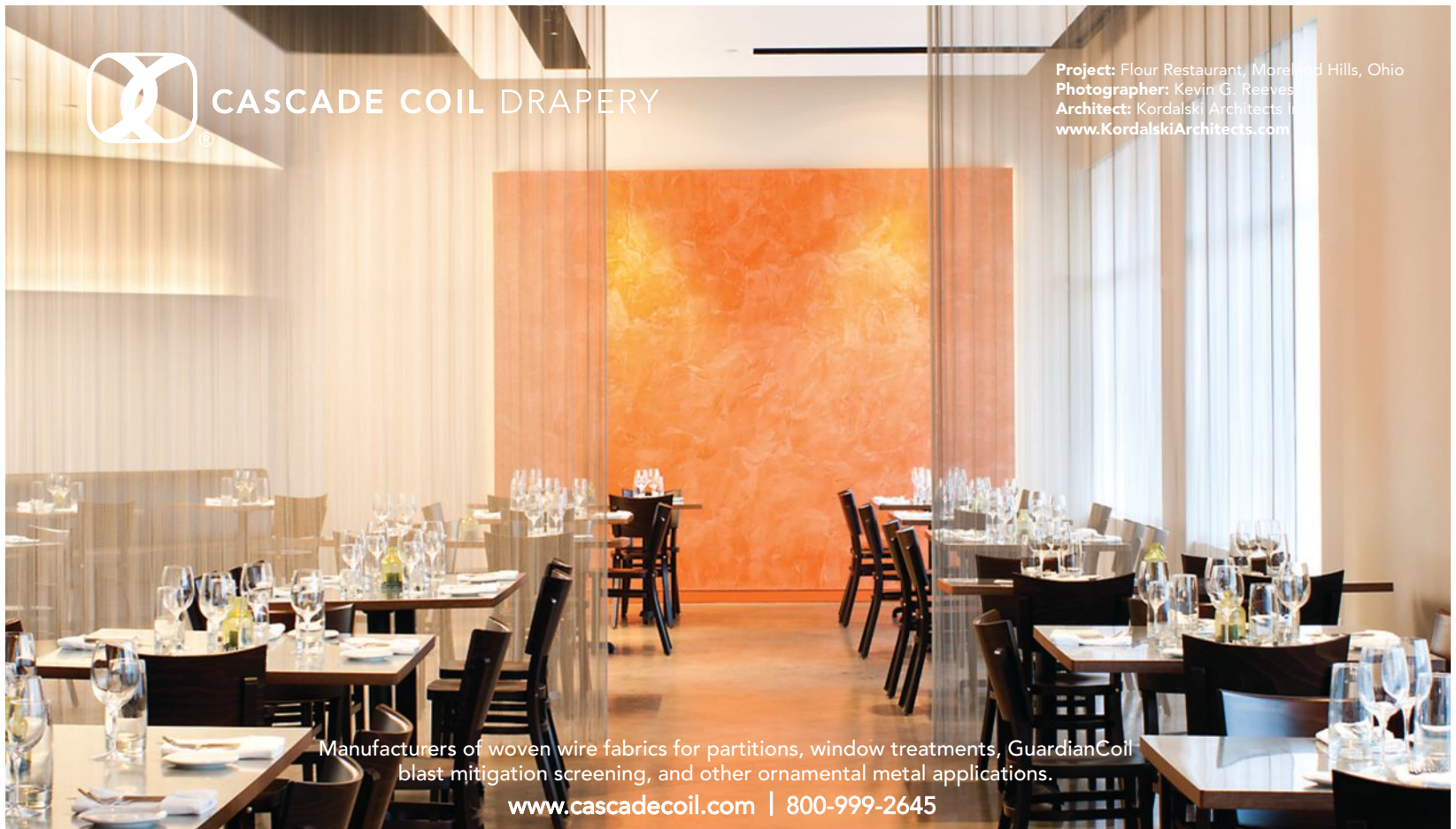
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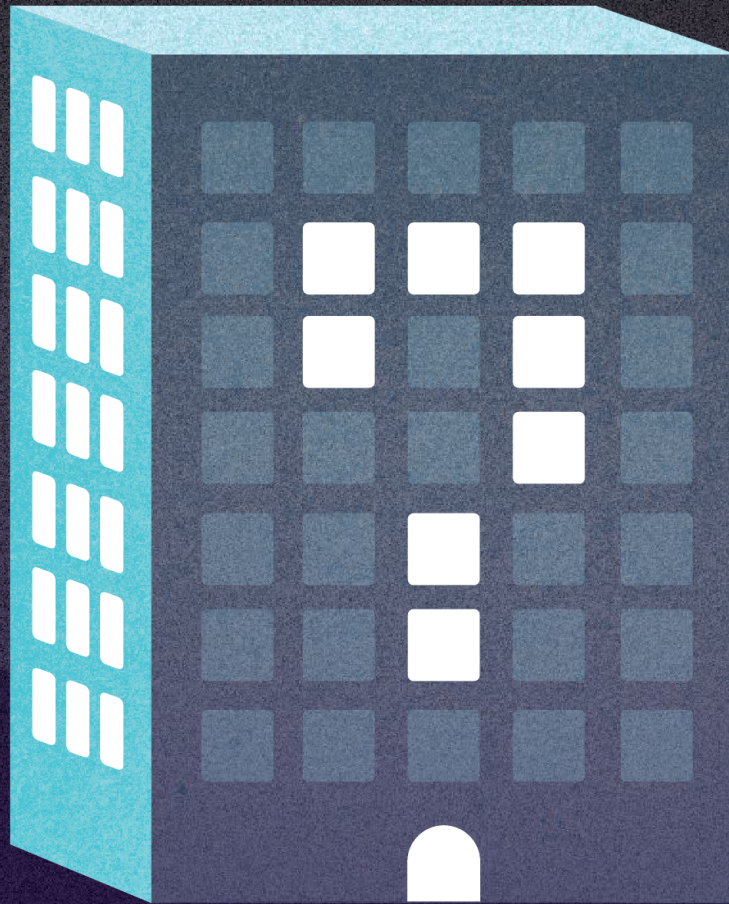
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CONTRIBUTORS



DEANE MADSEN

DEANE MADSEN, ASSOC. AIA, is the assistant editor of design at ARCHITECT, where he oversees the Project Gallery.

Madsen was an architectural assistant to Andrea Lenardin Madden, AIA, at her Los Angeles-based A L M Project, from 2007 to 2011. While with the firm, he worked on several residential remodels and restaurant concepts as well as the design for the Sprinkles Mobile food truck for L.A.-based Sprinkles Cupcakes.

Madsen moved to Los Angeles after receiving a bachelor's degree in drama at Tufts University. In L.A., just before the writers' strike began in 2007, he enrolled in an exploratory summer program in architecture at UCLA.

Having enjoyed it immensely, Madsen proceeded to earn his M.Arch I at the University of California Los Angeles's School of Architecture and Urban Design, where he was an active student leader, winning the Alpha Rho Chi Medal.

His fascination with buildings began back in Boston, where he grew up and witnessed the implosion of the Travelers Insurance Building. This enthusiasm continued from his early years of Lego city planning through later forays into amateur architectural photography. As a result, Madsen never travels without a camera.

Today, he resides with his wife in Washington, D.C., where, to his relief, there are plenty of cupcakes to be found.

➔ READ MADSEN'S COVERAGE OF NEW PROJECT DESIGN, BEGINNING WITH BING THOM ARCHITECTS' XIQU CENTER, ON PAGE 36.

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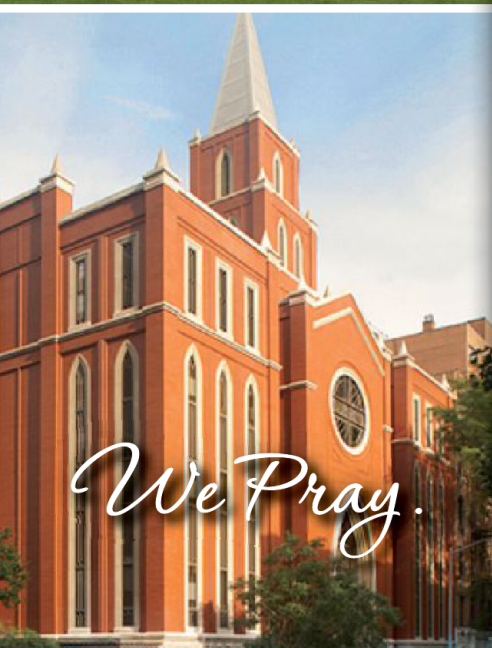


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FRONT



2013 AIA GOLD MEDAL

THOM MAYNE, THE BAD BOY OF LOS ANGELES ARCHITECTURE, COMES AWAY WITH ONE OF ARCHITECTURE'S MOST PRESTIGIOUS HONORS.

The AIA awarded the 2013 Gold Medal to Thom Mayne, FAIA. Mayne is the 69th recipient of one of the profession's highest honors, awarded in previous years to such architects as Le Corbusier and Frank Lloyd Wright.

Mayne founded his Los Angeles-based practice, Morphosis, in 1972. Calling architecture "one of the most esoteric art forms of all the forms," he has been celebrated for projects such as the San Francisco Federal Building and 41 Cooper Square, an extension of the Cooper Union's downtown New York campus (above).

Mayne described his design philosophy to ARCHITECT at the November preview of his new Perot Museum of Nature and Science in Dallas: "I like provoking people. It's what you're supposed to do." Indeed, Mayne's iconoclastic approach to design, as well as his reputation

as "the bad boy and angry young man of Los Angeles architecture," as *The New York Times'* Robin Pogrebin once described him, have become legendary. But the architect has also become a supporter, and beneficiary, of the U.S. General Services Administration's Design Excellence Program, noting that after years of being branded as a bad boy, it's "kind of curious that I'm the one who ends up doing schools and public buildings."

Mayne co-founded the Southern California Institute of Architecture (SCI-Arc) in Los Angeles in the same year that he founded his firm. He is a Pritzker Prize laureate, a member of the American Academy of Arts and Letters, a member of the President's Committee on the Arts and Humanities, and a recipient of the Rome Prize Fellowship. KATIE GERFEN

2013 AIA Architecture Firm Award

RECIPIENT TOD WILLIAMS BILLIE TSIEN ARCHITECTS BUILT THE MOST CONTROVERSIAL PROJECT OF 2012.

The AIA named Tod Williams Billie Tsien Architects the 2013 winner of the Architecture Firm Award, the highest honor the association bestows on a firm each year.

Tod Williams, FAIA, and Billie Tsien, AIA, were responsible for one of the highest-profile—and most controversial—projects of the year: the Barnes Foundation, which moved its galleries from their original home in Merion, Penn., to Philadelphia's museum row. Williams and Tsien were chosen for the commission by a search committee spearheaded by Pritzker Architecture Prize executive director Martha Thorne. The commission did not come without strings attached: The museum's trustees had stipulated that the new galleries had to "replicate the scale, proportion, and configuration" of the old ones. In the face of harsh criticism, the architects embraced the restrictions imposed by the commission and designed a building dubbed "absolutely wonderful" by *Vanity Fair's* Paul Goldberger.

The Barnes was not the only arts project that the firm completed this year. The Reva and David Logan Center for the Arts at the University of Chicago references the city's skyline as well as its setting on the Great Plains. In 2003, Tod Williams Billie Tsien Architects' celebrated design for the American Folk Art Museum, a highly textured and idiosyncratic building completed in 2001 that was awarded an AIA Honor Award. (The nearby Museum of Modern Art acquired the Williams and Tsien-designed building last year, prompting fears that it may be razed.)

The architects, who are married, have been working together for more than 30 years. When Williams hired Tsien, in 1977, it was her first job. KRISTON CAPPS

2013 Topaz Medallion and Edward C. Kemper Award Winners

THE AIA NAMED THE WINNERS FOR ITS HIGHEST ANNUAL HONORS IN EDUCATION AND PUBLIC SERVICE.

Robert Greenstreet, Intl. Assoc. AIA, won the 2013 Topaz Medallion for Excellence in Architectural Education, the AIA's top award for education work, in honor of his 20-year career as the dean of the School of Architecture and Urban Planning at the University of Wisconsin-Milwaukee. The AIA also recognized John D. Anderson, FAIA—who was president of the Institute during the attacks of Sept. 11, 2001—with the Edward C. Kemper Award for Service to the Profession.

Greenstreet, who received his architectural education at Oxford Polytechnic University (now Oxford Brookes University) in London, has served as an educator for a number of U.S. universities, including Ball State University, Kansas State University, and the University of Kansas. He is the author of seven books on architecture and planning and more than 150 internationally published articles and papers.

In 2007, Greenstreet helped to launch a design-focused public high school in Milwaukee, the School for Urban Planning + Architecture. Among other projects, Greenstreet conceived and executed Community Design Solutions, a program that helps UWM students work with AIA members so that they can provide pro bono services to inner-city neighborhoods and community groups.

John Anderson was president of the AIA in 2001 when the profession, and the nation, faced its gravest challenge since the country's founding. Following 9/11, Anderson shaped the AIA's response and worked closely with the New York chapter to coordinate local and national recovery efforts, in particular through the New York New Visions program. Anderson launched a compensation fund for victims and family members affected by the attacks, the issue that dominated his administration. As a member of the AIA, he has encouraged the participation of women and minorities in the industry. κ.c.



'UTOPIA'

Two new bodies of painter Enoc Perez's work that focus on Bertram Goldberg's Marina Towers in Chicago and Luigi Moretti's Watergate in Washington, D.C., are now on exhibit at the Corcoran Gallery of Art. The New York-based Puerto Rican artist has a penchant for painting portraits of buildings. He has painted Oscar Niemeyer's Palácio de Justica in Brazil and Gordon Bunshaft's Lever House in New York, among others. Binding them all is the title theme: **Utopia**. Through Feb. 10.

LINDSEY M. ROBERTS

December 2012

Architecture Billings Index



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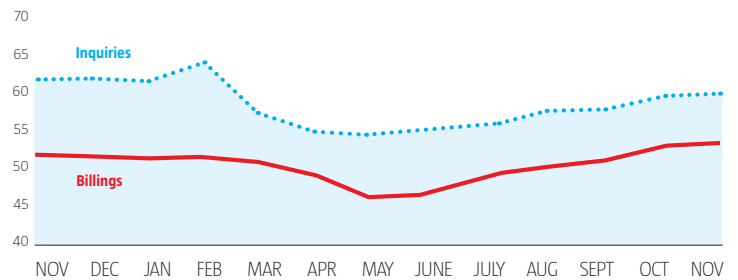
Commercial ↑



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2013 Thomas Jefferson Award

The AIA named two winners for the 2013 Thomas Jefferson Award for Public Architecture: District of Columbia Public Libraries chief librarian and executive director Ginie Cooper and architect Michael Pyatok, FAIA.

Cooper, chief librarian for Washington, D.C., since 2006, has overseen the construction of several new libraries that set a new bar for excellence in public design in Washington's underserved neighborhoods. New libraries designed by the Freelon Group, Adjaye Associates, and Davis Brody Bond—built in association with such D.C. architecture firms as Core, Bell Architects, and Wiencek + Associates—have expanded the capacity and improved the perception of the public library system in the nation's capital. Cooper's work has boosted the presence of architecture in the city of Washington beyond the capital's monumental federal core.

Pyatok has emphasized low-income and affordable housing throughout his career. Himself the product of Brooklyn's tenement housing system, he launched his firm, Pyatok Architects, in 1984. Just over a decade later, the National Endowment for the Arts and the AIA gave him grants to write 1995's *Good Neighbors: Affordable Family Housing*, still an indispensable guide for designing public housing. Pyatok has designed more than 35,000 public-housing dwellings in the U.S. and designed more than 5,000 low-income homes internationally. κ.c.



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A NEW LEADER FOR THE AIA

INAUGURATED AS THE PRESIDENT OF THE AMERICAN INSTITUTE OF ARCHITECTS IN DECEMBER, MICKEY JACOB WILL HELP LEAD THE AIA'S "REPOSITIONING THE INSTITUTE" INITIATIVE.



The AIA inaugurated Mickey Jacob, FAIA, the managing principal at Urban Studio Architects in Tampa, Fla., as the Institute's 89th president. Jacob succeeds Jeff Potter, FAIA.

Jacob will be charged with helping oversee the "Repositioning the Institute" communications initiative that Potter helped launch during his tenure. The repositioning agenda, which is being developed through comprehensive input and engagement with AIA members, seeks to hone the Institute's mission and response to numerous challenges currently facing the profession. The initial recommendations from the initiative are scheduled to be released this year.

In comments released by the AIA, Jacob spoke especially about the need to mentor young architects, to help them rise to leadership positions: "I look forward to working together to harness our power to shape the future of the architecture profession, with a priority on building leadership and enhancing the impact and role of our emerging professionals," he said.

Jacob also cited among his priorities the need for the AIA to continue to lobby for smart and effective local and federal legislation related to design, as well as a continued emphasis on spreading the message about the role design plays in developing livable and sustainable communities that are not only resistant to natural disasters, but that are also affordable and available for all.

Jacob has held numerous AIA positions during his 25-year career, serving as AIA Florida president in 2004 and 2005, AIA Florida/Caribbean regional director on the AIA National Board of Directors from 2007 to 2009, and AIA vice president in 2009 and 2010.

Jacob received his B.Arch degree from the University of Detroit Mercy in 1982, began practicing in Tampa, and in 1989 formed Urban Studio Architects with his partners. Jacob helps oversee the business operations and strategic direction for the firm, which brings a focus on sustainable design practices to its portfolio of residential, interiors, and hospitality projects. ERIC WILLIS

2013 DRIEHAUS PRIZE LAUREATE

TOM BEEBY EARNS NOTRE DAME'S DRIEHAUS PRIZE FOR HIS COMMITMENT TO CLASSICISM.

A member of the "Chicago Seven," Thomas Beeby, FAIA, took home the 2013 Richard H. Driehaus Prize at the University of Notre Dame to become the prize's 11th laureate.

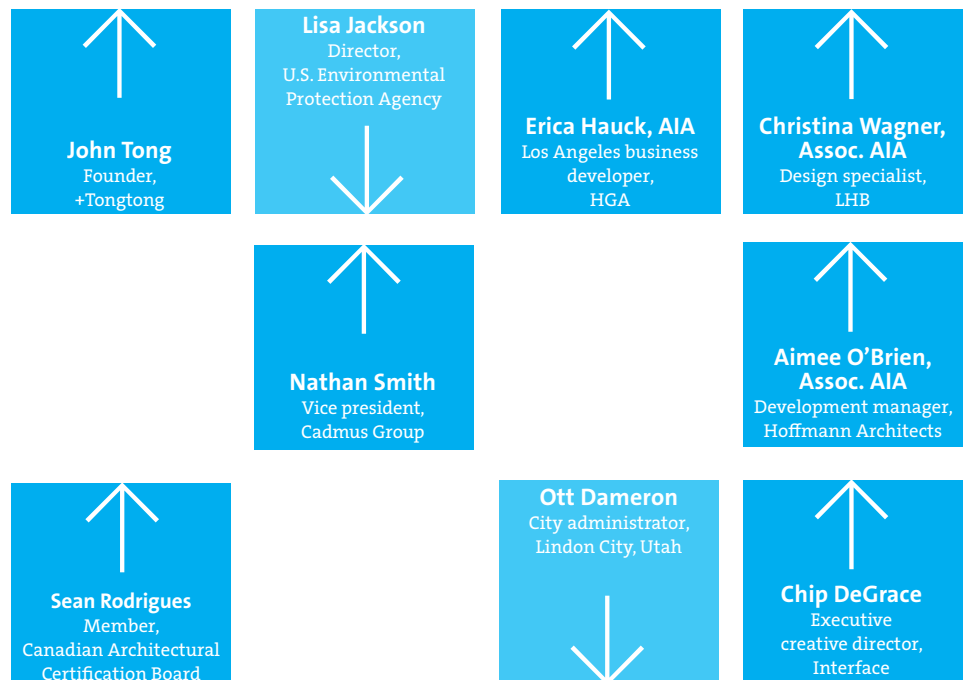
Beeby is best known for his part in steering architectural trends toward a more classical design approach during the 1970s and '80s. After receiving his B.Arch from Cornell University and his M.Arch from Yale University, he joined the Chicago practice now known as HBRA Architects. He is currently the firm's chairman emeritus. Beeby's notable designs in Chicago include the Harold Washington Library Center as well as the Rice Building at the Art Institute.

Beeby has served as a professor at the Illinois Institute of Technology, and at Yale, where he currently teaches, he previously served as dean of the school of architecture.

As the winner of the Driehaus Prize, Beeby will receive \$200,000 at an award ceremony in March in Chicago, honoring his contributions to classical architecture.

ALEXANDRA RICE

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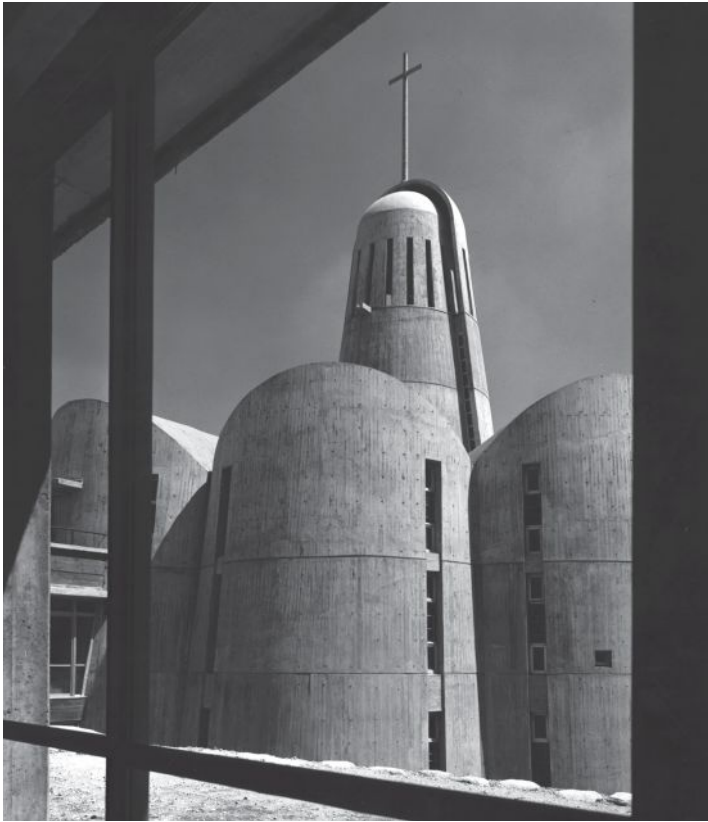
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'THE PRINCIPLES OF ARCHITECTURE ARE ABSOLUTE'

Although his firm kept offices in New York and Tokyo, part of architect Ladislav Rado always remained in his native home of Czechoslovakia. Languages he learned as a lad and concepts he cultivated in the avant-garde scene of 1930s Prague served him well in the U.S., where, at the behest of Walter Gropius, he emigrated in 1939. As an expat, Rado tagged along with Germans (Gropius, Mies Van der Rohe) and Hungarians (Marcel Breuer, artist László Moholy-Nagy). It was only when he met partner Antonín Raymond, a fellow immigrant from Czechoslovakia, that he could speak and work in Czech. Now on view at the Embassy of the Slovak Republic in Washington, D.C., **The Principles of Architecture Are Absolute**—a show of Rado's work curated by Peter Lizoň, FAIA—reveals Slovakia's influence on the architect, and the Slovak architect's influence on the world. Through Jan. 31. **K.C.**

CONTINUING ED

HOT UNITS

WOOD IN BUILDINGS: STEPS TO DURABILITY AND LONGEVITY

Architects specify wood for reasons that include cost, availability, ease of construction, thermal performance, aesthetics, and design versatility. Research and new product development have only added to the versatility of building with wood. This program surveys new products that enable increased dimensional stability, higher strength-to-weight ratios, and greater long-span capabilities. (1 AIA HSW)

METAL ROOFS AND WALLS FOR ACHIEVING NET ZERO

The article is an update on the Architecture 2030 initiative and introduces the 2030 Challenge for products. It identifies how metal roofs with PV arrays and insulated metal wall panels can contribute toward the greater net zero goal. (1 AIA HSW)

INCORPORATING UNIVERSAL DESIGN INTO THE BATHROOM

The expansive Baby Boomer generation is aging, which signals the increasing need for homes, services, and products that cater to their lifestyle. The majority of this population would prefer to age in place rather than to relocate to a nursing home or assisted living facility. This program looks at the increasing and urgent need to remodel the existing housing stock or build new residences that incorporate universal design to minimize injury and ease everyday tasks. (1 AIA HSW)

MOISTURE TESTING OF CONCRETE FLOOR SLABS

The amount of moisture in a concrete slab will determine when it can be finished. Several tests are available to test the moisture content in concrete—but as this program will show, not all of these tests are accurate or reliable. This program will review the common sources of moisture in concrete floor slabs and why it is crucial to test these slabs for moisture. This program also describes test methods and discusses why relative humidity testing is the most accurate test method for determining the moisture content of concrete slabs. (1 AIA)

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BLOOMBERG BUSINESSWEEK HOSTS FIRST DESIGN CONFERENCE

BLOOMBERG ACQUIRED *BUSINESSWEEK* MAGAZINE IN 2009 TO APPEAL TO THE CORPORATE SET. ITS FIRST DESIGN CONFERENCE—WHICH ASSEMBLES ARCHITECTS, GRAPHIC DESIGNERS, AND EVEN ROBOTICISTS—IS AN EFFORT TO REACH MORE CREATIVE INDUSTRIES.

Pentagram partner Edward Opara and New York City Department of Transportation commissioner **Janette Sadik-Khan** were among the presenters at Bloomberg Businessweek Design 2013, the first design conference hosted by *Bloomberg Businessweek* magazine.

Architects who participated in the one-day design conference at the deYoung Museum in San Francisco on Jan. 14 included Morphosis Architects founder **Thom Mayne**, FAIA; Studio Gang Architects founder **Jeanne Gang**, FAIA; and Lot-ek founders **Ada Tolla**, Intl. Assoc. AIA, and **Giuseppe Lignano**, Intl. Assoc. AIA. Autodesk

provided exclusive demonstrations at the museum.

Attendance at the conference was limited: Just 250 attendees were admitted, on an invitation-only basis, to enjoy the magazine's first foray into hosting presentations and networking events geared specifically toward designers. Some events were available through Bloomberg TV and on the Businessweek website.

"Good design," says *Bloomberg Businessweek* editor **Josh Tyrangiel**, "is often the defining element of the products, businesses, environments, and sciences that become legendary." **K.C.**

64.8

Percentage of 392 surveyed firms, organizations, and professional respondents who said that they benefitted from new hires' ideas about sustainability


SOURCE: DESIGN INTELLIGENCE'S AMERICA'S BEST ARCHITECTURE & DESIGN SCHOOLS, 2013

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MVRDV'S BOOK MOUNTAIN

It's just that: a ziggurat of bookshelves that spirals upward underneath a pyramidal glass enclosure. Unfolded, the terraced construction consists of a 480-meter-long path with a bookshelf surface area of 9,300 square meters. Like other contemporary libraries, this building for Rotterdam, the Netherlands, is also populated with meeting rooms, an auditorium, a café, and offices. Archivists will be happy to note that **Book Mountain's** sun-drenched volumes anticipate a four-year life span in situ, thus avoiding damage from solar exposure.

BLAINE BROWNELL



"THE TRUTH IS, THE BILBAO EFFECT IS LARGELY A MYTH. FRANK GEHRY'S MUSEUM ALONE DIDN'T TURN AROUND THAT CITY. IT CAPPED DECADES OF CIVIC RENEWAL."

—MICHAEL KIMMELMAN,
THE NEW YORK TIMES

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JUST MISREAD THE "BILBAO EFFECT" AS THE "BILBO EFFECT"; HAD TO REMIND MYSELF THAT FRANK GEHRY DID NOT BUILD THE SHIRE. #ARTLOVINGNERD

@EBKENT:

IF CRITICS HAD CHALLENGED THE GUGGENHEIM BILBAO & ITS FALSE "EFFECT" EARLIER, WE COULD HAVE AVOIDED A MISDIRECTED ERA OF #ARCHITECTURE.

@WITOLDR:

I'M AFRAID THERE IS A BILBAO EFFECT. THIS AWFUL BUILDING IS AN EXAMPLE.

A HOPE FOR HAITI

SEGUNDO CARDONA WILL DESIGN THE PORT-AU-PRINCE CATHEDRAL.



Even as the 113th Congress scrambles to decide whether it should provide emergency funds to the areas of the northeastern U.S. struck by Hurricane Sandy, cleanup and repair seems to never end in Haiti, following the devastating earthquake that struck the island nation three years ago.

That painful work got a surge of hope in December, when a winning design to replace the Port-au-Prince Cathedral was announced. A panel of six figures from the University of Miami School of Architecture chose a modern take on traditional cathedral architecture by Puerto Rican architect Segundo Cardona.

Cardona designed the Puerto Rico Pavilion for the 1992 World Expo in Spain as well as the

Coliseum of San Juan. His design, which beat four other finalists from a total of 133 submitted designs, maintains the original cathedral's front façade, which was not destroyed during the earthquake, according to *The Miami Herald*. The circular building, which is centered around the altar, also features retractable walls for events.

Miami school of architecture dean Elizabeth Plater-Zyberk told the *Herald* that the jury admired Cardona's combination of modern and traditional. Another Miami faculty member, Steven Fett, placed third in the contest. Mexican architect Diego Ramos took second place.

Funds are not yet in place to rebuild the cathedral, according to the report. **K.C.**

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Project: Colorado School of Mines: Marquez Hall
Architect: Bohlin Cywinski Jackson and Anderson Mason Dale Architects – **Photographer:** ©Nic Lehoux



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DECEMBER JOBS: ARCHITECTS AND CONSTRUCTION BOTH UP

THE U.S. ECONOMY ADDED 155,000 JOBS IN DECEMBER: 3,800 WERE ADDED IN ARCHITECTURAL AND ENGINEERING SERVICES, AND THE CONSTRUCTION SEGMENT ADDED 30,000 JOBS.

For the final month of 2012, the U.S. economy added 155,000 jobs, with the unemployment rate remaining constant at 7.8 percent, as reported by the U.S. Department of Labor's Bureau of Labor Statistics (BLS). The 155,000 jobs match the average for job growth for 2012, which was 153,000 jobs per month.

The architecture and engineering services segment of the economy added 3,800 jobs. That's an improvement over the 2,400 jobs added in November, which in turn was an improvement over the 1,500 added in October.

And the November employment numbers have been revised as well. Now the BLS says that architecture and engineering added 3,000 jobs between October and November. In the past 12 months, since December 2011, the

architecture and engineering services segment of the economy has added 33,900 jobs.

The construction industry had a good month as well. After losing 20,000 jobs in November (which the BLS has now revised to a smaller 10,000 loss), the industry added 30,000 jobs in December. Breaking down that 30,000: residential construction added 5,800 jobs; nonresidential construction added 7,000; heavy and civil engineering construction lost 700; and specialty trade contractors (both residential and nonresidential) added 17,900.

But the construction industry is up by only 18,000 jobs over this point a year ago. While nonresidential construction is up by 12,200 over the past year, residential construction actually has fewer workers, by 6,600. GREIG O'BRIEN

XIQU CENTER, BY BING THOM ARCHITECTS AND RONALD LU & PARTNERS

The Xiqu Center, part of the West Kowloon Cultural District, will be designed by the collaborative team of Bing Thom Architects and Ronald Lu & Partners. The Cultural District will comprise 17 venues aimed toward the preservation and promotion of Chinese performance arts. This first project (pictured) will be a venue for Xiqu—a form of Chinese opera—while also serving as a gateway into the proposed arts hub. DEANE MADSEN



INTERIOR STRENGTH

ACCORDING TO ASID, THE RESIDENTIAL SECTOR REPORTS SIGNIFICANT AND CONTINUAL INCREASES IN ITS THIRD QUARTER BILLINGS REPORT.

Owners of single-family houses are hiring interior designers at a continually upward rate, according to the third quarter results of the American Society of Interior Designers' (ASID) Interior Design Billings Index. Released in December, the index shows an overall positive growth—scores of 50 and above indicate designers are seeing improved billings—but analysts exclusively attribute the headway to residential markets. Whereas the index score for July came in at 51.4, the number jumped to 53.4 in August and again to 55.3 in September.

The residential sector shows a long record of sustained improvement, with nine straight months of scores above 50. The average rate for residential billings is 52 for the third quarter, with future inquiries at nearly 60.

Predictions for 2013 are modestly optimistic. Looking at regional statistics, the northeast demonstrates the highest figures with an overall score of 55. Analyzing numbers according to firm size and type, small companies or sole practitioners have the strongest growth. SHELLY D. HUTCHINS

52

ASID Sector Index Average: Residential

48

ASID Sector Index Average: Institutional

40

ASID Sector Index Average: Commercial

55.3

ASID Interior Design Billings Index for quarter ending Sept. 30



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BEYOND BUILDINGS

GORKY GOES GARAGE

SHIGERU BAN HERALDS THE BEGINNING OF ART'S MERGING WITH NATURE IN MOSCOW—OR AT LEAST THE CLEANUP OF MOSCOW'S GORKY PARK.

Parks and art often go together. In New York, the Metropolitan Museum of Art sits in Central Park, and around the country, major museums inhabit parks in Baltimore, Philadelphia, Boston, Cincinnati, St. Louis, Chicago, Indianapolis, Los Angeles, and San Francisco. The relationship between nature and culture makes both theoretical and practical sense, as the co-location of places to refresh body and mind lets these institutions feed off each other.

This phenomenon is less common in Europe, but Moscow is about to gain a site where art and park will intertwine. Gorky Park, a rundown place filled with illegal activity that's finally on the rise, will become the focus of the art activities of the Garage—the arts center that was, until recently, housed in a Konstantin Melnikov–designed bus depot.

Under the sponsorship of heiress Dasha Zhukova, the Garage has organized some of the most interesting exhibitions and events

in Moscow. Now it will take over several structures that remain in Gorky Park from the days when it was the site for craft and technology fairs. As a first move, the Garage has opened a temporary pavilion designed by Shigeru Ban, Hon. FAIA.

For Ban, the pavilion is more or less standard issue, a circle of cardboard columns surrounding a round hangar for exhibitions. Much more promising is OMA's renovation of a concrete rectangle dating from the post–World War II era. Beyond that, one can anticipate further revitalization of Gorky Park. Jemal Surmanidze, a local architecture expert, suggested recently that the site could be expanded across a busy road to encompass a large exhibition hall and sculpture park. Then it could be a real showcase for both the history of culture, in every sense of that word, and its future, that is worthy of Moscow—or any city.

AARON BETSKY



THE LIGHT CIRCUS

Celebrate a bygone era with a presentation of vintage neon signs that once graced some of Nevada's most iconic restaurants, casinos, hotels, and business establishments. From flashing incandescent bulbs to candy-colored neon tubes, the nostalgic pieces featured in **The Light Circus: Art of Nevada Neon Signs** at the Nevada Museum of Art in Reno, Nev., have not been seen publicly since they illuminated street side locales decades ago. Through Feb. 10. L.M.R.

