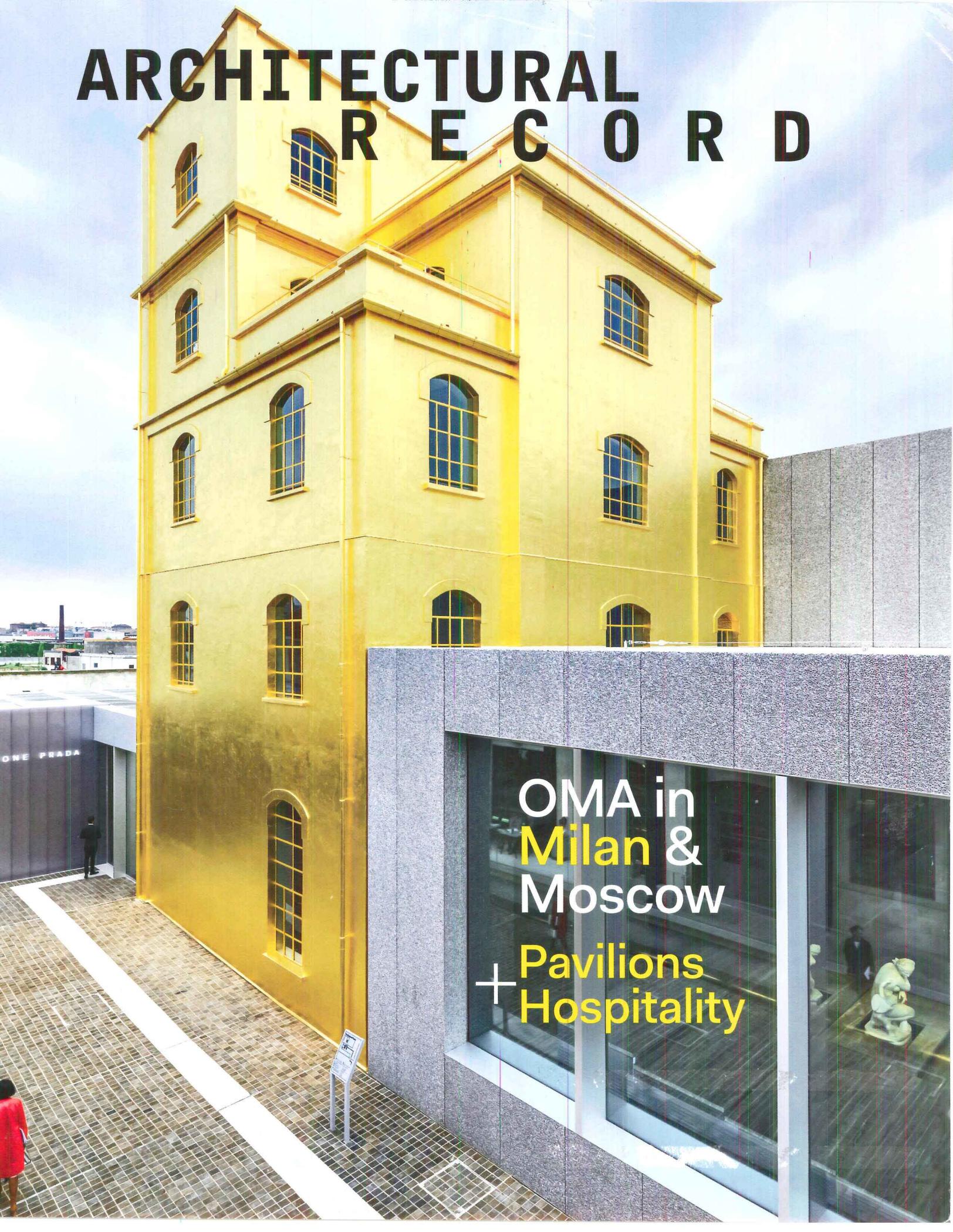
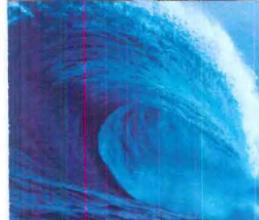


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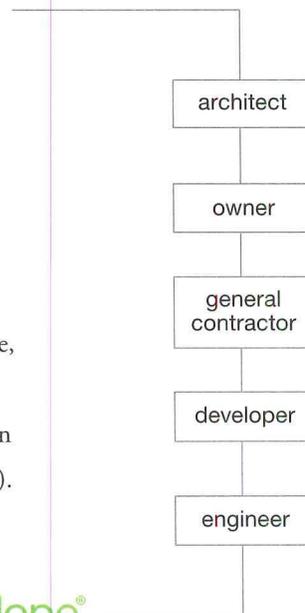
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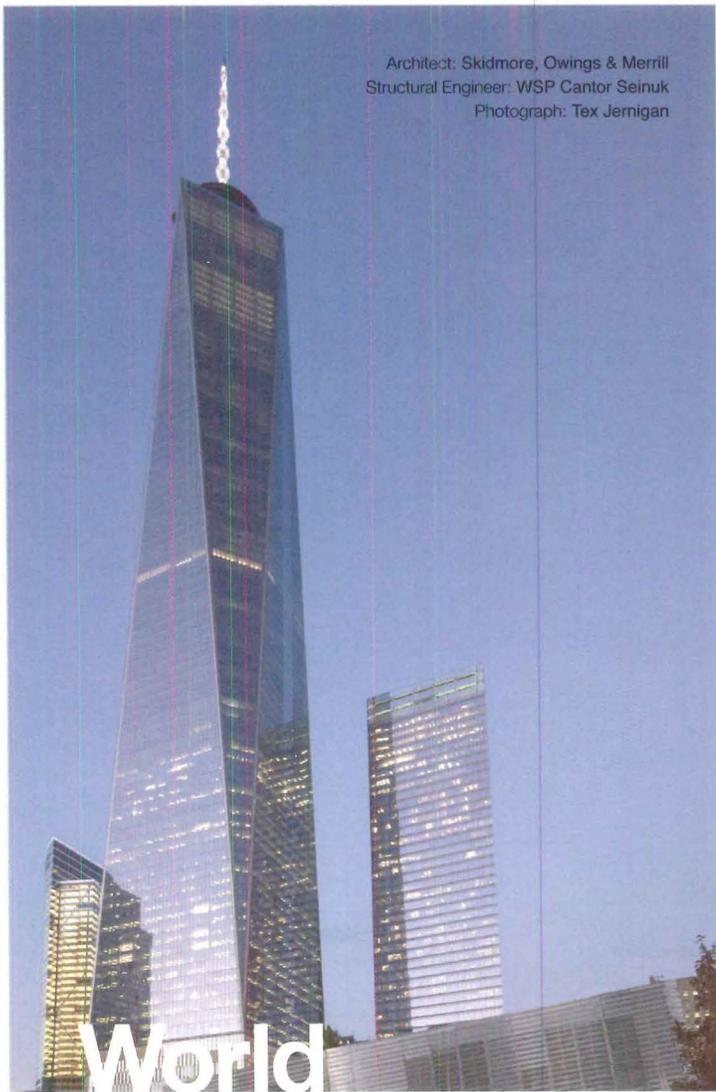


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MANAGING EDITOR	Beth Broome, <a href="mailto:elizabeth.broome@construction.com">elizabeth.broome@construction.com</a>
DEPUTY EDITORS	Clifford A. Pearson, <a href="mailto:clifford.pearson@construction.com">clifford.pearson@construction.com</a> Suzanne Stephens, <a href="mailto:suzanne.stephens@construction.com">suzanne.stephens@construction.com</a>
SENIOR EDITORS	Joann Gonchar, AIA, LEED AP, <a href="mailto:joann.gonchar@construction.com">joann.gonchar@construction.com</a> Linda C. Lentz, <a href="mailto:linda.lentz@construction.com">linda.lentz@construction.com</a>
PRODUCTS EDITOR	Sheila Kim, <a href="mailto:sheila.kim@construction.com">sheila.kim@construction.com</a>
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EDITORIAL INTERN	Lauren Palmer
COPY	Anna Shapiro
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ASSOCIATE ART DIRECTOR	Travis Ward, <a href="mailto:travis.ward@construction.com">travis.ward@construction.com</a>
CONTRIBUTING ILLUSTRATOR, PRESENTATION DRAWINGS	Peter Coe
EDITORIAL SUPPORT	Monique Francis, <a href="mailto:monique.francis@construction.com">monique.francis@construction.com</a>
CONTRIBUTING EDITORS	Sarah Amelar, Fred A. Bernstein, Robert Campbell, FAIA, C.J. Hughes, Clare Jacobson, Blair Kamin, Jayne Merkel, Josephine Minutillo, Robert Murray, David Sokol, Michael Sorkin, Ingrid Spencer, Sarah Williams Goldhagen
SPECIAL INTERNATIONAL CORRESPONDENT	Naomi R. Pollock, AIA
INTERNATIONAL CORRESPONDENTS	David Cohn, Tracy Metz, Aric Chen, Chris Foges
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Laura Viscusi, [laura.viscusi@construction.com](mailto:laura.viscusi@construction.com)

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Brenda Griffin, [brenda.griffin@construction.com](mailto:brenda.griffin@construction.com)

## SENIOR DIRECTOR, HEAD OF MARKETING

William Taylor, [william.taylor@construction.com](mailto:william.taylor@construction.com)

## PRODUCTION MANAGER

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## DIRECTOR OF MARKETING

Eileen Lamadore, [eileen.lamadore@construction.com](mailto:eileen.lamadore@construction.com)

## FINANCE DIRECTOR

Ike Chong, [ike.chong@construction.com](mailto:ike.chong@construction.com)

## FINANCE MANAGER

Tom Maley, [tom.maley@construction.com](mailto:tom.maley@construction.com)

## ASSISTANT TO MEDIA DEPARTMENT

Pina Del Genio, [pina.delgenio@construction.com](mailto:pina.delgenio@construction.com)

## ADVERTISING SALES

### NEW ENGLAND AND PA: Joseph Sosnowski

(610) 278-7829 Fax: (610) 278-0936, [joseph.sosnowski@construction.com](mailto:joseph.sosnowski@construction.com)

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(859) 987-9913 Fax: (404) 252-4056, [susan.shepherd@construction.com](mailto:susan.shepherd@construction.com)

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(224) 216-7836 Fax: (312) 233-7430, [elizabeth.tuke@construction.com](mailto:elizabeth.tuke@construction.com)

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(513) 345-8210 Fax: (513) 345-8250, [lisa.zurick@construction.com](mailto:lisa.zurick@construction.com)

### NORTHWEST: Bill Madden

(503) 557-9000 Fax: (503) 557-9002, [bill.madden@construction.com](mailto:bill.madden@construction.com)

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(760) 568-0465 Fax: (720) 559-9818, [sherylen.yoak@construction.com](mailto:sherylen.yoak@construction.com)

### KS, NE, ND, NY, SD: Risa Serin

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### WORKFORCE/ RECRUITMENT: Diane Soister

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## INTERNATIONAL

### GERMANY: Uwe Riemeyer

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### KOREA: Young-Seoh Chin

(822) 481-3411/3 Fax: (822) 481-3414

## DODGE DATA & ANALYTICS

CHIEF EXECUTIVE OFFICER Mike Petruzzo, [mike.petruzzo@construction.com](mailto:mike.petruzzo@construction.com)

CHIEF FINANCIAL OFFICER Desmond Douglas, [desmond.douglas@construction.com](mailto:desmond.douglas@construction.com)

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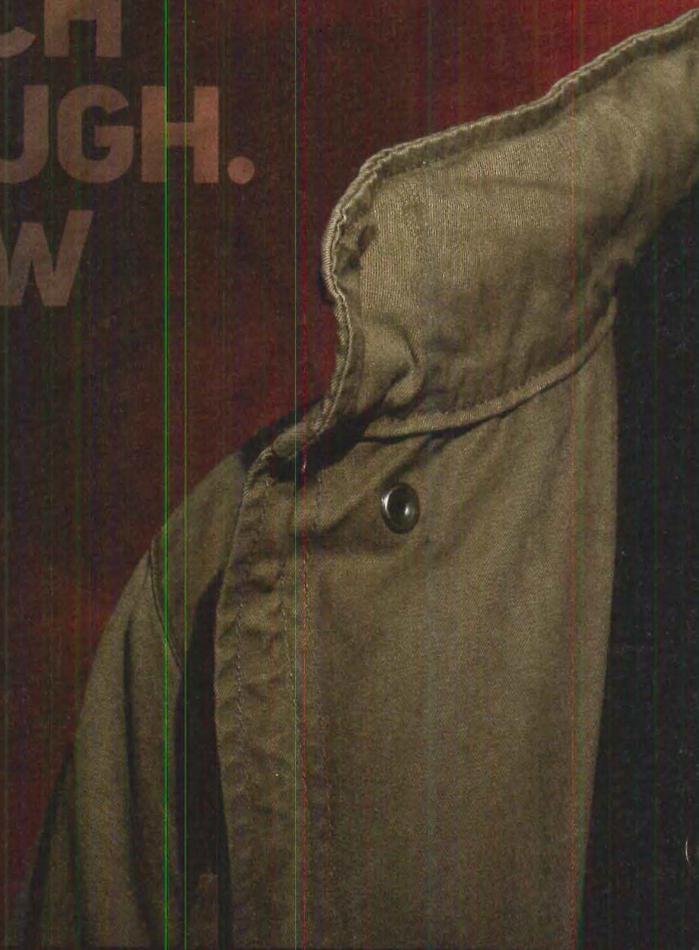


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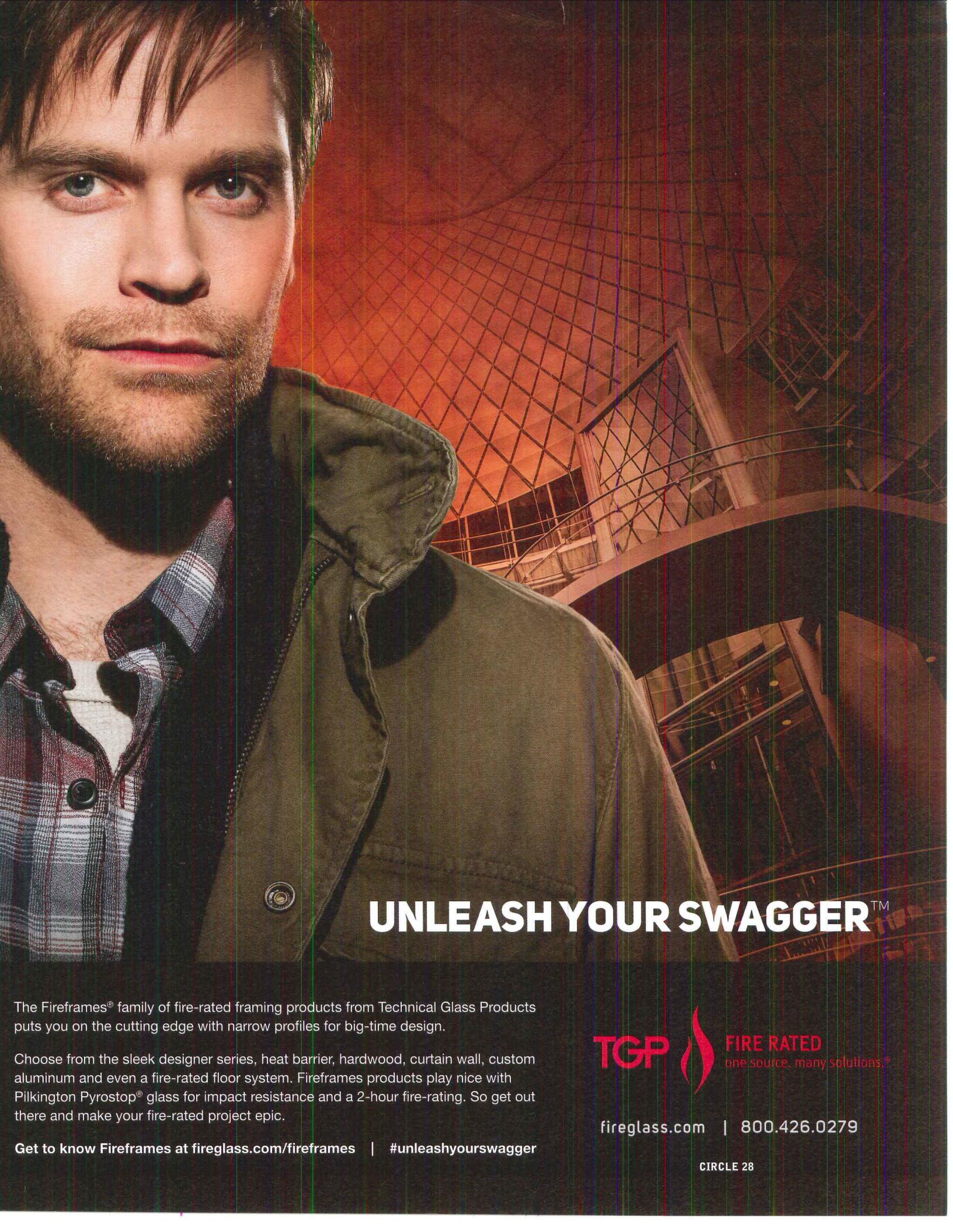
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ON THE COVER: PRADA FOUNDATION, BY OMA. PHOTO BY SERGIO PIRRONE.

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## Beauty in Small Packages

Ingenious pavilions and a pair of bold cultural complexes offer surprise and delight.

**THE DALLAS-BASED** architect Frank Welch recently sent me his just-published memoir, *On Becoming an Architect*. In the book, he describes how he, as an inquisitive, artistic young boy growing up in Sherman, Texas, during the Depression, became a critically acclaimed modernist whose distinguished career was cemented by one extraordinary project.

The seminal building wasn't grandiose: it was a simple pavilion. A shelter set on a rocky rise on a ranch in West Texas, it opened to magnificent views across the rugged landscape. The client didn't want plumbing or electricity—just a big fireplace and a spot to have lunch or to camp. Welch writes that he struggled to resist making a statement of “self-conscious forms.” “Think simple,” he kept telling himself. He looked to the land, using stone from the ranch and weathered oil-rig timbers for beams. The basic structure was a box, embraced by wood walls that could slide open on outrigger tracks in good weather or become a cozy enclosure when cold winds blew. And there were particulars about the local conditions: “To protect against snakes, I lifted the box off the ground,” he notes. Grounded in stone yet appearing, with a cantilevered deck, to float, “the Birthday,” as the shelter was called, was a poetic expression of modern design, tied deeply to its place. After it was completed in the 1970s, it was widely published and celebrated: in 1997, the Texas Society of Architects made the unusual decision to bestow the Twenty-five Year Award on two projects, Welch's pavilion sharing the honors with Louis Kahn's Kimbell Museum.

This month, *RECORD* too celebrates pavilions—a modest building type with a big capacity for lyricism and ingenuity. Picture what it might be like to work inside a glass-sided study carrel on the grounds of the American Academy in Berlin, underneath the innovative tent-like roof of Barkow Leibinger's pavilion (page 68). Think of having a snack in the new San Francisco café by Mark Cavagnero Associates, next to Renzo Piano's California Academy of Sciences, which inspired its graceful design (page 72). The new Australian pavilion for the Venice Biennale, by Denton Corker Marshall, with its opaque, dark granite cladding, is a surprising yet elegant solution for a gallery space (page 76). And in Japan, two pavilions in a cemetery—one a community hall, the other a chapel—by Hiroshi Nakamura exploit dramatic geometric forms and exquisite craftsmanship to create serene spaces linked to light and nature (page 82).

In addition, this month's issue features two spectacular cultural projects by Rem Koolhaas and his firm, OMA. Koolhaas has long been one of the most compelling—and quirkiest—commentators on the global architecture scene, in both his words and his designs. The Prada Foundation in Milan and the Garage Museum in Moscow reflect in varying ways his evolving ideas about preservation and adaptive reuse.



Where Koolhaas has questioned the obsession with preserving historic architecture in the past, he now has elevated some fairly humdrum old buildings through stunning transformations for viewing art. The Garage had a former life as a 1960s-era industrial-scale Soviet cafeteria that could feed 1,200 comrades at a single seating. OMA has sheathed the tough concrete structure in a polycarbonate shell—not a pricey material but one that imparts a shimmery glamour to a proletarian edifice. The Prada Foundation was created out of a century-old distillery complex, with new construction alongside renovated buildings. In one dramatic move, Koolhaas decided to coat a small, formerly dilapidated building entirely in gold leaf, remarking that the material turned out to be “a surprisingly effective way to distribute aura around the site.”

A number of years ago, I asked Koolhaas in an interview if he sought to instill beauty into a particular design. The word made him squirm—beauty, he insisted, was merely a by-product. Really? It may be only skin deep, but let's face it—the gold is simply beautiful.

We hope you revel in the beauty on the pages ahead. Or, at least, enjoy the aura. ■

*Cathleen McGuigan*

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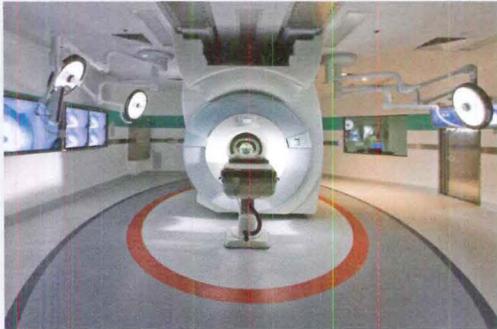
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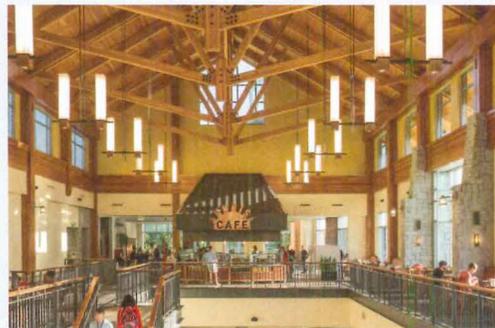
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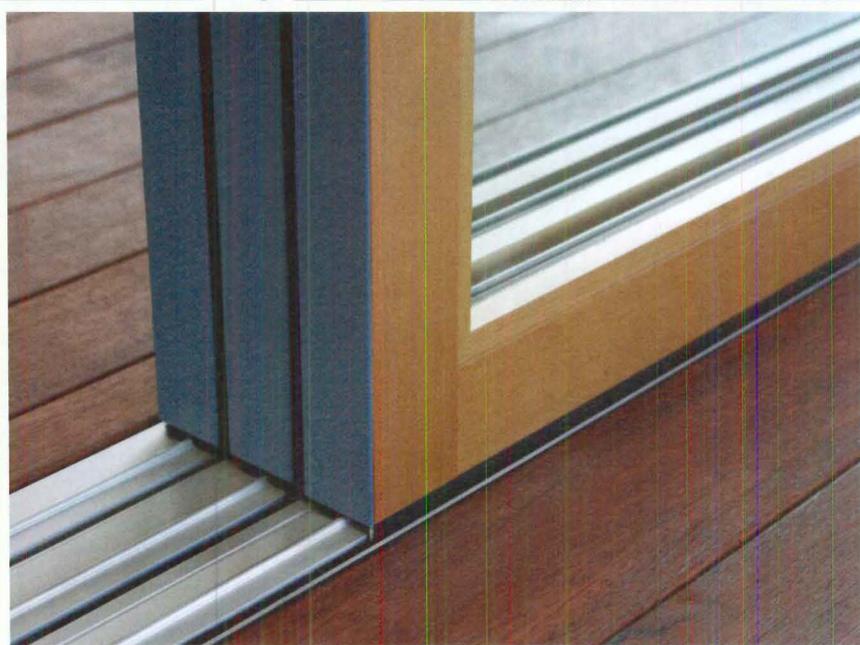
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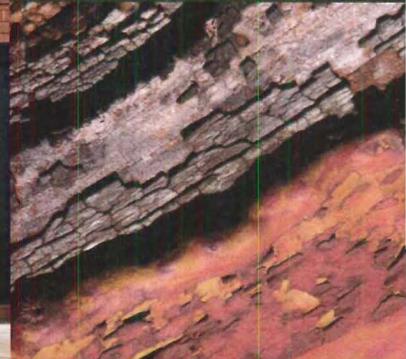
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## perspective

## BIG Unveils Redesign of 2 World Trade Center

BY ANNA FIXSEN

**THE MYSTERY** about the architect for 2 World Trade Center is now solved. On June 9, architecture firm Bjarke Ingels Group (BIG) revealed a new design for 2 World Trade Center—a gleaming 1,340-foot-tall stack of seven glazed volumes—that will replace an earlier scheme by Foster + Partners. “The building has to be a respectful and dignified finalization of the towers and memorial, but also a lively, engaging, living building,” Ingels told *RECORD*.

An April 24 article in the *Wall Street Journal* created a brouhaha when it announced that the Danish architect would replace Norman Foster’s design in order to accommodate 21st Century Fox and News Corp’s new downtown headquarters. After more than a month of silence (internally, the project was referred to as “Project Gotham”), the two companies announced that they had reached a nonbinding agreement with Silverstein Properties, the site’s developer.