50.9

Percentage of 392 surveyed firms, organizations, and professional respondents who said that new hires lacked a sufficient background in building, facility, and equipment life cycles

SOURCE: DESIGN INTELLIGENCE'S AMERICA'S BEST ARCHITECTURE & DESIGN SCHOOLS, 2013



LOUVRE-LENS OPENS

The Louvre-Lens Museum, an outpost of the Louvre in Paris, has opened to the public in the city of Lens, France. A collaboration between Tim Culbert, Intl. Assoc. AIA, of Atelier Culbert and Kazuyo Sejima of SANAA led to a proposal that beat out 115 other submissions in a 2005 international competition for the commission. D.M.

“EVERY MORNING I BOIL WATER FOR MAKING TEA OR COFFEE (I ALTERNATE). WHAT STARTS MY DAY IS THE MOST PERFECT KETTLE I HAVE EVER USED. IT IS THE WORK OF SORI YANAGI (1915–2011) ... YANAGI STUDIED ARCHITECTURE, BUT THE KETTLE IS DECIDEDLY NOT ARCHITECTURAL—NO PURIST PLATONIC FORMS, NO POSTMODERN IRONY, NO GIMMICKY WHISTLES. IT IS JUST A KETTLE: HANDLE, SPOUT, LID.”

—WITOLD RYBCZYNSKI

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A TALK WITH ...

Harvard Graduate School of Design dean Mohsen Mostafavi describes the Wheelwright Prize, once an award just for alumni.



The Arthur W. Wheelwright Traveling Fellowship was previously open only to GSD alumni. Why did GSD expand it into the Wheelwright Prize? The Wheelwright is intended to be a global prize open to graduates of any recognized architecture program. We felt that it would be interesting to see the prize as a gift by the GSD to young architects from all over the world. Of course, we expect our own graduates to apply as well, and, of course, I hope and expect them to do well. The prize will also make the GSD the global center of interaction and discourse with the best and the brightest young architects.

The prize is \$100,000, but it recognizes early accomplishment—promise—instead of lifetime achievements. Do you think of it as a kind of inverted Pritzker Prize?

Well, I suppose it is going to be hard not to compare the Wheelwright to the Pritzker, but the aims are quite different. The Pritzker is for work already done; the Wheelwright is to help promote research through travel that would otherwise not be possible. So in many ways—through the choice of the winners—we will be hoping to shape the landscape of architecture as a discipline. At the same time, this is very much about enhancing careers and encouraging people to take a risk and participate in a life-changing adventure.

What is the purpose of a traveling research fellowship?

The nature of the research projects can be really varied. They can be based on issues or themes or foreground geographic conditions. The lineage of this type of prize goes back to the idea of the grand tour, which many classical European architects did, for example, in the 18th century. But now we all travel to lots of places, and we no longer think of just Europe as the location of important ideas. So the question is, in the age of global fluidity and movement and digital communication, how can travel lead to new forms of knowledge for architects and for architecture? This is an exciting project that will encourage applicants to construct their own projects and argue for critical topics that will impact and transform the built environment. K.C.

➔ FULL INTERVIEW AT
ARCHITECTMAGAZINE.COM

ESTO GALLERY

Ezra Stoller: Photographer (Yale University Press, 2012) documents the legacy of the late Ezra Stoller by collecting his works alongside text by his daughter Erica Stoller and critic Nina Rappaport, with additional remarks from Andy Grundberg, Akiko Busch, and John Morris Dixon, FAIA. From iconic images that capture the rise of Modernism to lesser-known prints celebrating industry and mechanization (right), the book spans the full range of work of the celebrated shutterbug, whose archives started the Esto photography house. D.M.



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AIA VOICES

EXECUTIVE SUMMARY

REPOSITIONING ARCHITECTS FOR THE 21ST CENTURY

The value of architecture isn't always self-evident—a lot of what goes on behind the scenes makes a difference in how we live and work. But it's a difference that needs to be communicated more widely, says Robert Ivy, FAIA, CEO of the American Institute of Architects. In the coming year, the AIA will begin drawing a clearer circle around architecture's potential and its impact on our everyday lives, as part of its Repositioning initiative. "It's about the dynamic between stasis and change," Ivy says.

ARCHITECTS SHAPE VIRTUALLY EVERYTHING YOU SEE WHEN YOU walk out your front door. They have played a part in any building of any consequence in any community. It's hyperbole, but it's also true—and that value is a fact that hasn't been fully communicated to the public. I think the position that the AIA now occupies is an extremely rich heritage that represents the breadth and variety of the interests and talents of 80,000 members. That's also our challenge: to gain focus in order to broadcast the role architects play. It's about consolidating the skills and knowledge and experience of our members in order to present them again in a compelling way. As a group, architects are the most important intellectual quotient for shaping the built environment.

Part of what the AIA's Repositioning initiative has shown—that many architects know—is that we are ripe for change. We are poised for it. Members have been telling us that they're eager to reflect 21st-century ideals. So we have to shift and be nimble. What does that mean? Well, for one, I think the architect's creative process has shifted and changed because of digital technology. The ability of the computer to visualize what architects have to create is more complex. We're able to design more comprehensive and information-rich models than we ever dreamed before. In some cases, that new ability is inhibiting; it can lead to a superficial response to a design problem because digital design is so much quicker than pre-digital design. Regardless, the architect's synthetic ability is still critical to producing fine work.

Architecture possesses both the elements of change and stasis—the eternal and immutable, but also something that's adaptable and responsive. There's an ideal that underlies a great deal of architectural thinking—a generative engine that's part abstract, part geometrical, part earthly, and part spiritual. Repositioning is about the polarity between science and art—the permanent and the dynamic—that means we need to recognize when it's time for an evolution in thinking and making. —As told to William Richards **AIA**

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Stuart Kaplow, Esquire, Green Building Attorney

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ACROSS THE INSTITUTE

1. Ponce's Premier. When the Hotel Ponce de León in St. Augustine, Fla., opened in 1888, it was one of the first large-scale commercial properties to be outfitted with electricity via massive DC generators. Designed by the New York firm Carrère and Hastings, the hotel is now one of the centerpieces of Flagler College—whose eponymous oil magnate founder was also the Ponce's developer. The college has just completed a multiyear restoration of its central solarium to mark the 125th anniversary of the building's completion and will host an opening day tour on Jan. 12.

➔ Learn more, at ponce125.com.

2. Unchecked Growth. House design captures our everyday life aspirations, but it's skyscraper design that captures our commercial aspirations. To wit, if there's one superlative that the popular media often reports—in spite of all that's happening in architecture—it's "tallest building." With this in mind, *eVolo Magazine* is sponsoring the eighth annual Skyscraper Competition—with no restrictions for site, size, or program. Registration closes on Jan. 15, and proposals are due on Jan. 22.

➔ Learn more at evolo.us/category/competition.

4. Learning Curves. After the most recent school-building boom in the 2000s, there are several new models of K-12 and university buildings that integrate high-performance technology, passive systems, and the landscape. You may have even seen some of them during the aughts at the School and College Building Expo, which has changed its name to Learning Environments. This year's expo, held in conjunction with the AIA Committee on Architecture for Education, will take place in Orlando, Fla., Jan. 29–31.

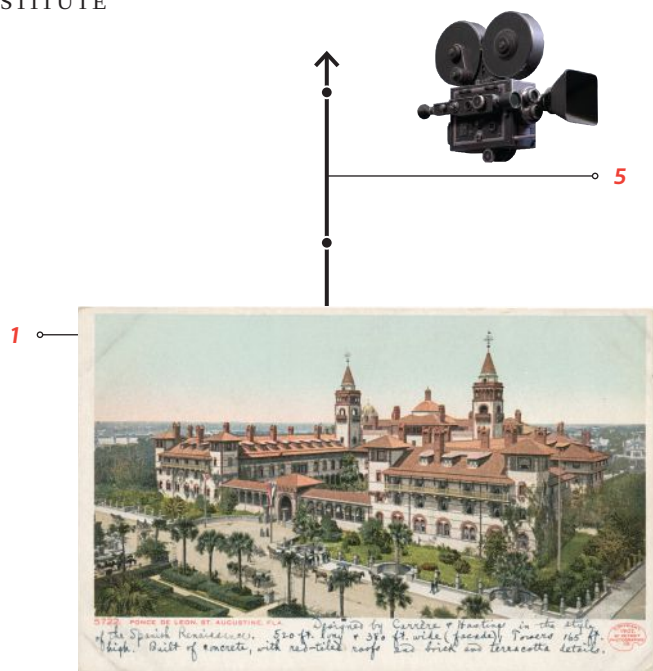
➔ Learn more at lexppo.com.

3. Mass Appeal. Kickstarter may be the most popular so-called crowdfunding site since its launch in 2009, but it's one of a dozen that are changing the way equity is created for small projects. The AIA will launch its own crowdfunding initiative to promote the financing of projects (with an overall cost of less than \$1.8 million) through small donor contributions and online investment portals. You can help shape this initiative by responding to five questions in a survey open through Jan. 31.

➔ Learn more at s.zoomerang.com/s/AIACrowdfunding.

5. Minnesota Videotect. What does livability look like? Is it architectural? Is it urban in scale, or is it block-to-block? Does it have to do with green space? And what will green mean tomorrow? *Architecture Minnesota* magazine wants your answers in video form for its third annual competition, Videotect, which takes on the city of the future for this year's competition. Entries are due by Jan. 24. Online viewing and voting will be open Feb. 6–15, and the Walker Art Center in Minneapolis will host a screening on March 7.

➔ Learn more at architecturemn.com/am/videotect.



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2



4

BUILDING LEADERS

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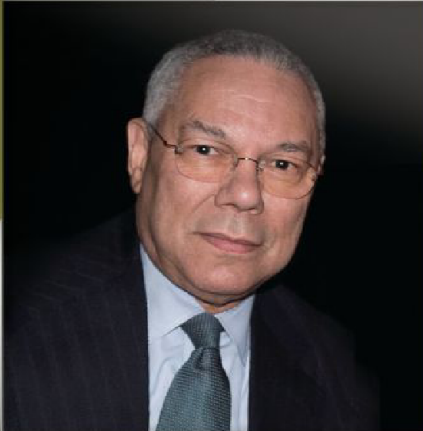
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AIA FUTURE

BALANCING ACT | WHAT DOES OBAMA'S REELECTION MEAN FOR THE CONSTRUCTION INDUSTRY?



ILLUSTRATION: RANDY LYHUS

WHILE THE CONSTRUCTION INDUSTRY WAS HARDLY A MAJOR ISSUE in the recent presidential campaign, there are many upcoming issues that will affect the future direction of building activity. Some of these will influence the direction of the broader economy, thereby influencing demand for nonresidential facilities. Others will directly affect nonresidential activity. While yet others will determine the strength of the housing recovery, which in turn has a direct bearing on what happens in the nonresidential markets.

The overall economy has been growing at a very sluggish pace, with payroll increases barely sufficient to accommodate the growth in the labor force. However, there is optimism that the pace of economic growth can increase if we can solve some key issues. At the top of the list is dealing with the “fiscal cliff,” the combination of around \$400 billion a year in expiring tax cuts and \$100 billion a year in federal spending cuts that would have likely sent the economy into recession if nothing had been done. The good news is that both parties avoided what would have effectively been an across-the-board series of tax increases and spending cuts that would’ve decimated defense spending as well as other discretionary federal programs.

Dealing with the fiscal cliff was just step one in developing a grand compromise in Congress for the growing federal debt problem. The current debt burden and annual deficit levels are unsustainable and will need a comprehensive bipartisan solution.

While the federal institution that has been the most aggressive in dealing with this economic downturn has been the Federal Reserve Board, future Fed actions are uncertain. This situation is clouded by the fact that Chairman Ben Bernanke’s term expires in January 2014, and he has indicated that he is not looking to be reappointed. Under new leadership, it is unclear what actions the Fed might take to manage monetary policy.

While not on the radar during the presidential election season, the recovery of the **nonresidential building sector** is key to stronger economic growth. Construction commodity costs and energy prices are critical to the construction outlook, and given that many construction materials and much of our energy is imported, trade policy and international tensions can have a dramatic effect on the price and availability of these products. Also, as we saw with Hurricane Sandy, natural disasters can dramatically affect the supply chain for many products and potentially disrupt major industries.

Buildings and homes are major energy consumers, so any national strategy looking to achieve energy independence must have programs in place for both the construction and retrofit of buildings.

We are likely to see renewed interest in an energy-efficient building program.

In terms of a **residential recovery**, it is surprising how small a role housing played in the national elections given the outsized role this sector played in the international financial meltdown, and the role it traditionally plays in an economic recovery. Even though significant progress has been made, there are still more than 1.5 million mortgages in the foreclosure process and an additional nearly 1.5 million mortgages that are 90 days or more past due and at risk of foreclosure. These distressed homes are holding down housing prices and limiting a stronger economic recovery.

Years after the housing bust, we’re still trying to figure out the appropriate role for government in the housing finance system. Many of the Dodd-Frank regulations, with respect to home mortgages, have not been implemented. The ultimate resolution of Fannie Mae and Freddie Mac has not been resolved.

In an effort to cut government spending to manage the federal debt, a growing number of tax preferences are being discussed. Near the top of the list is the mortgage interest deduction, which allows taxpayers to deduct most, if not all, home mortgage interest payments as well as interest payments on home equity loans and lines of credit. Together, these tax preferences cost the government around \$100 billion a year in foregone payments. A related tax preference, the deductibility of local property taxes, costs the government another \$25 billion a year.

Finally, it is clear that the federal government needs to reform its immigration policy. While immigration policy is not a housing issue, per se, the immigrant population is a very large source of housing demand in the U.S. and, traditionally, a large segment of the residential construction labor force. Moving forward, housing demand would fall dramatically without strong immigration numbers.

The construction outlook looks very promising for 2013. The housing market is rebounding nicely, and commercial, industrial, and institutional buildings will follow suit as long as our economy is growing. However, there is more than the normal amount of uncertainty in terms of federal policy that will greatly influence this outlook. There were hopes that the presidential and congressional elections would resolve many of these issues. We now know they just delayed the inevitable negotiations that, hopefully, can at last begin in earnest. —Kermit Baker, Hon. AIA. **AIA**

AIADesign

TACKLING LEFT | PLACETAILED SUGGESTS A BROADER MODEL OF COMMUNITY PRACTICE

PLACETAILED STAFF MEMBERS, LEFT TO RIGHT: DECLAN KEEFE, EVAN SMITH, JAMES DRYSDALE, TRAVIS ANDERSON, STEPHEN DALY, AND KEVIN YOUNG. | PHOTO: PORTER GIFFORD



BANGING HAMMERS AREN'T PART OF THE DAILY ROUTINE AT MOST architects' offices. Nor is pumping 10 tons of cellulose into the rafters overhead. But Placetailed isn't your typical architectural firm—in fact, it isn't an architectural firm at all. It's a four-year-old design/build/develop/bike-to-work cooperative with projects all over the Boston area. Although it isn't clear whether its got a viable model for reinventing how buildings get built, the practice offers a critique of the profession that may resonate beyond its R-48 walls.

Placetailed was started in 2008 by Simon Hare, Assoc. AIA, a designer and builder passionate about developing new models of design and construction that challenge industry standards. Placetailed's first project was the Hare family's home, Pratt House, which garnered attention for its energy-efficient renovation and small physical and environmental footprint. Hare recruited a team of

young designers and builders turned off by design-firm hierarchies and an industry they see as pitting architects against contractors. The company has had an evolving cast of characters, united by the conviction that designing and building should be joined together as a cooperative enterprise.

Declan Keefe, who has been with Placetailed from the beginning, took over as director when Hare went back to Israel. Just 24 years old, Keefe recently graduated from Boston Architectural College. Evan Smith left his high-end landscaping business to join a values-based company focused on a new way of shaping the world. Travis Anderson studied architecture at the University of Washington with Steve Badanes, AIA, a co-founder of Jersey Devil, the pioneering design/build firm whose collectivist ethos seems to be an animating spirit for many emerging professionals.



These three, along with Kevin Young (Boston Architectural College), James Drysdale (Massachusetts College of Art), and Steve Daly (Wentworth Institute), comprise the “tailors of place” who share design and building duties, and decisions on structuring their future. There is no office to keep up or sweatshop hours for the Placetaylor crew: they work out of temporary “mini-houses” set up on their sites and put in a four-day week. No one has a pickup truck and they rarely use cars, preferring bikes instead.

“We try to rethink every aspect of the design and building process to make it rewarding at a lot of different levels” Keefe says. “Our business model is constantly evolving so we can balance profitability with other goals.”

Keefe sees their enterprise expanding through a network of loosely affiliated cooperatives that can keep a local focus while still

having a broader impact. It’s a bit of the “stay hungry, stay crazy” startup mentality that is hard to sustain as firms grow and get bigger and more prominent commissions.

Because personal fulfillment is as important to Keefe as meeting social and environmental goals, Placetaylor has adopted German Passive House principles that slash energy usage to practically zero. They construct a super-insulated shell-within-a-shell wrapped in an air-sealed skin, then duct in fresh air with a heat recovery ventilator to recapture heat from the air ducted out.

The devil is in the details, of course, and Placetaylor works hard to make sure every pipe and wire is run so it doesn’t puncture the airtight wrapper. The result is a house that is kept warm all winter by its occupants’ bodies, their cooking, and sunshine. Or, as they claim, the same amount of energy consumed by a typical household hair dryer, which is about 1,000 watts.

Placetaylor’s recent docket of work includes residential rehabilitations, a new house built from the ground up, and energy retrofits for a 100-year-old church. But its most prominent project is a three-unit condominium building on a tight urban site in the Roxbury section of Boston. Dubbed “Powahouse,” it is intended to make sophisticated energy saving technologies accessible to a broad-based urban constituency. Placetaylor was not only the designer and builder but the developer as well, allowing them to bring the neighborhood in on the planning process.

“Design needs to include input from the entire community,” Keefe says, “rather than being imposed by architects from above.”

Placetaylor has been smart about branding its approach with the catchy Powahouse name and logo, and sending the message that zero-energy construction isn’t just for show-house projects. Yet the collective seems to be less concerned with using design to give form to its cultural visions. Powahouse looks like a fairly conventional residential building, without much formal ambition or exuberance to suggest the unconventional building process behind it.

What Placetaylor does provide, importantly, is a useful model for how contemporary practice could move in a more entrepreneurial and cooperative direction by responding to trends in both the academy and industry. Many architecture school studios create an opportunity for collaborative work, but those opportunities often screech to a halt after graduation, leaving many young designers longing for an alternative to the typical office. Recent graduates are also confronted with more options for getting buildings built, including modular and prefabricated buildings and a variety of community-oriented design/build programs. Some building delivery systems may focus on a strong formal vision, while others see construction techniques and neighborhood input as the primary drivers of design. Placetaylor provides an alternative to the architect as the primary, authorial voice.

Without question, buildings continue to speak long after their builders have moved on to other projects. Honing a more enduring message through design can only help in the creation of meaningful buildings and neighborhoods, no matter how they are delivered. Placetaylor is suggesting a broader model for practice that could return architecture back to its community roots; whether eloquent design can come out of its more egalitarian process still remains to be seen. —David Eisen, AIA **AIA**

➔ Learn more at placetaylor.com.



PHOTO: PORTER GIFFORD

Three schools, three cities, and one loaded term.

THE URBAN REINVESTMENT AND RENEWAL EFFORTS OF THE LAST half-century left a legacy of neglect and underinvestment in many American cities. Large-scale public housing projects and forced relocation programs created pockets of poverty in inner cities, concentrating the problems of low-income urbanites and not really doing much to effectively solve them. The concept of urban reinvestment has, understandably, developed a negative connotation over the years.

Now that pattern is shifting, and university architecture programs are leading the change. Through innovative community-focused studio projects, architecture programs are playing a new role in planning, designing, and building in some of the most resource-limited parts of American cities.

Cincinnati's Over-the-Rhine neighborhood has undergone the sort of demographic and financial transitions experienced by a lot of former industrial areas in the Midwest and Northeast. From the height of industrial prowess and wealth in the early 20th century to the abandonment and gradual drain caused by the midcentury suburban boom to decades of poverty and underinvestment, Over-the-Rhine has devolved into an area of empty buildings, homeless residents, and widespread poverty. The neighborhood has the bones of a historic neighborhood but the innards of a very sick patient. Its population

Grow Dat Youth Farm. Forty-three students from Tulane University's School of Architecture completed a 4-acre farm for New Orleans's City Park, about 5 miles north of the school. The project participants hope to encourage area high school students to think about urban ecology as well as agriculture in their native city.

predominantly lives below the poverty line, and years of neglect have reinforced the cycle that's kept them there.

In an effort to disrupt that cycle, the Department of Architecture + Interior Design at Miami University decided to get involved. Based in the town of Oxford, Ohio, about 40 miles north of Cincinnati, the department began focusing some of its students' work on Over-the-Rhine in the late '90s, collaborating with community development corporations, low-income housing developers, and homeless shelters to design and build small-scale projects to serve a community that had for so long been underserved. Projects of the Over-the-Rhine DesignBuild Studio have included affordable housing renovations and storefront conversions, but also smaller-scale projects, such as constructing terraces and balconies on existing buildings. Since 2006, the studio has run a semester-long residency program with an interdisciplinary approach that helps the faculty's and students' knowledge base intersect with the knowledge and experiences of the Over-the-Rhine community members.

John Blake, DesignBuild Studio's coordinator of community projects, says that exposure helps the studio understand the community's needs. "We try not to come in preconceived like, 'Here's the project we want to do, and here's a good spot to do it, so we're going to do it for you,'" Blake says. "We try to really make sure



PHOTO 1: EMILIE TAYLOR, TULANE CITY CENTER; PHOTO 2 AND 3: BALL STATE UNIVERSITY

we're being responsive, and I think that's a really good thing for most designers to understand."

It's also a good thing for other groups working in the area who are often the studio's clients. Over-the-Rhine Community Housing, one of the groups building and renovating affordable housing there, has been able to leverage design and planning work from the DesignBuild Studio to apply for federal historic tax credits. "We got professional-level work accomplished at no charge, and the students got real-life experience," says Mary Burke, Over-the-Rhine Community Housing's executive director.

Building relationships between the university students and the community is crucial for these types of design/build studios—and almost always mutually beneficial. The ecoREHAB program at Ball State University in Muncie, Ind., has been performing sustainable rehabilitation projects on vacant and abandoned houses across the city since 2009. Working closely with the Muncie Department of Community Development, the program identifies projects or sites in need of intervention, and then spends three semesters planning, designing, and constructing each project. At the end, they sell the project to a qualified low-income buyer and recycle the intentionally small profits back into the next year's project.

Jonathan Spodek, who runs the program, says the single-house approach is intended to focus efforts, but also to target the potential effect on neighborhood development. "We see this as a way the

university and architecture students can get a ball rolling. We're certainly not in a position to take on a whole, large development program, but maybe we can be a catalyst or bring in resources or a design thinking that may not otherwise be there," Spodek says. The program's work has encouraged other investment in the areas around their projects and he sees that momentum building into not just a single house rehab, but in some cases a neighborhood rehab.

But it's not only economic and neighborhood development that's on the line. The design/build program at the Tulane City Center at Tulane University in New Orleans is also focusing on building a kind of developmental fluency in the community. In the years after Hurricane Katrina, the city of New Orleans has been subjected to what many have called an overdose of planning. Groups, institutes, and design studios parachuted in to propose ways to help the city rebound. But few of those efforts lasted, and even fewer translated into long-term change in the city. In the months after Katrina, the university—and its architecture school in particular—set out to establish a community-focused curriculum that would not only plan projects, but also actually see them through with the neighborhoods as partners. Design/build projects led by the Tulane City Center could see those sorts of projects through in a city desperate for reconstruction.

"The idea was, we can show them what a whole development cycle looks like—even if the idea was modest—and demonstrate our value," says Dan Etheridge, associate director of Tulane City Center. "We understood that, at some stage, a lot of other people's contracts were going to run out and they were going to go home, and we were going to be working with our neighbors permanently."

Some of the center's most recent work includes a community center and performance venue for a Mardi Gras Indian group in the Ninth Ward, a 4-acre working farm for high school-age youth in New Orleans City Park, as well as a number of prototype houses for some of the poorer sections of the city. Working with the community, Etheridge says, creates an understanding on the ground about how residents can be effective participants in the process of urban reinvestment.

This community-focused partnership approach carried out on a small scale distinguishes these university-led efforts from the larger-scale top-down projects of the past. These studios are proving that putting the resources of a university on the ground to work in and with neighborhoods creates long-term community investment that can actually heal the wounds of the past. —Nate Berg **AIA**

➔ To learn more about community advocacy, visit aia.org/advocacy.



AIAPERPECTIVE

ON THE DOCKET



PHOTO: WILLIAM STEWART

THIS FIRST ISSUE OF ARCHITECT IN THE NEW YEAR PROVIDES A chance to share what AIA members, along with our colleagues in the profession, government, and the public, can expect from the Institute in the months ahead. As we move forward into 2013, the AIA is standing on the threshold of exciting opportunities. These are opportunities to promote the value of design, enhance member sharing of knowledge, renew the focus on the growth of emerging professionals, look forward to business and marketplace trends that will help our firms grow and create jobs, and optimize the abilities of our components. It's a big agenda to shape the future of the profession, and it can only be achieved by thoughtful leadership, effective advocacy, and clear communication.

It is important that our profession builds a network to identify, recruit, and train architects who aspire to leadership. Expanding our reach through this network heightens the public awareness of design and positions architects as a valuable part of the worldwide marketplace. To ensure this long-term marketplace value, we must commit to leadership development of emerging professionals. As the future of the profession, their knowledge and energy are essential to the continued growth and prosperity of the profession.

Our leadership is also essential to support our advocacy agenda—not only to aggressively promote responsible legislation on the local, state, and federal levels, but to enthusiastically communicate our vision of the important role that design plays in shaping livable and sustainable communities. Sustainability is about our health, how we educate the next generation, developing research and technology, public safety, accessibility to quality housing, and the ability for our communities to withstand and recover from the forces of nature. The legacy of the AIA will be built through political and community advocacy for a sustainable lifestyle that is understandable, available, and affordable for everyone.

These issues cry out for our profession's core competency—design. Our success is dependent on our leaders moving this platform forward. That's why, under the leadership of 2012 AIA President Jeff Potter, the Institute embarked on a major communication initiative last year to study the way that the AIA—and, most importantly, you and I—talk about the value of design. “Repositioning the Profession” is not an academic exercise in rebranding. It's much more. It has to do with the way we tell our story about the power of design and how it makes a positive difference in every aspect of our lives.

Beginning next month, AIA members will learn about the initial recommendations of this unprecedented initiative. The “Repositioning” agenda has been developed with the assistance of over 15,000 points of information provided by you—committed and interested AIA members—responding to a call for your ideas and thoughts on how to address the issues facing the profession. Much of the rest of the year and beyond will be focused on how best to implement a strategy to expand an appreciation for, and increase the marketplace value of, the multitude of services we provide for our clients—services that affect the built environment and the quality of life in our communities. Nobody is better prepared to be in the center of shaping the future than architects. Our training, our vision, our work, and our passion make a difference in people's lives every day. For me, the way forward is clear: Building leaders builds our future.

Our challenge and our responsibility will be to find new ways to tell the story of how architecture makes a difference. It's now up to us to decide how to implement the “Repositioning” of the profession and I'm excited about the possibilities. **AIA**

➔ Join our conversation at aia.org/repositioning.

Mickey Jacob, FAIA, 2013 President

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PRODUCTS



ARROYO

Curtain panels, picture frames, waste cans, lighting, bath accessories, and mirrors: Brooklyn, N.Y.-based artist and trained sculptor William Harvey has designed them all. Harvey's new line of cabinet knobs and pulls for **Du Verre Hardware** further expands his portfolio. Made from recycled aluminum, the geometric hardware can be finished in white, oil-rubbed bronze, or satin nickel (latter two shown). Sizes of pulls include large, medium, and small, ranging from 1 $\frac{3}{4}$ " to 4 $\frac{3}{8}$ " long. Knobs (not shown) are $\frac{3}{4}$ " square by $\frac{1}{4}$ " deep. Each piece is finished by hand. duverre.com Circle 100

Edited by **Wanda Lau**



SUNCLEAN

Window cleaners hanging precariously with squeegees outside office buildings have a new competitor: **PPG Industries** has introduced a glass with self-cleaning properties. The glass has a transparent, hydrophilic—as well as photocatalytic—coating (on the left in the image above) that spreads out water and prevents beading so as to break down and wash away dirt. The lites come in many sizes, up to 130" by 204". ppg.com Circle 101



BRIA CLIMAPLUS

The durable, acoustical ceiling panels by **USG Corp.** are more than just easy to maintain. With a noise-reduction coefficient of 0.70 and a ceiling attenuation class of up to 38, they also meet ANSI S12.60 guidelines for classroom acoustics. The low-VOC panels contain 73% recycled content and are 2' square by $\frac{3}{4}$ " thick. usg.com Circle 102

QUILTED COVERS

Whether seating needs a pick-me-up, some additional cushioning, or just some sass, furniture company **Moroso** now offers quilted covers for three of its chairs: Take a Line for a Walk by Alfredo Häberli (shown), Moon by Tokujin Yoshioka, and Fjord Relax by Patricia Urquiola. Each zip-on polyester, microfiber-filled cover contrasts in color to the back of its matching chair shell. moroso.it Circle 103



TERRA TRAFFIC AND CLASSIC

Eighteen colors grace **Terra Green Ceramics'** collection of tiles designed for walls, countertops, and floors. The tiles are made of 55% recycled glass and range in size from 4" to 12" square. Both lines are stain and fade resistant. terragreenceramics.com Circle 104

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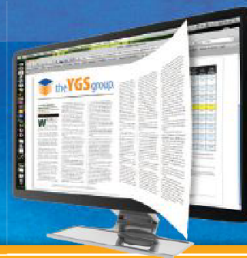
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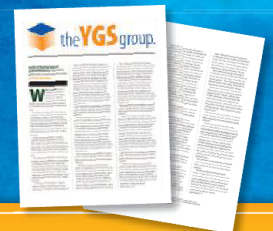
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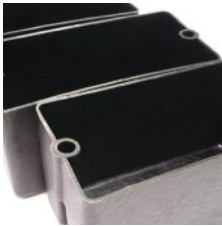
INDUSTRY NOTES

From Waste to Walls

A BUILDING MADE FROM ALGAE, SEAWEED, AND MUSHROOMS MAY SOUND FIT FOR A SEAFARING HOBBIT, BUT MYCELIUM INSULATION AND BIOPLASTICS ARE POSITIONED TO HIT THE COMMERCIAL MARKET SOON THANKS TO A FEW PIONEERING COMPANIES THAT ARE DEVELOPING THE NEXT GENERATION OF MATERIALS FROM AGRICULTURAL WASTE AND INVASIVE PLANTS.

Text by **Heidi Moore**

Illustrations by **Peter Arkle**



ALGIX BIOPLASTICS AND RESINS

Bogart, Ga.-based Algix creates bioplastics from aquatic biomass—namely, the blue-green algae spirulina and the miniscule duckweed—grown in a controlled environment containing nutrient-rich wastewater from nearby agricultural and industrial facilities. If released into a water body, the wastewater would induce harmful algal blooms, Algix co-founder and director of research and development Ryan Hunt says. Algix harvests, dries, and mills the algal biomass into tiny particles, and then combines it with plastic polymers. The resulting bioplastics and resins can be used to make foam boards, insulation, plastic sheeting, and wire coatings.

The algae reduces the amount of petrochemicals in conventional plastic by up to 70 percent. “Algae is one of the lowest-cost options to treat that wastewater,” Hunt says. Growing algae also consumes carbon dioxide, which is by no means in scarcity. The finished product currently has a slight odor—like a fish tank in need of cleaning. Algix is working on eliminating the scent.



RYAN HUNT

Co-founder and
Director of R&D, Algix



ECOVATIVE MUSHROOM MATERIALS

Agricultural waste offers another promising material: mycelium. Eben Bayer, CEO of Ecovative Design in Green Island, N.Y., says that the stringy fungal material has the same flexural strength as polystyrene, but far superior compressive strength. In fact, pound for pound, mycelium is stronger than concrete. “We combine mycelium cells with low-grade agricultural waste [such as plant stalks] ... and put it in a mold, where the cells digest corn stalk and form more mass,” he says. The undigested corn serves as scaffolding for “living plastic,” a white, porous, and hard substance that’s nontoxic, fireproof, and mold and water resistant.

Providing an insulation value of R-3 or R-4 per inch of thickness, mycelium can be used in applications such as insulation, structural insulating panels, acoustical tiles, and building blocks. Biocomposite mycelium sheets, which are virtually VOC free, can even replace conventional particleboard. Ecovative plans to launch a building product line commercially this year.



EBEN BAYER

CEO, Ecovative Design



TAMARISK TECHNOLOGIES ALGINIX

Based in Las Vegas, Tamarisk Technologies CEO and molecular microbiologist Daniel DeBrouse was researching insulin when he discovered an unusual property of alginate, a biopolymer that has long been used in dental molds and thickening agents. “I could not hit a melting point on this stuff in the lab,” he says. Combined with proprietary natural constituents, the lightweight polymer—which comes from brown seaweed, or kelp—has a compressive strength “many times that of the strongest concrete” at full cure. “With this material, we can literally pour a slab ... treat it with a mist of ionized water, and within 30 minutes you can walk on [it],” DeBrouse says. Tamarisk is developing a second formulation that gives Alginix the tensile strength of steel.

Found in abundance in the ocean, brown seaweed grows rapidly and can overwhelm aquatic ecosystems. “There’s never a concern about running out,” DeBrouse says. Due to hit the commercial market in Canada this month, Alginix is also nontoxic, he says. “You could eat it if you wanted to.”