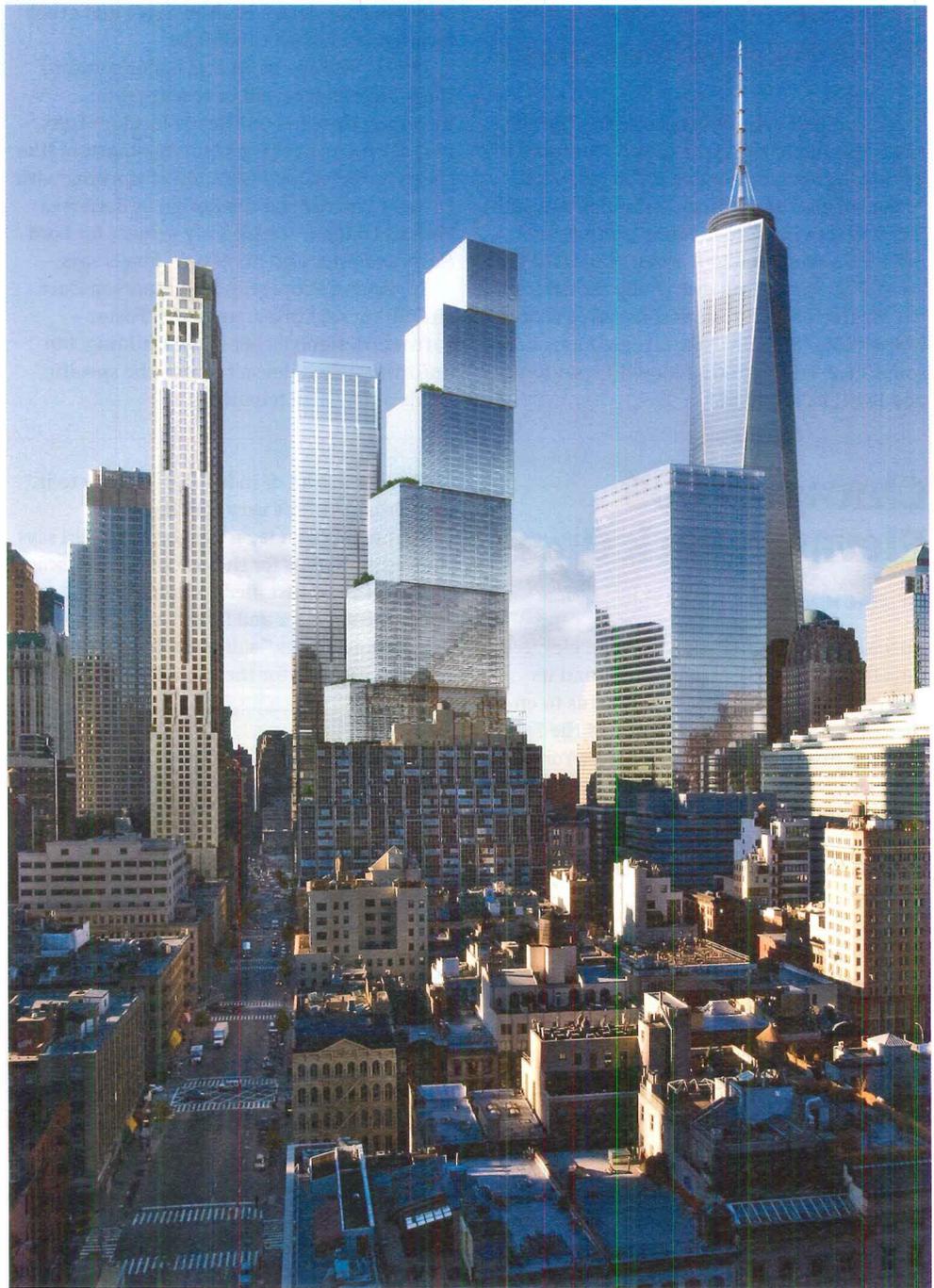
The BIG-designed tower will further the vibrant transformation of the Financial District, joining Trade Centers One, 3, and 4 by SOM, Rogers Stirk Harbour + Partners, and Fumihiko Maki, respectively, as well as Santiago Calatrava’s seagull-like transportation hub and the 9/11 memorial and museum, designed by Davis Brody Bond and Michael Arad, among others.

Standing shoulder-to-shoulder with SOM’s One World Trade Center, the tower will appear from Tribeca as a series of stacked terraces, while the southern end will look like a slim tower akin to its Financial District counterparts. “Because of its location and size, it has to be a resident of two radically different neighborhoods,” Ingels says.

Unlike the Foster scheme, which anticipated a population of investment bankers when it was designed nearly a decade ago, BIG’s design is conceived for a media company and incorporates open-plan offices and nearly one acre of outdoor terraces, as well as basketball courts, a track, and screening rooms. News Corp and 21st Century Fox, with their some 5,000 employees, will occupy the lower half of the tower, complete with open TV studios and newsrooms, while the upper portion will be

**Zaha responded to the program, so you can’t criticize her too much – but it is expensive.**

—Fumihiko Maki, on Zaha Hadid’s Tokyo National Stadium at a lecture at the Japan Society, in New York City on June 10



BIG’s design of 2 World Trade is made up of seven staggered boxes. Catered to a modern media company, each volume will function as its own building and include double-height atria, views between floors, and access to generous terraces.

reserved for future tenants. The base of the tower will have 350,000 square feet devoted to shops and restaurants, along with a public plaza and access points to 11 transit lines.

Care was taken with the design to maintain views to St. Paul's chapel and the 9/11 memorial site, and will appear to lean toward One World

## Because of its location and size, it has to be a resident of two radically different neighborhoods.

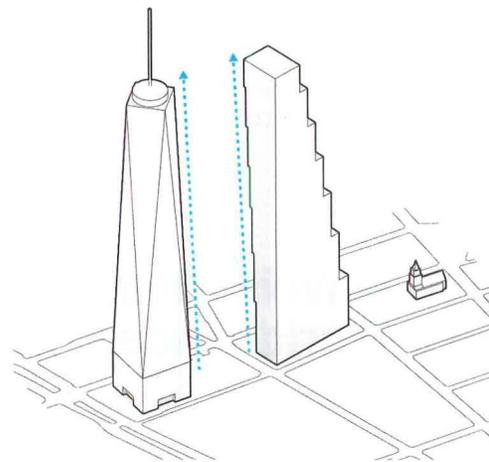
Trade, complementing its geometry, "not like the twinning of the Twin Towers but more like a yin/yang acknowledgement," Ingels says.

For Ingels, the project is personal: the architect was moving into his first Manhattan office in September 2001 when planes hit the Twin Towers. "I think everybody thought of the skyline of New York as something that was irreversible," he said. "It's a tremendous honor, something we are taking incredibly seriously, and I will be proud of."

Although *Wired* reported that "James Murdoch didn't care for the [Foster] building . . . that's why Foster ended up being bumped aside in favor of Ingels, who is exactly half his age," 21st Century Fox and News Corp brought Ingels on before a site was even chosen. With a lease on 1211 Avenue of the Americas in Midtown set to expire in 2020, 21st Century Fox COO James Murdoch and CFO John Nallen had been assessing company needs. Early this year, after evaluating a wide array of architects, they chose BIG. World Trade Center wasn't the only site considered: Hudson Yards and other locations were also candidates.

This is just one of several major commissions BIG has received in recent years, including Google's California headquarters, plus several other projects in Manhattan, like the pyramid-shaped W57. BIG is working with Foster + Partners on the design of Battersea Park in London. "I have only respect for Lord Norman Foster and his team," Ingels says.

Silverstein Properties spokesperson Dara McQuillan said in a statement, "Foster + Partners designed a beautiful building, but unfortunately it doesn't match the specific needs of our new tenants."



BIG's design will have the appearance of leaning toward SOM's One World Trade, evoking the Twin Towers, and will preserve views to St. Paul's chapel.

Foster appeared unfazed. "These things happen," the Pritzker Prize-winning architect told *RECORD*. "They happen to every architect. They're part of the profession."

While a lot of the literal heavy lifting has been done at the site (a foundation was laid years ago for the Foster + Partners' tower), the team has set forth an ambitious goal to have the project finished by late 2020. Says Ingels, "We have our work cut out for us." ■

## Chicago's 606 Elevated Park Opens

BY ZACH MORTICE

**CHICAGO'S 606**, the nation's second elevated rails-to-trails park, opened June 6, and its designers and client have taken pains to ensure that it's a unique expression of the Second City, not just to be compared to New York's High Line. In form, function, and funding, the 606's evolution has taken a different path.

"The High Line is a bridge with a garden on it," said Matthew Urbanski, of Michael Van Valkenburgh Associates, the project's lead designers. "This is a landscape," he says of the less flowery plan.

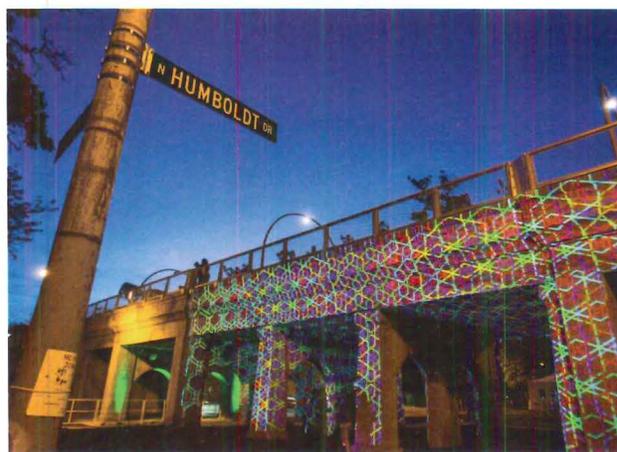
Located on the former route of the derelict Bloomingdale freight line and developed by the national nonprofit Trust for Public Land, the park stretches 2.7 miles through Chicago's Bucktown, Wicker Park, Logan Square, and Humboldt Park neighborhoods on a one-story concrete embankment.

The pedestrian and bike paths on the trail slope up and down, meandering from one side of the embankment to the other, for a more pastoral plan than the High Line. Many of the 606's ground-level access points are large public parks that gradually rise to meet the trail, which is as tall as 17 feet in places.

"It's got a kind of industrial honesty to it," said Urbanski. "It's very Chicago."

So much brawn is on display, Urbanski says, that he is anxious for the rest of the landscape's plantings to be installed to balance it out.

"Over the summer and into the fall, you'll see the final plantings," said Beth White, Chicago regional director for the Trust for Public Land.



The new 606 elevated park connects four Chicago neighborhoods.

Densely wooded trails filled with young saplings to the side of the main trail will provide seclusion from cyclists and joggers zipping from one end of the park to the other.

Bicycles are a key component of the 606's design and funding, which was financed

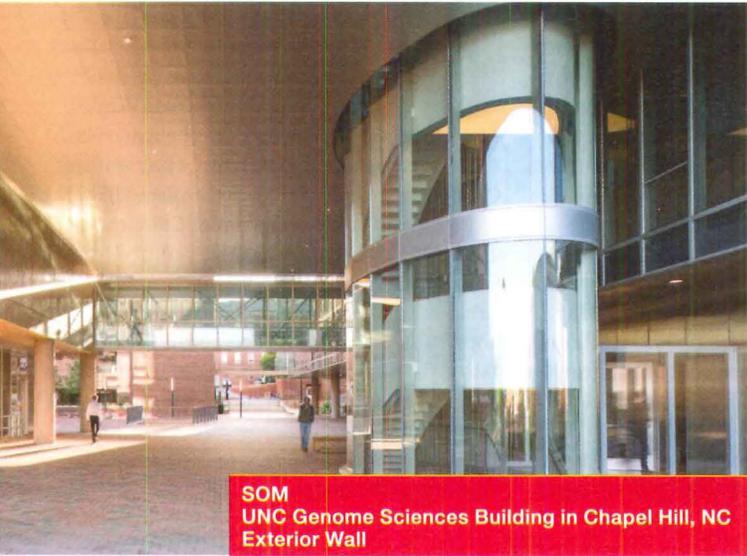
essentially as transit infrastructure. A Federal Highway Administration program called Congestion Mitigation and Air Quality (CMAQ) provided \$50 million of 606's \$95 million price tag, dwarfing city and county contributions of a combined \$5 million and private donations of \$40 million.

"This is an innovation in using CMAQ dollars in a way they had never been used before," said Chicago Mayor Rahm Emanuel, who attended the preview and called the project "landmark public space."

Public art will be a vital part of the 606's programming, and White is working to organize programs for the park beyond its busy opening weekend, when the Chicago Park District took control of its management. She is also working with the Chicago Architecture Biennial to integrate the 606 into its tours and presentations.

Urbanski said he hopes the 606 (named after the first three digits of all Chicago zip codes) "becomes something to emulate," which seems more and more likely. There are plans for two more elevated rail parks in Chicago alone, plans the Trust for Public Land is already discussing with the city. ■

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# Gensler Surpasses \$1 Billion

BY LAURA MIRVISS

**GENSLER SURPASSED** \$1 billion in architectural revenue in 2014, setting a record and maintaining its leading status for the fourth consecutive year on RECORD's annual Top 300 Architecture Firms list, which ranks companies based on earnings from the prior year.

Gensler made huge gains last year, particularly in domestic revenue, which totaled \$778.45 million, and major international clients have tapped the firm to help them expand into the U.S. market. (Gensler recently designed Metropolis in Los Angeles, a \$1 billion mixed-

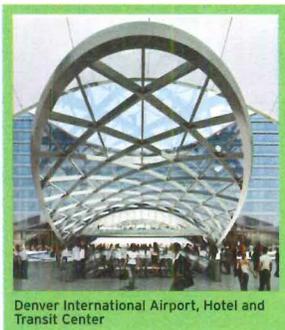
use project by China-based developer Greenland.) "Because Gensler is a global firm with 46 offices across five continents, we partner with clients that also have a global footprint," says Gensler's co-CEO Andy Cohen. "Clients are looking for opportunities beyond their markets."