DANIEL DEBROUSE

Founder and CEO,
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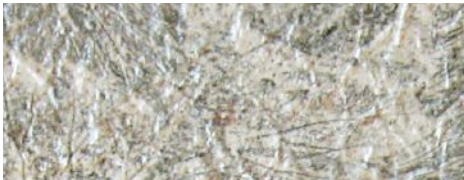
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GLASS TILE

Each year, 2 million pounds of glass collected from discarded bottles end up repurposed in **Oceanside Glasstile's** products, turning waste into backsplashes, shower walls, and more. New to Oceanside's 40-color palette are sapphire (shown), canary, toffee, and all spice. Every color is available in three surface finishes: iridescent, non-iridescent (shown), and matte. glasstile.com Circle 105



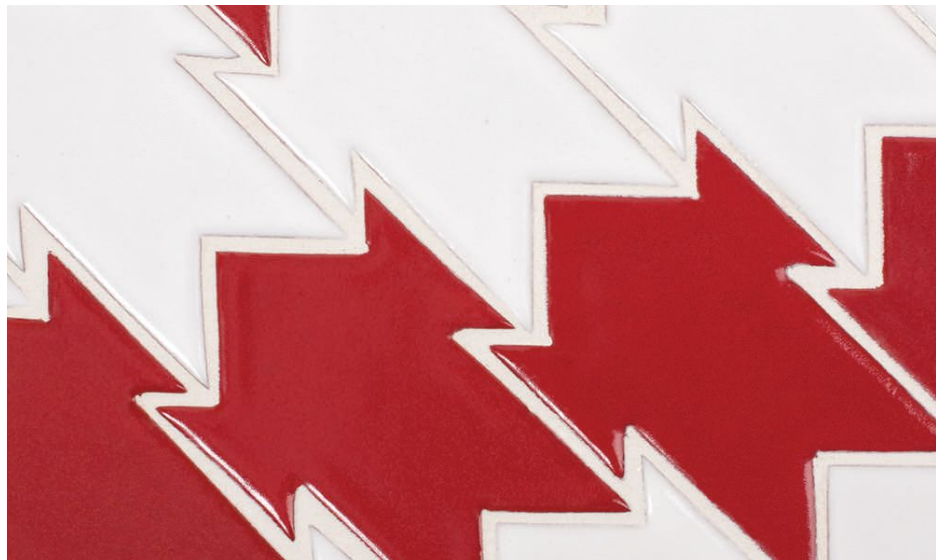
ASH

Duradek has introduced a new color for its Forest Floor line of walkable roofing membranes. The line, which features a fossilized leaf pattern, now comes in a taupe color with gray undertones. In 72"-long sheets, the PVC product may be used to waterproof balconies, decks, and patios. Previously released color options were inspired by the colors of birch and alder trees. duradek.com Circle 107



BASKET SAUCER

To create its new fixture, **Dform Design** hand weaves birch wood veneers into a three-dimensional surface pattern. Manufactured and assembled in Brooklyn, N.Y., the luminaire is available in five different diameters, from 24" to 52"; heights vary from 11" to 21". It uses two 60W incandescent lamps and comes in an aspen (shown) or birch color. dformdesign.com Circle 106



RUNWAY COLLECTION

Fireclay Tile collaborated with Texas-based interior designer Kelly LaPlante to create four tile patterns inspired by iconic fashion designs such as the houndstooth shape (shown) and the corset. They are available in the company's 224 all-natural ceramic glaze colors. fireclaytile.com Circle 108

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DETAIL

Moiré in Masonry

DESPITE THEIR DIGITAL ORIGINS, THE RIPPLING BRICK WALLS OF THE LANXI CURTILAGE ARE STEEPED IN CHINESE TRADITION.

Text by **Murrye Bernard**



Archi-Union based its design of the Lanxi Curtilage on nature as well as on traditional Chinese architecture. The sweeping silhouette of the building's roof symbolizes rolling mountains and rivers, and alludes to the traditional sloping roof. Meanwhile, the ripple wall memorializes the movement of water.

PRESERVATION OF CULTURAL IDENTITY gained new significance after the 2008 Sichuan earthquake rocked Chengdu, the capital of the province in southwest China. The government, in an effort to attract tourists and to establish a biennial celebration of Chinese traditions in cuisine, music, dance, language, and storytelling, developed the International Intangible Cultural Heritage Park in partnership with UNESCO. The park features more than 270 acres of open and programmed space, including exhibition and performance venues and a hotel.

Visitors to the park can take in the multi-dimensional and almost dizzying masonry skin of the Lanxi Curtilage, which translates loosely to "courtyard." Designed by Shanghai-based studio Archi-Union Architects, under the direction of principal Philip F. Yuan, an associate professor at Tongji University's College of Architecture and Urban Planning, the 4,000-square-meter (43,056-square-foot) restaurant and private club feature a linear layout inspired by traditional gardens found in southern China. A series of courtyards within the masonry skin transitions

from casual to formal; during the biennial festival, these spaces open to the public and provide a serene setting for sampling traditional Chinese street food, such as barbecue.

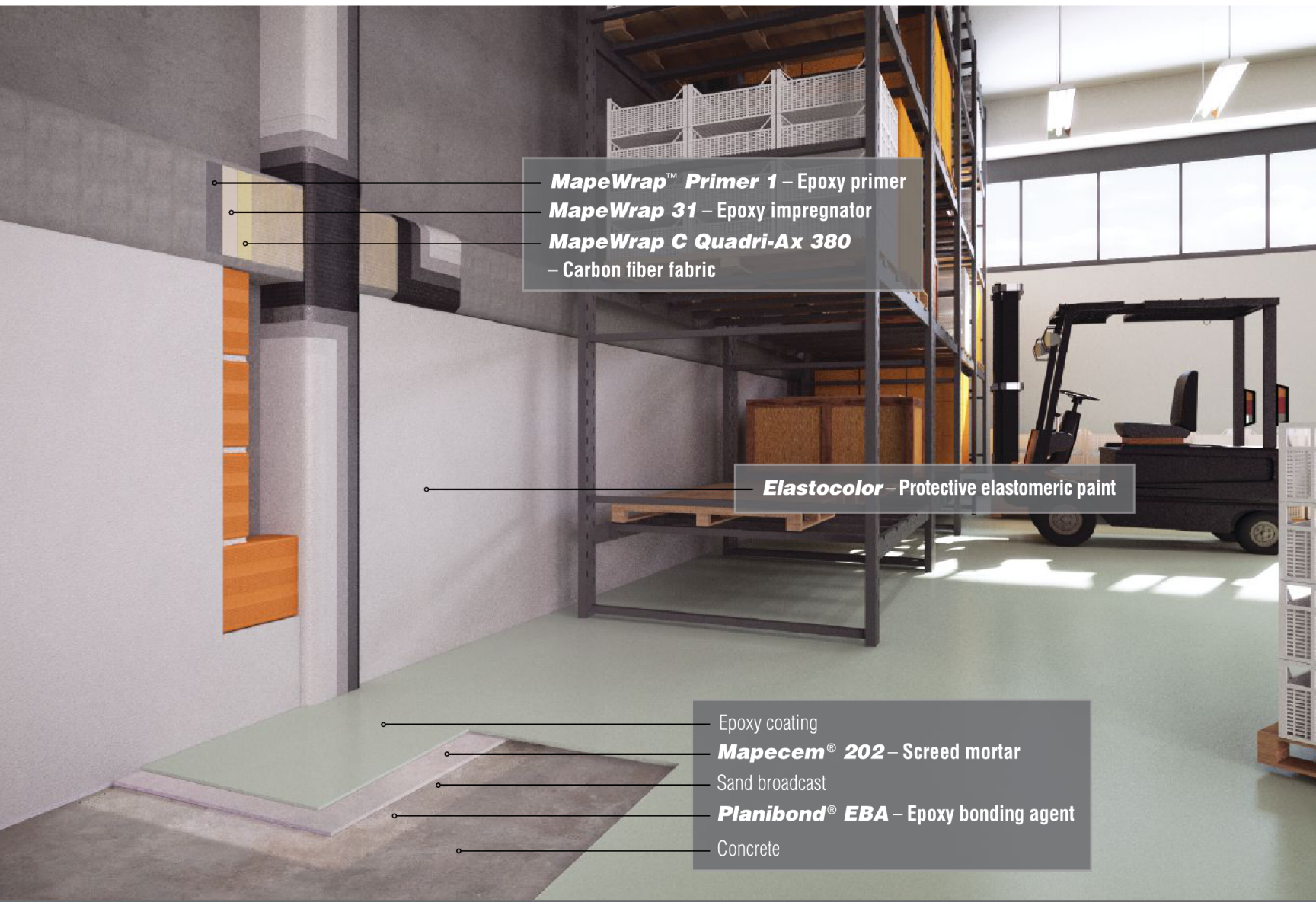
Made from a traditional and locally sourced material, the blue-gray brick was formed from a mixture of soil with concrete, brick, and stone aggregate. In accordance with the building design's abstracted nature theme, the masonry walls, which run the length of the curtilage, follow a rippling, coursing pattern derived from a digital interpretation of water.

The pattern is a notable departure from the typical running bond. Archi-Union's designers used the graphical algorithm editor Grasshopper, integrated with Rhino's 3D software, to define nine different brick sizes as well as brick layout sequences. The largest masonry units, which are called the preliminary units, measure 100 millimeters (4 inches) tall by 500 millimeters (20 inches) long and wide; they establish the base of the pattern.

Archi-Union alternated courses of preliminary units with courses of subsidiary units, which

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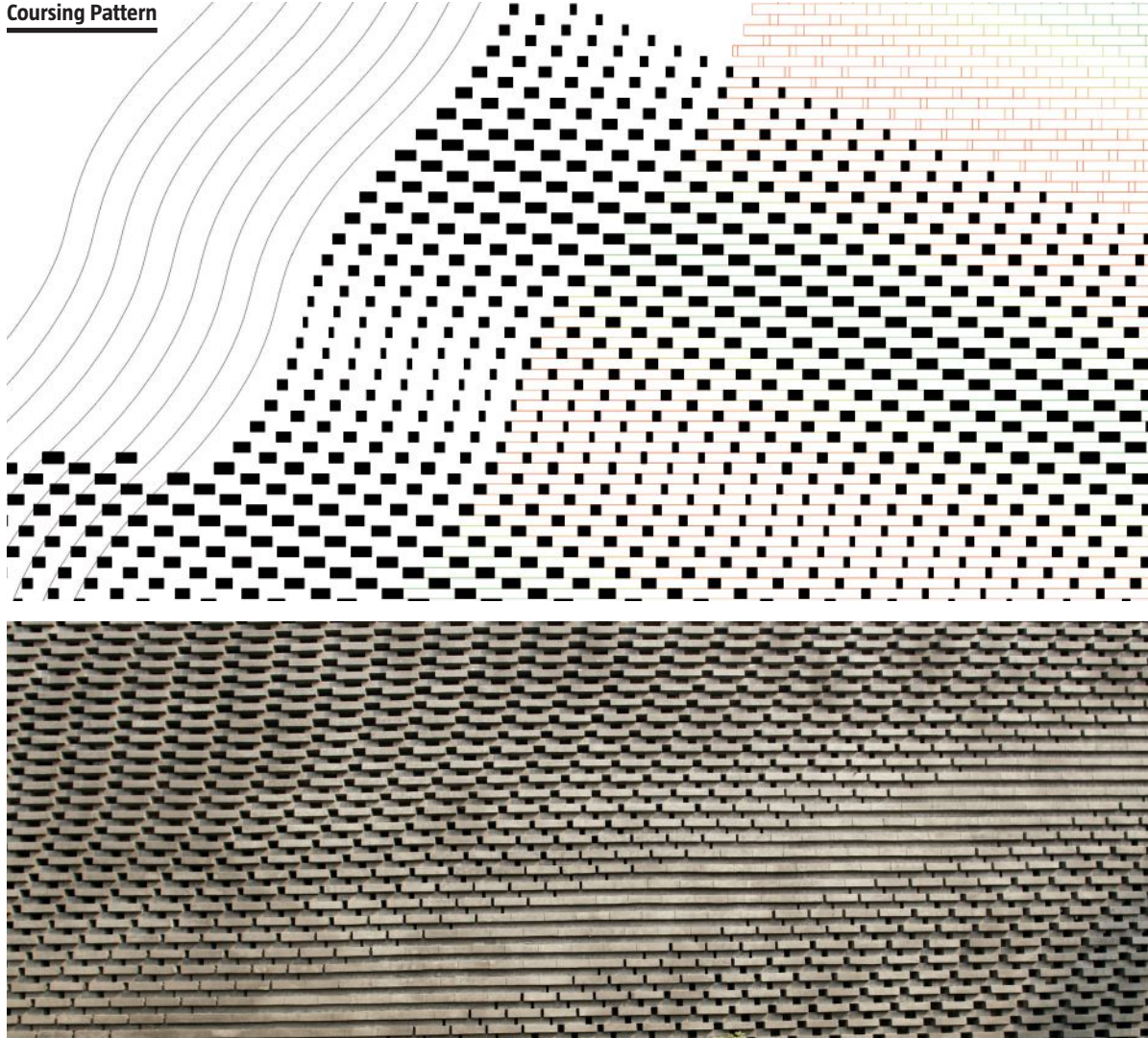


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Coursing Pattern

Joints (shown as black) in the brick pattern are staggered to create opaque wall sections and then widen to become “hollow,” portraying the rippling movement of water. The masonry courses alternate at varying depths to create a play of light and shadow across the wall surface.

also measure 100 millimeters tall, but are 350 millimeters (14 inches) long and range in width from 60 to 220 millimeters (2.5 to 8.5 inches).

Though the design of the rippling walls was inspired by nature, it was also guided by the building’s program. The bonded brick pattern expands and contracts to create surfaces reminiscent of waves. Archi-Union enlarged joints and omitted mortar to capture views and light in some wall expanses, creating brick screens; where more privacy is needed, it compressed the joints to form a solid face, resulting in a surface gradient.

Archi-Union established a template of five different joint dimensions; this pattern repeats every two building column spans, which run about 6 meters (20 feet) each. The building’s columns—which, as in many traditional Chinese structures, are made from brick and reinforced with steel to withstand seismic forces—are sandwiched between two wythes of brick.

Maintaining a tight tolerance was crucial to ensuring that the pattern coordinated with column locations. Yuan initially considered us-

ing a robotic arm to lay the bricks. However, automating the process proved too expensive. Anticipating a learning curve for local brick layers, Yuan sent a member of his team to the site to teach them how to read his diagrams. It only took a few days for them to catch on. “The local workers are very bright, gave us some feedback about the design, and made suggestions on how to make the joints look better,” Yuan says. “Actually, they taught us.” The workers completed the brick walls in three months, while the overall curtilage was completed in about 18 months.

Though Louis Kahn famously insisted that a brick wants to be an arch, 3D computer modeling has allowed designers to envision brick patterns and surfaces in entirely new ways. But that doesn’t mean thousands of years of craftsmanship will be thrown out the door anytime soon. “I think it’s possible to use digital technology to design while still infusing buildings with cultural meaning and tradition,” Yuan says. “By teaching workers new truths of an old material, together we create a new materiality.”

20

The number of custom-sized rulers Archi-Union created to help masonry workers lay out the bricks for the Lanxi Curtilage.

SOURCE: ARCHI-UNION



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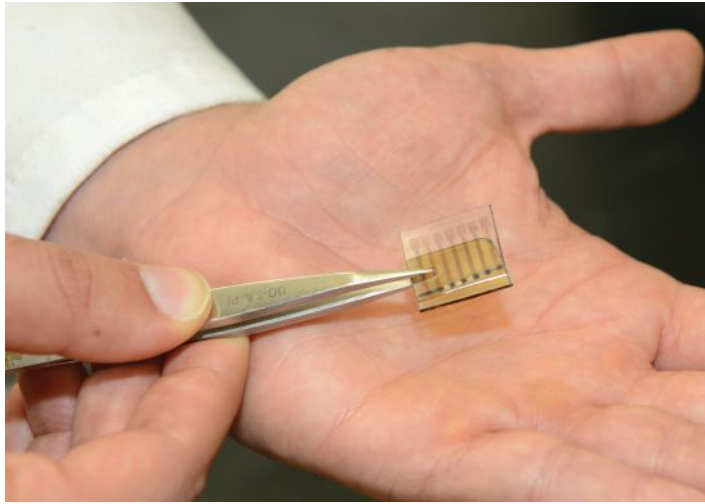
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MIND & MATTER

A Place in the Sun

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Made from a sunlight-absorbing, photoactive layer sandwiched between two electrodes, Stanford University's solar cell is the first to be made entirely from carbon.

FROM ARTIFICIAL PHOTOSYNTHESIS to algae-powered solar collectors, the ever-evolving field of renewable energy has seen significant innovations in the past few years. Two primary trajectories represent particularly notable breakthroughs in solar harvesting technologies.

The first addresses solar cell efficiency, or the percentage of sunlight that is converted into electricity. Currently, the most advanced single-crystalline silicon photovoltaics have an efficiency of about 25 percent, according to the National Renewable Energy Laboratory. A new composite developed by Princeton University researchers promises to raise the bar significantly.

The composite, which researchers call the subwavelength plasmonic cavity, comprises a sandwich of nanostructured metal and plastic and acts as a light trap. The new material can retain far more incident solar radiation than conventional, commercially available photovoltaics, and increases the efficiency of electricity conversion by 52 percent. Furthermore, it can harness 175 percent more indirect, diffused light from low-angle sunlight and cloud-filled skies—a longstanding obstacle for standard photovoltaic technologies.

The second trajectory pertains to the life cycle of the materials used in the solar cells now on the market. Photovoltaics employ rare earth metals and other substances that are in limited supply. According to Stanford University chemical engineering professor Zhenan Bao, "Materials like indium are scarce and becom-

ing more expensive as the demand for solar cells, touchscreen panels, and other electronic devices grows."

Bao and her research team have developed an all-carbon solar cell, which capitalizes on the abundant and inexpensive element. Most importantly, they have demonstrated how carbon may be used to replace the rare materials, such as indium, that are used for electrodes in thin film solar cells. Unlike inflexible solar rooftop panels, the scientists' thin film prototype—which utilizes an active layer of graphene and carbon nanotubes—is made from a solution that can coat a variety of surfaces. "Perhaps in the future, we can look at alternative markets where flexible carbon solar cells are coated on the surface of buildings, on windows, or on cars to generate electricity," Bao says.

Although the all-carbon prototype cell has an efficiency of only 1 percent, the scientists anticipate that the technology will advance. "We clearly have a long way to go on efficiency," Bao says. "But with better materials and better processing techniques, we expect that the efficiency will go up quite dramatically."

Both the Princeton and Stanford breakthroughs will require more development in the lab before they are ready for commercial prime time. However, these remarkable innovations suggest a promising new era for renewable energy. Up next: an intersection of these two technological trajectories that will lead to highly efficient, earth-friendly solar cells.

1:10,000

The width of a single-walled carbon nanotube, used in Stanford University's all-carbon solar cell, compared to that of a human hair.

SOURCE: STANFORD UNIVERSITY



Text by **Blaine Brownell**
Illustration by **Peter Arkle**



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CENTER

Posthumous projects: Kahn's FDR Memorial and Abraham's Musikerhaus 70 Embracing integrated project delivery 80 Do Niemeyer's opulent buildings jibe with his communist ideology? 88



Oscar Niemeyer's French Communist Party Headquarters in Paris. Niemeyer, who began work on the building in 1965, died on Dec. 5, 2012, at age 104.

CRITICISM

A VISION DEFERRED

WHEN AN ARCHITECT DIES, IT TAKES SPECIAL CIRCUMSTANCES FOR THE PROJECTS LEFT ON THE DRAFTING BOARD TO BE REALIZED. BUT AS KAHN'S F.D.R. MEMORIAL SHOWS, THE RESULTS CAN BE WELL WORTH THE WAIT.



Louis Kahn's proposed memorial for Franklin Delano Roosevelt on Roosevelt Island in New York languished for decades after the architect's death in 1974. But Gina Pollara, an architect, and William vanden Heuvel, a retired diplomat, helped make Four Freedoms Park a reality.

Text by **Christopher Hawthorne**

WHEN I WAS an undergraduate at Yale, in the early 1990s, I was assigned to live in Morse College, a dormitory designed by Eero Saarinen and completed in 1962. I'd arrived at Yale as an admirer of modern architecture and soon became a fan of Saarinen's work—especially his Ingalls Rink from 1958, a humpbacked arena on the edge of the Yale campus known as the Whale. But I never liked living in Morse. An idiosyncratic spin on residential Modernism, it had a sculptural power that made it transfixing from afar. But to spend days on end inside was a different story. Its extremely narrow windows and tough surfaces gave the place a medieval feel—or, as I thought when I was feeling especially cynical, a touch of the penitentiary. In winter, its brown-beige palette, set off against gray skies and patchy earth, was depressing, especially for a kid from California like me.

My love of Modernism aside, I secretly longed to live in one of the neo-Gothic residential colleges that still, for most of the world, define the look of Yale. In my junior year I moved off-campus with two friends, to a nondescript apartment above an Italian restaurant rumored to be owned by the mob. I'd found Saarinen's dormitory so unpleasant that I traded it for a place that was controlled

by low-level wise guys and smelled all day of baked ziti and eggplant parmesan.

Over the course of my four years in New Haven, as I learned more about Morse—and its sister college, Stiles, also designed by Saarinen, and also finished in the fall of 1962—I came to chalk up some of its faults to the fact that it had opened a full year after the architect's death. I heard stories that Yale had cut corners on the construction budget and made changes to the design that Saarinen, had he been around to oversee the completion of the buildings, would never have stood for. In particular, I learned that the stones embedded in the façade were supposed to have been less smooth and more randomly arranged.

I concluded, with the kind of righteous certainty common to undergraduates, that Morse was a textbook example of the perils of posthumous architecture. I decided that the integrity of Saarinen's design had been lost, and that because of that loss Morse would never be considered one of the architect's more impressive achievements, let alone ranked alongside his masterpieces—the Gateway Arch in St. Louis, say, or the TWA Terminal at Idlewild, now Kennedy Airport.

But it turns out I was wrong—about the circumstances of Morse's construction, and about the latter stages of Saarinen's career. To

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Top: The triangle-shaped memorial, with a wide grass plain flanked by linden trees, narrows toward the southern tip of the island. At the tip is a bust of Roosevelt and words from his 1941 “Four Freedoms” speech. **Right:** Kahn fortunately had completed a working set of drawings for the memorial before his death.



begin with, when Saarinen died in September 1961—of a brain tumor, at the age of 51—work on Morse and Stiles was nearly complete. In addition, it was never a project that seemed to fully engage his talents—Saarinen’s young associate Cesar Pelli led the design team for the colleges. (Another up-and-coming architect in Saarinen’s office, Kevin Roche, also worked on Morse and Stiles.) The details that I’d fixated on as symbols of the project’s shortcomings seemed precisely the sorts of design elements an older architect, healthy or not, would have delegated to a younger one.

And those landmarks of Saarinen’s career that I’d looked to as examples of unspoiled achievement? Well, those were finished after Saarinen’s death too; they were subject to all of the same post-mortem risks as Morse and Stiles, without the resulting flaws. The TWA terminal opened in 1962, and the Gateway Arch wasn’t officially completed until 1968.

In a broader sense, I was also wrong about posthumous architecture. Over the last several months, I’ve visited several designs

constructed after their architects’ deaths. And what I’ve learned—particularly in studying newly built projects by Louis Kahn and Raimund Abraham—is that the chief danger for designs sitting on architects’ drafting tables or computer monitors when they die is not that they will be horribly compromised. It is that they will never be completed. Especially if they are doing innovative or experimental work, architects spend far more time and energy working to get projects built—to find and cultivate the right patrons, to grease the right wheels—than they ever do designing them. And when architects die, that interest in driving the process of construction forward often disappears, too.

THAT’S CERTAINLY WHAT HAPPENED with Kahn’s design for a New York City memorial for Franklin Delano Roosevelt, now known as Four Freedoms Park. First sketched out in 1973 for a site at the tip of the newly christened Roosevelt Island—a piece of land in the East River formerly known as Welfare Island—the memorial languished after Kahn

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CENTER



View from the South



Top: Raimund Abraham's Musikerhaus, which today sits partially built after the architect's death in a car crash in 2010. **Above:** Abraham had completed drawings for the project, and construction had started, before his death.

died of a heart attack inside a men's room at New York's Pennsylvania Station in 1974. The city's financial crisis wouldn't culminate with the famous *New York Post* headline—"Ford to City: Drop Dead"—for another year, but morale and the economy were already bad enough at the time of Kahn's death that the Roosevelt memorial, an expensive, expansive, and optimistic project, became a very tough sell. It slid into limbo even as development of the rest of Roosevelt Island moved forward.

In 2005, the memorial was rescued by a pair of unlikely saviors: an architect named Gina Pollara and a retired diplomat and longtime Roosevelt admirer named William vanden Heuvel. Pollara organized an exhibition on Kahn's design for the memorial in 2005 at the Cooper Union. Around the same time vanden Heuvel—who had also been inspired by Nathaniel Kahn's 2003 documentary on his famous father, "My Architect"—began raising money to build it. Even more important, he also began exploring ways to smooth its political path to completion. He eventually collected more than \$53 million, started a foundation to oversee its operation, and hired an architect (Mitchell/Giurgola) and a landscape architect (Villa/Sherr, working from original designs by Kahn's collaborator Harriet Pattison) to work with Pollara.

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A detail showing a connection between the concrete base of the Musikerhaus and the concrete "crown" that graces the top of the building.

The finished memorial, which I visited a few days after it opened last October, is the opposite of compromised. Perhaps because it was built so long after Kahn's death, or because its completion seemed so unlikely for so long, everyone involved seems to have taken great care to get the details exactly right. (It also helped that Kahn had finished a complete set of working drawings for the memorial before he died.)

A white-granite staircase 100 feet wide brings you up onto a wide grass plain flanked by rows of linden trees. The whole triangle-shaped memorial then narrows as it moves south toward the tip of the island. At the point of the triangle, right where it noses into the river, is an open-air room marked by heavy granite walls on three sides and a larger-than-life bust, by the sculptor Jo Davidson, of Roosevelt. Inscribed in the granite are words from the 1941 State of the Union address—better known as the "Four Freedoms" speech—that gives the memorial its name.

The design's brawn and its careful, chiseled proportions make an indelible combination. And the view it offers of Midtown Manhattan across the river is among the best architectural vistas in the country.

The final product is aided, of course, by the fact that Kahn's particular approach to architecture was impervious to trends and architectural fashion. Since his work stood (and stands) so easily out of time, the newly built memorial doesn't seem particularly anachronistic, which is remarkable given that it was designed four decades ago. (Can you imagine a novel from 1974 being published for the first time today and not seeming horribly dated? The best-sellers on the fiction list that year included books by Graham Greene, Agatha Christie, and James Baldwin.)

But the really astonishing part of this story is not that Kahn's work has withstood this peculiar kind of time travel; he seems better suited for it than nearly any other 20th-century architect I can think of. What's amazing is that this memorial design found in Pollara and vanden Heuvel a pair of terrifically effective patrons decades after Kahn produced it—patrons who unwrapped the dusty blueprints and saw not a relic or a missed opportunity, but a piece of architecture waiting to be built.

IN THE SPRING of 2010, the Austrian-born, New York-based architect Raimund Abraham, best known for his tall, thin, and menacingly powerful Austrian Cultural Forum in Midtown Manhattan, was invited to give a lecture at the Southern California Institute of Architecture in Los Angeles. During the talk, he encouraged the students in the audience to stay faithful to

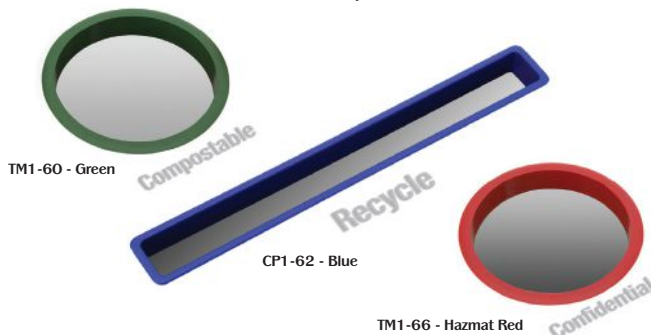
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A gathering and performance space in Musikerhaus. The building was designed to hold practice rooms, performance spaces, and living quarters for four musicians at a time.

their own visions of professional success. “You don’t have to become a slave in a corporate office or a groupie of a celebrity architect,” he said. “All you need is a piece of paper, a pencil, and the desire to make architecture.” Later that night, as he was driving from a dinner in his honor to his hotel, he collided with a public bus on the streets of downtown L.A. and was killed almost instantly.

Since Abraham finished so few buildings during a long career that was also spent writing and teaching (at Cooper Union as well as SCI-Arc), speculation turned almost instantly to the fate of a partially built project he had designed on an artist’s colony near Düsseldorf, Germany, known as the Hombroich Museum Island. Construction on the building, meant to hold practice rooms, performance spaces, and living quarters for four musicians at a time—each living in a separate quadrant of the circular structure—had begun in 2009, and by the time of Abraham’s accident it was roughly two-thirds complete, with the concrete frame already poured. Abraham called it the “Musikerhaus,” or “House for Musicians.”

When I went to see it late last summer, more than two years after the architect’s death, it was in essentially the same condition. The building still lacked doors, windows, and interior finishes. With its wide concrete base sliced at a dramatic angle and covered by a kind of concrete crown, it looked at once like an artwork, a building, and a ruin—a very powerful ruin, but a ruin all the same.

As Roland Eckl, Abraham’s former associate, pointed out when we talked later by telephone, the pause in construction has left the Musikerhaus looking more like sculpture than architecture. Before Abraham died, Eckl said, the architect was pushing to get the building fully enclosed, seeing that step as a crucial one in keeping construction from stalling entirely.

The delays that have plagued the project can’t be blamed solely on Abraham’s sudden death. The building’s client was the German developer and art collector Karl-Heinrich Müller, who founded the 62-acre Hombroich art colony in the 1980s. When Müller died in 2007, the future of the entire colony became uncertain. Abraham’s death was a second blow. The colony has an energetic new director, Ulrike Rose, but Eckl told me that finding the money needed to complete the Musikerhaus looks unlikely. Abraham’s daughter Una, a chef who lives in Vienna, has been working with Eckl and Rose to keep the project alive, but at the moment none of them seems especially optimistic.

It’s telling that Abraham was unhappy about seeing the Musikerhaus stalled on the wrong side of the divide between sculpture and architecture. There is a reason you don’t hear much about posthumous paintings, canvases waiting to be completed after an artist’s death. In art the line between inspiration and production is often—though of course not always—very thin. In architecture it is a huge gap, a chasm that defines the complex appeal of architectural practice.

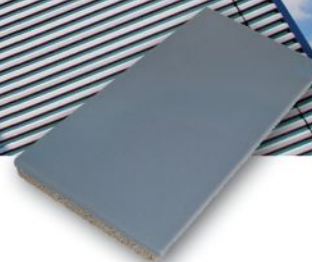
Abraham, who fought political, financial, and aesthetic battles for more than a decade before seeing the Austrian Cultural Forum completed in 2002, understood that better than most architects. Even as he stressed the value of so-called paper architecture, he knew that seeing unusual buildings through to completion was the rarest and most important skill of all, and that a design without an architect to fight for it is like a plane without a pilot: not exactly impossible to land safely, but nearly so. “Building is the most difficult form of architecture,” Abraham once said. “It engages you completely. You have to become a street fighter, a lawyer, and a detective to succeed.”

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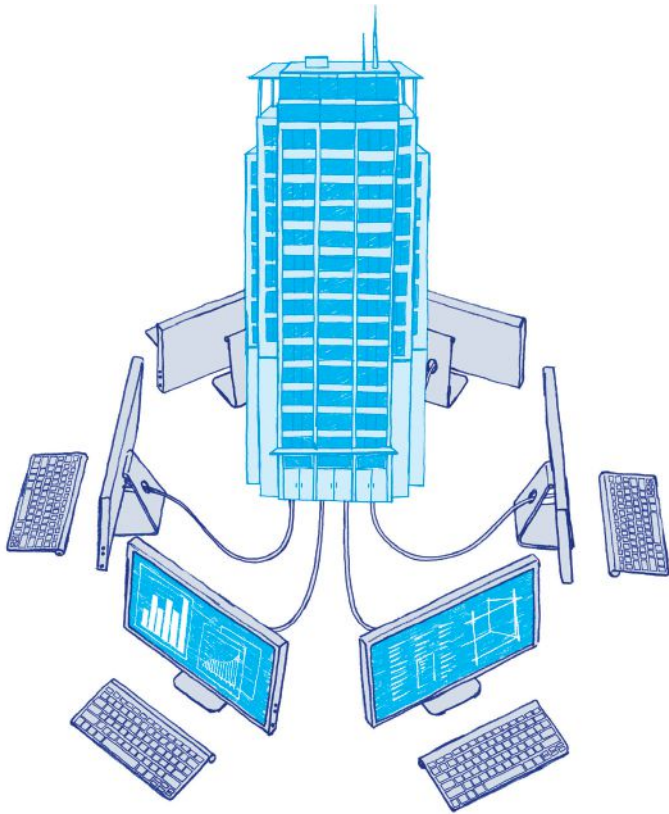
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Text by **Brian Libby**
Illustration by **Lauren Nassef**

ON A RECENT AFTERNOON in the Portland, Ore., office of Sera Architects, associate principal Alene Davis, AIA, shows off a photo on her iPad of one of the firm's recent projects: the Collaborative Life Sciences Building, a 16-story, 500,000-square-foot medical facility in Portland that the firm co-designed with Los Angeles-based CO Architects. The photo is anything but glamorous. Rather, it is a shot taken during construction of a small detail inside the building. Davis points out how a sprinkler line, running along a concrete ceiling, was installed with a notably bizarre U-shaped jog.

In fact, she says, the dip was intentional, designed to allow a duct to be subsequently installed through the opening. "He knew

before he got in the field that he had to re-route his pipe," Davis says of the sprinkler-line contractor. "Just because he got there first didn't mean he could put his pipe in straight."

Though such planning during construction may sound like standard practice, Davis and Sera principal Joe Pinzone, AIA, say that not that long ago, the sprinkler line would have been installed straight and then re-routed later. "One of the dirty little secrets of construction is how much re-work has to be done," Pinzone says. "Moving something three times is built into the cost of that sprinkler head."

But Sera was able to coordinate the sub trades ahead of time for the Life Sciences Building because the firm used Revit, Autodesk's Building Information Modeling (BIM) software, to manage the entire project. Sera is seven years into a full embrace of BIM, which has enabled the firm to better coordinate its construction schedule—not to mention help cut project costs.

"It probably took us a couple years before we started seeing some returns on investment because it was a different way of doing work," Pinzone says. "But as time frames got squeezed more and more, we didn't have the time and fees to bring people along as we traditionally might have. Junior staff was being relegated to doing drafting. With BIM, now we're getting younger staff and architects understanding the three-dimensional issues we're dealing with. I think there's a fundamental shift."

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Number of days it takes Boeing to build a Next-Generation 737. Meanwhile, constructing even a small house can take months, but integrated project delivery stands to make the design industry more efficient.