Overall, U.S. architecture firms are booming, with income totaling \$12.3 billion, an increase from \$11.2 billion in 2013. The gains are particularly strong in the domestic market, where 2014 revenues added up to \$9.4 billion, up from \$8.85 billion the previous year. International earnings rose to \$2.89 billion, up half a billion.

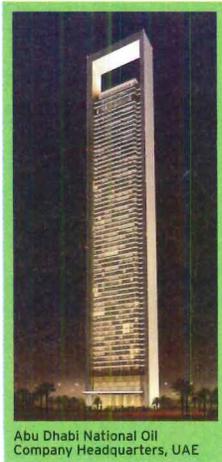
AECOM, which came in second, also grew enormously, particularly in international revenue for architecture, which increased by nearly \$275 million. A major factor in the firm's blockbuster year was its acquisition of industry

giant URS, which ranked sixth on last year's list. "It was more of a merger than an acquisition—we doubled in size," says Ross Wimer, who oversees architecture for the Americas. AECOM came in third last year after trailing CH2M HILL, which fell to sixth place this year.

Following the acquisition of Callison in 2014, ARCADIS/Callison RTKL jumped to the fifth spot, doubling revenue in the last year. Arcadis has kept the names for both RTKL and Callison, known for its retail practice. "Most firms at the size and scale of Arcadis haven't taken that approach," says Lance Josal, CEO of Callison RTKL. "Arcadis recognizes the power behind these two brands and is keeping them intact." ■



Denver International Airport, Hotel and Transit Center



Abu Dhabi National Oil Company Headquarters, UAE

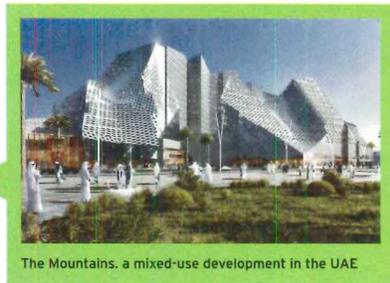


Baoshan Long Beach Winder Tower, Shanghai

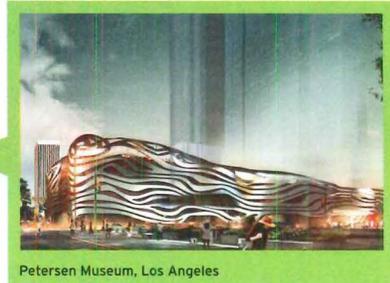
## TOP 25 U.S. ARCHITECTURE FIRMS OF 2015

Companies are ranked by revenue (in **millions of dollars**) for architectural services performed in 2014. These data also appear in *Engineering News-Record's* "Top 500 Design Firms" list, which, unlike our ranking, also includes firms that do engineering exclusively.

RANK	2015	2014	FIRM, U.S. HEADQUARTERS	TYPE OF FIRM	TOTAL ARCHITECTURAL REVENUE
1	1		<b>Gensler</b> , San Francisco	A	<b>1041.28</b>
2	3		<b>AECOM</b> , Los Angeles	EA	<b>801.5</b>
3	4		<b>Jacobs</b> , Pasadena, CA	AEC	<b>435.03</b>
4	5		<b>Perkins+Will</b> , Chicago	A	<b>413.07</b>
5	13		<b>ARCADIS/Callison RTKL</b> , Highlands Ranch, CO	EA	<b>390</b>
6	2		<b>CH2M HILL/IDC</b> , Englewood, CO	EAC	<b>372.25</b>
7	7		<b>HDR Architecture</b> , Omaha	EA	<b>298.5</b>
8	8		<b>HOK</b> , St. Louis	AE	<b>288.72</b>
9	12		<b>HKS</b> , Dallas	A	<b>280.5</b>
10	9		<b>Skidmore, Owings &amp; Merrill</b> , New York City	AE	<b>240.9</b>
11	14		<b>Kohn Pedersen Fox Associates</b> , New York City	A	<b>223.188</b>
12	16		<b>Perkins Eastman</b> , New York City	A	<b>182.9</b>
13	10		<b>Bechtel</b> , San Francisco	EC	<b>167</b>
14	11		<b>NBBJ</b> , Seattle	A	<b>163</b>
15	-		<b>Woods Bagot</b> , New York City	A	<b>157</b>
16	21		<b>Stantec</b> , Irvine, CA	EAL	<b>141.36</b>
17	20		<b>Populous</b> , Kansas City, MO	A	<b>122</b>
18	18		<b>Cannon Design</b> , Grand Island, NY	AE	<b>120.4</b>
19	17		<b>ZGF Architects</b> , Portland, OR	A	<b>119.84</b>
20	22		<b>SmithGroupJJR</b> , Detroit	AE	<b>115.29</b>
21	24		<b>DLR Group</b> , Omaha	AE	<b>102</b>
22	38		<b>EYP</b> , Albany, NY	AE	<b>101.82</b>
23	19		<b>Leo A Daly</b> , Omaha	AE	<b>100.28</b>
24	23		<b>Hammel Green and Abrahamson (HGA)</b> , Minneapolis	AE	<b>90.4</b>
25	26		<b>Page</b> , Washington, D.C.	AE	<b>85</b>



The Mountains, a mixed-use development in the UAE



Petersen Museum, Los Angeles



Walker Art Center entrance, Minneapolis

Key to firm types

- A** Architect
- AP** Architect Planner
- AEC** Architect Engineer Contractor
- AE** Architect Engineer
- EAL** Engineer Architect Landscape (not all combinations listed)

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# Tomorrowland Inspired by Calatrava's Architecture of Today

BY DANTE A. CIAMPAGLIA

DISNEY'S BIG non-superhero movie this summer, *Tomorrowland*, which opened in theaters Memorial Day weekend, is all about a mysterious place full of wonder and whiz-bang. But its vision of a far-off advanced civilization is very much grounded in the physical reality of present-day Spain—specifically, Santiago Calatrava's City of Arts and Sciences in Valencia.



*Tomorrowland's* futuristic set was based on Santiago Calatrava's City of Arts and Sciences in Valencia, Spain, shown in this still (above). The rest of the scenery was created digitally.

In the film, teenager Casey (Britt Robertson) is transported to Tomorrowland whenever she touches a unique lapel pin. To make sense of where she goes and what she sees, Casey tracks down Frank (George Clooney), a former boy genius who seems to know a lot more about Tomorrowland than he cares to admit.

To create this fantasy world, director Brad Bird could have relied on computer trickery and green screens. But Bird wanted his actors to work within a physical reality where possible. So while there was a fair amount of digital magic used to build the way-out-there structures of Tomorrowland, its foundation rests on Calatrava's work and its progressive spirit.

"Calatrava's architecture is just phenomenal

## perspective **news**

and inventive and exciting," producer Jeffrey Chernov said at a press conference. "It's very skeletal, like you're looking at the vertebrae of a dinosaur or prehistoric fish. You walk into that place and you never want to leave. That's the vibe we wanted for *Tomorrowland*."

"The architect's imagination represents that great optimistic version of life where you just go, 'I want to build that' and somebody builds it," Clooney said. "It's pretty amazing."

The horseshoe-crab design of the City of Arts and Sciences—not to mention the World's Fair-esque scale and aesthetic of the project—has a retro feel (think Eero Saarinen) perfect for a movie based on a Disneyland theme-park attraction that opened in 1955 in Anaheim, California.

On a more fundamental level, though, the *Tomorrowland*-Calatrava connection is a natural one: the architect's "optimistic version of life"

is very much in keeping with Walt Disney's goals for Tomorrowland.

"A vista into a world of wondrous ideas, signifying man's achievements," Disney called Tomorrowland in his opening dedication. "Tomorrow offers new frontiers in science, adventure, and ideals: the Atomic Age, the challenge of outer space, and the hope for a peaceful and unified world."

More than 50 years later, Calatrava espoused a similar sentiment in talking with *The New York Times* about his work, in 2013. "My goal is always to create something exceptional that enhances cities and enriches the lives of the people who live and work in them."

There's another point of overlap between the film and the Calatrava, though not nearly as positive: they're both boondoggles.

The City of Arts and Sciences ran hugely over budget, coming in at more than \$1.12 billion, four times the original cost estimate. Disney, meanwhile, spent \$180 million making *Tomorrowland* (not to mention millions more on marketing), only to have the film open with an anemic \$41.7 million at the box office.

No one ever said Imagineering came easy. Or cheap. ■

## noted

### Frank Lloyd Wright House Rediscovered in Wisconsin

A modest bungalow built in 1917 in Shorewood, WI, has been confirmed as a genuine Frank Lloyd Wright–designed house. An expert in American System-Built Homes, Wright's attempt to bring design to the masses, verified the house as the architect's.

### Frick Scraps Expansion Plan

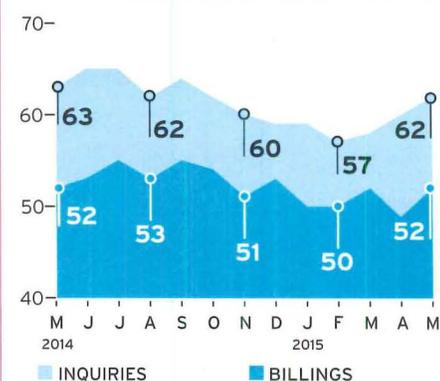
On June 6, New York's Frick Collection abandoned plans for a controversial expansion. The addition, designed by Davis Brody Bond, would have placed a six-story structure in the museum's garden, a plan that received widespread criticism from architects and preservationists. The museum's director said future proposals would maintain the garden.

### Cooper Union President and Five Trustees Resign

The president of Cooper Union, Jamshed Bharucha, resigned in late June due to a New York State investigation into the college's finances. Bharucha's resignation came after five of the college's board members left, including architects Daniel Libeskind and François de Menil.

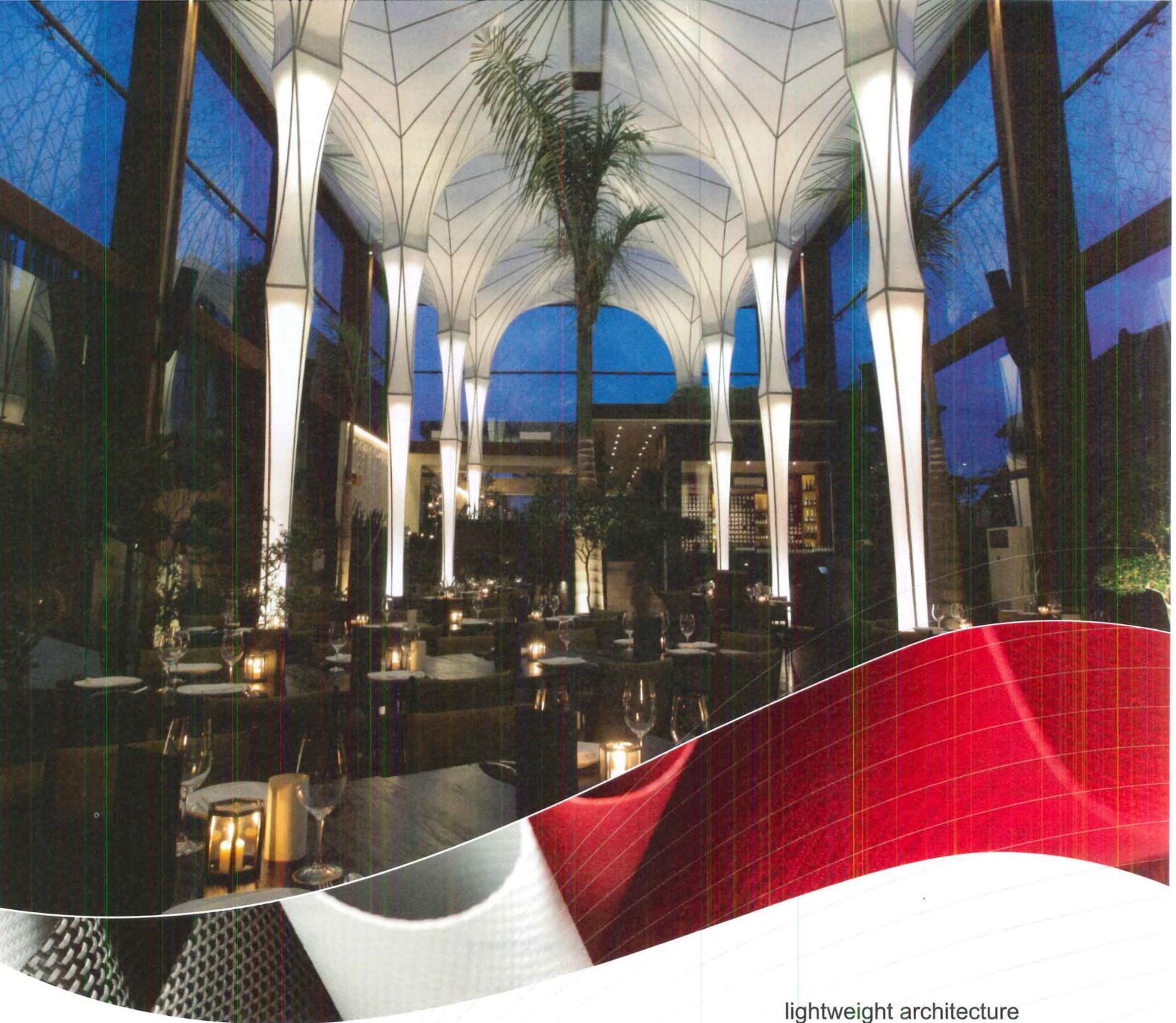
### Büro Ole Scheeren Expands into North America

Architect Ole Scheeren has unveiled a design for a residential tower in Vancouver, BC, his first project in North America and his first outside of Asia. The tower at 1500 Georgia Avenue is composed of offset volumes, and designed to achieve a LEED Platinum rating.