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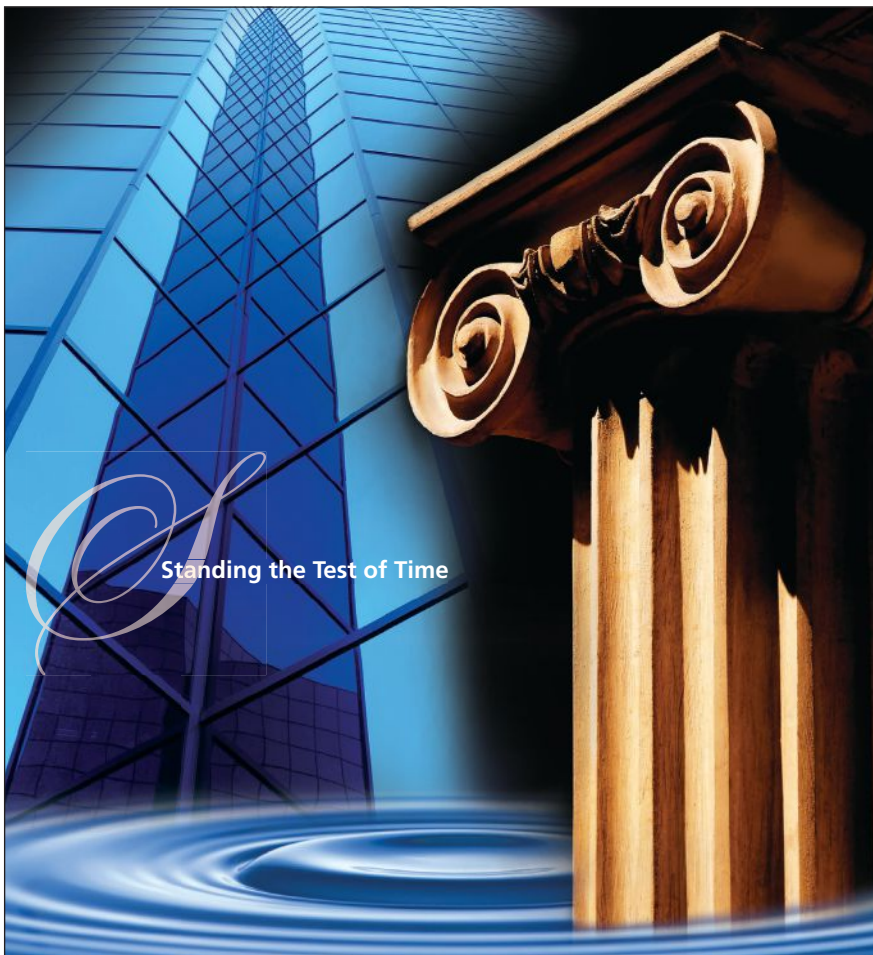
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But a transformation is under way in the profession. As BIM technology converges with cloud computing, mobile apps, and ubiquitous Internet access, the entire building process—from initial design to pinpointing the exact location of the final screw that’s installed—is being digitized and made three-dimensional.

The benefits are numerous. Construction timelines are being shortened and mistakes reduced. BIM is making it easier to use prefabricated and modular components, which can be produced in a controlled environment and require fewer man-hours in the field. Such construction often relies on orchestrated modularity, known as Permanent Modular Construction (PMC), which is the process that enables the rapid construction of Boeing planes.

But it’s not just about speed and cost. As Sera discovered, BIM allows the rising generation of architects to design three-dimensionally and holistically. “One of the things we talk about at Yale, where I teach, is this emerging sensibility among the younger generations of form manipulation: that buildings are only properly understood as objects that can be rotated on the screen,” says Phil Bernstein, FAIA, vice president of Autodesk, Revit’s developer. “There’s a whole set of ideas about a building’s context that are more difficult to explore when a student is exclusively working in a two-dimensional design.”

BIM is indeed empowering young architects, says Randy Deutsch, AIA, author of *BIM and Integrated Design: Strategies for Architectural Practice* (2011). “The old hierarchy is turned on its head,” he says. “In the past, someone might hand a set of documents to them and have them draw it up. In BIM, you’re side by side. The person seeing things for the first time is frequently the emerging professional in the firm. Somebody who feels comfortable with software can discover things in 3D that even someone working at an architecture firm for 20 years might not be able to perceive in the mind’s eye.”

Even a new subset of the design profession has taken shape: BIM consultancy. Some consultants simply provide a Revit model from CAD, Rhino, or other drawing inputs. But other firms, such as New York’s Case Design, go a step further, becoming a third-party manager of a project or firm’s information systems and strategies. Founded by three former members of SHoP Architects, Case provides a range of services, from individual project management to long-term strategizing. “There hasn’t existed in the past a trusted adviser who will help you make absolutely the most out of technology to provide the best design that you can provide,” says Case co-founding partner Federico Negro. “And that’s [the niche] we want to fill.”



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With BIM making design and construction more fluid and collaborative, Negro says, a BIM consultant can be a project's point guard. "BIM, at its core, is basically asking for more transparency across parties," he says. "Every culture will rear its head to make a slight re-interpretation of what that process may be. But the goal is always to remove friction from the process and get to where we need to get to be cheaper and better."

Negro says Case can ensure that valuable data generated by a project gets captured. "It's mainly about saying, 'There's a ton of info and models being created, but nobody is looking out for the long-term benefit of the project.' Some of the larger CMs and architects would have this internally, but a lot of people don't. And a lot don't care to have it. They find it to be too far away from their central scope of work."

Many large institutional clients are already requiring handover of a BIM database after a project is completed. "The General Service Administration (GSA) has been doing this," Negro says. "That's where we see it going. Eventually the drawings will be part of a database."

But that same collection of project data can also, Negro believes, transform the profession. "Design is all about intellectual property. It's the knowledge gained, the experience," he says. "If you've done a lot of healthcare, for example, that sets you apart. You know what was successful and what worked. But all that analysis now is anecdotal information. If I said, 'Let's look at how you have designed fire partitions for the last decade.' Can you answer that question efficiently? The answer is no. You'd have to gather 10 years of project managers and put together a list in Excel and then track this stuff. This incredible wealth of acquired knowledge is just sitting there, but it's not easily accessible. Those who are data driven will have an enormously insightful tool at their fingertips."

FOR ALL OF BIM'S PROMISE, not all firms have adopted the technology. Each firm, Bernstein says, must decide how technology fits into its practice. "Most firms decide the shift is a useful thing, and it's part of the arc of their practice," he says. "But it's perfectly legitimate to say, 'This does not fit with the way we work. We'll outsource it.' Make an explicit decision about what is the right way to do your work."

Negro believes that for BIM-reticent firms, the sharing of information is not the main obstacle; it's the giving up the freedom to choose what platform they design in. "People could say, 'I'm an AutoCAD house, and we model everything in Rhino. We don't mind sharing it with you, but we don't want to



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model it in such-and-such a way,” Negro says. “We’re not going to sell BIM. If you want to do BIM with Excel instead of Revit, we’ll take that on as a challenge. We don’t care what you want to use. We just want to make sure the process works. And the culture of the office really comes through in the tools they use from day to day.”

“For smaller firms, perhaps the greatest impediment is cost,” Randy Deutsch says. But, he adds, the obstacles can go beyond cost, too. “There are large-scale firms that are resistant because they feel it will compromise their brand. They worry all their work will be boxy or simplistic. They want the free reign to work the way they want to work.”

Austin, Texas, designer Kevin Alter, Assoc. AIA, who leads Alterstudio and is associate director of the Center for American Architecture and Design at the University of Texas at Austin, raises another issue. “It seems less like a design tool than a quantification tool,” he says of BIM. “And that’s the larger worry in architecture: that quantification can trump everything else. It can make that which you can’t quantify seem not important.” Alterstudio generally focuses on smaller projects like houses, for which Alter says BIM is less relevant: “I think the value is with larger buildings when you’re tweaking things or doing energy calculations—that’s an awesome tool. My intuition about it, and that of most of my colleagues, is it wouldn’t be nimble enough to design with.”

BIM proponents like Sera’s Davis dispute this, however, saying Revit simply comes at a later stage, after hand sketching and playing with concepts in Trimble SketchUp. Autodesk also recently released FormIt, which allows architects to streamline from concept sketches to BIM models.

In the future, its users say, BIM’s reach could be expanded both within the design-construction phase and beyond. During design, Davis believes there’s more potential to perform cost estimating using a BIM model. There’s also more potential for integration with subcontractors. “Right now our subs’ equipment typically doesn’t interface with the Revit models,” says JE Dunn Construction’s Jason Schaumberg. “I can absolutely see where they’re going to start a patch to have their systems talk with what’s been modeled by the design team.”

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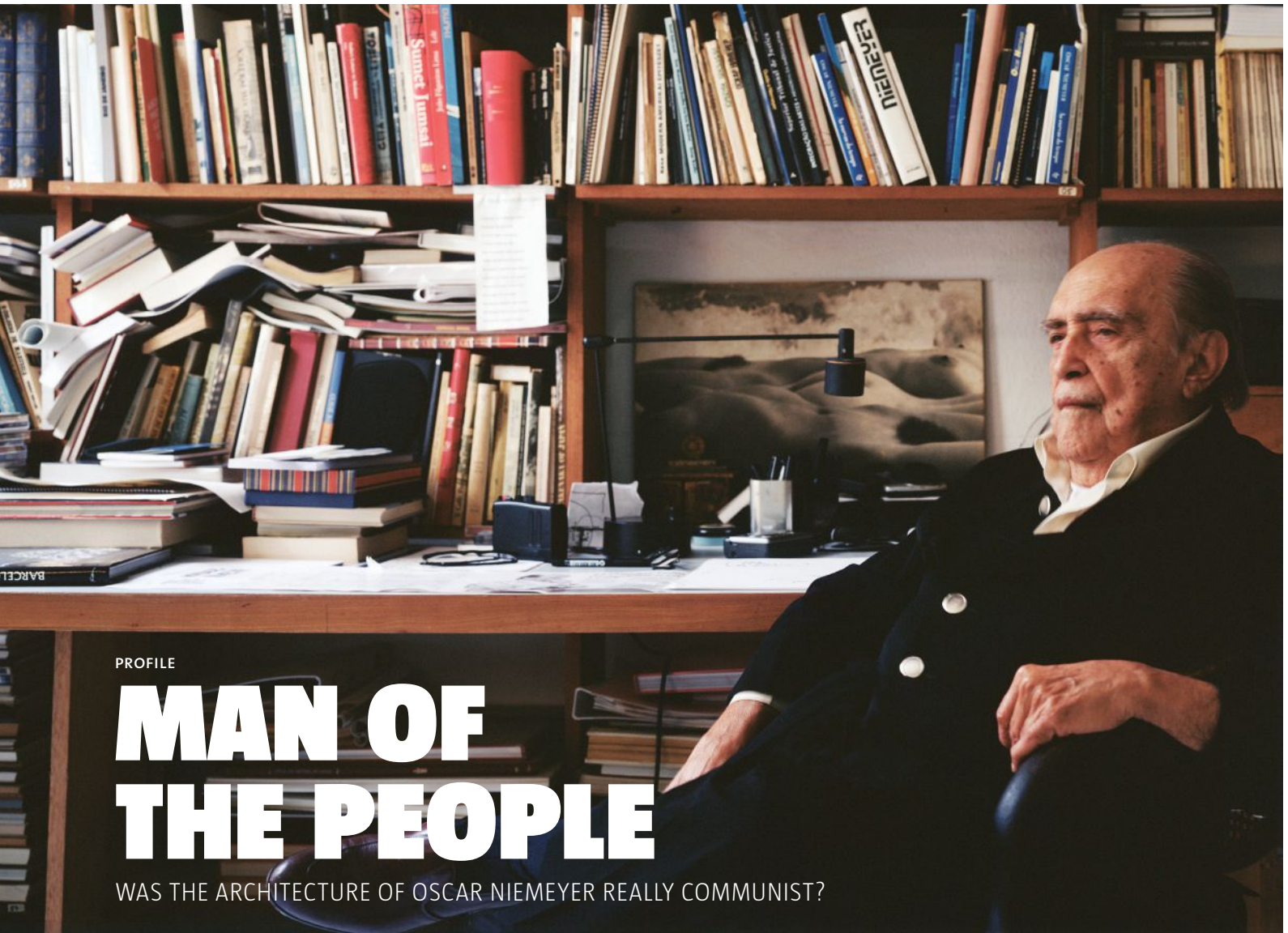
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WAS THE ARCHITECTURE OF OSCAR NIEMEYER REALLY COMMUNIST?

The death of Oscar Ribeiro de Almeida Niemeyer Soares Filho in December, at age 104, followed periodic hospitalizations for pneumonia and dehydration. The architect worked until the very end, on projects ranging from the Centro Niemeyer arts institute in Avilés, Spain, which opened in 2011, to a series of Niemeyer sneakers for Converse.

Text by **Carolina A. Miranda**

ONE OF THE MORE unlikely buildings ever designed by Oscar Niemeyer can be found in Brasília, the federal capital he helped conceive and build. The Ministry of Defense is, in many respects, classic Niemeyer: a flat, shoebox structure paired with an ebullient reviewing stand that looks like the curl of a breaking wave. Off to one side, a partially buried auditorium resembles a concrete arachnid, ready to scuttle off into the wild Brazilian plain. The ministry is remarkable for a variety of reasons. For one, it represented a wildly modern piece of architecture for the socially conservative Brazilian military. (As the story goes, the design was approved over classical architecture after Niemeyer asked a high-ranking general, “In a war, do you prefer modern weapons or the classic ones?”)

But, more significantly, it stands as testament to the contradictory impulses of one of the world’s most renowned architects. An outspoken leftist and a long-time member of the Brazilian Communist Party, Niemeyer designed the building for the army in 1967—three years after a right-wing military regime had taken over Brazil in a coup d’état, and the same year he went into self-imposed exile in Europe. In fact, he was working for the very institution that had made his life miserable since the 1964 coup: ransacking his office, hauling him in for questioning, jailing and torturing his friends, and making it difficult for him to work in Brazil. He lost the commission to build Brasília’s airport after the air force minister declared that “the place for communist architects is in Moscow.”

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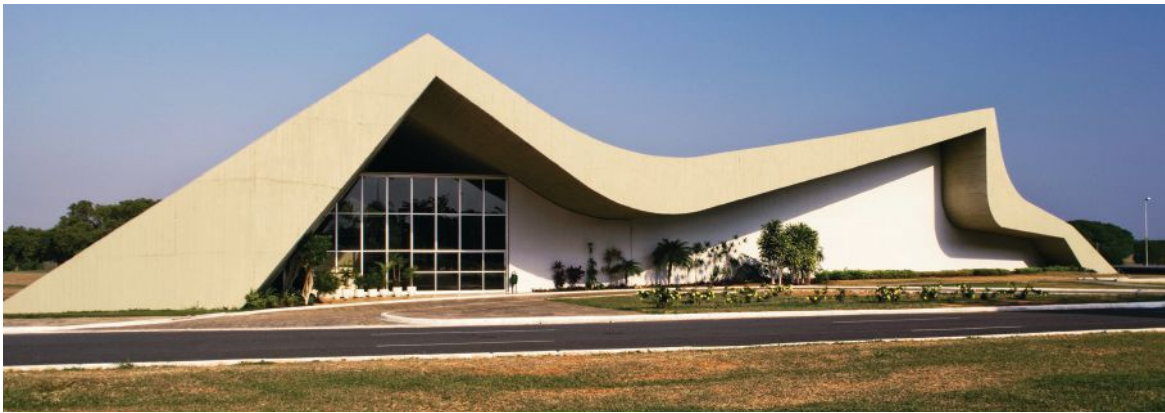
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The acoustic shell and obelisk at the Ministry of Defense in Brasília (top left) are dedicated to Luís Alves de Lima e Silva, the Duke of Caxias and 19th-century patron saint of the Brazilian military. Like much of Niemeyer's work, the Ministry of Defense auditorium (bottom left) is partially below grade.

complete the Ministry of Defense is a mystery. Later in life, Niemeyer studiously ducked questions on the subject. There is not a single mention of the project in *Curves of Time* (2007), his nearly 200-page autobiography.

WHEN NIEMEYER PASSED AWAY in December, just 10 days short of his 105th birthday, the life of one of architecture's more polemical figures came to a close. He remained an unreconstructed communist in the end, even as his designs appeared to be everything but. His coffin may have been flanked by floral arrangements from Raul and Fidel Castro, but his flamboyant buildings were created in the service of power: sprawling residences for the Brazilian elite, yacht clubs and theaters, the United Nations building (done in collaboration with Le Corbusier and others), and too many government ministries to begin to name.

Niemeyer's greatest patron, in fact, was a president—one who danced the samba and carried a German .25 underneath his tailored suits. Juscelino Kubitschek was a charismatic former physician who was bent on transforming his country into a modern state. He had previously served as governor of Minas Gerais, a well-to-do mining state—Brazil's answer to Texas—where he'd overhauled

the electrical grid and built almost 2,000 miles of roads. (To this day, Minas has one of Brazil's top economies, producing much of the country's iron ore, as well as steel and industrial machinery. Its GDP is third only to São Paulo and Rio de Janeiro.)

As a politician, Kubitschek was as much a visionary as he was an opportunist. He voted to outlaw the Brazilian Communist Party in 1947, yet tacitly accepted the party's support when he ran for the presidency less than a decade later, thereby winning a three-way election by a hair. Despite taking office with only 36 percent of the vote, he made it a principal goal of his administration to build an ambitious new capital in Brazil's uninhabited interior. He began planning on Brasília, in the mid-1950s, without holding a competition for the construction contracts, which was in violation of federal law. To cover building costs, he printed money and increased foreign and internal debt. Critics dubbed him "Pharoah Juscelino." Kubitschek's response: "The capital is moving, and anybody who tries to stop it will be lynched by the people."

Though they shared a single-minded determination—not to mention healthy egos—Niemeyer and Kubitschek couldn't have been more different on an ideological level.

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Niemeyer was laid in state at the Palácio do Planalto (top left), which he designed in 1960 as the official workplace for the president of Brazil. The inverted parabolic arches running transversely to the building's body serve as columns, a variation on the arches that Niemeyer designed for the Palácio da Alvorada, the presidential residence. There, his inverted arches run parallel to the building.

In 1966, Niemeyer began work on a number of projects in Paris, where he lived in exile. One of these was the headquarters for the French Communist Party (see page 69). The project's below-grade auditorium (bottom left) surfaces as a dome in front of the French Communist Party's six-story tower.



Kubitschek was bent on industrializing Brazil, courting investment from the likes of the U.S.; Niemeyer was known for uttering phrases like “capitalism is crap.” Yet, for Kubitschek’s grand oeuvre, Niemeyer nonetheless delivered some of the most iconic modern structures of the 20th century: the National Congress, with its two slim towers and bowl-shaped assembly halls; a presidential palace supported by ethereal spear-shaped arches; and a swirling cathedral draped in stained glass. Recalling a visit to the city in the early 1960s, Soviet cosmonaut Yuri Gagarin said, “I had the impression I had landed on another planet.”

The buildings were breathtaking; the city, wildly futuristic. But the monumental scale of Brasília—in which a handful of powerful men controlled the city’s entire skyline—hardly seemed to jibe with Niemeyer’s collective ideals. Kubitschek had secured the land, the money, and the political will. Niemeyer produced all of the most important buildings.

And the city’s master plan was devised by Lúcio Costa, a Rio-based architect and urban planner who had served as Niemeyer’s mentor and most important champion. For Brasília, Costa devised a layout that consisted of two axes intersecting in a cross. The main government structures inhabited the east-west axis, while residential superblocks ran north to south. The retiring Costa was never a brash political adherent in the Niemeyer mold. (“I am neither a capitalist nor a socialist; I am not religious or an atheist,” he once said.) His innately Corbusian city, with its tidy separation of functions, contains a few nods to transparency and egalitarian values: trees ring residential areas rather than walls, and blocks are numbered instead of being named after colonial heroes. But Brasília wasn’t designed with the intent of making life good for the little guy. Its large scale, Costa explained, communicated that “the city isn’t a province, but a capital;” the cross these axes carved into



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the savannah was an "act of possession."

"Even though the rhetoric announced that the new city would create a democratic and egalitarian society," writes architectural historian David Underwood in *Oscar Niemeyer and the Architecture of Brazil* (1994), "Brasília is a city born of imperial ambitions and as such could only reinforce the existing colonial structures." On a symbolic level, the broad boulevards and austere architecture ended up working just as well for the right-wing military dictatorship of the late 1960s and '70s as it had for the idealistic Kubitschek. In 1970, in fact, military leader Emilio Garrastazu Médici—one of the country's more notorious human-rights abusers—decreed that cabinet ministers could only conduct their business in Brasília. Critic Robert Hughes described the city as a "utopian horror." Another later wrote that Niemeyer's Ministry of Defense was the sort of "structure that would not have looked out of place in Saddam's Iraq." Niemeyer nonetheless defended his work and that of Costa's until the very end. "Brasília works," he told *The New York Times* in 2005. "There are problems. But it works."

NIEMEYER'S ARCHITECTURE, friendships, and lifestyle have all been held up as evidence that he was an armchair communist, *tsk-tsking* the status of the downtrodden while tooling around Rio in an Italian sports car. Certainly, some of his commissions seem to defy explanation—such as the Ministry of Defense—but Niemeyer's architectural practice was not entirely in contradiction with his politics. First and foremost, there is the issue of context. Brazil in the middle



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Designed in 1951 to serve as his family residence in Rio, Casa Das Canoas was Niemeyer's answer to Ludwig Mies van der Rohe's Farnsworth House or Philip Johnson's Glass House.

decades of the 20th century was not exactly the sort of place where designers (or the government, for that matter) sat around contemplating housing solutions for the poor. A small, fair-skinned elite controlled just about everything, including half the nation's income. Any architect who wanted to eat had no choice but to work for them.

More importantly, Niemeyer's political views shouldn't be held hostage to a North American understanding of communism. The Red Scare culture of the U.S. has long associated communism with the authoritarian power of the Soviet state or one of various armed movements (think: Cuba). For a whole school of Latin American leftists, however, communism—and socialism, too—are a somewhat softer concept, less about establishing a dictatorship of the proletariat than about highlighting social problems in a continent where they run rampant. (In the early 1980s, Brazil had a poverty rate of almost 50 percent. Today it stands at 21 percent—with an extreme poverty rate of 13 percent.) Nor is Latin American communism necessarily about kowtowing to the Soviets. At a 1963 speech in Moscow, Niemeyer told the assembled audience: "On the politics, I'm with you. But your architecture is awful."

Certainly, Niemeyer's sleek aesthetic couldn't have been more diametrically opposed to the Soviet styles of the 1940s

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Although it is broadly recognized as Niemeyer's residential masterpiece, Canoas did not escape criticism. Niemeyer told a biographer that Walter Gropius once observed that the organic home's flaw was that it could not be mass produced.



S.L.M. Architects Photo by Paul Mullins

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and '50s. The Soviets condemned Modernism as decadent, while Niemeyer couldn't have celebrated it more. Though the U.S.S.R. had enjoyed a short burst of avant-garde architecture in the 1920s, Stalin had put a stop to it as soon as the 1930s rolled around. The two decades that followed saw the streets of Moscow and other Soviet Bloc cities littered with a pastiche of late empire styles—Neoclassical, Gothic, and Russian baroque—all done in super-duper sizes. The numerous wedding cake buildings led *Time* magazine to conclude in 1958 that "Russia's official style of architecture has long been stuck back in the Woolworth Building era." Where Soviet buildings thrust into the sky, full of power and might, Niemeyer's hovered gently over the horizon. Where the Stalinists sought to intimidate the masses; Niemeyer wanted to delight them: "I try to make them beautiful and spectacular so that the poor can stop to look at them, and be touched and enthused."

NONE OF THIS is to imply that Niemeyer was buying European or American Modernism hook, line, and sinker. His buildings, in fact, embody a unique strain of 20th-century leftist thought. For centuries, Latin American elites had diligently taken their intellectual cues from Europe—in the case of architecture, reproducing baroque, Neoclassical, and Beaux-Arts designs all over their capitals. But the leftist, indigenist movements of the

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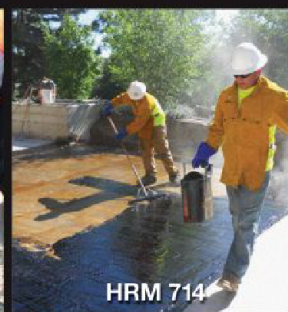
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20th century changed that. They championed the idea of looking inward to produce institutions that were uniquely reflective of the realities of the New World. For many prominent intellectuals—such as Chilean Nobel Laureate Pablo Neruda—communist politics were therefore about carving out a uniquely Latin American identity.

In this regard, Niemeyer's architecture couldn't have been more representative of leftist ideals. His buildings were singularly Brazilian in shape and form, a startling synthesis of modern principles, Portuguese design, tropical building techniques, and the undulating lines inspired by one of the world's great wilderness landscapes. His flagrant curves were a firm rebuff of the boxy Bauhaus Modernism emanating from Europe. “It must offer pleasure as well as practicality,” he told *The Guardian* in 2007. “If you only worry about function, the result stinks.”

Likewise, the construction of Brasília might have seemed like a wildly authoritarian gesture. But, for Brazil, it was also a way of shaking off the legacy of colonialism. “We must occupy our country, march to the west, turn our backs to the sea and stop staring fixedly at the ocean—as if thinking of departing,” Kubitschek declared in the late 1950s. The whole concept of Brasília, therefore, couldn't have been more in keeping with Niemeyer's communist sympathies. The project wasn't simply about putting up a few grandiose buildings in the middle of the savannah, it was about rejecting northern paternalism and showing that Brazil was capable of devising its own design solutions—ones that could resonate at an international level. Decades later, in his autobiography, Niemeyer wrote, “We were beginning to show the Old World that there wasn't much they could teach us Latin Americans.”

Niemeyer's politics revealed themselves in other, smaller ways, too. His personal home, in Canoas, built in 1953, contained no separate entrance for servants, a scandalously egalitarian flourish for the Brazil of the period. In the late 1960s, he designed the rippling headquarters of the French Communist Party in Paris (which the right-leaning Charles de Gaulle described as “the only good thing those Commies have ever done”). Two

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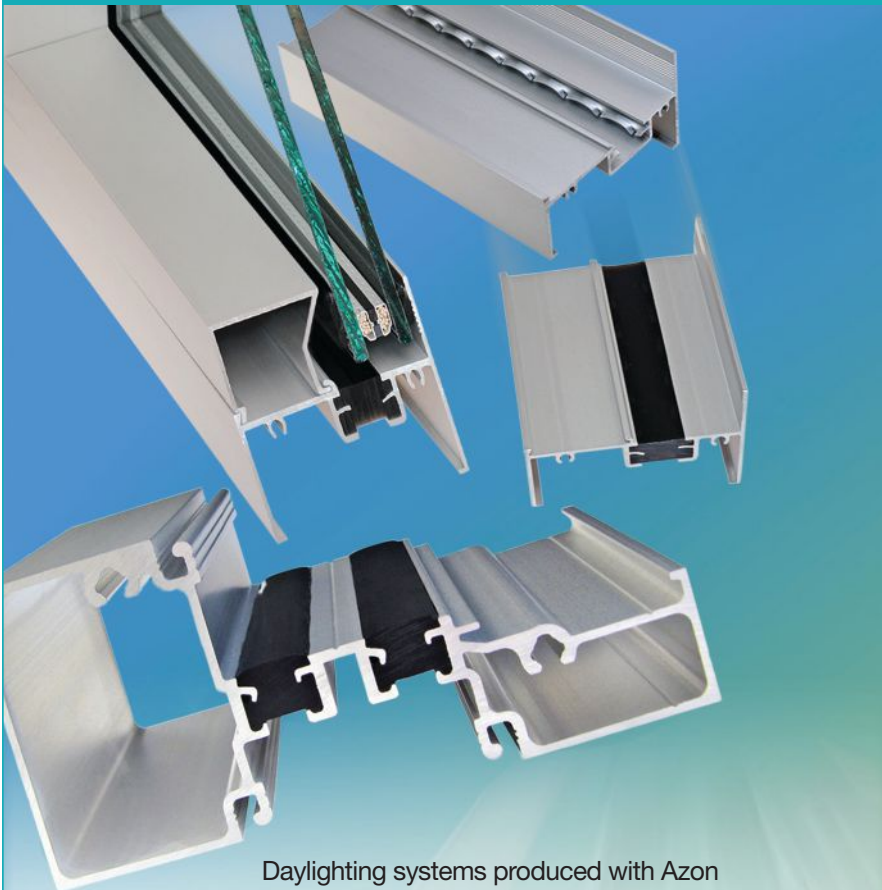
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NIEMEYER PRODUCED ONLY A MODEST NUMBER OF SOCIALLY DRIVEN PROJECTS. HE EXPLAINED THIS BY SAYING THAT IT WAS “NOT WITH ARCHITECTURE THAT ONE CAN DISSEMINATE ANY POLITICAL IDEOLOGY.” THAT’S A CONVENIENT POSITION FOR A DESIGNER WHO WAS HIMSELF A COMFORTABLE MEMBER OF THE BOURGEOISIE. BUT THAT DOESN’T MEAN THAT HIS POLITICS WEREN’T REFLECTED IN HIS WORK.

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decades later, he created a series of modular educational centers in Rio—referred to as CIEPs, for Centros Integrados de Educação Pública—geared at impoverished students. Moreover, the superblocks of Brasília were, in theory, supposed to house a wide spectrum of residents in similar apartments, so that lawyer and laborer might live side by side. (In practice, it didn't work. Government cronies occupied the superblocks; the poor were left to inhabit the slums that circled the city. This, however, was hardly Niemeyer's fault.) There are other scattered examples of his political leanings, including a series of ponderous public monuments, such as Mão, in São Paulo, which shows the bleeding silhouette of Latin America carved into the palm of a splayed concrete hand. (Subtle, it's not.)

As has been repeatedly noted, Niemeyer produced only a modest number of socially driven projects. He explained this by saying that it was “not with architecture that one can disseminate any political ideology.” That's a convenient position for a designer who was himself a comfortable member of the bourgeoisie. But that doesn't mean that his politics weren't reflected in his work. Underwood, who has written several books on the architect and interviewed him on numerous occasions, describes him as an “aesthetic communist”—someone who never called for an armed uprising, but whose designs nonetheless embody a firm resistance to Eurocentric ideals.

At the dawn of the 20th century, when Niemeyer was born, Brazil was largely an agrarian state. Today, it is a supercharged BRIC economy, producing airplanes and automobiles—not to mention plenty of architecture, from soccer stadiums to hospitals to glitzy shopping centers. Fifty percent of its population is middle class. In the next three years, the country will host an Olympics and a World Cup. Interestingly, its last two presidents have been socialist, albeit of the distinctly Latin American, market-friendly variety.

This Brazil is built, in part, on the image crafted by Niemeyer more than half a century ago. In his architecture, Latin America was finally able to see itself—in “all its grandeur and its poverty,” as he once wrote. In its time, few ideas could have been more radical.

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Innovative Designs Add Building Value and Enhance Sustainability

By: C.C. Sullivan

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A trusted, long-proven technology in Europe, vegetated roofs are literally sprouting up all over North America, with high-profile projects in almost every major city. Some hurdles to their widespread acceptance still exist in the United States – in particular, worries about the cost, leaks and the weight of the systems – yet it's becoming harder to ignore their myriad benefits to both buildings and the greater public good.

Then there are hard numbers: The North American roofing market will grow to about \$18 billion by 2014, with "the most rapid gains expected in alternative roofing technologies, including green roofs," according to a survey by Geosynthetics magazine. The trade group Green Roofs for Healthier Cities (GRHC) notes that the growth related to vegetated roofs has been steady for the last decade, too, though it slowed during the 2008 recession and housing crisis.

The projects can be ambitious. Seminal examples include the 24.5 acres of intensive greenery – made with traditional garden plantings – covering the parking decks under Chicago's Millennium Park, and extensive green roofs like the 450,000 square feet of sedum and other plants growing atop Ford Motor's River Rouge Plant in Dearborn, Mich. These and other planted roofs examples draw lots of publicity – like The Gap's San Bruno, Calif., headquarters' wavy roofscape, for a building now occupied by YouTube – and they serve as touchstones for education, like the American Society of Landscape Architects' Washington, D.C., home.

As with any new building technology, however, acceptance comes with time. Architects and their clients have been justifiably conservative in adopting even proven German systems, some of which have been in place for 40 years-plus.

LEARNING OBJECTIVES

1. Discuss the environmental benefits, features and design requirements of properly functioning vegetated roof systems.
2. Explain how building performance needs and green design intent affect the selection and application of vegetated roof assemblies.
3. Describe four ways that green vegetated roofs impact building function and operations, including safety, energy use, and weather/climate impacts.
4. List related trends in sustainable building, occupant health and building life-cycle considerations that influence the use of green roofs.

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However, if Europe is any indication, the U.S market is sure to follow. The economics of green roofs make sense – decreased energy consumption and resilient enclosures, with tax credits and incentives by Federal and municipal governments, all incentivizing a move toward verdant building tops.

DRIVERS OF GREEN GROWTH

The reasons for considering use of some sort of planted roof fall into four categories: economic, environmental, regulatory and aesthetic. The contribution of each factor varies from region to region.

In some jurisdictions, for example, municipal regulations and bylaws, as well as economic incentives, drive much of the green roof market. In Chicago, tax incentives have sustained green roof growth for more than a decade, while Portland, Ore., requires a green roof that

covers 70% of the roof area for all new city-owned buildings. Toronto recently passed a Green Roof Law mandating that each new building in the city must have a green roof of a size proportional to the total development size. Those with a total floor area of more than 21,527 square feet must cover from 20 percent to 60 percent of their roofs with vegetation, depending on their total size.

Research program, depending on the rain event and type of roof system. Other ecological issues positively addressed by green roofs including mitigation of heat-island effect – when built-up areas get hotter than nearby rural areas – reduction of energy use, improvement of overall water quality, and preservation of wildlife, in addition to saving energy.

DEFINING THE ROOFSCAPE

Whether called vegetative, vegetated, green or planted, this class of roofs comprises two basic categories, according to Charlie Miller, P.E., of Roofscapes, Inc., who co-authored a definitive primer with several Building Enclosure Council leaders in the Whole Building Design Guide (WBDG, wbdg.org): Extensive systems, which are less than 6 inches in depth and ideal for achieving specific performance goals; and intensive systems, “which can have very deep soils and merge into more familiar on-structure plaza landscapes with promenades, lawn, large perennial plants and trees.”

Motivations for green roofs as an architectural gesture range widely. “Is it intended to be seen as an aesthetic element in addition to improving environmental performance?” asks Yoes. “There are many green roof systems available that improve building performance but are not much to look at. Vegetated walls by definition have more visual impact.”

In terms of its functional role, a roof garden or vegetated roof can be focused more on the “productive and performative” traits of any architectural landscape or biosystem, says David Seiter, principal of the design-build firm Future Green Studio, Brooklyn, N.Y. Productive applications may include rooftop farms, roof orchards, and even green roofs combined with solar or wind energy systems. Ecologically performative green roofs include such ideas as catchment systems, drought-tolerant approaches, and the like.

In either case, the mindset for a green roof is clearly different than that for a standing-seam metal gable. “Too often, architects think it’s some magic green carpet,” says WXY’s Yoes. “It’s not. These are diverse communities of organisms that support each other, and that should be long-lasting and truly sustainable.”