### ABI Takes a Positive Turn

The American Institute of Architects (AIA) reported an Architectural Billings Index (ABI) in May of 51.9, up from 48.8 in April. The new projects inquiry index was also up 1.4 points from the month prior. But the AIA's economist says that in spite of a positive trend, "there are still construction sectors and regions of the country that are struggling."



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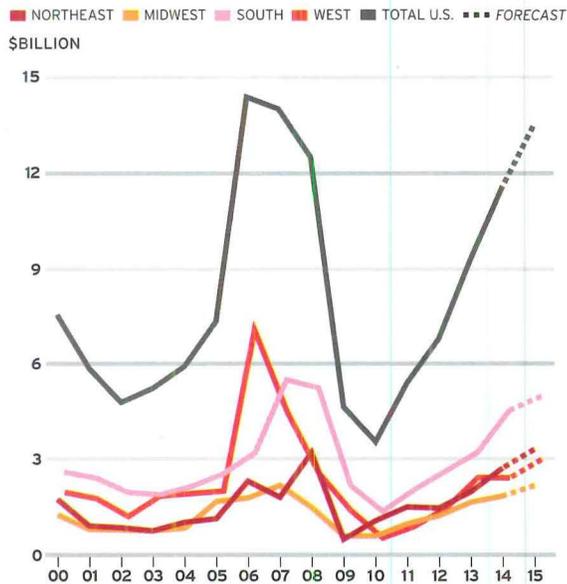
**Serge Ferrari**

# MARKET FOCUS

## HOTELS

### Hotel Starts by Region

In addition to U.S. total and 2015 forecast figures



Hotel construction has come back in full force since the recession. Demand for new buildings is expected to continue to grow, thanks to a solid economy and a resurgence in both business and leisure travel.

### Top Metro-Area Markets

Ranked by total hotel starts 1/2014 through 4/2015

RANK	REGION	\$ MILLIONS
1	NEW YORK CITY	1,472
2	HOUSTON	786
3	LOS ANGELES	696
4	WASHINGTON, D.C.	660
5	MIAMI	647



21c Museum Hotel, Durham, NC, Deborah Berke Partners, page 124.

### The Dodge Index for Hotel Construction 4/2014-4/2015



The index is based on seasonally adjusted data for U.S. hotel construction starts. The average dollar value of projects in 2006 serves as the index baseline.

### Top 5 Design Firms

Ranked by hotel-construction starts 1/2011 through 4/2015

- 1 Gensler
- 2 HKS
- 3 Cooper Carry
- 4 AC Martin
- 5 Morris Architects

### Top 5 Projects

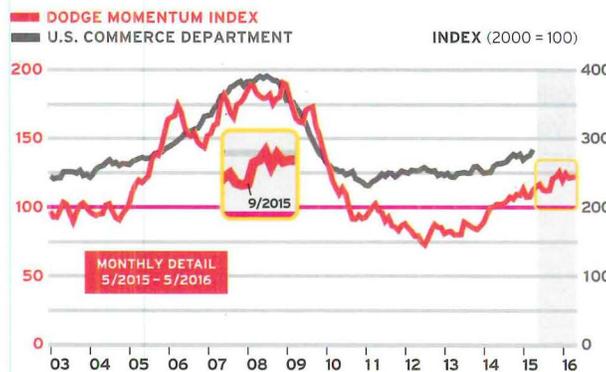
Ranked by hotel-construction starts 1/2014 through 4/2015

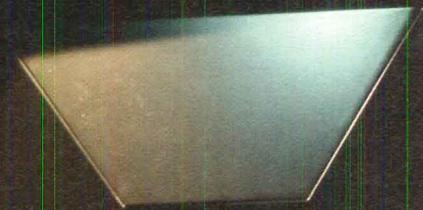
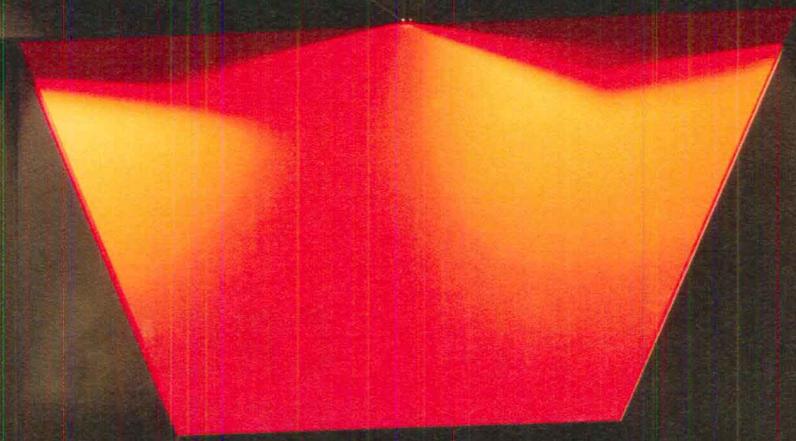
- \$272 MILLION**  
PROJECT: Marriott Marquis Houston  
ARCHITECT: Morris Architects  
LOCATION: Houston
- \$272 MILLION**  
PROJECT: Convention Center Hotel, Hilton  
Cleveland Downtown  
ARCHITECTS: Cooper Carry, VOA  
LOCATION: Cleveland
- \$203 MILLION**  
PROJECT: Fairmont Austin Hotel  
ARCHITECT: Gensler  
LOCATION: Austin, TX
- \$200 MILLION**  
PROJECT: Old Post Office Trump International Hotel  
ARCHITECTS: Beyer Blinder Belle, WDG  
LOCATION: Washington, D.C.
- \$190 MILLION**  
PROJECT: The Grand Islander by Hilton Grand Vacations Club  
ARCHITECT: Group 70 International  
LOCATION: Honolulu

## MOMENTUM INDEX PLATEAUS

In May, the Dodge Momentum Index held steady at 122.3. Even though planning activity has been flat in recent months, the index is still up 6.1% compared to a year earlier.

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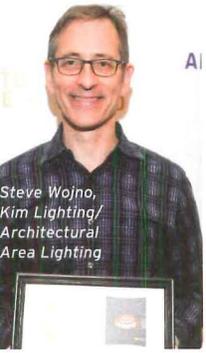
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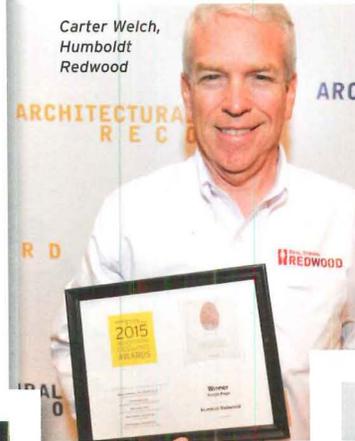
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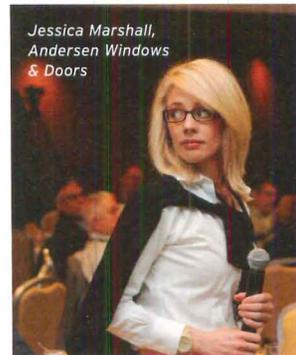
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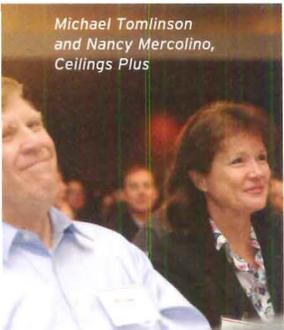
Laura Viscusi with juror architects  
Manuel Cadrecha, Tom Dalia,  
and Merrill Elam



Jessica Marshall,  
Andersen Windows  
& Doors



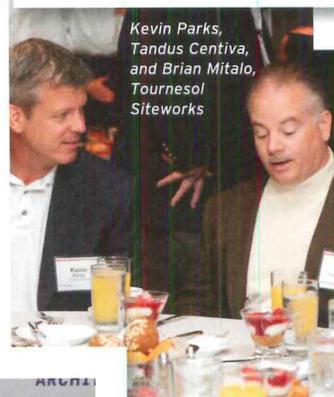
Hannah Stephens and  
Christain Huot,  
ReThink Wood/FII



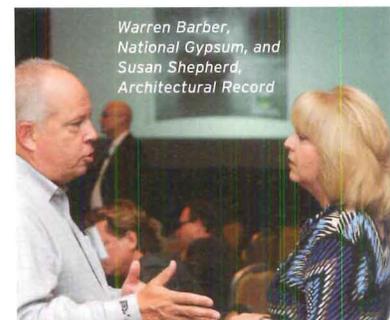
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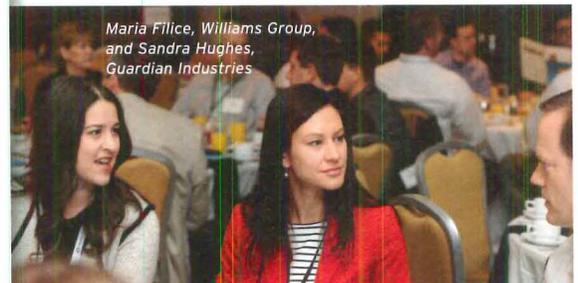
Warren Barber,  
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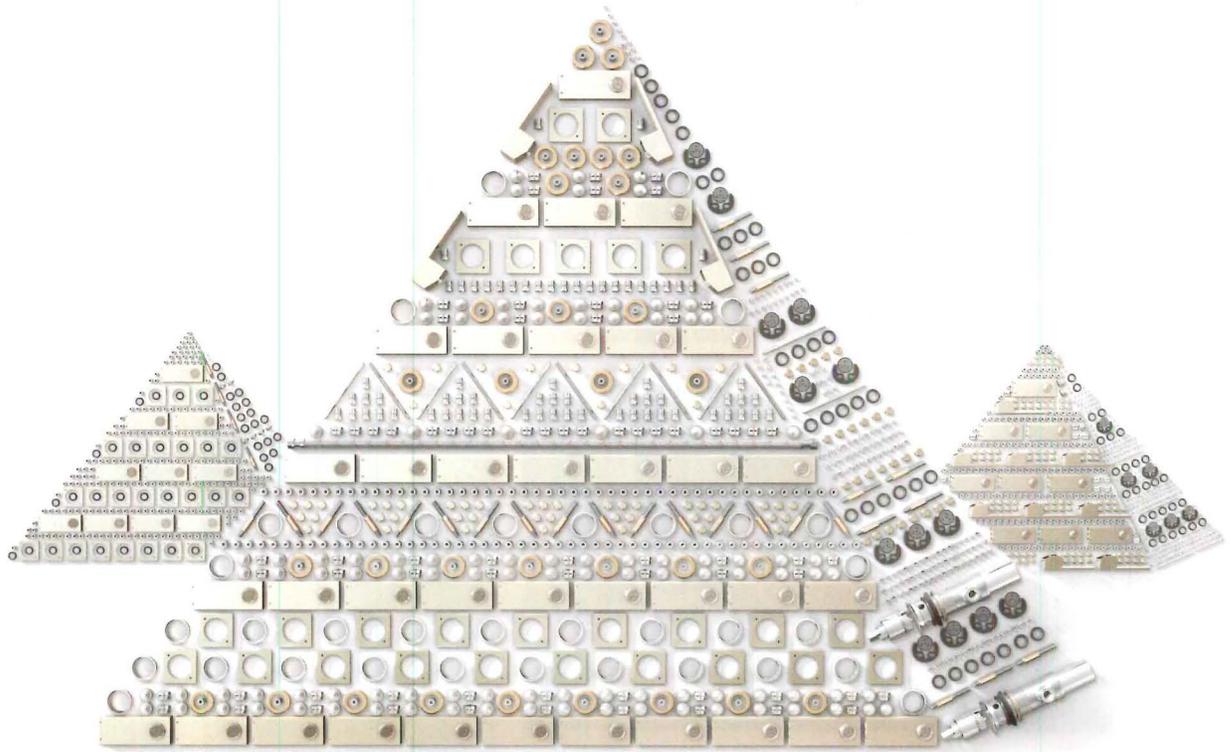
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# perspective house of the month