As with any building system, project goals and budget must be resolved in the design phase. “Having a grasp on the larger goals and the budget constraints will ensure the green roof designed is viable,” says Kathryn Blatt Ancaya, LEED AP, cofounder of Living Roofs, Inc., a design-build firm in Asheville, N.C. “Understanding the primary goals of the green roof – stormwater retention, reductions in energy use, green space that is accessible – will determine what system is best suited for the client.” For example, if the roof area is not visible,

CREDIT REQUIREMENTS

SSC7.2: Heat Island Effect – Roof



Some green standards and codes, including the U.S. Green Building Council’s LEED certifications, reward the use of planted roofs. The LEED credit for mitigating heat-island effect, for example – part of Sustainable Sites credit SSC7.2 in LEED-NC version 2.2 – requires a vegetated roof covering at least 50% of the roof area. The credit is also given for high-albedo roofing with a solar-reflectance index (SRI) of at least 78 for low-slope roofs and at least 29 for high-slope roofs (pitches greater than 2:12). Or the credit can be earned by combining green rooftop and high-albedo surfaces.

In addition, specific environmental concerns drive public interest as well as new codes and regulations that favor green roofs. One is combined sewer overflows (CSOs), which can discharge wastewater into rivers and coastal waters when storm-water levels peak. Green roofs reduce rainwater runoff from buildings by up to 60 percent to 100 percent, according to Michigan State University’s Green Roof

“I tell developers the green roof is performing a service for the building,” said Ed Snodgrass, a nursery operator and author of *The Green Roof Manual*, in a recent interview. “And it can be done with a minimal of cost.” As a farmer, Snodgrass is quick to point out that green roofs are nothing like natural ecosystems: “Everything is designed – there’s no natural analogue. There’s no place in nature to find anything like a green roof system.”

Saving money, protecting the earth and improving building performance, these unnatural uses of nature are more attractive today than ever before. But architects, more than ever, need to fully understand the design strategies and construction techniques that underlie today’s successful green roofs.

“The larger design questions are: who is it for, what message is being conveyed, and how does it fit into an overall design?” asks Mark Yoes, AIA, principal of New York City’s WXY Architecture + Urban Design.

Creating Rooftop Environments



Modular decking systems add great livability and enjoyment to green roof projects. As green roofs become more of an integral part of the urban environment, accessing their components for maintenance and long term sustainability is increasingly important. Deck systems add value, provide easy access for maintenance, and protect roofing materials -- thus prolonging the roof lifespan. In addition, deck systems cover unsightly rooftop penetrations, provide space for irrigation systems and facilitate water drainage from green roof planters. Create dynamic outdoor spaces using a variety of surface materials, concrete pavers, stone tiles, and decks on joists and customize the spaces ever further with planters and modular storage crafted from ipê or aluminum using low VOC sealants and finishes.



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a relatively costly pre-vegetated system may not be the best use of funds. That's one reason a number of firms integrate green walls and other kinds of vegetated and related features with their planted roof designs, even if they are using an off-the-shelf roofing product, says Seiter. "It's not only about the environmental component; there is also beauty, and roof gardens and green roofs are often about designing with limitations," he explains. One common approach is to "take a baseline systems and look at other ways of customizing them to native conditions and site-specific needs -- and also to give an aesthetic drive to them."

"These are diverse communities of organisms that support each other, and that should be long-lasting and truly sustainable."

FROM DESIGN INTENT TO FUNCTION

Performance criteria for vegetative roofs vary from project to project, but the key factors are building type, climate and geographic location, local codes, and use of the planted area -- those with traffic versus non-traffic uses. Visual impact may be among these top considerations, too. Then a range of other factors that will play into the design, including:

- Orientation, shape and slope.
- Wind exposure.
- Building height and size.
- Occupancy types.
- Fire rating requirements.
- Required service life.
- Energy code requirements and goals.

In short, no two green roof projects are alike. The majority of roofs, however, especially the larger ones, tend to be the extensive systems with shallower depths. With full, healthy plant growth, these roof systems tend to be relatively affordable and have a good return on investment (ROI). They can accomplish the primary goals of a green roof: storm-water management, heat-island cooling, noise reduction, and energy use reduction. They also tend to be aesthetic enhancements over most other kinds of exposed roofing materials, yet they are not as lush as intensive types.

Myriad design options exist, many



conferring advantages for certain project types. Yet the critical specification challenges for intensive and extensive systems are growing media composition, drainage, and plant selection. In terms of design and construction detailing, a few core elements must be considered

for an extensive green roof, according to Roofscapes' Miller:

- **Drainage.** Drainage is not just about managing rainfall and protecting against erosion and ponding of rain and irrigation water. Vegetative roof drainage also maintains optimum growing conditions in the growth medium. A typical assembly may include a filter fabric on top of a panel for moisture retention and drainage, in addition to a waterproofing membrane and building drainage features.
- **Waterproofing.** The barriers and membranes used for moisture and bulk water protection systems must effectively protect the structure. This waterproofing system and enclosure, however, must also be protected against such forces as ultraviolet (UV) degradation, microbiological growth, and also maintenance and foot traffic. Properly designed, the green roof should actually extend the life of the waterproofing components and membranes.
- **Plant support.** The growing media and engineered assembly supporting it must be carefully designed to provide for long-term plant nourishment, growth and stability, with adequate capacity for holding water and protecting against wind scouring.
- **Insulation systems.** As with any roof, insulation must be protected so it can provide good thermal performance to reduce energy needs. In this regard, the green roof is more than icing on the cake.

Selection and detailing of these four essential pieces is the key to success for green roof projects. The following component guidelines and considerations are important for selecting and detailing the four key areas:

Membranes for use under green roofs, membranes must be tested to resist water penetration under a hydrostatic head, says Andrew Dunlap, AIA, LEED AP, a principal with SmithGroupJJR's Building Technology Studio in Detroit. "In effect, these are waterproofing systems, not roofing. Most roof membranes are not manufactured and designed to hold water for an extended period of time," he adds, noting that roofing membranes are engineered for rapidly draining water. "Roofing systems," he emphasizes, "should not be used as vegetative roofs. Waterproofing membranes are produced knowing that they will be used in situations where



Extensive Green Roof System. Life Expression Wellness Center, Sugarloaf, PA. Photo courtesy Sika Sarnafil.

extended exposure to water is expected and acceptable.”

Vegetative roof systems are designed to hold water, whether for storm-water management or just for plant health. Rather than the usual rooftop design mantra, “get the water off,” these systems instead want to “keep the water on,” says Dunlap.

Root barriers, also called membrane protection layers, are made of tough, dense materials such as polypropylene geotextiles, high-density polyethylene (HDPE), and reinforced polyvinyl chloride (PVC). Some designs have used copper foil, concrete and insulation board as root barriers, though these are less common.

Some plants grow more aggressively than others, so membranes typically range up to 30 mils thick and as much as 60 mils for the toughest flora; laps are typically thermally fused (welded), according to the WBDG. Bamboo and a few other species are simply unsuitable for a green roof, as pretty as they may be, because their rhizomes can puncture and compromise any typical barrier material. Copper is used because it inhibits plant growth, but the metal materials degrade over time and leach away high levels of minerals with rainwater.

Insulation. According to the WBDG experts, for many roofs and in particular for cold climates and high-humidity occupancies, insulation is located above the membrane. Vapor retarders are often used below the insulation in these climates, but the design should consider the issue of trapping water between a vapor retarder and the waterproofing layer – effectively a double vapor barrier – where it won’t be able to dry. Architects can use design guidelines from the National Roofing Contractors Association (NRCA) or a dewpoint analysis (or both) to assess the need for a vapor retarder. Typically, says Miller, insulation is set on top of the waterproofing membrane in a protected roof membrane (PRM) assembly or inverted roof membrane assembly, or IRMA.

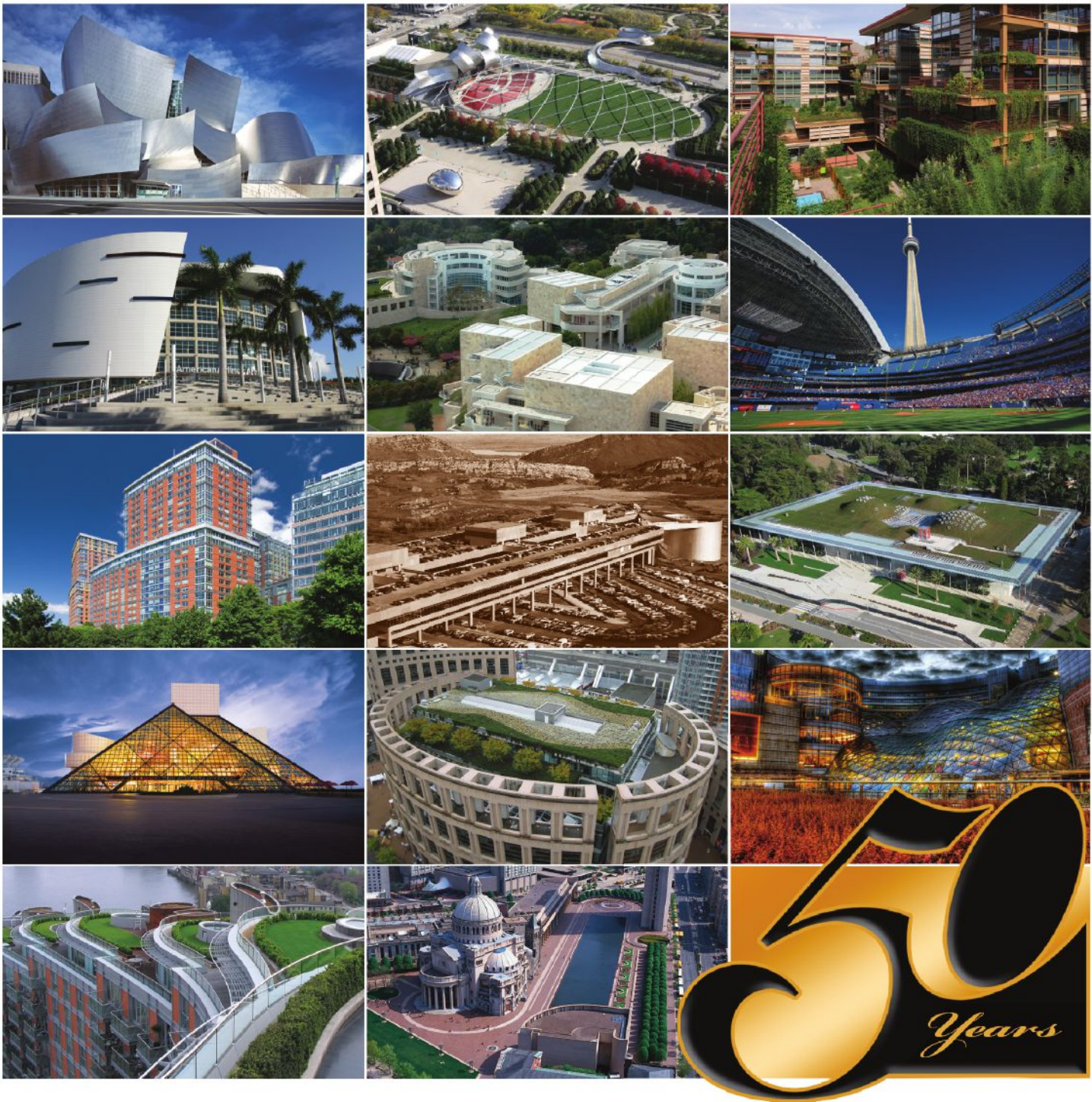
Various kinds of insulation may be used, but savvy architects look for materials that are not absorbent and are manufactured specifically for green roof assemblies. In all cases, assume that the R-value will be reduced somewhat – 10 percent or so – due to the wet roof conditions on most roofs; xeriscapes and drought-tolerant vegetation may have less of an R-value reduction.

Slope and drainage. “Even though vegetative roofs are designed to hold water and the waterproofing can withstand the hydrostatic head, good practice suggests that the substrate should still slope 1/4 inch per foot to drain,” says SmithGroupJJR’s Dunlap. “Manufacturers may state that zero-slope decks are acceptable, but they’ll still recommend and prefer positive drainage.” As with any roof design, live-load deflection on framed or deck roofs as well as permanent deflection (creep) of cast-concrete decks will affect the actual surface slope.

This article continues on www.architectceuniversity.com. Go online to read the rest of the article and complete the corresponding quiz for credit.

TEST

- The LEED credit for mitigating heat-island effect – part of Sustainable Sites credit SSc7.2 in LEED-NC version 2.2 – can be earned by including a vegetated roof that covers what portion of a building’s total roof area?
 - At least 10%
 - At least 25%
 - At least 50%
 - The credit cannot be earned with a vegetated roof.
- Unlike extensive vegetated roof systems, which tend to have very deep soils and can transition into plaza landscapes and lawns with larger perennial plants, intensive systems are typically ...
 - less than 6 feet in depth
 - less than 6 inches in depth
 - less than 0.6 inches in depth.
 - None of the above.
- In what ways can vegetated roof drainage impact the performance of the building?
 - It protects against erosion and rooftop ponding.
 - It maintains the growing media in proper condition for plant health.
 - It helps prevent moisture intrusion through the building enclosure.
 - All of the above.
- “Membrane protection layers” are typically made of dense materials such as polypropylene, HDPE, or reinforced PVC in thicknesses up to 60 mils. Copper foil and insulation board have also been used for these layers, which are also known as ...
 - root barriers.
 - geotextiles.
 - inverted roof membrane assemblies (IRMAs).
 - underlayments.
- True or false: Even though vegetative roof substrates are often sloped at 1/4 inch per foot or more for positive drainage, manufacturers prefer zero-slope roof decks because the roof assemblies are designed to hold water and the waterproofing can withstand the hydrostatic head.
- True or false: A vegetated roof can employ a pre-grown, off-the-shelf sedum mats alongside custom native plantings and grasses.
- Although green roof maintenance is generally less intensive than at-grade landscaping, adequate operational planning should minimally include:
 - Soil testing.
 - Replanting.
 - Weed control.
 - All of the above.
- After applying water to a new green roof installation, the roof can be tested for waterproofing membrane failures using low-voltage current in a procedure called
 - Low-voltage drain mapping, or LVDM
 - Electric-field vector mapping, or EVFM
 - In-situ flood testing, or ISFT
 - None of the above.
- In a vegetated roof assembly, water-management failures can be especially difficult to repair because the waterproofing membrane is protected by dirt, gravel and pavers, collectively known as:
 - Lagan layers.
 - Ballast.
 - Overburden.
 - Membrane protection layers.
- The flowering plant genus sedum includes plants that store water in their leaves for later use, ideal for shallow soil depths. While not all sedum species thrive on green roofs, there are at least 400 species
 - that require more than 4 inches of soil depth.
 - That can survive in all U.S. microclimates.
 - For use on vegetated roofs.
 - Known in nature.



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—NEIL HOWE AND WILLIAM STRAUSS, *MILLENNIALS RISING: THE NEXT GREAT GENERATION* (2000)

More than a decade after its publication, *Millennials Rising* remains the definitive primer about the generation born roughly between 1980 and 2000. The authors Howe and Strauss, historians who essentially invented the field of generational studies, argue that the Millennials will be another “hero” generation—like the Greatest Generation of World War II—that comes of age during a crisis and helps rebuild the nation and its institutions. With the oldest Millennials now in their early 30s, the seismic consequences of their coming-of-age are starting to have profound effects on the profession of architecture. The revolution has started. And as the profession scrambles to respond, the question is: Where will it lead?

CHILDREN OF THE REVOLUTION

They're the most studied generation in world history. They're a total mystery to their elders. And they're ready to take on a profession wracked by change. What will the rise of the Millennials mean for architecture?

Text by **Elizabeth Evitts Dickinson**

WHEN STEVEN RATLEY graduated with a B.Arch from Virginia Tech School of Architecture and Design in May 2011, job prospects for aspiring architects were bleak. He and his college roommate, another architecture major named Kalin Cannady, picked up and moved to San Francisco. "Since you can't control that you're unemployed, you can at least control where you're unemployed," says Ratley, now 27, who believed that San Francisco would foster two entrepreneurial types with dreams of entering the design profession.

The move paid off. After two months job-hunting and using the free Wi-Fi at a neighborhood coffee shop, Ratley and his roommate were hired by the café's owner to design an outdoor space for the business. Suddenly, Ratley was putting his architecture education into practice and getting a crash course in contracts, city regulations, and business management.

On the surface, this seems a typical, if auspicious, kind of career development. A young architect-in-training gets a modest first commission. But unravel the components of this story and you discover a 21st-century spin. First, consider the funding. Without solid job prospects after graduation, Ratley and Cannady created a campaign on Kickstarter—the online website whose funding now outpaces brick-and-mortar stalwarts like the National Endowment for the Arts—and raised \$3,000 to help underwrite their move and subsidize independent design work as they hunted for jobs in established architecture firms. They used state-of-the-art laser technology to create customized thank you notecards that

would entice bidders to give. "We had a product, people liked it, and we got funded," Ratley says.

Then, there's the nature of the commission. The outdoor space that Ratley helped design wasn't attached to the coffee shop; rather, it was a Parklet, a parking space on a city street in front of the café, which the owner purchased for use as public green space through a city initiative. The program of turning parking spaces into parks grew out of a 2005 intervention by Rebar, a locally based art-and-design firm that famously fed a parking meter for several hours, rolled out sod and benches, and transformed pavement into an impromptu oasis. The event inspired annual PARK(ing) days in cities around the country.

Some might argue that transforming a parking space into a park doesn't exactly qualify as "architecture." In Ratley's case, none of the design work that he performed in the commission of that job counted toward licensure and the requisite hours necessary for NCARB's Intern Development Program (IDP), because the project didn't meet criteria for work experience established by NCARB.

"We were doing so many things that would count toward IDP," Ratley says, but the work happened outside of an architecture firm and wasn't overseen by an NCARB-approved supervisor. "You're not even considered to be on the path yet," Ratley says. "So, because of the economy, I couldn't advance my career even though I wasn't just sitting around. I was making things happen, but it didn't count because it fell outside the regimented, hierarchical system that has been set up."

THE ELDEST MEMBERS of the Millennial generation, defined loosely as those born between 1980



A GENERATION IN PROFILE

Millennials expound on humanitarianism, licensure, and other issues of their time.

Interviews by **Alex Hoyt**
Photos by **Noah Kalina**

PROFILE ONE

MARIA GOMEZ

Age: 28 Position: Designer, Barrio Planners in Los Angeles

On studying architecture as an undocumented immigrant: I was born in Guadalajara, Mexico, and came to Los Angeles at age 8. In sixth grade I knew that I wanted to be an architect. I was accepted at Berkeley, the only University of California school with architecture as an undergraduate major. But I couldn't afford to go. As an undocumented immigrant, I wasn't eligible for public, state, or federal financial aid. So I lived at home and went to UCLA, paying my way by cleaning houses and through private donations and loans. I majored in sociology and minored in public affairs. Eventually, with the help of my dad and private scholarships, I enrolled in architecture school

at UCLA. **On the DREAM Act:** It became so important to me to help others get the chance to go to school. I ended up working with a huge group of college-educated, undocumented individuals advocating for civil rights in education. I went to D.C. to support Sen. Richard Durbin (D-Ill.), an author of the federal DREAM Act, who presented my story before the U.S. Senate. **My work now:** Thanks to President Obama's deferred action decision, I now have a work permit for the next two years. I found this small firm owned by Latinos, Barrio Planners. The work is just what I was hoping to do—combining architecture and urban design with a regard for people and social justice.

THE INFORMATION GAP

"Millennials are young and hungry, and they want to learn," Christopher Parsons says. "The amount of information at their disposal is staggering." Parsons is the founder and CEO of Knowledge Architecture, a San Francisco-based company that offers knowledge management and information systems consultancy to architects. "We help firms become more intentional and systematic about sharing information," Parsons says. "We get people out of their disciplinary tribes to share innovation across the firm."

Learning to communicate between generations and to embrace and properly deploy technology and social computing is a valuable skillset. Parsons advocates for a "Connected CEO," who blogs internally and externally in order to make the intricacies and values of practice more transparent. The vast majority of firms use social media tools to talk about themselves. "But the innovative leaders use it to talk about their clients' issues, to highlight their research, and to communicate thought leadership within their firm," Parsons says.

They also use it to educate ideas from young staff. "It's the people who don't raise hands in meetings, but who then post thoughtful blogs later. The smart firms are capturing this collective knowledge," Parsons says. "And when a CEO reaches out to his staff and says, 'I think we should be looking more into post-occupancy. What do you think?' That type of leadership model, where you are asked questions and not just told the answers, is very attractive to Millennials."

and 2000, turn 33 this year. Millennials such as Ratley are now maturing into the workforce, and with their arrival comes an attendant shift in perspective and priority.

In *Millennials Rising*, Neil Howe and William Strauss argue that each generation rebels against its forebears. Millennials, they write, will bristle against Gen-X'ers "over-the-top free agency, social splintering, cultural exhaustion, and civic decay," and will correct for the excesses of the Boomer's "narcissism, impatience ... and constant focus on talk" over action. One cartoon in the book shows a child telling her father in a breakfast-table showdown, "But daaad, I don't want to grow up to be smug like you."

Defined as confident, self-expressive, liberal, upbeat, and open to change—and encompassing the most ethnically diverse demographics of any American generation to date (61 percent white and 39 percent Black, Hispanic, Asian, or other, according to the Pew Research Center)—Millennials are coming of age in the midst of profound cultural and global change. "For Millennials, this shift will focus on the needs of the community more than the individual, so it is likely to induce large-scale institutional change," Howe and Strauss write. "Thus, the word *rebellion* is not entirely appropriate. The word *revolution* might better catch the spirit of what lies ahead."

Design leaders have already grasped that this rising generation, along with rapid changes in technology and global business practice, will have a revolutionary effect on architecture. Technology, like BIM, will claim a central role as the profession moves from a document-driven business to a data-driven model. Sustainability will not just be a priority to Millennial associates, but a standard of practice, and the complexity of infrastructure and building needs around the world will demand an integrated approach.

Millennials, for their part, will view work as an activity more than a place, and will likely transform office life, according to a 2012 survey by Knoll. At the AIA's 2008 convention, Meg Brown, Director of Human Resources for Perkins+Will, led a session titled "Tethered Millennials," about hiring, training, and retaining young workers. She found the lecture hall populated by seasoned firm leaders miffed over the evolving landscape of social media and the willful requests of their newest hires.

"Five years ago they were looking at the proliferation of social media and things like Facebook and thinking, 'What the heck is this?'" Brown says. "The younger generation was coming into firms hungrier for upward mobility in a quicker way as compared to the Boomers, but also interested in having a life outside of work."

Today, "there's more of an awareness that we can't just come to lectures and read about this, that we have to start working side-by-side

and leverage relationships," Brown says. "Firm leaders are thinking that they have to really start preparing the next generation."

Young associates can no longer be left to languish in cubicles churning out grunt work while waiting to earn a leadership role in the firm, not when talent in the industry is in such short supply. The 2012 AIA firm survey revealed that architecture firms cut staff by nearly a third since 2008. As the markets show signs of minimal recovery, this could lead to what strategy and management consultant Ray Kogan, president of Kogan & Co., calls a "talent scramble."

"A lot of firms had to cut deeply and a lot of those people are not available any more. They gave a shot at the profession, but now don't have a strong desire to return," Kogan says. "As the markets recover, there's going to be a scramble for what little talent there is. There is going to be not just a recruiting problem, but a retention problem."

Couple this critical recruitment and retention challenge with the other major Rs—recession, a predicted downturn in architectural registration, and the pending Baby Boomer retirements—and architecture is in the midst of a significant transition, one that has implications for education, regulation, and practice. Some cutting-edge educators and firms have already responded with novel approaches to curricula, mentorship programs, and business management.

But many questions remain. How will the Millennials respond to the opportunities and challenges that they are inheriting—both in the profession and the world at large? How will they influence the practice of architecture? And, perhaps most important, without drastic changes to pedagogy, licensure, and firm management, is the profession prepared to capitalize on what comes next?

ONE NEED ONLY TRAVEL to the campus of Virginia Tech in Blacksburg, Va., where Ratley studied, for a peek at the revolutionary spirit that Howe and Strauss outline in their book. Here, a class called "Designing Practice," developed by professors (and husband and wife) Keith Zawistowski, Assoc. AIA, and Marie Zawistowski, explores the future boundaries of the profession.

The Zawistowskis studied under Samuel Mockbee at the Rural Studio, where they built a house as a part of their coursework. The experience shaped their pedagogical approach. "We're part of the first generation of educators who were educated in design/build," says Marie, who turns 33 this year, putting her on the cusp of Millennial status. "Our perspective is drastically different because we know that our 21-year-old students are fully capable of making architecture. We know it because we experienced it ourselves."

The Zawistowskis left the Rural Studio inspired to continue building. They co-founded the firm OnSite, but soon bumped up against the lengthy process of becoming registered architects in the U.S. “You could be 40 years old by the time you get to be a registered architect making buildings, and by then you have a family and a mortgage that sideline your ability to take risks,” says Keith, now 33, who is still completing his ARE exams to become licensed. Marie is registered in her native country of France. (For more on licensure, see page 118.)

So the couple rewrote the curriculum for the requisite professional practice course by compelling students to treat their impending work lives like a design challenge. Students not only learn the pragmatics of practice—contracts, legal documents, client management, and such—they must also draft business models based on their personal vision of the profession. “The premise of the course is that there is no one way to practice architecture,” Keith says. “Rather than us telling them what practice should be, we’re going to push them to test and shape a unique vision. What do you want your life to be? How do you want to deploy your architecture education? We are teaching students to think as creatively about practice as they do about design.”

Says Marie, “Many of them come up with business models that we’ve never thought about.” One student, for example, developed a model to franchise architectural service through branded storefronts aimed at enticing people to hire architects. “It’s like the Apple Store of architecture,” Marie says.

Another student, Chelsey Berg, proposed a firm that delivers architecture to developing countries. Berg moved to Denver after graduation last year to work with Habitat for Humanity, and she now uses her fluent Spanish to help with outreach in Latino communities. She makes just \$12,000 a year and is on food stamps, but she won’t jump into a higher paying job at an architecture firm just for a paycheck.

Berg says that a firm’s portfolio will influence her future employment decisions, an economic choice her mother recently challenged. “My mom said: ‘You can’t tell me that you wouldn’t take a job because they don’t design what you want,’” Berg says. “And I replied that I don’t want to live my life designing things that I don’t believe in.”

This selectiveness (even in this economy) isn’t unique to Berg. Five years ago, human resource consultants Barbara Irwin and Cara Bobchek surveyed associates with up to seven years experience at AEC firms about their professional wants and goals. The results of this “Future Leaders Focus” survey showed that the most important factor for young architects

when deciding where to work was the type of projects that the firm offered associates. Future career opportunities, company reputation, and training and development opportunities also ranked high, as did socially responsible design. A respondent quoted in the report summed it up this way: “In looking for a position, I’d look for the opportunity to positively and directly affect the health of the global environment.”

Once licensed, Berg envisions herself working on a graduate degree from an institution offering humanitarian programs, such as the Harvard Humanitarian Initiative, a university-wide center that uses evidenced-based practices to improve the delivery of aid. An increasing number of academic institutions are now creating advanced degrees that straddle the lines of design disciplines and social sciences, and that cater to students interested in moving beyond theoretical case study to working directly with communities. At the Maryland Institute College of Art in Baltimore, for example, a new Masters in Social Design integrates design with civic engagement and includes students trained in architecture among its ranks.

These new academic paths for architecture students may lead to positions in nonprofits and community-based organizations, or to the creation of startups, rather than to jobs within traditional architecture firms. “I look at working for a firm—the classic definition of an architecture firm—only to get licensed and to get more experience,” Berg says. Eventually, she hopes to be the resident architect within a humanitarian organization, or to start her own nonprofit.

“Am I the rule or the exception to the rule?” Berg asks. “At this point, I don’t think there are rules anymore.”

LIZ GERBER, BREED junior professor of design at Northwestern University, has taught Millennials for 12 years. She sees many students like Berg who are invested in human-centered design careers that don’t follow the prescribed boundaries of traditional practice. In 2009, Gerber founded Design for America (DFA), a national network of interdisciplinary student teams and community members that use design for positive social change. The award-winning program allows students in myriad fields to usurp the typical boundaries of discipline and rally around pragmatic design solutions.

“The Millennial generation has grown up with social computing, which has made it possible for them to connect with people throughout the world, learn about problems and solutions, and do so independently and—in many cases— independently of traditional authority figures like parents, teachers, bosses,” Gerber says. “Social computing raises awareness of the importance and urgency of problems to be solved and

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Percentage of interns let go during the recession told the 2010 AIA/NCARB Internship and Career Study that it was unlikely they would return to the profession



PROFILE TWO

JIMENEZ LAI

Age: 33 **Position:** Founder, Bureau Spectacular/Assistant Professor, University of Illinois at Chicago

On the gap year: I took a year off and lived and worked in a desert shelter in Taliesin and later in a shipping container at Atelier Van Lieshout on the piers of Rotterdam. **On inspiration:** I'm fired up about the art of architecture—more precisely, formalism and historicism. When people talk about being more than just architects, about solving other world problems—affordable housing, carbon emission, landscape urbanism—in my mind, they're effectively forfeiting the very thing they're supposed to be an expert on. If we're not going to cultivate formalism, who will? **On licensure:** Right now, I'm really turned off by it. We're only going to be young for so long, so why would I want a legal document that warrants me liable for random things, and limits my creative ambitions in the meantime? My peers who were invested in getting licensed seem to have quickly grown old on the inside. Basically, it's like high school: I'd rather hang out with the goths and the grunge kids than the school-spirit people.

lowers the barriers to resources to solve them. When Millennials see their peers making a difference through design, they ask themselves, "Why not me? What's stopping me from directly engaging with the world's problems?"

This isn't an outlier sentiment. Social responsibility as an accepted standard of good architecture is an ideal that's also found among young associates at large architecture firms. "People are much more socially motivated than they were before, and Millennials are looking to make a difference in the world," says Phil Harrison, FAIA, president and CEO of Perkins+Will.

Perkins+Will conducted an informal survey among its Millennial staffers a few years ago. In 2035, the firm celebrates its 100th anniversary, and so it asked future leaders—some who are not yet 25 years old—where they see architecture heading in the next quarter century. One respondent voiced a widespread idea among associates by replying that "the problems that we are going to confront are going to be bigger and more complex than the traditional structure allows."

As a result, many believe that architecture will become more about systems and infrastructure than designing objects, and that research-based practices incorporating energy modeling and sustainability will be a given. Rapidly expanding global urbanity will give rise to more renovations and greening of existing building stock, while disaster-relief architecture and specialties—such as pioneering solutions for flood-prone areas—will be necessary to "clean up from the human errors of what we're doing right now," according to one associate. Fields from nanotechnology to neuroscience will shape building materials and influence the way architects design, while practices themselves will be composed of integrated teams harnessing the expertise of economists, demographers, performance engineers, and others. The practice will, to quote another respondent, "completely move away from disciplines and market sectors of traditional architecture firms."

It's important to note that Millennial employees aren't the only ones advocating a more expansive definition of the architecture field. Design-savvy, younger clients are also pushing the agenda. "As a profession, we tend to underestimate our clients," Harrison says. "We did that with sustainability. We thought we had all of the answers. And almost overnight clients became more sophisticated and their requirements for sustainability outpaced our capacity."

Brown notes that clients, like younger associates, crave participatory design. "It's what the clients want," Brown says. Being able to tell the story of the firm—the story of architecture and the value of its ideas—is an increasingly important asset. At a time when everyone from a computer engineer to a politician is the "archi-

tect" of this or that, it's incumbent on architects to recast themselves in a world of competing design thinkers. "You cannot go into client meetings the traditional way. You have to connect on an emotional level. You have to be able to tell a good story," Brown says.

IT WOULD BE FACILE to claim that this evolving and expansive vision of architecture delineates cleanly along generational lines. The taproot of change to the profession already exists—seeded by practices like Rebar, SHoP Architects, Interboro Partners—that redefine when, how, and where architecture happens.

Lateral Office, founded in Toronto in 2003 by Mason White and Lola Sheppard, describes itself as using "design as a research vehicle to pose and respond to complex, urgent questions in the built environment." The firm's portfolio encompasses architecture, landscape design, and urbanism.

"There is a compartmentalization of our environment, of our world intellectually and territorially, in terms of who belongs to what, and we've found it empowering to be a little more promiscuous about the possibility of the architect," White, 39, says. White and Sheppard undertake projects addressing multifaceted issues, such as water and ecology in California and food supply networks in the Arctic.

White is quick to add that he's not encouraging an end to architecture as it exists. "I love form. I love the production of space. There is an ingenuity that only architects offer, and there should be those true to the core of the discipline. But that's not all that we are," White says. "We can have a significant impact in other areas of design and somehow our teaching and education and certainly our business models, the organizations surrounding our disciplines, have a narrower view. That's a missed opportunity."

Advancing a broader definition of architecture is nothing new in the profession. Consider mavericks like Buckminster Fuller. But White, who is also an assistant professor at the Faculty of Architecture, Landscape & Design at the University of Toronto, says that what is distinct about this generation's pursuit of that broader vision is its access to information and to one another, to that social computing that Gerber mentioned. "They can find each other, they can network, they can form micro-practices," White says. "It's like looking at the revolution in Egypt. You can have these mini-revolutions in a profession that are supported by this powerful connectivity."

What may be new today, then, are the sheer number of Buckminster Fuller-type individuals interested in experimenting and driving new ideas within the field of design. Fueled by technological connectivity and the belief that they do matters, Millennials tend to trust in the

"WHAT MAY BE NEW TODAY ARE THE SHEER NUMBER OF BUCKMINSTER FULLER-TYPE INDIVIDUALS INTERESTED IN EXPERIMENTING AND DRIVING NEW IDEAS WITHIN THE FIELD OF DESIGN. FUELED BY TECHNOLOGICAL CONNECTIVITY AND THE BELIEF THAT WHAT THEY DO MATTERS, MILLENNIALS TEND TO TRUST IN THE AGENCY OF THE INDIVIDUAL, IN WORK AS A SERVICE TO THE GREATER GOOD."

agency of the individual, in work as a service to the greater good, and in the need for action versus rising-through-the-ranks passivity on the job. "If they can't find the organization that can take them where they want, they will likely create it," White says.

Behavioral scientists might say that these altruistic attributes aren't generational, but rather that this generation is beginning to benefit from our increased understanding of human motivation. In his best-selling book *Drive: The Surprising Truth About What Motivates Us* (2011), Daniel Pink writes that the carrot-and-stick, hierarchical model of business is outmoded as a way to get the most out of employees, and is being replaced by an approach that understands "our innate need to direct our own lives, to learn and create new things, and to do better by ourselves and the world."

So what does this mean for architecture? "Employers should expect a group of workers that respect their employer but view them as one part of their toolkit to realizing their best selves—rather than the sole source for understanding, connection, and evaluation of opportunities," Gerber says.

KNOWLEDGE TRANSFER IS FAST becoming the most vital need as the Baby Boomers who helm many firms look to retire in the coming years. Harrison, who also sits on the Executive Committee for the AIA Large Firm Roundtable, says that leadership training of Millennials and knowledge transfer among Boomers and the subsequent generations is a topic of great concern that requires ingenuity.