IN A RESORT TOWN ON LONG ISLAND'S EAST END, BATES MASI + ARCHITECTS DESIGNS A HOUSE SHIELDED FROM THE SUMMER SCENE ON ONE SIDE AND OPEN TO NATURE ON THE OTHER BY JOSEPHINE MINUTILLO

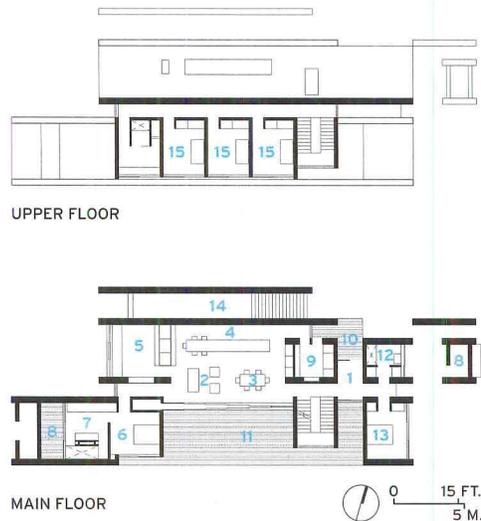
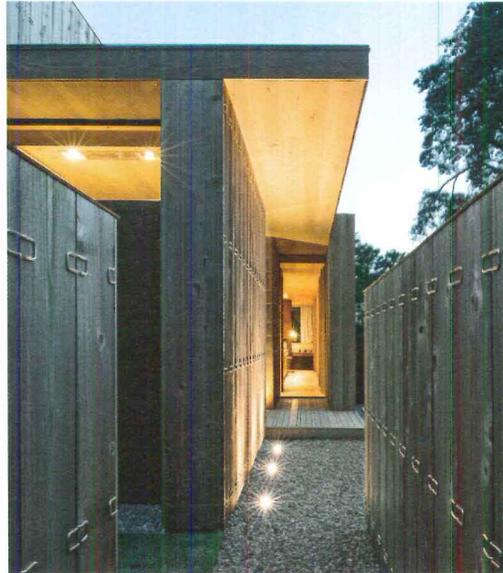


**THIS HOUSE** is not the first Paul Masi designed for himself, but it is, as he puts it, “much more grown up.” As one half of Bates Masi + Architects, a firm based in Sag Harbor, New York, he has now crafted a 3,200-square-foot house for his family in the heart of nearby Amagansett. The half-acre site close to the resort’s main road posed a particular acoustical challenge to an architect adept at translating the local vernacular of cedar-shingled cottages into graceful modern residences.

To form an acoustic barrier to the rumbling traffic just a couple of hundred feet away, Masi created a series of parallel windowless walls throughout the house, each 20 inches thick, sheathed in cedar, with a poured concrete core.

The 12-inch-wide boards that clad both sides of the walls are held in place by spring-like stainless-steel clips that allow unhindered expansion of the wood. That same 12-inch vertical module is used for the marble wall slabs in the three bathrooms and for built-in furnishings and interior details. The custom clips that hold the various elements in place also serve as hooks and cabinet pulls. Oak floors and ceilings and weathering steel, in the house and for the outdoor showers, round out the sparse material palette.

The dominant wall of the main space—for cooking, dining, and gathering—features felt panels between the concrete and its loosely hung cedar boards for additional sound absorption. Opposite it, sliding glass doors open completely to the outside, where hornbeam trees line the perimeter of the property—making a private and tranquil oasis at the center of town. ■



- 1 ENTRY
- 2 LIVING
- 3 DINING
- 4 KITCHEN
- 5 DEN
- 6 MASTER BEDROOM
- 7 MASTER BATH
- 8 OUTDOOR SHOWER
- 9 LAUNDRY
- 10 ENTRY DECK
- 11 DECK
- 12 GUEST BATH
- 13 GUEST BEDROOM
- 14 LIGHTWELL
- 15 CHILD'S BEDROOM

The heavily glazed south facade (top) includes over 30 feet of sliding glass doors on the ground floor that open completely to an outdoor deck and rear yard. The layered entry sequence on the north side acoustically insulates the house (above, left). The large central space combines kitchen and dining with a casual sitting area. Light oak floors and ceilings contrast with the Western Red Cedar walls (above).



*One World Trade Center, New York, NY*



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CIRCL

## Three's Company

An architect, industrial designer, and a fabricator join forces to create immersive environments and a growing business.

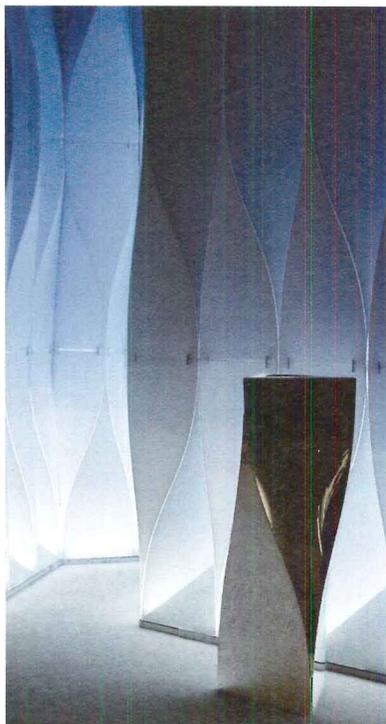
BY ANNA FIXSEN

IN A workshop near the Greenpoint waterfront in Brooklyn, New York, Christopher Williams, Charles Constantine, and Drew Seskunas are tinkering with a fog machine, a tub of ice, and a plastic-walled room—a mock-up of their latest architectural installation. Williams flicks a switch, and a heavy mist hisses in, swirling around a series of colored LEDs. “This is a very early stage of it,” explains Seskunas. “It’s like a little lab.”

Such experiments are essential to the way Williams, Constantine, and Seskunas—a master craftsman, an industrial designer, and an architect—work. As cofounders of the firm the Principals, their combined skills and DIY ethos result in environments and



The Principals (above) founded their firm in 2011 and have created a variety of objects (including this stainless-steel hip flask, below) and interactive environments. For a recent collaboration with Ford, they designed a pavilion (far left) made of corrugated plastic and mirrors that uses sensors to pulse with visitors' heartbeats. Last year, they designed Ancient Chaos, a sound-activated canopy (left) for Sonos.



objects that challenge expectations of traditional design: walls that seem alive, materials that defy their intended use.

“We want to produce work that allows us to look at the world in a new way,” says Seskunas. “Our projects are about decontextualizing elements to expand our understanding.”

The three founded the Principals in 2011 after an all-nighter in a metal shop where Constantine and Williams worked. At the time, Seskunas (who knew Constantine from childhood and Pratt Institute) was leading the Berlin outpost of the design agency SAQ, and he needed help fabricating a sculptural lamp. The red-eye collaboration went so well, they decided to start a firm.

The first major project the team pursued was Cosmic Quilt, a parabolic canopy made from silver-coated paper that undulated according to movement beneath it through a system of light sensors and motors. After a successful Kickstarter campaign, they built Cosmic Quilt for a design fair in New York's Soho. The project was noticed by a scout for the Bonnaroo music festival and later installed in its VIP tent.

From there, commissions trickled in, including requests for product design, which resulted in objects as diverse as a

set of concrete dominos and a steel hip flask that looks as if it were liquid. Word of their interactive environments spread. Last year, the audio company Sonos approached the firm to design a sound environment for a collaboration with the electronic musician Dev Hynes (aka Blood Orange). Drawing from what they learned with Cosmic Quilt, the Principals created Ancient Chaos, a canopy made from an assemblage of Mylar squares that responded to the frequencies of Hynes's music. “Our work self-perpetuates,” explains Williams. “Once you see a project to fruition, you start to have other ideas.”

Now the Principals can sustain their business entirely on commissions as increasingly prominent clients line up, including Ford and a major tech company, which the firm cannot yet name. The Principals are also in talks to design a permanent retail space in Manhattan.

Back in the studio, the three continue their cloud test, trying to get the opacity of the mist just right. This project marks a recent shift in the Principals' work, experimentation with so-called “ethereal materials”—including spandex mesh and clouds, in the vein of Olafur Eliasson's installations, Frei Otto's canopies, and Diller Scofidio + Renfro's Blur Building (2002). Says Seskunas, “We're trying to figure out ways the built environment can be not so built.” It's the sort of thinking that suggests the Principals are built to last. ■



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CIRCLE 41

# ARCHITECTURAL RECORD

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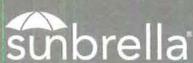
The answer to the June issue's Guess the Architect is **ALVAR AALTO**, who completed the Paimio Sanatorium near Turku, Finland, in 1933. The design of the reinforced-concrete frame building for tuberculosis patients featured rooms with balconies angled for sunlight and views of the surrounding forest. For more details, including the winner, go to [guessthearchitect.com](http://guessthearchitect.com).

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**Patience and Fortitude: Power, Real Estate, and the Fight to Save a Public Library**, by Scott Sherman. Melville House, June 2015, 224 pages, \$26.

Reviewed by James S. Russell, FAIA

A HISTORIC-PRESERVATION battle over Carrère and Hastings's 1911 marble palace for the New York Public Library is the subject of Scott Sherman's *Patience and Fortitude: Power, Real Estate, and the Fight to Save a Public Library*. The title's grandiosity is somewhat misleading: at no time was the landmark's exterior or its public spaces endangered by a controversial consolidation plan. Yet the battle over the main branch of the New York Public Library, which rises majestically along two city blocks behind a pair of stone lions (the *Patience and Fortitude* of the title) raises tough historic-preservation questions: What is essential to a great building's integrity? What should be done when money is not available to maintain treasured resources?

As is rare for big-city libraries, the system's headquarters is almost entirely devoted to research. A Central Library Plan, devised in 2007, threatened that status, as trustees cooked up a complicated real-estate deal to shore up the institution's deteriorating finances. The idea was to close and sell two nearby branches, which sit on highly valuable midtown-Manhattan plots, and insert their consolidated functions into a new circulating library. And the architectural plan for the library's interior, as designed by Foster + Partners, would have replaced the main building's book stacks, which feed the spectacular Rose Reading room, a football-field long cathedral beloved by writers and researchers.

Selling public assets to underwrite failing public services is a time-honored fiscal gimmick in New York. The deals, however, are complicated and opaque; projects sold as "free" to the public end up requiring large injections of public funds. The book chronicles the unraveling of the library's unholy deal.

The story is not so much about power as the hubris of wealthy trustees who worked in secret and ignored the evidence of the project's risk. That risk stared them in the face in the form of a 2007 sale of the busy Donnell branch to a developer. The deal promptly went south as the economy imploded. A second buyer ultimately took over and has left space for the branch, designed by TEN Arquitectos, within a 50-story tower. The library says the branch will open late this year, three years later than promised.

As for the main library on 42nd Street,

scholars were infuriated that 1.2 million books from the stacks would be shipped to off-site storage. Foster's design had library floors opening to a full-height atrium. Its flimsy references to Henri Labrouste's great Bibliothèque Nationale in Paris were justly jeered at. A blistering critique on December 3, 2012, by Ada Louise Huxtable—her last column before her death weeks later—signaled the beginning of the end. Given that proceeds from the branches' sale (estimated at \$200 million) might fall short, and Foster's \$300 million design might have gone over budget, the project could have obligated the library to hundreds of millions in unanticipated costs when it would at best have offered \$7 million in annual operational savings.

Much of the book describes the struggle to stop the project by preservationists concerned with historical integrity and scholars who saw the library dumping printed documents. Charles Warren, an architect and Carrère and Hastings scholar, argued eloquently that the ornate iron stacks were essential to the architectural conception: "The building is a machine for reading books in . . . The books . . . rise up out of that machine into the reading room to serve the people." He also noted

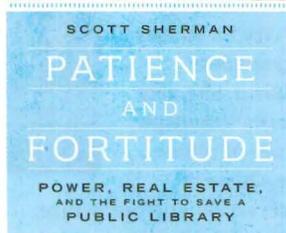
that the stacks aren't furniture but structure, making their removal painstaking and costly.

The scholars were criticized as elitists for trying to hold onto the vast building primarily for research. Given its fiscal distress, the library had no choice but to consider how many volumes it needed to store on some of the most valuable real estate in the world. The library did a terrible job of framing this essential debate, while downsizing the very staff that had the expertise to help set priorities.

The opponents ultimately won: the library withdrew the plan last year. But it has removed the books from the historic stacks and is building at least some new ones under Bryant Park. It must still develop a full plan for the historic stacks. Meanwhile, it will renovate the Mid-Manhattan branch, keeping it as a circulating library.

Sherman's most shocking revelation is how little the trustees understood the mission of the institution they claimed to be saving. ■

James S. Russell writes for many publications and blogs at [jamesrussell.net](http://jamesrussell.net).



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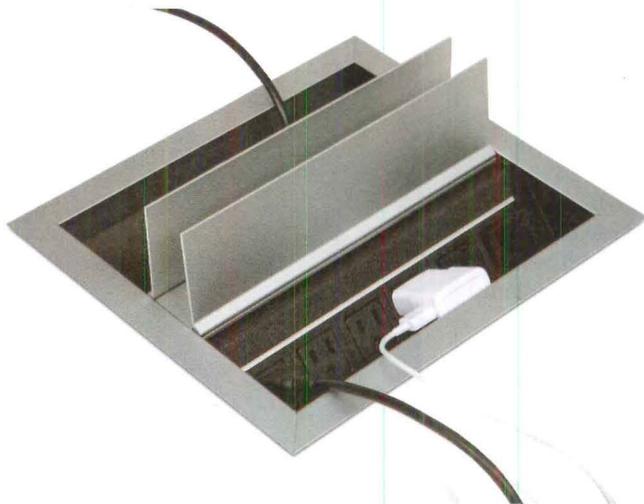
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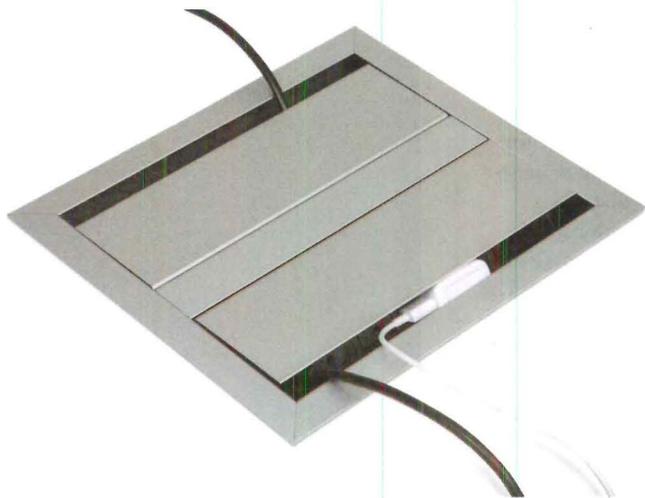
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CIRCLE 43

## perspectivebooks

**We're Still Here Ya Bastards: How the People of New Orleans Rebuilt Their City**, by Roberta Brandes Gratz. Nation Books, June 2015, 404 pages, \$28

Reviewed by Aleksandr Bierig

A CRISIS is a moment of reckoning. By altering or destroying the status quo, a crisis opens things up, making visible what is often submerged, making possible what is usually thought otherwise. In 2005, Hurricane Katrina laid bare the deep inequalities in the city of New Orleans, while clearing paths for reform and change. In her new book, Roberta Brandes Gratz tracks efforts to reshape the city in the wake of the storm.

Gratz is a self-proclaimed urbanist in the tradition of Jane Jacobs, and here, as in her previous books, she scours the city for stories of grassroots activism. She ably describes multiple frames of reference—historic preservation, infrastructure, crime, sustainability, public health, education, and planning—in order to outline a constellation of interconnected issues, showing how the physical shape of the city reflects its politics and policies.

But while the issues change, Gratz's approach stays the same: these are stories of heroes and villains, of individual resilience against structural ineptitude. As she writes, "The story of the regeneration of New Orleans after the storm is filled with tales of the impossible being accomplished by those too naive to know that it 'can't be done,' or those determined to just do it and ask permission afterward." She includes accounts of the revival of local preservation efforts, the proliferation of sustainable building techniques, and the beginnings of environmental remediation in the surrounding bayou. Particularly in the most

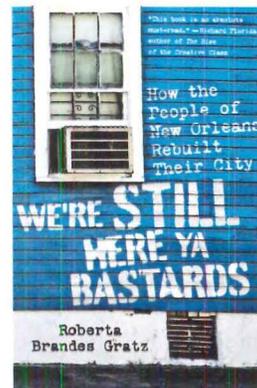
devastated areas, Katrina provided an impetus to rethink the city at the level of the individual house and block, with numerous formal and informal organizations emerging to promote responsible, sustainable growth.

As the book progresses, however, Gratz's resilient individuals come up against larger forces. She is repeatedly appalled at the ineptitude and corruption of those in charge. This is most apparent in two chapters on the demise, following Katrina, of the Charity Hospital and the city's 1930s-era public housing; both had long served as important safety nets for poor New Orleanians; both

sustained minimal damage during the storm; both have been effectively dismantled by politicians and business interests determined to use the crisis as an excuse for redevelopment and the privatization of formerly public services.

In these cases, the battered ideals of transparency, democracy, and community participation were simply overpowered. It is surprising that Gratz seems startled by the failures of "experts" and others to judiciously conserve these vital supports for an underserved community. While the house or the city block might be revived, entities like hospitals and housing (and highways and levees) are huge undertakings that reflect the priorities, capabilities, and values of a society; they are formed at a scale beyond the capabilities of any ordinary individual. Gratz brilliantly exposes a complex web of injustice, but her book also conveys the looming sense that reforming the inequalities inscribed on the streets of New Orleans and elsewhere will require a more fundamental reevaluation of what constitutes our idea of the just city and the public good. ■

Aleksandr Bierig is a Ph.D. student at Harvard's GSD.



## Empty-Nest Cities

**Young-Old: Urban Utopias of an Aging Society,**  
by Deane Simpson. Lars Müller, March 2015, 384  
pages, \$50.

Reviewed by Henry Grabar

IN THE fastest-growing city in America, the birth rate is less than half the U.S. average. Most of us aren't allowed to live there. It's The Villages, a Florida retirement community whose population has more than doubled since 2010 and now stands at 114,000. Ninety-eight percent white, 80 percent married, and 86 percent between the ages of 60 and 85, The Villages is uniquely homogeneous, banal, and bizarre by turns.

America's largest gerontopolis is the most developed of four case studies in *Young-Old: Urban Utopias of an Aging Society*, an intriguing and vital new book by architect Deane Simpson, who teaches at the Royal Danish Academy School of Architecture in Copenhagen and at BAS Bergen in Norway. His subject is the "young-old," a budding, first-world class of seniors settling the newly opened land between the end of responsibility and the beginning of dependency. "Millions of retirees around the world consciously choose to spatially secede from the rest of society to achieve the ideal lifestyle," Simpson writes. You might ask, What kind of world are they building?

But the more apt question is, What kind of world are they buying? A common thread running through Simpson's descriptions of young-old settlements in Arizona, Florida, Spain, and Japan is that aging residents are mere players on the stage of master developers. The inclusion of full-color brochures in the book is instructive—marketing, rather than jobs, family, friends, or long-held dreams, has unleashed this unusual migration.

A house is only the first thing they buy. To find as many middle-class seniors as live in The Villages, you would have to travel to a city the size of San Diego or Houston. As a result, this central-Florida community an hour northwest of Orlando is a stop on major concert tours. It's home to a tremendous diversity of medical establishments. And it's a dream for targeted advertising, which helps support developer-run newspapers and TV.

Self-segregation, meanwhile, mutes the shocks of age. The themed architecture does its best to feel old, from the generic casitas around Torremolinos on the Costa del Sol to the reproductions of 16th-century Dutch

houses at Huis Ten Bosch, near Nagasaki, Japan. Isolated from the young and the poor, residents apparently feel spry and at ease. "They are reborn—I think—when they come here," says a senior official at The Villages.

It would be pleasurable enough to read Simpson's book for Studio Joost Grooten's dazzling maps and graphics, or for the parade of delightfully weird anecdotes from the world of the young-old: the tendency to peg the word "golf" to streets, houses, and even landscape features on the Costa del Sol, for example, or the fact that America's most successful 20th-century retirement magnate, Del E. Webb, honed his city planning skills

building Japanese internment camps during World War II.

But it's more serious than that. The young-old are a rapidly expanding class of global citizens. By 2050, the portion of the world's population over 60 will have grown from 12 to 20 percent. Their settlements portend our individual paths and the urban future at large. Let's hope, with their parades of borrowed forms, that they don't set an architectural example as well. ■

Henry Grabar is a journalist in New York City who writes about architecture, transportation, and city planning.

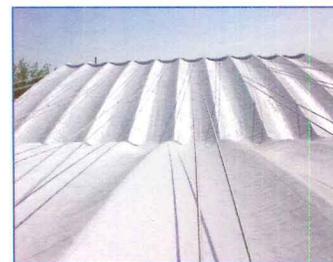


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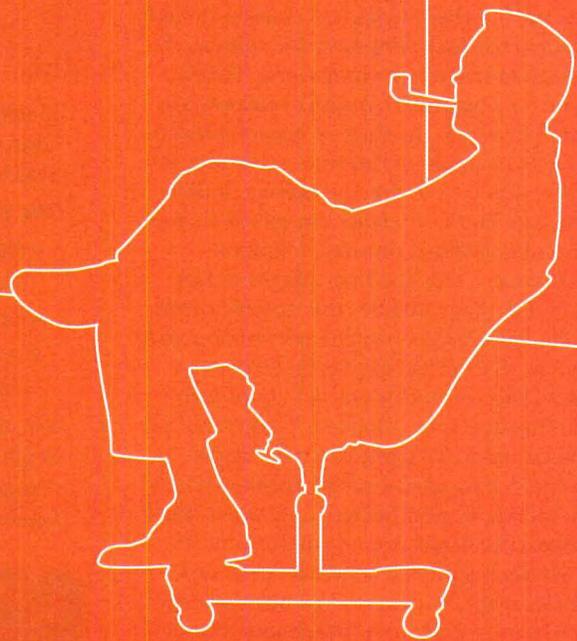
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INSTALLER: Alexander Metals, Inc.

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CIRCLE 47



# A Warm Welcome

Design-savvy building products and finishes—from bold, graphic carpet to minimalist door hardware—are going the distance to make hospitality venues inviting.

By Sheila Kim



**DH3, DH4, DH5**

These door handles range from traditional to transitional to modern in style. DH3 has completely squared corners, while DH4 is cylindrical, and DH5 features a heftier cylinder design. All are 12" long and available in satin nickel and a satin or polished chrome finish.

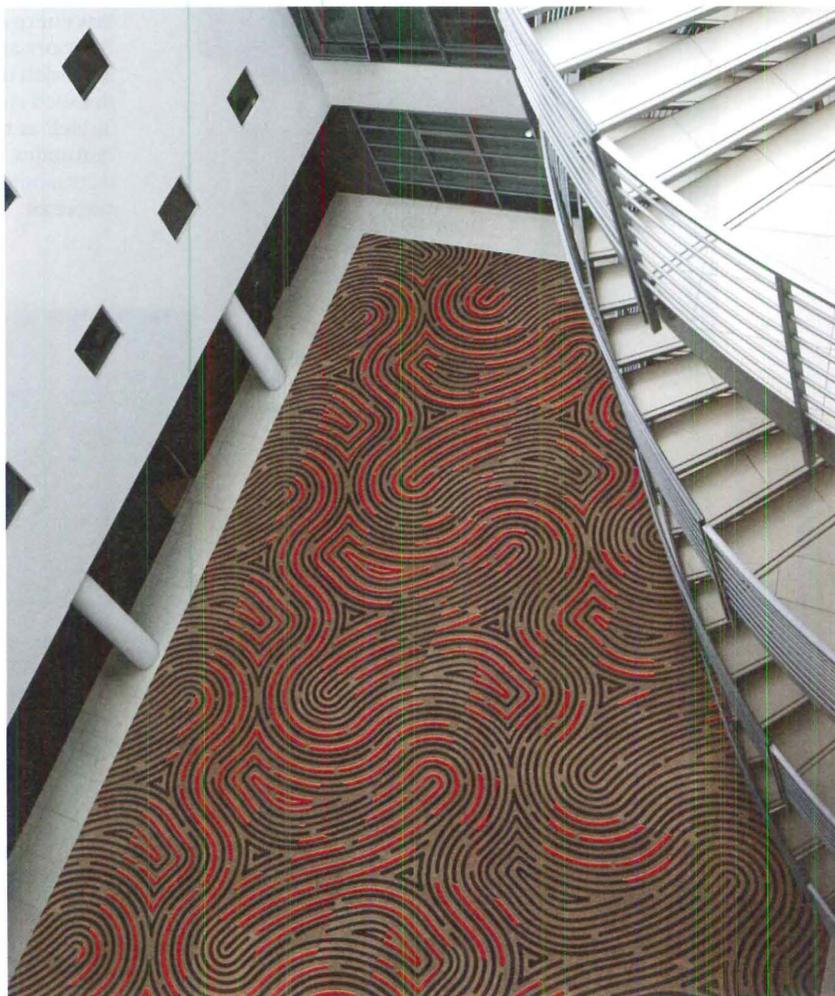
[mockett.com](http://mockett.com) CIRCLE 206

**Latent**

Part of Milliken's new Identity One modular carpet collection, Latent replicates the curvilinear patterns of the human fingerprint. Specifiers can play with the scale, color palette, sequence, and texture to compose floors as unique as a fingerprint itself for lobbies, guestrooms, corridors, and meeting spaces. Each tufted, cut-pile nylon (Type 6,6) tile comes with an antimicrobial layer.