"When things get tight economically, there is a strong tendency to go back to the basics and rely on the things and the people that have worked well in the past," Harrison says. "But if you wait to take on the challenges of leadership transition, all of a sudden you are going to wake up with that first generation retiring and not be prepared. We see this all the time in firms around the country."

Perkins+Will established a Leadership Institute in 2007. Each year, 15 emerging talents are tapped for extensive leadership training. Another fundamental change to the practice, Harrison predicts, will be the flow chart of responsibility. Firms will move away from the hierarchical model, where experienced leaders helm divisional teams, to a more inclusive approach that invites younger associates into key roles. "We are flattening the organization and talking about a broader notion of client engagement," he says. "We are putting younger people on the front lines."

This is a valuable strategy in attracting and retaining Millennial employees, according to Christopher Parsons, the founder and CEO of Knowledge Architecture, a San Francisco-based

company that offers knowledge management and information systems consultancy to architects. But many firms fear doing it. "The smart firms are trying to figure out how to elevate that next generation earlier and give them credit," Parsons says, "but there is this concern of, 'Oh my gosh, we can't share because our competitors will steal our young, hot talent.'"

Harrison admits that this is a potential outcome, but says it's part of the necessary risk of building relationships with Millennials. Think of it as open source management. "There is an open attitude. You need to have accountability and transparency together," Harrison says.

THE GOOD NEWS for Steven Ratley is that he finally landed a job last fall as a junior designer with a boutique residential architecture firm in San Francisco. He enrolled in IDP and is now officially on the path to becoming a licensed architect. But what if Ratley—like so many architecture graduates today—had never found a job? How long would he have waited out the economy and the frustration of working hard, but circling outside the accepted profession?

For several years now, critics have worried about a lost generation of architects. At the same time, clients and young designers have made significant strides in realizing the firm of the future, where creativity, acumen, and systems-thinking permit new ways of deploying technology and talent in the service of building. There is a prevailing sense, however, that the architecture establishment is failing to keep pace with these changes and is dissuading talented young designers from joining the profession.

"We touch base with NCARB regularly and have them involved in our class," Marie Zawistowski says. The organization responsible for overseeing architectural registration recognizes the need for edits to the licensure process, she says, but implementation is glacial. "They have ideas about how to change the practice, but it takes years. The current system makes it so that architects have a narrow role and are becoming more irrelevant. We've painted ourselves into a corner."

Is it possible to conceive of a regulated profession stable enough to protect the public's best interest yet nimble enough to respond to the cultural, economic, and technological shifts changing the landscape of work? A system inclusive enough to recognize the valuable work happening outside of current professional definition and daring enough to restructure education, regulation, and practice? Without it, the future of architecture is in jeopardy.

"We ask: What does architecture look like? Instead of: What can architecture do?" White says. "I feel, too quickly, we've stopped asking" that latter question.

"FIRMS WILL MOVE AWAY FROM THE HIERARCHICAL MODEL, WHERE EXPERIENCED LEADERS HELM DIVISIONAL TEAMS, TO A MORE INCLUSIVE APPROACH THAT INVITES YOUNGER ASSOCIATES INTO KEY ROLES. 'WE ARE FLATTENING THE ORGANIZATION AND TALKING ABOUT A BROADER NOTION OF CLIENT ENGAGEMENT,' PHIL HARRISON SAYS."



PROFILE THREE

TARLTON LONG

Age: 27 Position: Designer, Pei Cobb Freed & Partners in New York

On my current job: Since June, I've been working on designing a campus for a global financial services firm in India. It's all I work on. Down the road, one of the reasons I'm in New York is my appreciation for the extreme challenges of building in the city. In architecture school at Michigan, it was exciting to be in Detroit for the opposite reasons—the ease with which design students can make an impact. In my last semester, I worked on my own design/build project, a small infill façade on a former auto repair shop in Detroit's Corktown neighborhood. **My goals in 10 years:** I plan on getting licensed and con-

tinuing to design at a traditional firm. I like where I am, and there's potential to grow here. Like most young architects, I've imagined a private practice, but I don't hang on to visions of a firm with just my name on the door. I don't think that's the future of the industry. Architecture is becoming increasingly collaborative across disciplines, and as projects become more complex and as daily working platforms—Revit, BIM, and others—promote intense collaboration across disciplines, I think the idea of the sole designer, the mastermind, is less and less a part of my generation's ethos.

SEVEN IS ENOUGH

It takes an advanced degree and 8.5 years of internship on average to get licensed. A group of professors, spearheaded by Renée Cheng, thinks it can all be done in seven years.

Text by **Amanda Kolson Hurley**
Infographics by **Catalogtree**

IT'S 2013, otherwise known as Year 13 of Andrea Dietz's quest to become a registered architect. Dietz may technically be an intern, but her résumé doesn't read like it. The assistant graduate chair of the Woodbury University School of Architecture, she previously worked for the activist design practices of Design Corps and Estudio Teddy Cruz—jobs almost any young designer would envy, but which didn't confer much credit in the Intern Development Program (IDP) because they failed to meet various criteria for work experience as established by the National Council of Architectural Registration Boards (NCARB).

Dietz has now logged around 7,000 IDP hours, far more than the 5,600 required, but with overages in some categories and shortfalls in others. So she's managing construction projects on Woodbury's campus to make up the difference. She's enrolled in a prep course for the architecture registration examination (ARE) and plans to take the tests later this year. "I come from a family of professionals—doctors, lawyers," Dietz says. "They find it [her path to licensure] mind-blowingly bizarre."

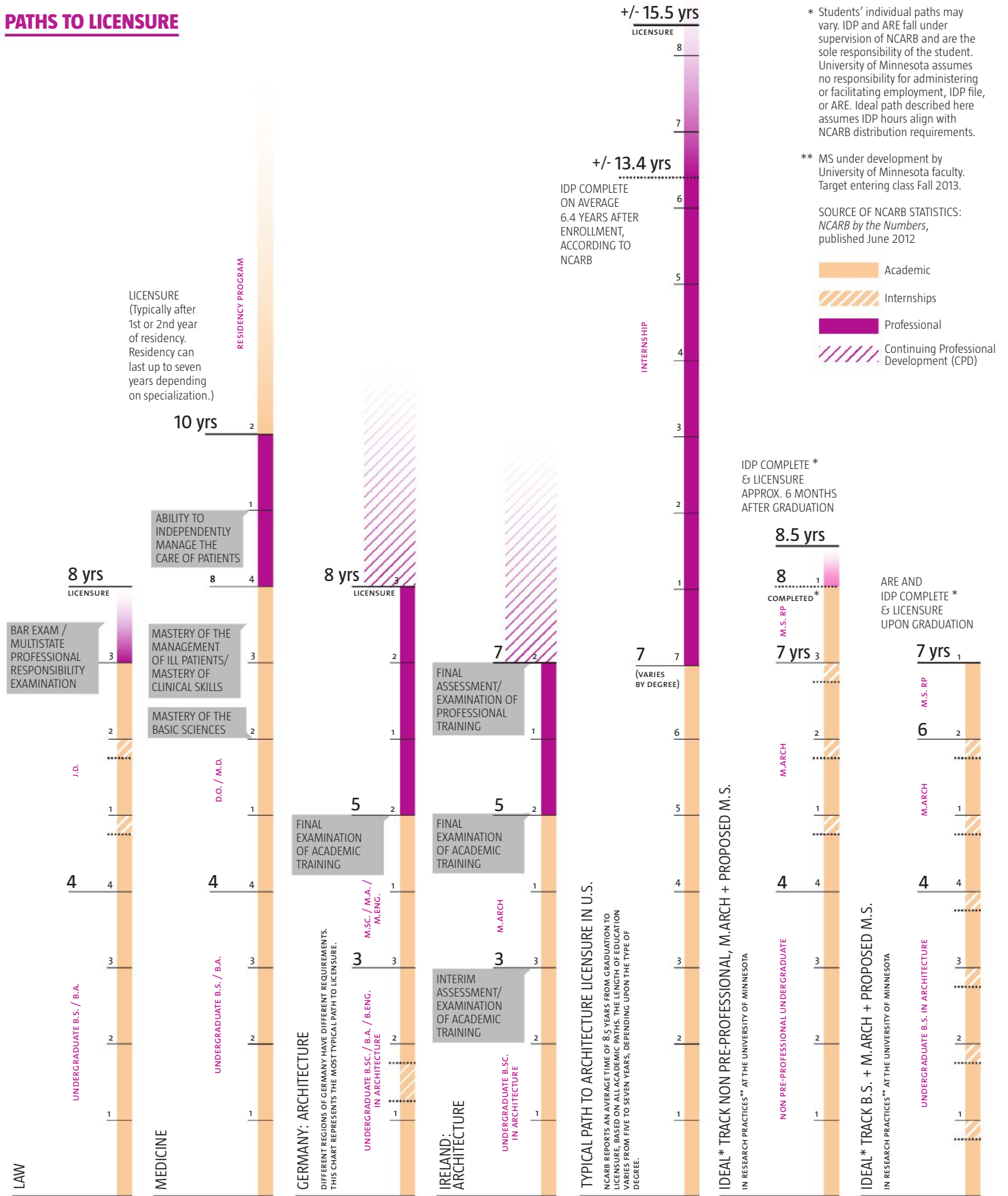
Dietz's story isn't typical, but it's not that uncommon either. According to statistics kept by NCARB, which administers the IDP, the mean time it takes for a graduate to finish his or her architectural internship is just over six years, and the average time from graduation to licensure is eight-and-a-half years.

By comparison, most law school graduates take the bar exam in July after earning their diplomas in May, and are then qualified to practice law. Medical school graduates complete a residency of between three and seven years, depending on their chosen specialty, and usually complete their licensing exams by the end of the second year.

In many European countries, architecture school graduates usually earn the title "architect" sooner than in the United States. In Ireland, for example, five years of architecture school is followed by two years of practical in-office training and a professional exam. Robust continuing education (or continuing professional development [CPD]) takes up where the practical training ends.

In this country, the drawbacks of the long, often twisting path to architectural licensure are clear: intern attrition (due to job changes or job loss, life events, or sheer frustration); career stall-out for those who remain

PATHS TO LICENSURE



in the profession without a license; and the risk of an architect shortage.

"The long fuse ... to become licensed in the architecture profession is worrisome," says James P. Cramer, Hon. AIA, chairman of the Greenway Group consulting firm and the publisher of DesignIntelligence. "It's perceived to be a disincentive for young people considering architecture as a career. That is the irony: A system developed to protect quality may be doing just the reverse."

Mickey Jacob, FAIA, the 2013 president of the AIA, is equally concerned: "Unless the industry leaders from all the collateral representative organizations come together to seriously address this issue, we will find ourselves facing a much more serious problem 10 to 15 years from now—a shortage of licensed architects unable to meet the demands of the marketplace."

Though it's hard to quantify the problem of attrition, both Cramer and McGraw-Hill Construction predict an architect shortage as soon as 2014, if current trends continue.

ENTER RENÉE CHENG, AIA, who directs the architecture school in the University of Minnesota's College of Design. (Cheng also sits on the ARCHITECT editorial advisory committee.) She and a group of her colleagues, including Jim Lutz, AIA, and Blaine Brownell, as well as Laura Lee, FAIA, a professor of architecture at Carnegie Mellon University, have thought for years about ways to streamline the licensure process and better integrate it with curricula. And now they have finally moved beyond speculation, piloting a new, research-intensive program that could dramatically shorten the time needed for students to become licensed.

They hatched the idea after NCARB unveiled significant changes to the licensure process in recent years. First, NCARB stipulated that 930 IDP hours be awarded for attaining an NCARB-approved post-professional degree. Second, students can start accruing IDP hours earlier than in the past—from the end of high school. Third, students can earn 1,860 hours for teaching and academic research.

Minnesota leveraged all of these changes when creating its new program, in which students will pursue a one-year M.S. in Research Practices after finishing their M.Arch. The M.S. confers the newly assigned 930 IDP hours, and these are rounded out by ample internship, research, and teaching hours. The internship hours can be accrued from the start of either a B.S. in Architecture or an M.Arch, depending on the student's path. Ideally, a student who goes through the whole program will earn enough hours to complete the IDP, pass the ARE, and achieve licensure upon graduation, or at the latest six months after.

Cheng and her colleagues are waiting for the university to approve the M.S. in Research Practices degree before launching the program in Fall 2013. "We're aiming for a small group at the beginning, maybe four to eight students," Cheng says. She expects most to be recent M.Arch graduates from within the school, and says that interest in the degree is high.

It sounds like a co-op program that alternates study with work experience—and it is a co-op "hybrid," Cheng confirms. But what sets it apart is a three-way research paradigm. Cheng and her colleagues are bringing together a consortium of firms and nonprofits that will sponsor in-house student research projects. Those projects (academic internships, under NCARB's definition) will be supervised by faculty members; a registered architect, whether the faculty member or someone from a firm, will always be involved.

The educators/architects will collaborate with a firm or nonprofit, but the primary liaison between these two groups will be the third point on the triangle—the student, says Laura Lee, who helped Minnesota faculty create the new program. "Students and interns become the conduits for the knowledge exchange" under this model, Lee says. "Their role becomes really elevated."

Jim Lutz, the IDP coordinator in Minnesota's School of Architecture, describes the research projects as "curated opportunities, where we're acting as academic matchmakers between members of the consortium and our pool of students."

Cheng emphasizes that the "amazingly strong relationship between the practice community and the school" gave her team an important head start. Firms have different reasons for signing onto the consortium, she says. "Some are in it because they want to shorten the time to licensure; some as altruism; some see the value for their clients. Others say, 'We want to do research, but can't really fit it in.' This gives [firms] a structured way" to undertake research.

Two students have already taken part in firm-sponsored research projects launched before the official start of the Research Practices degree, working on an analysis of energy modeling tools (with the Minneapolis-based firm MS&R) and on virtual reality applications for healthcare design (with HGA and its client, the Mayo Clinic.)

In addition to the research projects, students will receive personalized guidance to keep them on track with the IDP and will take the ARE as part of their course requirements. M.S. students will pay tuition, but will be eligible for tuition reductions on account of their

8.5

Mean time in years it takes between graduation and licensure for architects, according to NCARB by the Numbers, published by the organization in June 2012



PROFILE FOUR

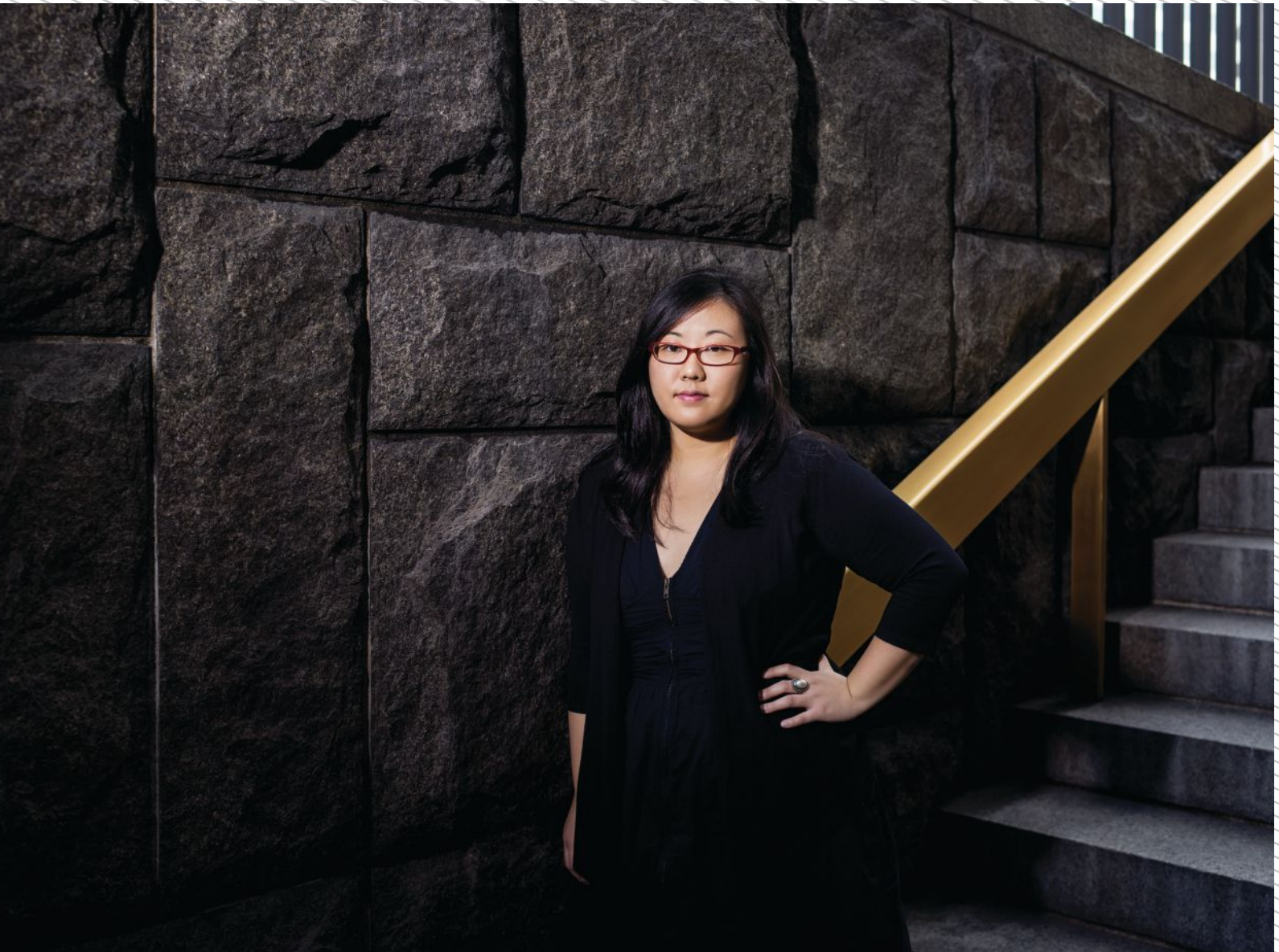
MELISSA BERNSTEIN

Age: 27 Position: Architect, KlingStubbins in Philadelphia

On landing my current job: After my second year of architecture school, I worked at an architecture firm for the summer and through my third year. At the same time, I was also developing an interest in structural engineering. I was really influenced by my structural engineering professors—that's what brought me to KlingStubbins. It's an architecture and engineering firm, and I came here for a summer internship on the structural side. But I also thought I might be able to transition to a job on the architecture side. I did—and I just got licensed in October.

On licensure: While I was doing my internship, Pennsyl-

vania passed a rule allowing you to take your licensure exams while you are in the Intern Development Program (IDP), but I didn't end up starting my exams until I finished the internship. Through my AIA involvement, I've been presenting at different universities about IDP and the importance of getting licensed. It's the capstone to all your learning. Right now, I feel there's a large portion of Baby Boomers who never got licensed—they did an apprenticeship and just kept working. But I think that's less common now. Most young professionals that I've spoken to seem to have the goal of getting licensed.



PROFILE FIVE

MINI CHU

Age: 29 Position: Architectural designer, Gensler

How studying literature made me a better architect: In undergrad I double-majored in ethnic literature and architecture, and I taught a year-long class in ethnic literature at U.C. Berkeley. The cross-cultural, political dialogues of ethnic studies made me more sensitive to the stories of the clients and communities I've worked with since. It's helped me to integrate the pragmatics of architecture—the social and political pedagogies—with the formal side of things. It's made me a better researcher, and it helps me in designing a space. **On humanitarianism:** After undergrad, I started working with Engineers Without Borders in San Francisco. We started a health clinic in a Haitian community in the mountains called the Bayonnais Valley. It's very rural, totally off-the-grid. The beginning was

about setting up infrastructure—clean water, electricity—and then came the architecture. We learned that we can build all we want, but if there wasn't anyone to sustain the project after we left, there was no point in doing it. Educating and collaborating with the local community became really important, and that process taught me how to collaborate with consultants, clients, and engineers—invaluable experience for the working world. **On corporate life:** One project I've worked on was a new terminal at Incheon International Airport, in South Korea. It taught me that young architects need to be fluid and on-the-go, because a lot of our work is international. We have to learn to use new technology, to use local materials, and to work on scheduling and communication with foreign clients.

research. They'll be paid for their work with the firms, helping to offset tuition costs.

SO FAR, NCARB is declaring the Minnesota plan kosher. "Based on what I've seen, I did not have any concerns," says Harry Falconer Jr., AIA, NCARB's director of internship and education. And not just kosher: In 2011, the proposal received an honorable mention in the juried NCARB Award, which honors programs that integrate practice and education.

Cheng presented the proposal, as part of the NCARB Award ceremony, to a crowd of architectural educators last November. The response was very positive overall. "Frankly, most people have been incredibly supportive," Cheng says—noting, however, that she heard the proposal was "hotly debated" by the jury.

David Cronrath, AIA, dean of the University of Maryland's School of Architecture, Planning, and Preservation, missed Cheng's talk but has since reviewed her proposal with enthusiasm. "Anything we can do to expedite the speed with which people can get licensed is a good thing," Cronrath says. "What Renée has done is establish a roadmap which a lot of people can follow. And, I think, of course they will."

Cronrath hopes that improved collaboration among architecture's four gatekeeping organizations—the AIA, NCARB, the National Architectural Accrediting Board (NAAB), and the Association of Collegiate Schools of Architecture—will eliminate some redundancies and help speed things up. "If you look at IDP and the knowledge and skills [it requires], particularly in some of the core categories, a lot of those are already required by NAAB, and are part and parcel of what the academy does," Cronrath says. "In the future, why can't we get greater synergies out of that?" Cronrath calls NCARB's rule changes a "huge step" in this direction.

NCARB—whether deliberately or not—has empowered schools like Minnesota to dream up new programs based on its changes to IDP, which it has been advertising by sending representatives to schools to host workshops and answer questions. "I'm really anxious to see what we can further do to integrate education and internship," Falconer says.

But he makes clear that the intent of the rule changes is not to accelerate the licensure process: It is to recognize more types of legitimate experience. "What we want to recognize is valid experience. If it conforms to the rules of the program, then it should be counted."

"People keep asking me how long it takes to complete IDP," Falconer adds. "The answer is: 5,600 hours. How you personally go through that program—and I'm not trying to sound harsh—it's based on personal circumstances."

To some extent, the length of the IDP is

a necessary flipside of its rigor. The internship requires that experience hours be spread across multiple categories, so that those wishing to practice architecture get a solid grounding in all pre-design and design skills and in both project and practice management. The seven-part ARE assesses whether intern architects are competent to protect public health, safety, and welfare—not a light responsibility.

Yet despite their exacting standards, the internship and tests are largely self-guided. Sure, it's convenient that you can take the ARE tests in any order, wherever and whenever you want to. But "one of the issues of why people aren't taking the exam in a timely way is a lack of cohort," Cheng says. "There's potentially so much flexibility [that] you don't have a deadline." By imposing more structure on the process, the Minnesota program seeks to foster cohorts like those that go through medical residency together, or through the architectural licensure process in other countries.

The larger goal of Cheng and her collaborators is to spur a change in culture that spans architectural practice and the academy, joining them in a feedback loop that has long been broken. Currently, the knowledge within firms is often proprietary, and closely guarded; research in schools is shared mainly through academic channels. When educators and practitioners together assume more responsibility for training future architects, they have the opportunity to close the loop, informing each other's pursuits in a meaningful way.

"There's tremendous knowledge in the academy, tremendous knowledge in practice," Lee says. "I would hope in five to seven years we have a model and a structure for that knowledge loop, and that exchange is really pervasive in the profession." If other schools of architecture create programs like Minnesota's—which, Cheng stresses, she's happy to share and offer as a template—it could happen.

THAT'LL BE TOO LATE to help Andrea Dietz (based on NCARB's recent changes, more of her early work experience would have counted toward her IDP record), but she thinks the new program sounds "really good for students." (Although she worries about them having to pay for another year's worth of school.) She'd like it to become standard for American architecture students to get most of the way through IDP while still in school, and then to do residency-style apprenticeships.

Why has she stuck with the internship for 13 long years? For ideological reasons: "The title of architect needs to apply to more than it does now," Dietz says. In her view, licensure will help legitimize her nontraditional, multidisciplinary mode of practice.

"'ANYTHING WE CAN DO TO EXPEDITE THE SPEED WITH WHICH PEOPLE CAN GET LICENSED IS A GOOD THING,' SAYS DAVID CRONRATH, AIA, DEAN OF THE UNIVERSITY OF MARYLAND'S SCHOOL OF ARCHITECTURE, PLANNING, AND PRESERVATION. 'WHAT RENÉE [CHENG] HAS DONE IS ESTABLISH A ROADMAP WHICH A LOT OF PEOPLE CAN FOLLOW.'"

THEY COULD BE HEROES

Curious how the next generation of architects will address economic uncertainty, extreme weather, energy scarcity, and other challenges that will define their careers, we put out a call for student projects. The result? Millennials are already rising to the occasion.



54

PERCENTAGE OF HAITIAN RESIDENTS
WHO LIVE IN ABJECT POVERTY



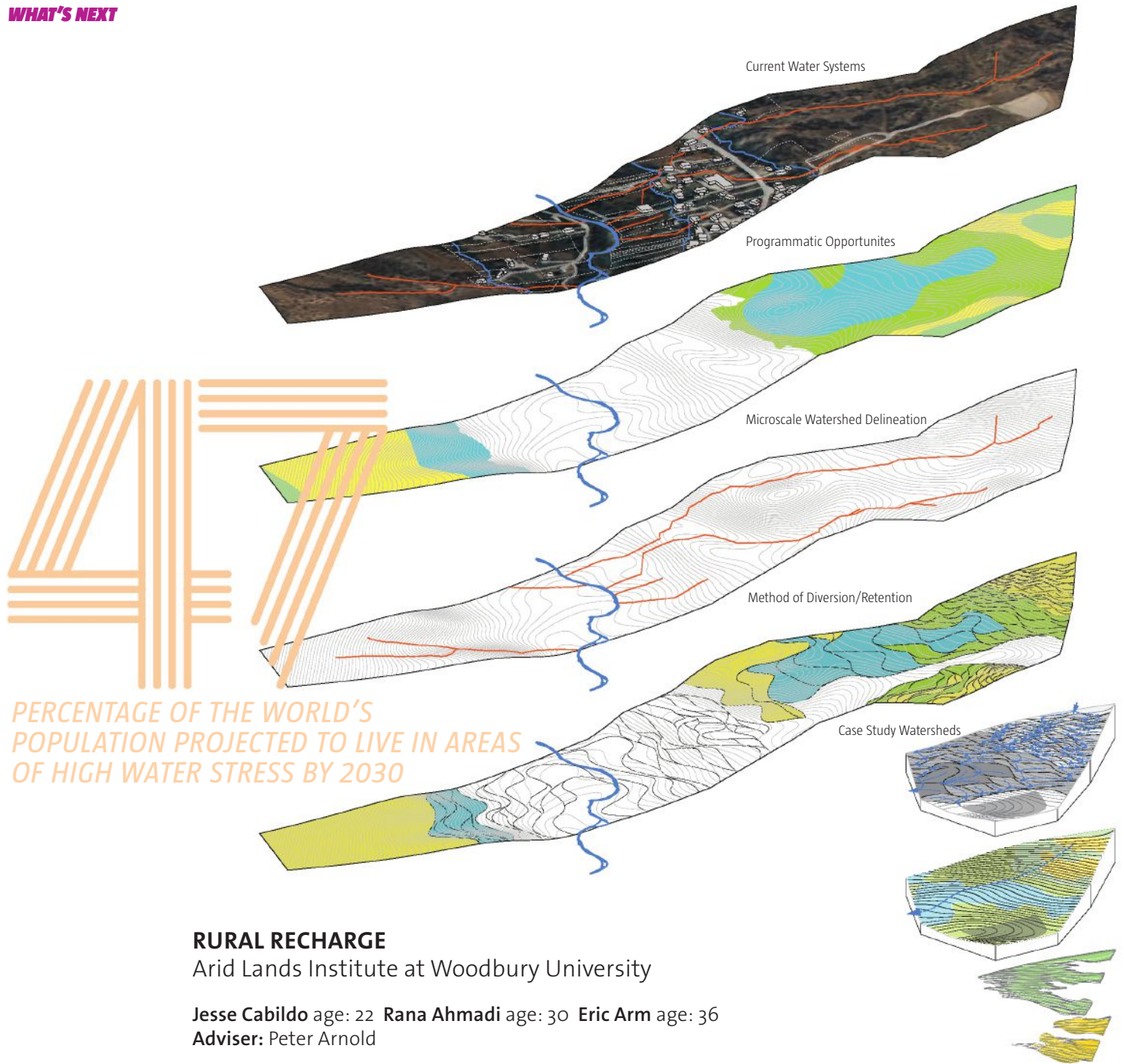
DEVELOPMENT PLAN FOR DUCIS, HAITI

University of Minnesota

Brent Suski age: 25
Abby Meuser age: 29
Adviser: Gayla Lindt

Suski and Meuser learned about Ducis, known for its rich agricultural land irrigated by a canal, while working for Architecture for Humanity and Sodade, a Port-au-Prince planning firm. The two students decided to make the coastal town in Haiti the focus of their joint master's project, which they completed in 2012. First, the students held community workshops to help identify the town's needs. Then they designed a comprehensive vision—including the construction of a new public plaza, a professional school, waste-processing and agricultural-processing facilities, and a general store—to help Ducis make strategic decisions about future development.

"As a team, we were drawn to this project for its potential to affect the lives of the small community we were working with. Eventually, we came to realize that even if we were unable to get our project built, we had at least begun a dialogue with the local residents, empowering them to envision a future for their community that they might be able to realize themselves."
—Brent Suski



RURAL RECHARGE

Arid Lands Institute at Woodbury University

Jesse Cabildo age: 22 Rana Ahmadi age: 30 Eric Arm age: 36

Adviser: Peter Arnold

With climate change and drought posing increasing hardships for rural farming communities in the American Southwest, a trio of undergraduate students at Woodbury University's Arid Lands Institute used a studio project to explore how Dixon, N.M., could better manage decreasing water levels from snowpack and increasing seasonal flash flooding. The students envisioned re-contouring the landscape using inexpensive, locally sourced materials to help with flood control, septic treatment, irrigation for farming, and aquifer replenishment. Small seed ditches would help prevent erosion; diversion dams would help control flood waters.

"I believe that solutions to the problems facing the arid West will require a high degree of community involvement coupled with a high degree of interdisciplinary cooperation from architects, engineers, scientists, and farmers. That said, I feel that architecture, as a material interface between user and environment, has the greatest potential to reconnect people to their surroundings through ecologically sensitive, responsive, and communicative design." —Eric Arm



PROFILE SIX

JARED HUETER

Age: 29 Position: Regional Associate Director, AIA Gulf States/Intern, Mathes Brierre Architects in New Orleans

On humanitarianism: I was the project manager for a religious organization that rebuilt homes post-Katrina. The first one I worked on belonged to a 9th Ward family. The wife was pregnant. In tears, the husband told me, “I want our child to grow up here.” There was very little money, but we figured it out. A team of carpenters from New York made beautiful custom cabinets for the nursery. The baby was born two weeks before we finished. **On teaching:** For three years I was the dean of design at the Priestley School of Architecture and Construction, which focused on inner-city, at-risk youth. We did design/build projects for the neighborhood. Our philosophy was that inherent within the design process is a great high school education. **On licensure:** Being at a nonprofit for so long, you get tired of not being an “architect.” It’s hard to get licensed and do nonprofit work at the same time. You’re young, you have cool ideas—you want to do that work right away. Because how easy will it be to go from an architect’s salary to a nonprofit worker’s? As I pursue licensure, I do think the path could be more inclusive to alternative tracks taken by more socially conscious designers.



PROFILE SEVEN

RYAN TYLER MARTINEZ

Age: 25 **Position:** Second-Year Graduate Student, SCI-Arc, Los Angeles

What I'm studying: My focus is the blurry zone between architecture, film, graphic design, and photography. I just had my first big film shown at the Pompidou Center in Paris—it's about the current vernacular of architectural geometry and form. I also have undergraduate degrees in graphic design and art history. For me, architecture school has been more about learning a new way of thinking than about preparing for a profession. **My goals in 10 years:** I'd love to be a director of architectural films. I'm interested in Joseph Kosinski, who most recently directed the [latest] *Tron* film, because a lot of his work deals with questions of architecture, even though his work is not architecture per se. I'm also interested in building,

but because of the economy I'm a little hesitant, though optimistic. **The big issue for Millennial architects:** Student debt. You're investing \$50,000–\$100,000 in a profession that might not give the return you want. Architecture isn't about becoming rich and famous. Our generation looks at these starchitects and thinks that we can be next, but that's like wanting to win the lottery. We have to be careful about investing a lot in a career that might not have the end result we want. **How Boomers influenced me:** I think Millennials are looking more to Boomers—the Peter Eisenman generation—than we are to Gen-X'ers. Our generation is thinking critically about solving our problems with the solutions of Postmodernism.



PERCENTAGE OF THE BUILT ENVIRONMENT IN
THE U.S. THAT IS PREDICTED TO BE EITHER
NEW OR RENOVATED BY 2035



YE NEW LIBRARY

Tulane University

Jack Waterman age: 22

With so much construction predicted for the coming decades, how architects respond to the fabric of existing neighborhoods as they design new buildings and remodel old ones will become an increasingly complex challenge. For a master's studio project, Waterman designed this library for the French Quarter of New Orleans. Prefabricated panels of brick are a modern take on the materials of the surrounding historic structures, and the library itself creates a new pathway between two formerly disconnected city streets.




"The rise of adaptive use results from more than the new accessibility of digital tools to document, visualize, and construct sustainably within a historic structure. The idea of mixing historic and contemporary has become acceptable. In fact, juxtaposing patina with modern design has become a hallmark of the contemporary style. This is more than just sustainability: Our generation is acknowledging the past in our frontal assault on the future." —Jack Waterman

WHAT'S NEXT







Successional Four Year Phasing









AQUACULTURE SPECIES

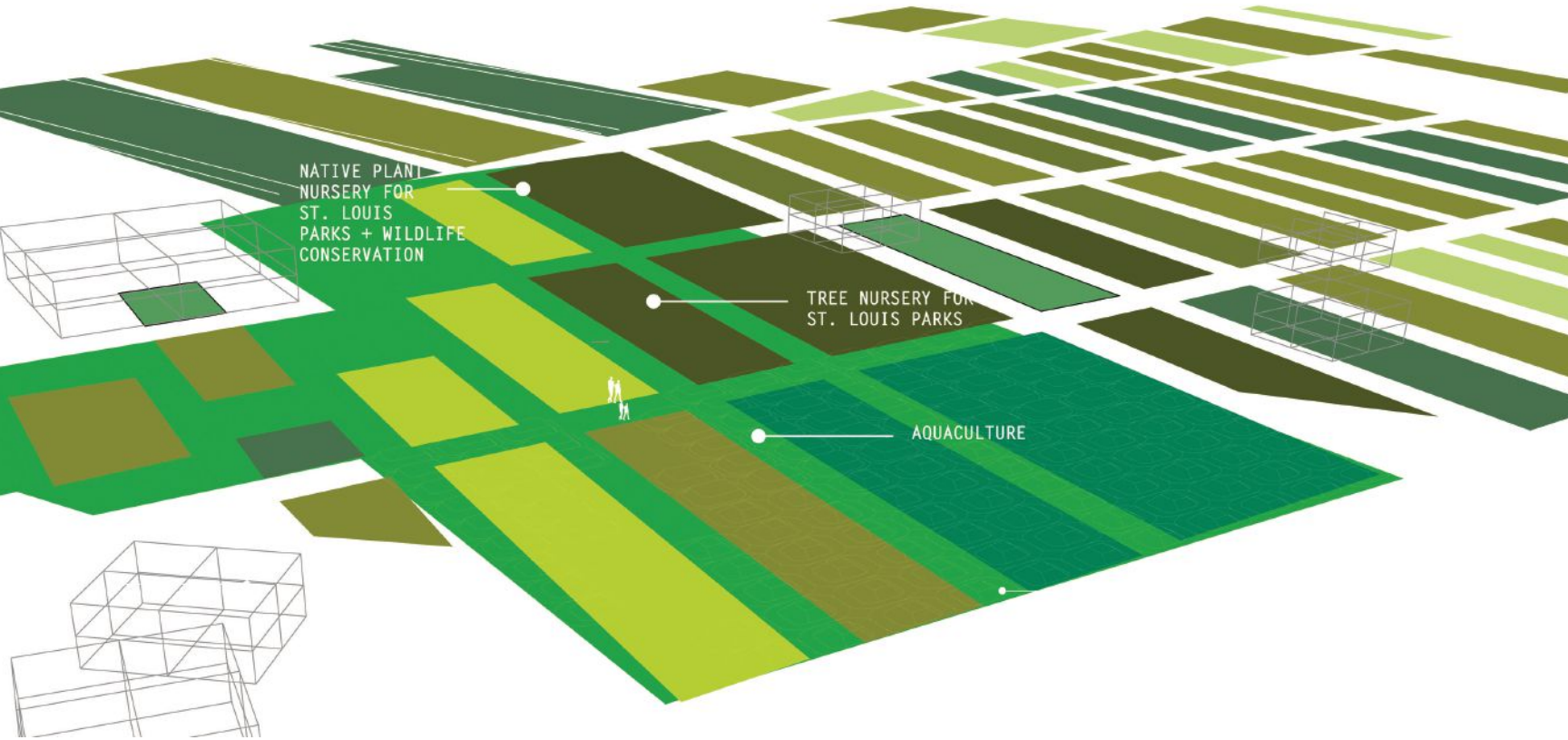
- Endangered  LAMPSELIS higginsii
HIGGINS EYE
- Endangered  ETHEDSTOMA nlangue
DARTER
- Endangered  ROTOPIS topeka
TOPEKA SHINER

PLANT NURSERY SPECIES

- Endangered  LINDERA
mellissifolia
- Endangered  BOLTONIA
decurrens
- Endangered  ASCLEPIAS
meadii
- Endangered  HELENIUM
virginicum
- Endangered  PLATANHERE
praeclara
- Endangered  TRIFOLIUM
stoloniferum

TREE NURSERY SPECIES

-  CARPINUS
carolinana
-  QUERCUS
macrocarpa
-  QUERCUS
valutina
-  NYSSA
sylvatica
-  GYMNOCLADUS
dioicus
-  CRAETAGUS
sp.





ASSEMBLY LINE WILL PROVIDE PLANTS + TREES FOR 13,000 ACRES OF ST. LOUIS PARKLAND AND REPLENISH NATIVE AQUATIC SPECIES IN MISSISSIPPI

ST. LOUIS ECOLOGICAL PRODUCTION LINE

Harvard Graduate School of Design

Heather Dunbar age: not disclosed

Xiaowei Wang age: 26

The 1970s demolition of Pruitt-Igoe, the St. Louis housing project, famously heralded the death of Modernism. Heather Dunbar and Xiaowei Wang envisioned a new use for the largely vacant 33-acre site with their winning entry in a 2012 competition called Pruitt Igoe Now. In a nod to a 1987 plan to build an industrial warehouse on the site, the students designed an ecological assembly line, with tree and plant nurseries that could supply city parks with greenery, and aquaculture basins to grow fish that could resupply the Mississippi River. They linked their design into surrounding areas to create a green corridor in the city.

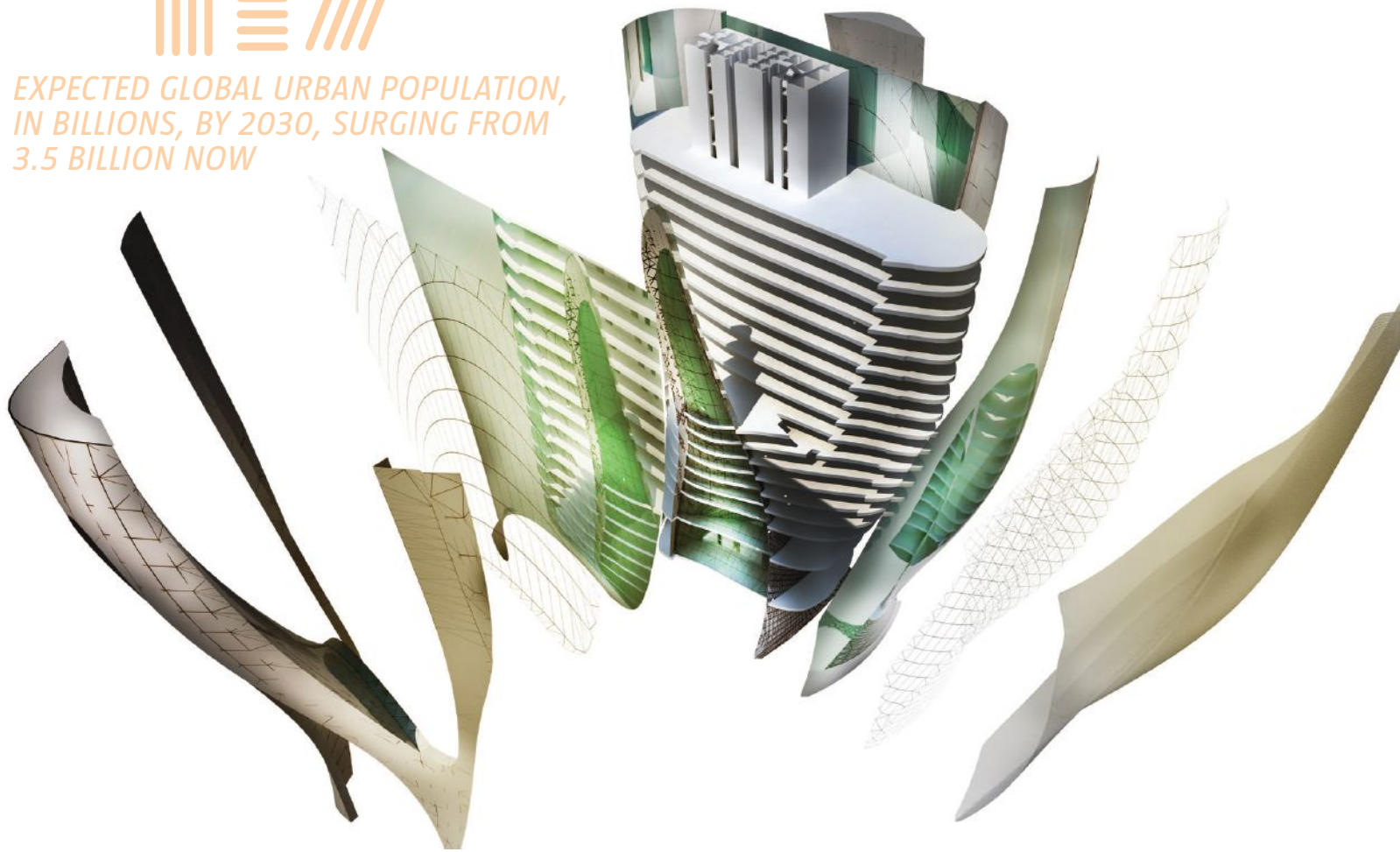
"We see the project as radically different from Modernist schemes where planning was top-down, and a reiteration of the new role of an architect as a designer of systems. While there's an increasing division of labor in the design professions, what we can offer is a vision, and a systems-based approach to urban design. We see this approach as negotiating policy and social and ecological concerns through the design of spatial form that allows for growth and change." —Dunbar and Wang



PERCENTAGE OF LAND CURRENTLY ESTIMATED TO BE VACANT WITHIN THE CITY LIMITS OF ST. LOUIS

49

EXPECTED GLOBAL URBAN POPULATION,
IN BILLIONS, BY 2030, SURGING FROM
3.5 BILLION NOW



THE DEVOID TOWER

Illinois Institute of Technology

Daniel Caven age: 24

Adviser: Ross Wimer

As we enter into the global age of the city, with discussions of density and urban design reaching an ever-greater fever pitch, emerging designers will be charged with building tall. And as this project by Daniel Caven illustrates, they will strive to make those buildings energy-positive. For an undergraduate studio, Caven relied on computational fluid dynamic system analysis, as well as examples of manmade and natural wind-harvesting techniques, as he designed the Devoid Tower, situated on the Chicago River. Wind is funneled into inset turbines, creating enough energy in theory to power four or five surrounding buildings.

"The past idea of towers acting as modern monumental statues has become obsolete. No longer can a tower be a mere stacked floor plate, withdrawing energy from an outsourced supply; they must be capable of generating active energy outputs using sustainable mechanical devices, ultimately creating economic gains for cities. And these new towers must also conform to each specific city differently." —Daniel Caven



PROFILE EIGHT

FRANCESCA DESMARRAIS

Age: 25 **Position:** Director, 2030 Challenge for Products at Architecture 2030, Santa Fe, N.M.

On my job: The aim of Architecture 2030 is to reduce greenhouse gas emissions in the built environment, with the ultimate ambition of reaching carbon neutrality by 2030. My job is to incentivize the development and use of low-carbon building products. The goal is for architecture firms to integrate the constraints of carbon emissions into their operations just like a budget: You have to come in under budget, and you have to design a carbon-neutral building. **On my goals in 10 years:** Right now, architecture school is looking less

and less likely. I'd love to continue working in a similar vein: taking a design approach to advocacy. Climate change will keep presenting a lot of opportunities for us to redesign houses and other structures. From now until 2030 we're going to build or renovate 900 billion square feet of floor area—three times the size of the U.S. **If I could give a TED Talk:** It would focus on the intersection of ecological design and social justice—how we can create communities that are healthy and empowered to develop in healthy ways.

AN ILLUSTRATED GUIDE TO THE GAP

Text by Mark Lamster

So much unites architects. A taste for midcentury furniture; an unwavering conviction that, if everyone else would just listen, they could solve the world's problems. But divisions have formed within the ranks. The ambitious Millennial, maestro of the digital, is pushing up against the experienced Boomer, dinosaur of the analog. And while the younger set may inevitably win out, architects need to bridge the generation gap to ensure a flourishing practice. And so, to lay the groundwork for mentoring (and up-mentoring), we provide a handy comparison chart of the idiosyncrasies and proclivities, similarities and disparities, of these sometimes embattled generations.

BOOMERS VS MILLENIALS

Got my start

Drafting plumbing details at SOM ↔ Sleeping in the bathroom at OMA



First commission



Beach house for parents ↔ Beach house for parents

My browser is always tabbed to

My investment portfolio ↔ BldgBlog

Preferred monograph format

Doorstop fat, like Rem ↔ Comic book, like Bjarke



Ideal vacation



Rome ↔ Hanoi

I always choose materials that

Make the coolest shapes ↔ Leave the smallest footprint

I always wear

Black ↔ Black

Architecturally inclined cinematic auteur

Peter Greenaway ↔ Wes Anderson



Dream commission



Art museum ↔ Mixed-income urban housing development

My favorite place to shop is

Barney's ↔ Etsy

My non-architect friends don't understand

My taste for bare concrete ↔ I don't have non-architect friends



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TOTAL

TOUR TOTAL

FRANK BARKOW AND REGINE LEIBINGER DISCUSS THEIR FIRST HIGH-RISE PROJECT, WHICH ANCHORS A NEW 40-HECTARE DEVELOPMENT IN BERLIN.





Interview and Text by **Ian Volner**
 Photos by **Christian Richters** (except where noted)

In designing this new tower, specifically in the context of a new 40-hectare development inserted into the urban fabric of Berlin, did you have examples of successful new neighborhoods or things you sought to avoid?

Frank Barkow: In Berlin, you have these new building cycles where things happen very quickly. Before this master plan, we were working at Potsdamer Platz where you have huge cycles of construction. The hope that this new Europacity development [planned by ASTOC Architects and Planners] isn't simply an autonomous master plan dropped into the city, but that through agent adjacencies to the Hauptbahnhof [Berlin's main train station], it will automatically generate a certain amount of animation and allow it to integrate into the city very quickly. It's difficult to say, because this is literally the first building within this master plan, but I think the plan is adaptable. It can transform and react depending on clients or housing—I'm optimistic about this one.

How is the new tower meant to respond, urbanistically, to the scale of the neighborhood?

Regine Leibinger: We were really meant to stick to the master plan, and there were three blocks with internal courtyards and towers of different heights right across from the train station, and then the urban fabric flattens out to the north. But for our project, the developer could only rent out the tower—they didn't have another client who would rent the rest of the space. That was actually very good for us because we were able to create a freestanding tower that really responds to the public space. It meant that we had to really think about the urban scale on different levels. So the base, at street level, has these colonnades that connect to a public square, and we're also hoping for a public café in there so people can use it. And then there's a major bend in the middle of the tower—like a curtain that's moving. It's really important to have this bend to experience this tower completely differently from other parts of the city. So we're thinking about ideas that you have to incorporate in a high-rise.

Barkow: I think part of this for us is to give us a chance to, at least locally, transform the master plan with this solitary tower to the west. We're working on the second phase of construction now for a low-rise that will form a pedestrian passage with the double-story arcade at the base of the tower. So the building will be part of our local ensemble of two buildings.

At what point in the design process did the tower's reticulated concrete façade strike you as the best design solution?

Barkow: In a way, we established the mapping of the building to begin with, and then began looking for a construction system to achieve it. This idea of a framed façade is a typical German typology. In this case we wanted to generate a load-bearing façade in order to generate more rentable space. And then there was the formal addition of this almost origamili-like folding of the surface, in terms of the visual effect we could produce. I think the subversion of the Berlin typology is that, particularly in an oblique view, you have this highly dynamic, practically formed façade.

What are some of the innovations that you developed in connection with this rather beguiling effect on the façade?

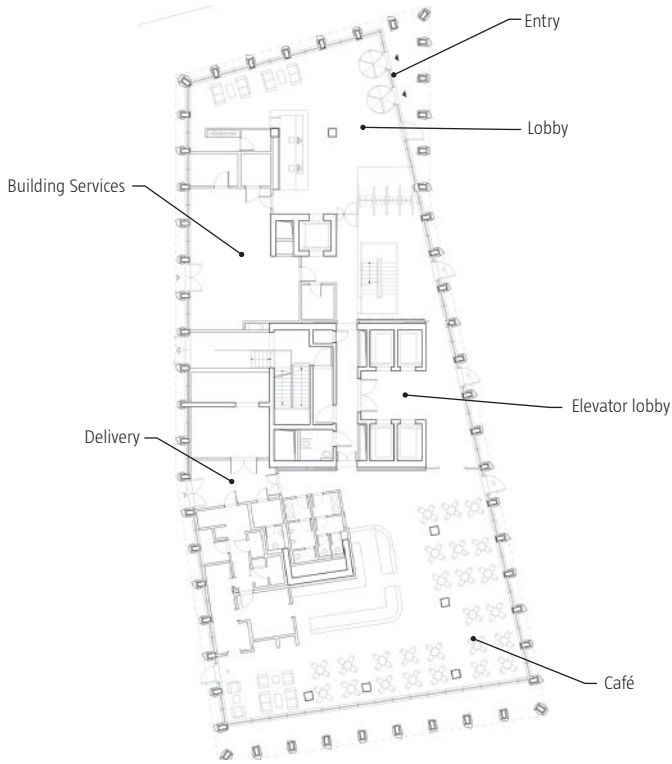
Barkow: We'd done precast concrete buildings and structural systems before, but this is the first time we did it for a full-blown high-rise project. And what I think we're exploring is quite interesting: The skin has a tooth-shaped element on the exterior and a comb-shaped element on the interior, and trapped between is the thermal installation and glazing. I think the next step for this technology is that we will take a single layer of precast on the exterior, connect it to the floor deck with an insulated connection, and eliminate the interior layer. It's really interesting because of the speed of construction, precision of the elements, the capacity for sustainability, and this exostructure that limits all the columns on the interior.

Are there technical explorations that preceded the design that led you to attempt this solution?

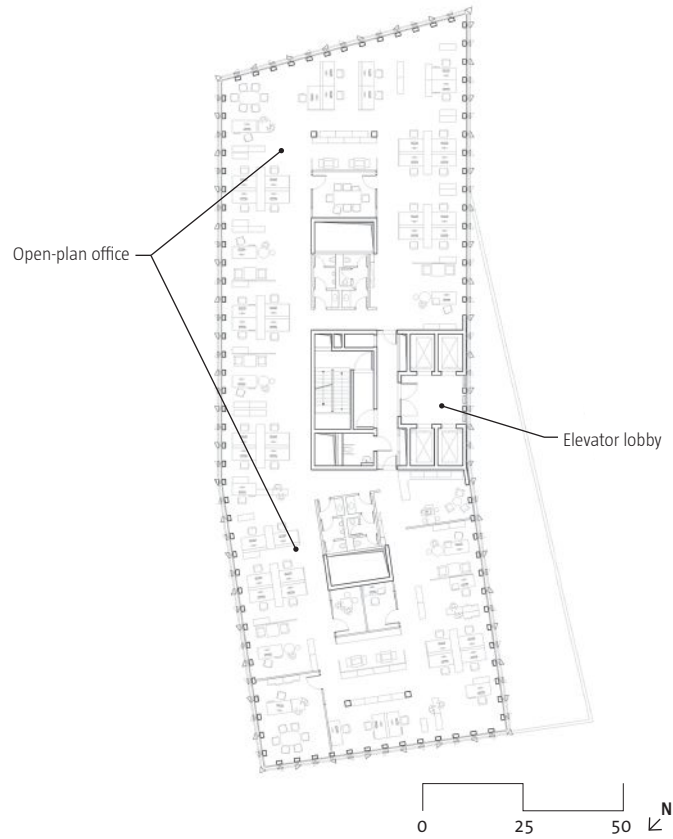
Barkow: For me, if you look at the World Trade Center, the original towers used this logic in steel and, in a way, I think they were on the right path in terms of technology, sustainability, and the idea of the skin having a kind of depth for controlling light, energy use, and a column-free interior. But the huge advantage of this concrete is the speed at which it generates its own fireproofing—there's highly protected steel inside this material. We have floor-to-ceiling triple glazing, exterior sun screening, and the windows open so you can get natural ventilation. You have to remember this was a developer core-and-shell building. There was not an unlimited budget for this project. It's quite compelling to have the kind of agility to work through these construction systems to get the design you want in an economical way that still feels quite functional.

Previous spread: The 18-story Tour Total—which towers over the surrounding historic fabric of Berlin—is the first completed building in the 40-hectare Europacity master plan to the north of the Hauptbahnhof, the city's main train station.
Opposite: The building is clad in a load-bearing skin of concrete columns and beams, which were fabricated by Dreßler Bau.

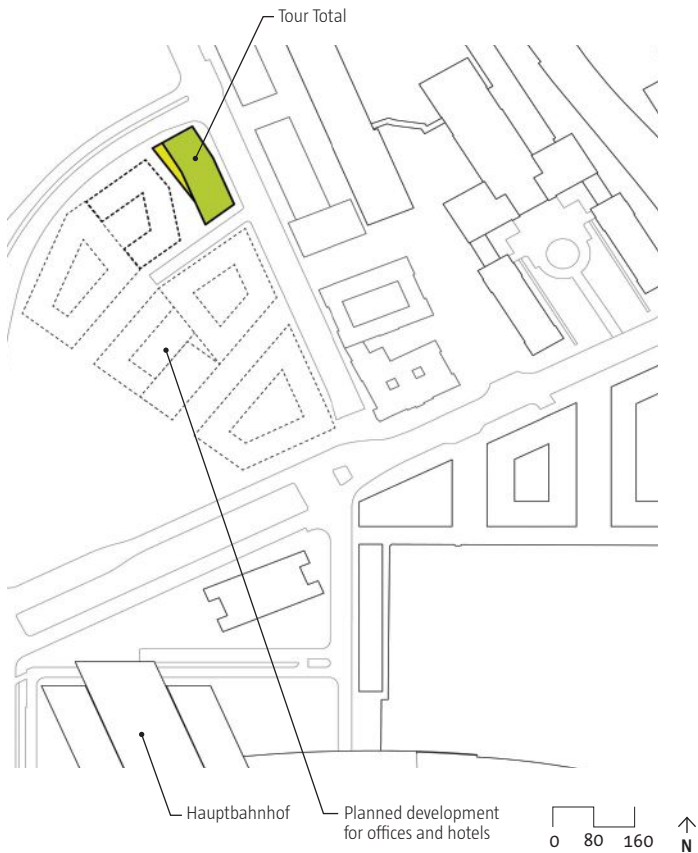
Ground-Floor Plan



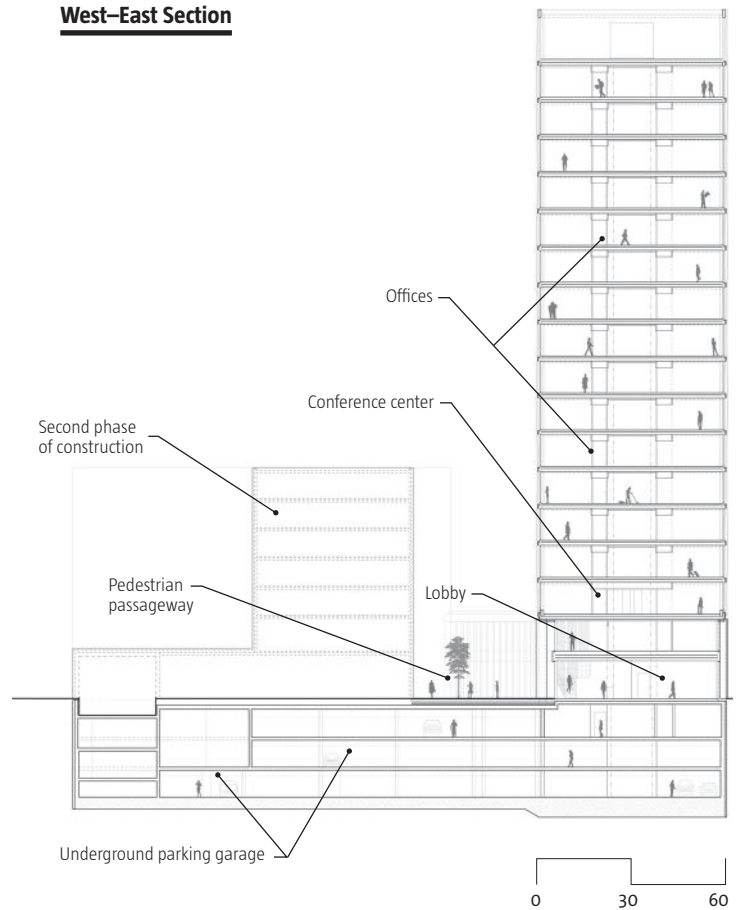
Typical Office-Floor Plan



Site Plan



West-East Section





This image: The articulated surface of the concrete skin creates a shadow pattern that offers an ombré effect at different times of day. This is further accentuated by the bent floorplate, which was the result of careful consideration to creating variation in views of Tour Total from the surrounding neighborhoods.

Next spread: At the base of the building, the concrete beams of the façade system give way to piers that form a colonnade which shelters ground-floor retail spaces. These will be occupied by a café and other amenities.



TOOLBOX: FAÇADE SYSTEM

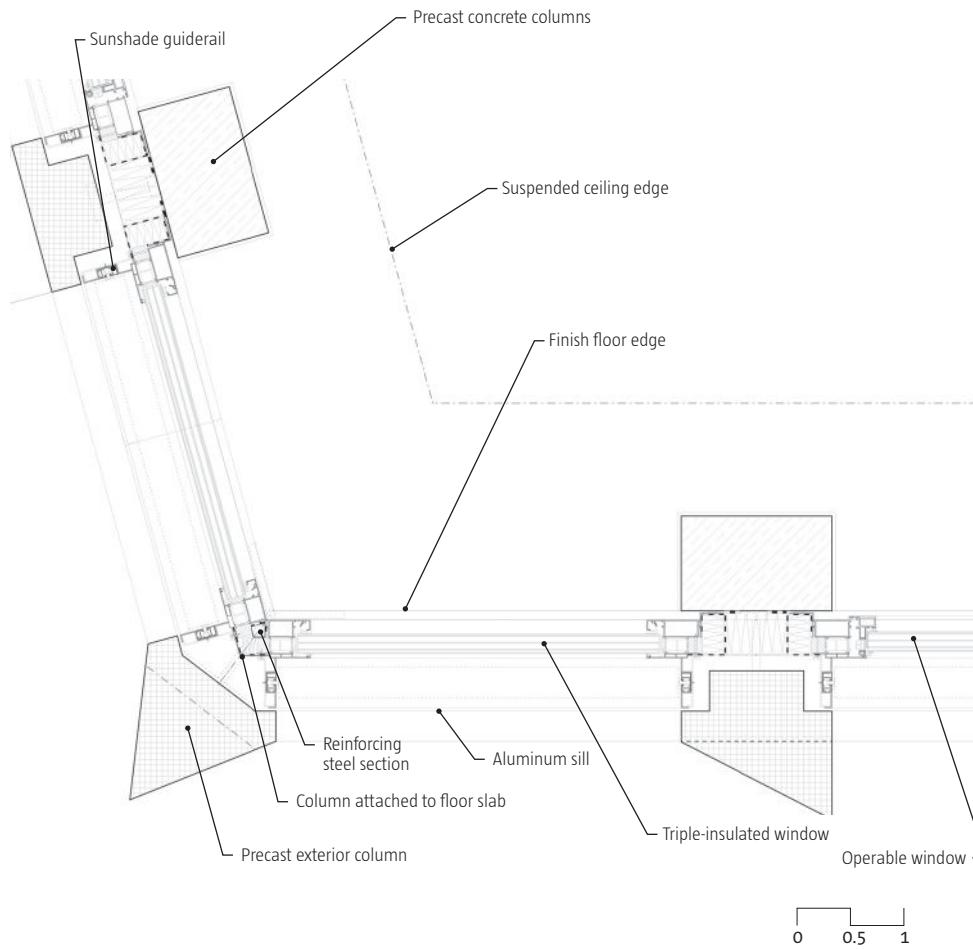
Barkow Leibinger has long made sustainability and materials science the twin cornerstones of its practice: For this firm, design begins with the investigation of prospective materials and strategies for performance enhancement.

For the ribbed façade of Tour Total, the team determined that a 60:40 ratio of glass to concrete was ideal to reach the energy-efficiency target as determined by its goal of a DNGB Silver rating. (DNGB is Germany's answer to LEED.) The balance of materials offers "a better insulated surface," Frank Barkow says; it also reduces the need for interior columns, as the concrete exoskeleton bears most of the load.

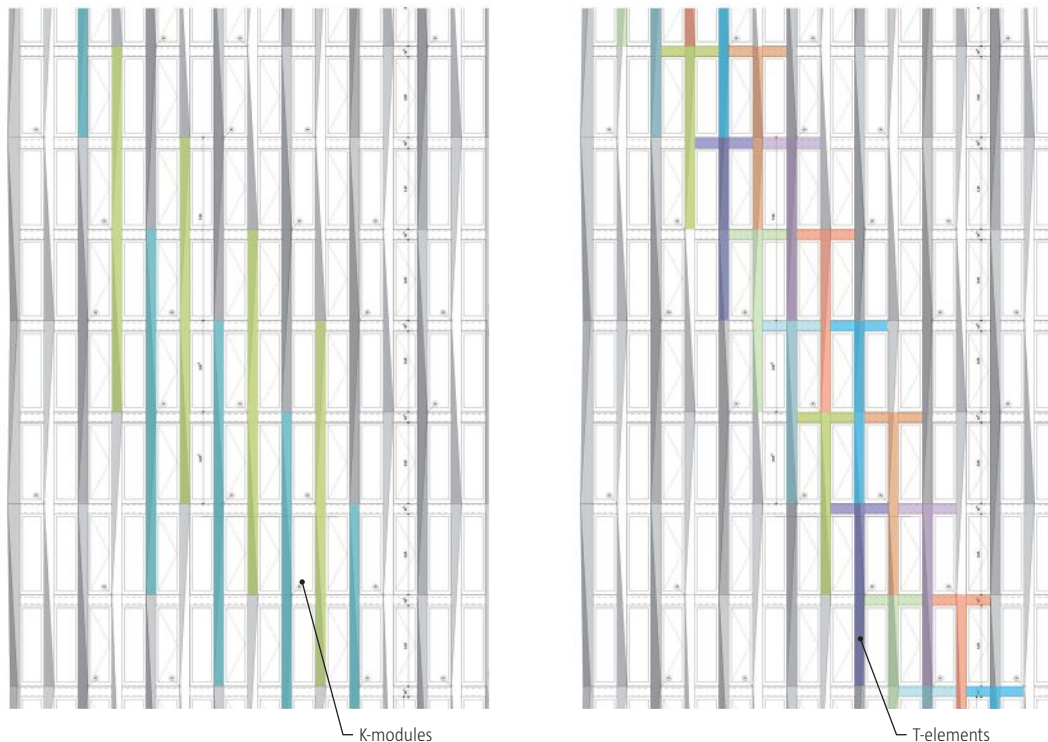
Concrete has been a special focus of the firm's recent material research: Of particular interest is infra-lightweight concrete, a variety that can achieve weights of as low as 800 kilograms per cubic meter. And though the firm has completed concrete projects in the past, Tour Total marks the first time that Barkow Leibinger is deploying the material in a tower—as, indeed, the building marks its first finished high-rise to date—and so the firm workshopped its approach extensively before proceeding.

Working with fabricators Dreßler Bau of Stockstadt, Germany, the team devised a bilayered section that sandwiches triple-glazing and insulation inside the concrete frame. Sunshades reduce heat gain and operable windows allow for natural ventilation. But the firm isn't finished innovating yet: The next step for the system, it says, will entail going from two layers of concrete to one, further speeding construction and lowering costs.

Horizontal Section Through Façade, Typical Floors



Load-Bearing Façade Elements







Opposite: The walls in the ground-floor lobby are clad in panels that mimic the articulation of the concrete façade. **Left:** The leasable office floors are being fitted out both by anchor tenant Total, a French oil and gas company, and others. **Below:** Other floors still sit empty, waiting for tenants, but a largely column-free interior allows for unobstructed views through the operable windows from Schüco International.





EDWARD A. BRENNAN
ENTRY PAVILION



RUSH UNIVERSITY MEDICAL CENTER

FORM FOLLOWS FUNCTION IN THIS NEW CHICAGO HOSPITAL DESIGNED BY RALPH JOHNSON OF PERKINS+WILL, AND THE BUILDING'S EFFICIENCIES RESULT IN AN ICONIC NEW GATEWAY FOR THE CITY.

Text by **Katie Gerfen**

THE TOWERS OF DOWNTOWN CHICAGO are no longer the only architectural landmark on the Eisenhower Expressway that links the Loop to the eastern suburbs. Ralph Johnson, FAIA, of Perkins+Will has designed a new four-petaled icon that marks the entrance to the city. But it's not a museum, a concert hall, or any other type of cultural institution often associated with this level of expressive form. Instead it's something far less expected: a hospital. "It's really a city-scaled civic building," Johnson says.

Iconic though it may be, the form of the new 800,000-square-foot hospital tower at Rush University Medical Center is actually the result of a relentless pursuit of efficiency. The new building houses diagnostic facilities and 386 patient rooms, and the program very much dictated the structure. The orthogonal six-story volume at the base of the building houses treatment facilities, operating rooms, radiology suites, and the emergency department, and care was taken to share resources between departments wherever possible. "A lot is based on functional adjacencies," Johnson says. "It's all predicated on very expensive people's time traveling from one space to another, and on the safety of the patients." Patient rooms are housed in the five uppermost levels, which take the form of a four-pointed star. The unique footprint ensures that each patient room is identical, to create efficiency for the staff, while maximizing the amount of exterior wall surface and the number of windows. This allows daylight into, and views from, each patient room. Nurses stations are positioned along the core, and the rounded rooms at the end of each point of the star are left open for lounge and consultation space.

The architects worked hand-in-hand with the hospital during the design process, and took the unusual step of establishing a 25-person office on site, even though the firm is based just a few miles away. The hospital in turn took several department leaders away from their full-time duties to staff the office, ensuring that what might normally be weekly meetings happened on a daily, or even hourly, basis. "Some of the magic of this was to make it feel like people were seamless and working with the same end in mind," says hospital executive vice president and COO Peter Butler. And nothing in the design was left to chance: When it was determined that the star-shaped layout of the patient tower was the front runner in a series of design options, the team painted out a full patient floor on the site so that doctors and nurses could walk the proposed layout of the hallways and ensure that all operational needs would be met before construction began.

Another design requirement was that the new building had to connect to an existing medical facility. "How this building interfaced with the existing hospital was critical," Johnson says. This created complexities in connecting new floors to old, but it did allow for a 100-foot-wide lobby between the two buildings. The double-height space is clad in wood, and features what Johnson terms "a reverse terrarium"—a glazed garden courtyard. The lobby can also serve as a shelter in case of biochemical attack: The space can be transformed into a fully functional emergency response area, and oxygen lines and other utilities, including those for decontamination showers, are hidden behind removable column covers.

In short, practically every design move furthers the goal of providing quality medical treatment for patients and a functional working environment for staff. And it seems to be paying off: According to Butler, patient response surveys indicate that metrics are up in everything from quietness to the number of positive recommendations—not only in the new facility, but across the entire campus. And he credits the architects not only for their careful attention to detail inside, but also with creating a new presence for the hospital. "While we weren't looking to make an architectural iconic statement, that's what happened," he says. "We think it's kind of a magnificent gateway to the city itself, and Rush always wanted to be viewed as Chicago's hospital."

THIS PAGE AND PREVIOUS: CONNOR STEINKAMP, STEINKAMP PHOTOGRAPHY





Previous spread: Viewed from the Rush University Medical Center campus, the curvilinear form of Perkins+Will's new hospital tower extends, in part, down to the base of the structure. **This image:** The façade of the lower floors of the building along the Eisenhower Expressway was conceived as a billboard, clad in a curtainwall from ASI. The patient tower is wrapped in metal panels from Sobital, with Viracon windows admitting daylight to perimeter patient rooms.

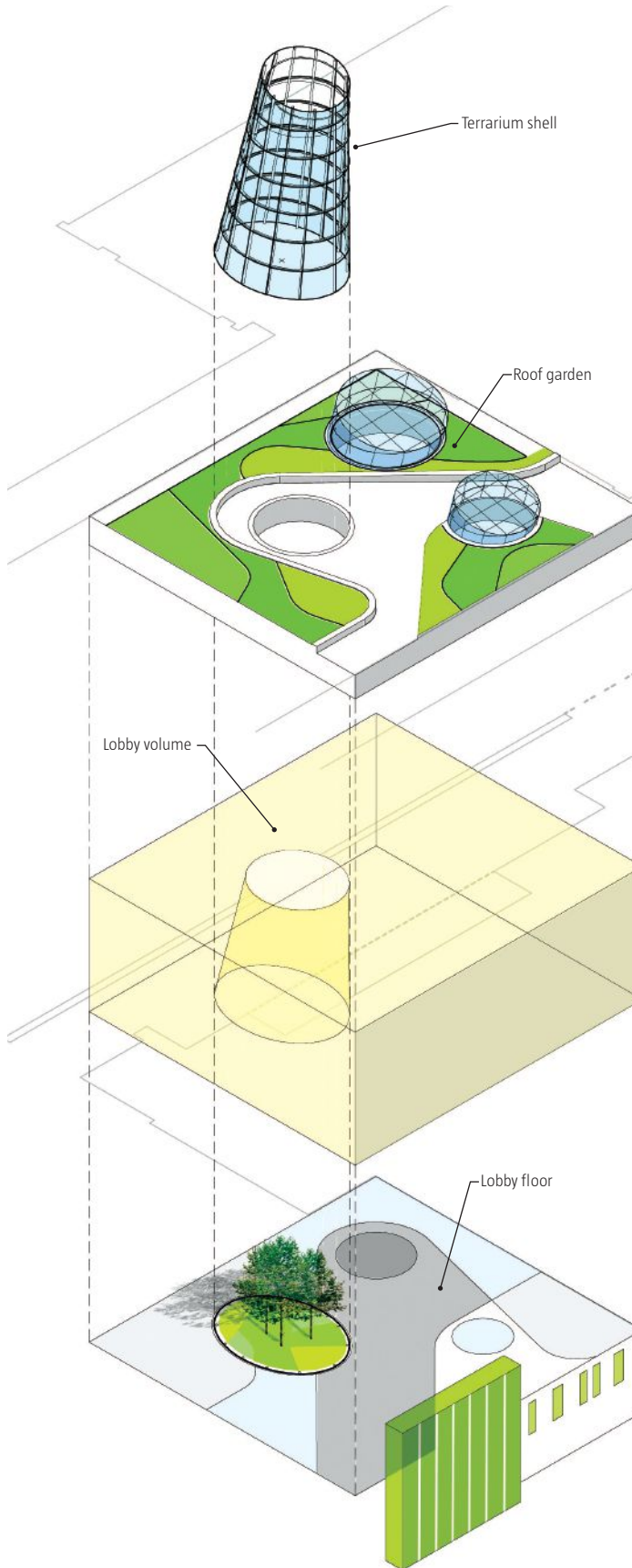


Above: Separating the patient tower above from the diagnostic platform below is a recessed mechanical level which contains all of the utilities for the building. In the remaining exterior space on this level, green roofs serve as gardens for the staff. Inside the mechanical rooms, condensate is reclaimed for irrigation water as part of a strategy that has contributed to a LEED Gold rating. **Opposite:** Between the new medical center and the existing, adjacent structure, a new lobby volume is topped by a green roof plaza, which serves as an open-air pathway between the buildings.

LEFT: AMES STEINKAMP, STEINKAMP PHOTOGRAPHY; RIGHT: CONNOR STEINKAMP, STEINKAMP PHOTOGRAPHY



Axonometric Through Terrarium

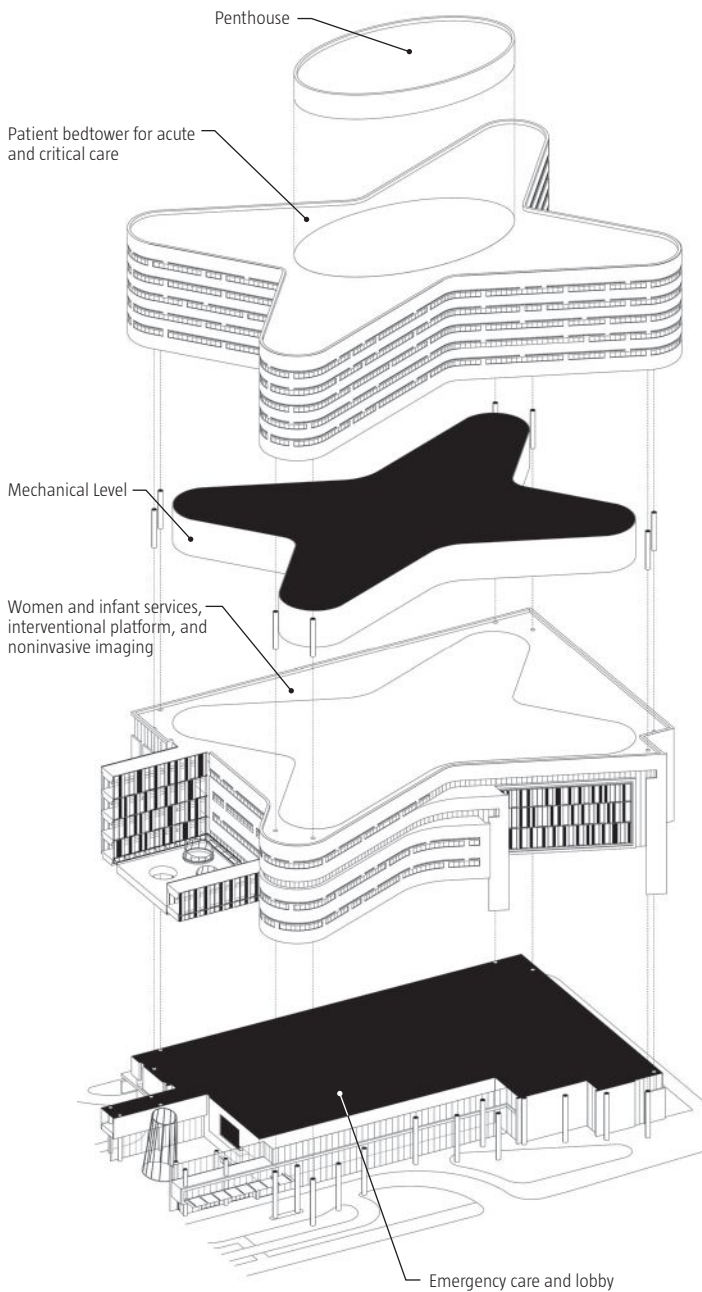


STEVE HALL, HEDRICH BLESSING

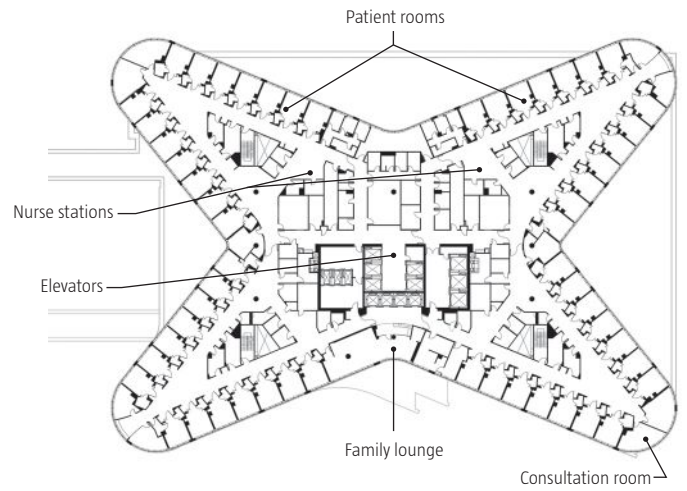
The double-height lobby serves as a new public entry to Rush University Medical Center, and the green-roof-topped volume also connects the new hospital tower to the adjacent existing building. The focal point of the lobby is what architect Ralph Johnson terms "a reverse terrarium," a glass-enclosed garden that brings greenery into the space without the possibility of plant-borne infection.



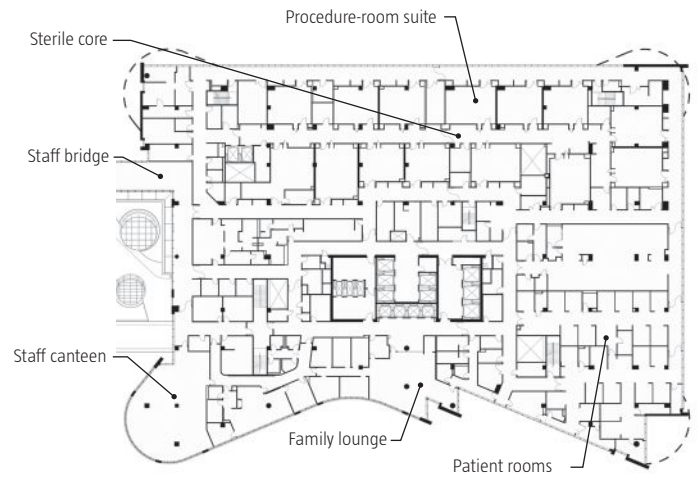
Axonometric



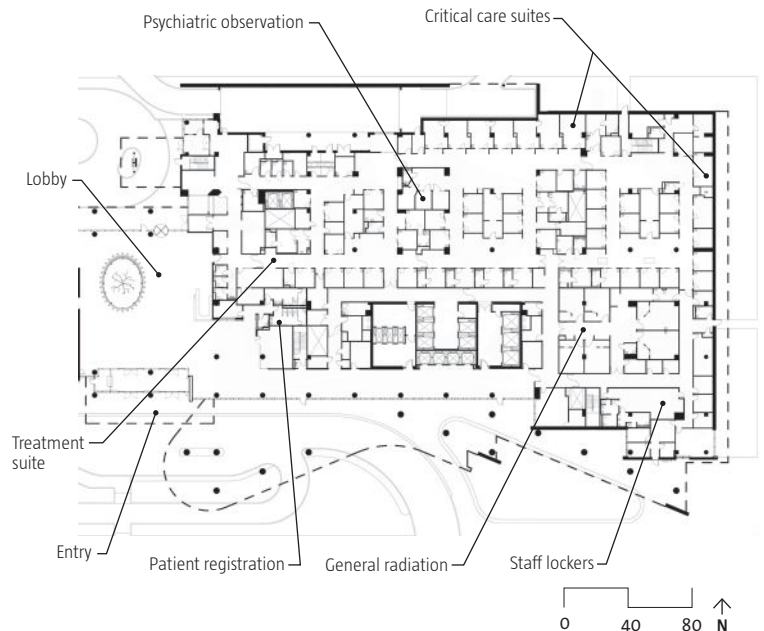
Tenth-Floor Plan: Critical Care



Fifth-Floor Plan: Interventional Platform

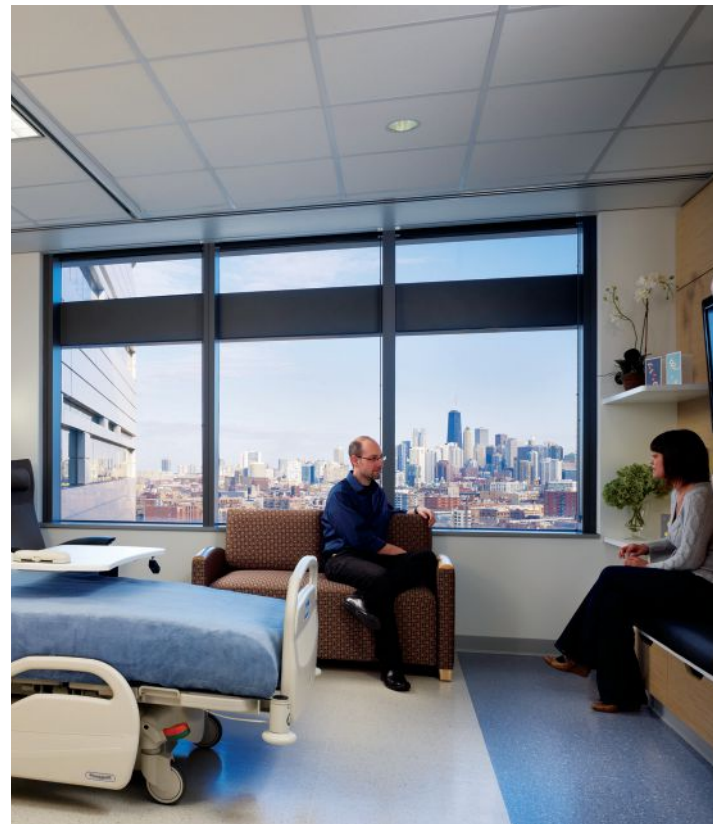


Ground-Floor Plan: Emergency Department and Lobby





Bottom right: Inside the star-shaped tower, patient rooms outfitted with furniture from Herman Miller Healthcare are located around the perimeter to maximize natural daylight and views. **This image:** Nurses stations anchor each arm of the building's patient-room floors. Cove lighting from Philips is inscribed into the ceiling to echo the overall building form. **Bottom left:** In the more orthogonal podium that makes up the first six floors of the building, view lines are maintained wherever possible to retain a connection to the outside.





MIESIAN REVIVAL

THE RESTORATION OF LUDWIG MIES VAN DER ROHE'S 1930 VILLA TUGENDHAT IN THE CZECH REPUBLIC BRINGS THE HOUSE BACK TO ITS FORMER GLORY, BUT THE PRICE IS HOLLOW AUTHENTICITY.

Text by Aaron Betsky
Photos by David Zidlický





Previous spread: The Villa Tugendhat's iconic living room, with its chrome columns, has been restored as part of a \$9.2 million overall effort. **Above:** The curved Macassar wood wall around the dining area returned to its original spot in the house (it was moved during the 1980 renovation), and clad in a new veneer. Now the sight lines through the living area and into the conservatory are restored to Ludwig Mies van der Rohe's original intent. **Opposite:** The street-level entrance leads into a marble-lined foyer with a curving stair that leads down to the main level of the house.

AFTER A TOP-TO-BOTTOM, \$9.2 million restoration, the 1930, Ludwig Mies van der Rohe–designed Tugendhat House in Brno, Czech Republic, has joined the list of modern homes—ranging from Gerrit Rietveld's 1924 Schröder House in Utrecht, the Netherlands, to Le Corbusier's 1930 Villa Savoye in Poissy, France, to Philip Johnson's 1949 Glass House in New Canaan, Conn.—that now look exactly the way they may have appeared when the owners first moved in. Take a guided tour through any of these museums (the only way to see them), and you can get a full sense of the architects' intentions. You might even understand why these houses were so influential in the development and spread of Modernism. The price for this achievement is the fact that what you see, certainly in the case of the Tugendhat House, is to a large extent a re-creation. You wander through rooms filled with replacement wall coverings, glass windows, wood and stone walls, and furniture while wearing protective slippers. No longer living places, these houses are now monuments that contradict the purpose that led them to be built in the first place.

The Tugendhat House was a home for less than eight years. Commissioned by Fritz and Grete Tugendhat—scions of two Jewish textile manufacturing families—for a hillside that was part of her parents' estate, the house accommodated the couple, their three small children, and their particular enthusiasms (there was a darkroom for Fritz) and needs (the house sported an advanced central air conditioning plant because Grete had asthma).

When Germany invaded in 1938, the Tugendhats left for Switzerland and eventually Venezuela. The building was taken over by the Gestapo, who did not use it kindly. Worse, according to historical reports, was the Russian cavalry regiment that bivouacked there with their horses after the war. The house then became a rehabilitation center for children with spine defects before the City of Brno took it over in 1980 and authorized a restoration that, though it stabilized the structure and repaired water damage, also altered much of the original design. Finally, the Czech government found the funds (mainly through grants from the European Union) to complete a thorough and scientifically grounded restoration to UNESCO standards, overseen by Marek and Vítěk Tichý of design firm Omnia Projekt in Brno.

Omnia had to strip the house almost to its foundations, which they then reinforced and sealed. They repaired or replaced almost every bit of mechanical equipment, as well as the roof, ceiling, walls, and floor surfaces, and even the sewage line. They ripped out the 1985 renovation-era terrazzo tiles and replaced them with ones that match the originals, of which there were still pieces in the house (you can buy fragments of them as souvenirs in the on-site gift shop). They replaced the glass, including the enormous, 3-meter-by-6-meter (9.8-foot-by-19.6-foot) floor-to-ceiling pane fronting the living room, which moves down into the lower floor at the flip of a switch. Every light fixture as well as every light switch now matches photographs of the original. The same is true of



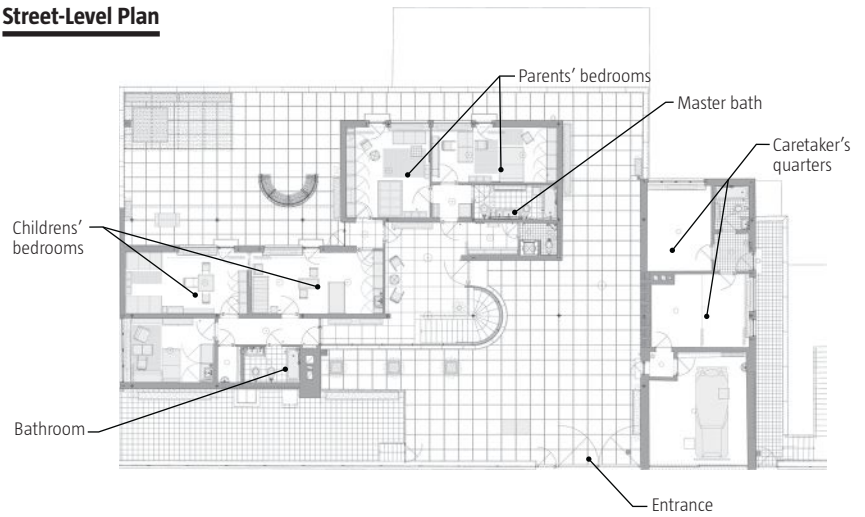
the levers and handles for the clerestories in the bathrooms. Finally, Omnia commissioned or bought reproduction furniture, including a blue version of the MR20 and a green Barcelona chair, whose colors it based on original records (the Brno chairs, designed for the house, are in plain white).

The results are startling, though not always in ways that are appealing. After you have reacquainted yourself with the spatial development of the main floor—which is essentially a spiral that uncoils from the back drawing room area, through the conservatory, past the onyx living room wall and the floor-to-ceiling glass wall that opens the house up to the view over the garden and Brno, and then into the dining table sheltered by the Macassar curve—what stands out are exactly those details. The fetishistic attention to the cross-shaped columns will be familiar to anyone who has studied modernist architecture, though it is breathtaking to watch these cruciform lines march through the open spaces, changing in material from bronze to chrome and finally to white paint in the kitchen. What jumps out are all the end points of the mechanical and structural systems that make this open space possible, and then the extension of those systems into metal, wood, and fabric furniture that cradle the body. The house appears as a technological web that wove together the activities of everyday life as they flowed in freedom through conditioned space. This was a version of Modernism that humanized and idealized technology, and as such became a utopian statement on how human ingenuity can liberate us.

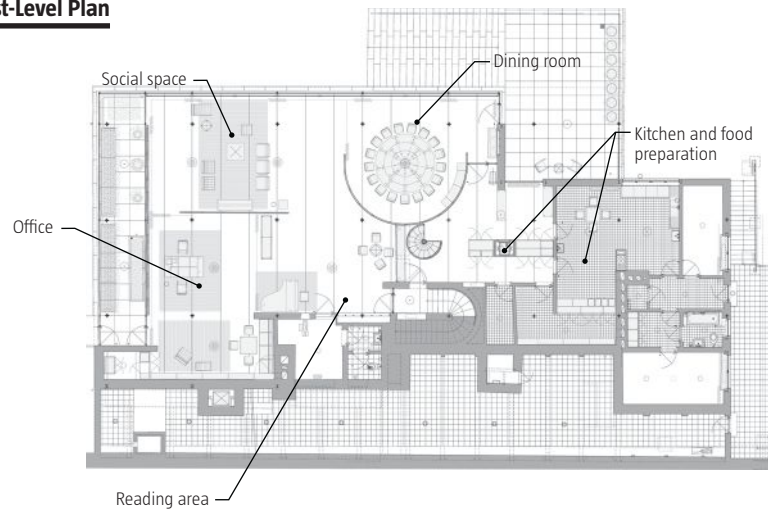
Except that now you experience merely the remnants of that life and of that dream. You have to imagine how you might live in here, and how the accoutrements of daily existence would fit into that abstract web. You have to listen to the tour guide as he tries to re-create a lost world, or gaze at it in the photographs laid out in the visitors center in the basement, where you wind up after your proscribed hour in the house, passing, of course, the gift store on your way out to reality. Local architectural historian Ladislav Zikmund-Lender, who has worked at several museum houses and now for the Czech preservation agency, put it this way: “The Tugendhat looks like new, because most of the materials and furniture are new copies. The architects want it to look like the Tugendhats have just left the house—with flower arrangements on the new furniture even. But the wardrobes are empty, there are no personal things. The personal experience is irreplaceable. Personally, for me the experience of the space and Mies van der Rohe’s concept was much more ravishing before the renovation.”

So should the Tugendhat House have remained a ruin? Certainly not. Should it have a different use, perhaps a cultural one that would let it transform into another form of architecture, with a different message and furnishings, as well as a new life? Perhaps. Certainly it is valuable to see what van der Rohe and collaborator Lilly Reich believed architecture could do. But we have to realize that what we are seeing is only a collection of remains woven together into a picture-perfect facsimile.

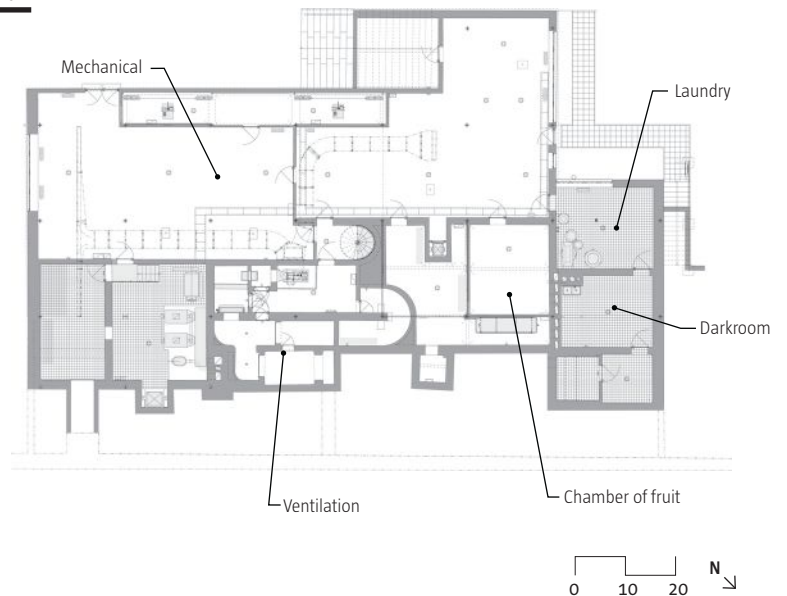
Street-Level Plan



First-Level Plan



Basement Plan



Clockwise from top left: Staircase leading from street level to the main living area; the front door of the Villa Tugendhat; custom door hardware leading to the terrace; bathroom; replica furniture in the main living space; restored office in Fritz Tugendhat’s bedroom on the lower level.





Right: The street-level façade of the Villa Tugendhat serves as the main entry to the house.

Opposite: The house steps down the hillside, revealing three living levels as well as a shaded porch on the garden façade.

Above: The most iconic view of the Villa Tugendhat is from the garden. The massive, nearly 10-by-20-foot glass panel that shields the living room can recess into the floor below—though originally two smaller panes, it was installed as a single panel during the restoration.





Project Credits

Tour Total

Project Tour Total, Berlin

Client CA Immo Deutschland

Architect Barkow Leibinger, Berlin—Frank Barkow, Regine Leibinger (principals); Klaus Reintjes (project management); Hans-Georg Bauer, Andreas Lang, Christina Möller, Ruwen Rimpau, Tobias Wenz (project team); Jens Weßel, Derek Bangle (model makers)

Mechanical Engineer Fürstenau & Partner Ingenieurgesellschaft

Structural Engineer GuD Planungsgesellschaft Ingenieurbau

Construction Manager OmniCon Gesellschaft Für Innovatives Bauen

Sustainability Consultants Drees & Sommer

Energy Design Energydesign Braunschweig

Façade Consultants Priedemann Fassadenberatung

Acoustical Engineer BBM Müller

Fire Protection Consultants HHP Berlin Ingenieure Für Brandschutz

Size 301,390 square feet (total gross); 193,750 square feet (above ground)

Cost Withheld

Materials and Sources

Elevator Schindler Aufzüge und Fahrtreppen schindler.com

Exterior Wall Systems FKN Fassadentechnik (metal façade) fkn-gruppe.de; Dreßler Bau (concrete unit fabricators) dressler-bau.de

Flooring Mero-TSK International & Co. mero.de

HVAC Lindner Group (heating/cooling ceilings) lindner-group.com

Lighting Systems Selux Lichtsysteme selux.com

Structural System Ed. Züblin (building shell) stuttgart.zueblin.de; Strähle Raum-Systeme (partition walls) straehle.de

Windows Schüco International schueco.com

External Sunshade Warema Renkhoff warema.de

New Hospital Tower, Rush University Medical Center

Project New Hospital Tower, Rush University Medical Center, Chicago

Client Rush University Medical Center

Architect Perkins+Will, Chicago—James Zajac, AIA (principal-in-charge); Ralph Johnson, FAIA, Jerry Johnson, AIA (principal designers); Jocelyn Frederick, AIA (principal planner); Bridget Lesniak, AIA, Walter Bissonnette (project directors); Robert Cohoon, AIA (senior interior architect); Rod Vickroy, Jason Rosenblatt, Barbara Burnett (senior interior designers); James Nowak, AIA, Jack Lesniak (senior technical architects); John Moorhead, AIA, Tom Demetron, Jose Valeros, AIA (senior design architects); Brent Hussong, AIA, Laura Zimmer, AIA, Patricia Canedo, AIA, Zahra Makki (senior medical planners); Jeff Saad, AIA (project designer); Marvinna Williams (medical planner); Dennis O'Malley (project manager); Milan Miladinovich, AIA, JB Park, Justin Aleo, AIA (project architects); Michael Tucker (interior designer); Carlos Barillas, AIA, Sawat Tulyathorn, Nathan Fell, AIA, Paul Stovesand, AIA, Rebecca Cox, Aaron Manns, Joachim Schuessler, Hugo Priill, AIA, Young Sup Park, Matt Booma, Bernard Chung, Gelacio Arias, Scott Blindauer, Crister Cantrell, Daniel Ferrario, Leigh Allen, Assoc. AIA, Jennifer Merchant, Hannah Jefferies, Remiko Kitazawa, Michelle Malecha, Assoc. AIA, Andrew Broderick, Assoc. AIA, Matthew Williams, Assoc. AIA, Michelle Hale Stern (project team)

Interior Designer Perkins+Will

Mechanical and Electrical Engineer Environmental Systems Design (ESD)

Structural Engineer Thornton Tomasetti

Civil Engineer Terra Engineering

Construction Manager and General Contractor Power Jacobs Joint Venture

Landscape Architect Hitchcock Design Group; Hoerr Schaudt (entry pavilion)

Lighting Designer HDLC

Lighting Aurora Lighting (entry pavilion)

Parking Walker Parking

Sustainability Ibc Engineering Services (entry pavilion)

Traffic Kimley Horn

Material Management St. Onge

Code Schirmer (Aon)

Equipment Walsh

Vertical Transportation Vertex Corp.

Exterior Wall Heitman & Associates

Acoustical Cerami Associates

Signage Fd2s

Size 830,000 gross square feet

Cost \$398 million

Materials and Sources

Adhesives, Coatings, and Sealants 3M Co. 3m.com

Carpet Interface FLOR interfaceflor.com; Bentley Prince Street bentleyprincestreet.com

Ceilings Armstrong armstrong.com; Ceilings Plus ceilingsplus.com

Curtainwalls ASI

Exterior Wall Systems Sobotec Architectural Wall System Solutions (metal panels) sobotec.com

Flooring Polyflor polyflor.com; Altro altrofloors.com

Furniture Herman Miller Healthcare hermanmiller.com/healthcare

Glass Viracon viracon.com

Green Roof LiveRoof liveroof.com; American Hydrotech hydrotechusa.com; Roxul (insulation) roxul.com

Lighting Control Systems Lightolier lightolier.com; Leviton leviton.com

Lighting Philips Lighting lighting.philips.com

Masonry, Concrete, and Stone Chicago Block and Brick Co.

Metal Alucobond alucobondusa.com; Kalzip kalzip.com

Paints and Finishes Sherwin-Williams sherwin-williams.com

Pavers Hanover Architectural Products hanoverpavers.com

Roofing American Hydrotech hydrotechusa.com

Seating Herman Miller Healthcare hermanmiller.com/healthcare

Structural Systems Nucor-Yamato Steel Co. (steel) nucoryamato.com

Walls Panolam panolam.com

Windows and Doors Viracon (exterior glazing) viracon.com

Window Shades Mechoshade mechoshade.com

Villa Tugendhat Restoration

Project Villa Tugendhat Restoration, Brno, Czech Republic

Client City of Brno; Fritz and Grete Tugendhat (original client)

Original Architect Ludwig Mies van der Rohe

Restoration Architect Omnia Projekt/Archatt—Marek Tichý, Vítek Tichý (chief design engineer)

Restoration Project Coordinator Iveta Černá (Tugendhat House director)

Restoration Site Manager Michal Malásek

Original Construction Artur and Mořic Eisler

Original Furniture Ludwig Mies van der Rohe

Original Interior Design Lilly Reich

Original Interior Furnishings Sergius Ruegenberg

Original Garden Architect Markéta Roderová-Müllerová

Restoration Garden Architect Přemysl Krejčířik

Original Sculpture Wilhelm Lehbruck

Size 2,600 square meters (27,986 square feet)

Restoration Cost 179.2 million CZK (\$9.2 million)

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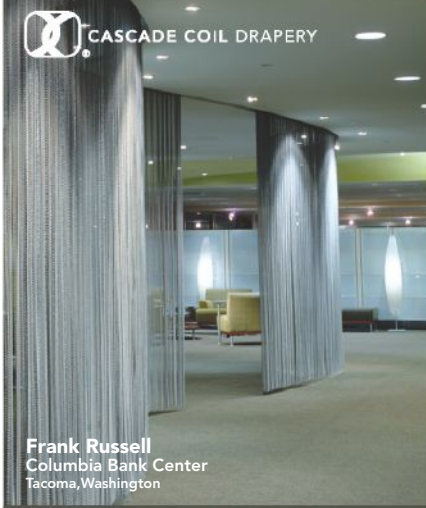


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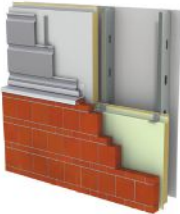
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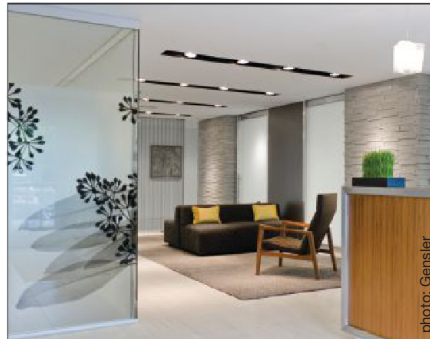


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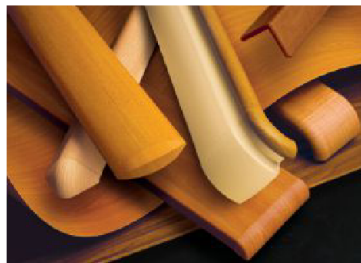
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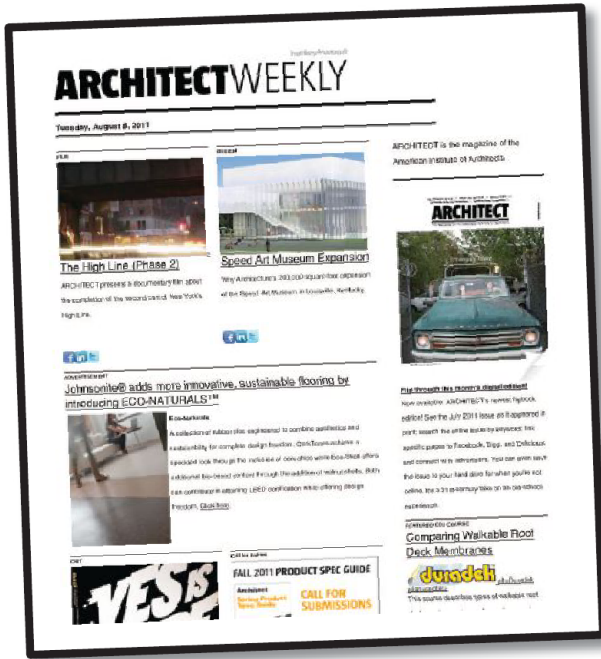
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Tale of the Swan and Dolphin

FOR DISNEY WORLD, MICHAEL GRAVES DESIGNED A PAIR OF HOTELS WITH PLAYFUL CARTOON IMAGERY.


Text by **John Morris Dixon, FAIA**

THERE WAS SOME serious calculation behind the two adjoining hotels designed for Disney World in Orlando, Fla., by Michael Graves & Associates (with Alan Lapidus, Architect, successor to legendary hotel designer Morris Lapidus). To diversify its extensive hospitality facilities beyond family-centered environments, the client commissioned two adult-oriented convention hotels: the Dolphin, with 1,510 guest rooms, and the Swan, with 760—both including extensive entertainment facilities. There had to be serious calculation, since the two structures total about 2 million square feet.

While most of the Disney World hotels simulate actual places either past, far off, or both, these two played on a kind of Pop imagery: forms of toylike geometry and colors, capped by the super-scaled rooftop creatures

that lent the hotels their names. These fraternal twins are situated on either side of an artificial lagoon, linked by an axial causeway. Convention wings for each are on their far sides, bordering their respective parking lots.

The P/A jury carefully hedged its approval of the project. "It's fantasy architecture, and it belongs in Disney World. That's where it is—which makes it acceptable," said juror Adrian Smith, FAIA. Writing in the October 1990 issue of *Progressive Architecture*, after the hotels were completed, architectural historian Vincent Scully observed that "one would have to be a mean old curmudgeon indeed to be less than delighted ... at least for a while." But he went on to deliver a judgment that seems less than positive: "The Swan and Dolphin are cosmic cartoons in toto, their shapes abnormally few, obvious, and vast."



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Empire State Building sustainability goals

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