[millikencarpet.com](http://millikencarpet.com)

CIRCLE 207



**Gem**

Designed by Ludovica + Roberto Palomba for Foscarini, this pendant gets its ethereal appearance from a white blown-glass sphere with a subtle bas relief of facets formed by crisscrossing grooves. The fixture is fully closed on the bottom, resulting in a soft glow; scheduled for release by the end of 2015.

[foscarini.com](http://foscarini.com) CIRCLE 209



**myRoom**

Upping the ante on guestroom controls, Lutron's myRoom system creates a slick, cohesive look using the manufacturer's own Palladiom QS keypad and thermostat to adjust light and temperature. The controls can also be paired with Alena QS motorized drapery tracks.

[lutron.com](http://lutron.com)

CIRCLE 208



**Oberon**

Sleek and pared down, these new single-hole faucets from TOTO have been designed with easy-to-operate levers for universal use. Three styles are offered, all in polished chrome and WaterSense-labeled, with a GPM of only 1.5. [totousa.com](http://totousa.com)  
CIRCLE 210

**Crossfuse Wood Panels**

These highly dimensional wall panels from Architectural Systems come in seven intricate patterns formed with reclaimed teak, ipe, ironwood, or walnut veneer (high-pressure laminate over MDF is offered as an alternative). Standard panels measure 4' x 8'.  
[archsystems.com](http://archsystems.com) CIRCLE 214

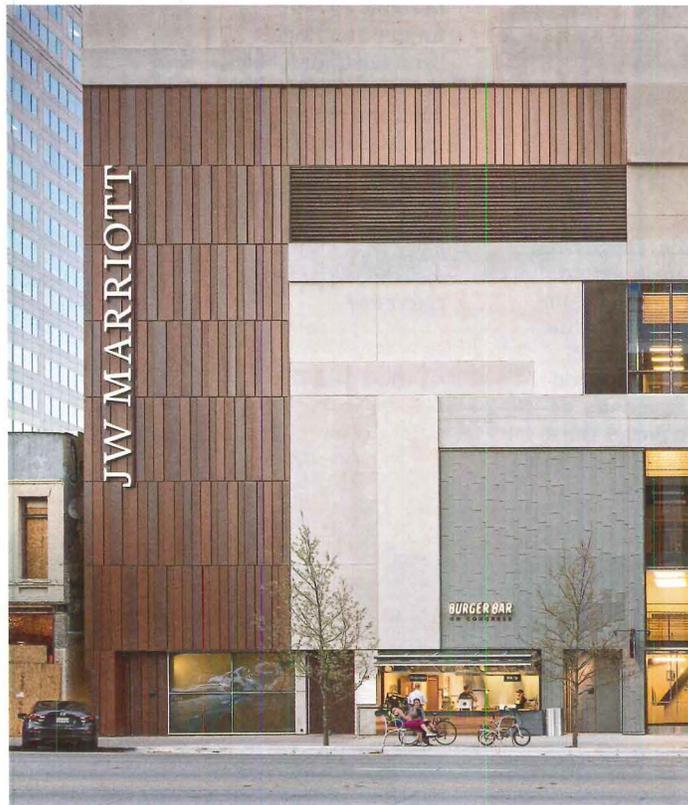


**5500 MRL**

Schindler's newest introduction to the machine-roomless traction-elevator market services mid-rise buildings, with a travel height of up to 350' (roughly 33 floors), and uses 30% less energy. The car interiors are customizable with mirror or brushed stainless steel, as well as numerous laminates.

[us.schindler.com](http://us.schindler.com)

CIRCLE 211



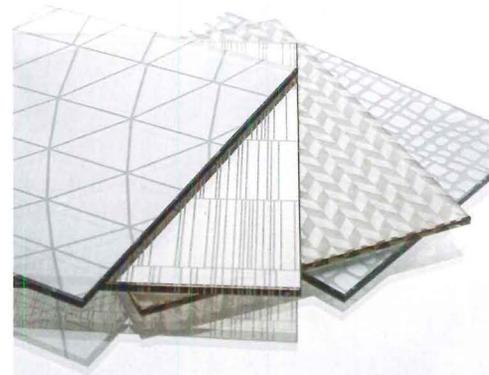
**Fluropon Coating**

For the JW Marriott in Austin, Texas, HKS Architects wanted to specify weathered steel, but its cost was too high. The firm's contractor worked with metal-wall manufacturer ProCLAD and selected 18-gauge steel panels coated with Valspar's durable, chemical-resistant Classic II Fluropon in three custom monochromatic shades to mimic weathered metal.

[valsparcoilextrusion.com](http://valsparcoilextrusion.com) CIRCLE 212

**C1 Collection**

CARVART's new glass series features 12 patterns etched onto one or both sides of a panel. Ranging from hand-drawn lines to geometric chevrons, the designs can be specified at small or large scale, and some are available with translucent views. The glass comes in a maximum sheet size of 48" x 120".  
[carvart.com](http://carvart.com) CIRCLE 213

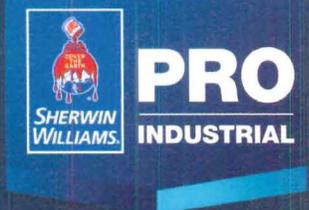




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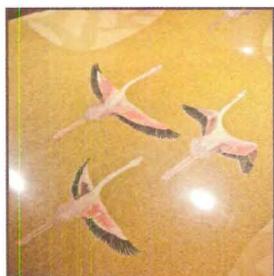
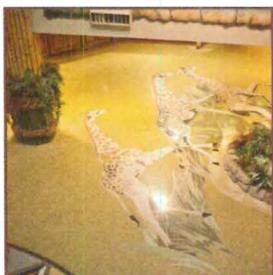
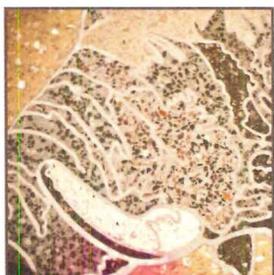
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Kalahari Resorts Wisconsin Dells  
Photo by David Markley



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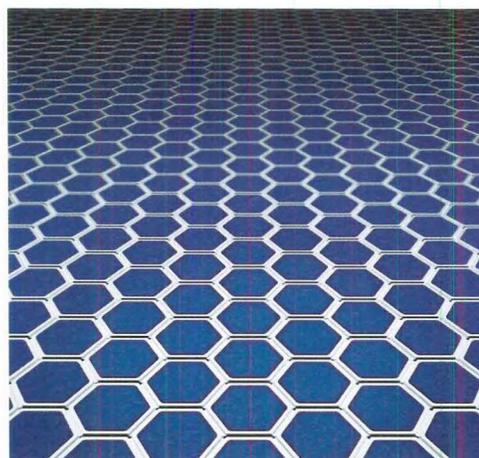
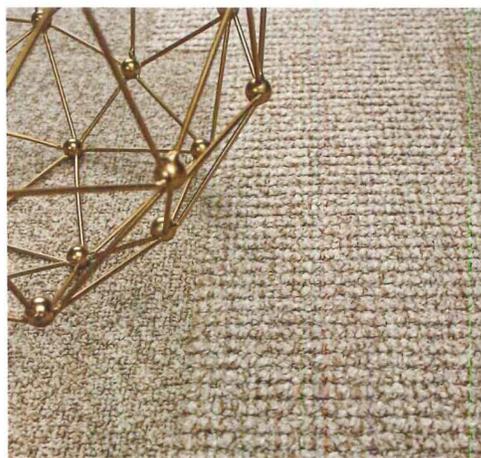


National Terrazzo & Mosaic Association  
[www.NTMA.com](http://www.NTMA.com)  
800.323.9736

CIRCLE 49

## products **flooring**

THESE HARD-WEARING FLOOR COVERINGS CATER TO A WIDE VARIETY OF MARKETS, FROM HEALTH CARE AND OFFICE TO RESIDENTIAL AND RETAIL.  
BY SHEILA KIM



### Kayar

Artigo [artigo.it](http://artigo.it)

Situated in Montreal's Olympic Park, the Institut National du Sport du Québec is a 150,000-square-foot athletic complex completed last year by Lapointe, Magne et Associés. The architects used Kayar rubber flooring in a saturated red flecked with natural coconut fibers to cover the sport center's locker rooms. The Greenguard Gold product comes in 23 other colors, in tile or sheet format. **CIRCLE 200**

### Trance and Magnetism

Bentley [bentleymills.com](http://bentleymills.com)

These two complementary commercial carpets feature a lush hand created by using vintage tufting equipment. Constructed of Antron nylon in a sophisticated neutral palette, both are available in modular formats (18" x 36" or 24" square). Trance, which also comes in broadloom, has an all-over chunky texture while Magnetism is a stripe formed by two different textures. The products are Cradle to Cradle and CRI Green Label Plus certified. **CIRCLE 205**

### Architectural Remnants

Armstrong Flooring [armstrong.com](http://armstrong.com)

Three new designs—influenced by coastal materials—have been added to this laminate line: To the Sea references colors and textures of wooden buoys and clapboard; Surf Side mimics the weathered white oak of porches by the sea; and Seaside Pine recreates the look of lap siding. A commercially rated wear layer provides extra stain resistance, while a denser ½" core helps dampen sound. **CIRCLE 201**

### Floormations

Construction Specialties [floormations.com](http://floormations.com)

Eight geometric styles ranging from hexagons to grids are offered in this highly customizable aluminum entrance-flooring system that is designed to keep debris and water from entering buildings. The pattern scales are modifiable, and options include a selection of carpet inserts from Shaw and recycled rubber. C/S will also work logos and other custom graphics into the entrance mats. **CIRCLE 204**

### RGlass Brights

Fritztile Terrazzo Tile [fritztile.com](http://fritztile.com)

Well suited to commercial, institutional, hospitality, and health-care settings, RGlass Brights build on Fritztile's already established terrazzo line with 20 new vibrant colorways: white rock mingles with glass in hues ranging from carbon black and teal to ruby and citron yellow. The affordable series is FloorScore certified, Class 1 fire rated, and can contribute to LEED points. **CIRCLE 202**

### Thinner

Florida Tile [floridatile.com](http://floridatile.com)

Pressed on a continuous belt at a force of 15,000 tons, Thinner is an extremely durable, flat, large-format porcelain slab that weighs a third less than traditional tiles of the same size. Offered in sizes up to 39" x 118", in thicknesses of ⅜" or ¼", the slabs have rectified edges, are manufactured using sustainable practices, come in a variety of styles including wood and stone looks, and are low-maintenance. **CIRCLE 203**



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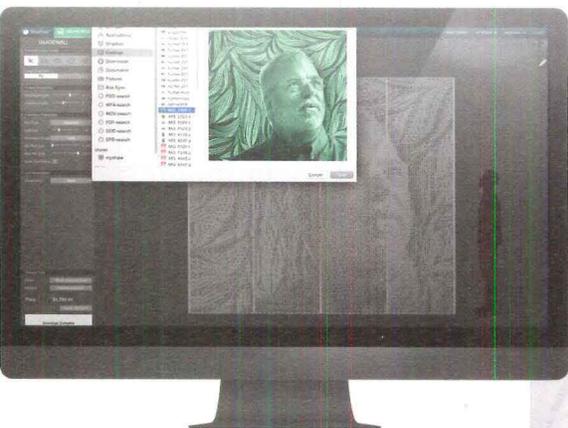
CIRCLE 50

photography: naohiro tsukada design: omdr

# Reimagining Mosaics in Metal, with ImageWall™

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CREATE IMAGERY ON ARCHITECTURE.”

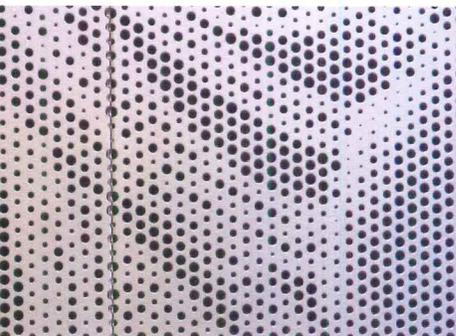
— Craig Long  
Lead Engineer, ShopFloor™



Turn your own images into real metal surfaces using ImageWall™, a browser-based app which runs on Windows as well as Mac desktops.



When it comes to making perforated mosaics on metal, there's only one company that builds an online web-app for that exclusive purpose. Last year, **Zahner** began developing a software called ImageWall™ that makes it simple to design and build imaginative facades. It's completely free, and it's powered by ShopFloor™ which means architects can see their pricing in real-time as they design and build, swapping out metal materials, patterns, shapes, and imagery.



The perforation pattern continues perfectly across each panel's reveal, creating the illusion of a seamless image when viewed from a distance.

ImageWall™ is the next technological step for Zahner, whose team was also the first to develop and then patent\* their original image-to-metal perforation system years ago. ImageWall™ brings an unprecedented level of museum-quality craft to perforated facades, with no visible fasteners, and seams that practically disappear. This level of quality was once only possible on the most expensive of projects. Now it comes standard with each new ImageWall™ shipped with ShopFloor™.

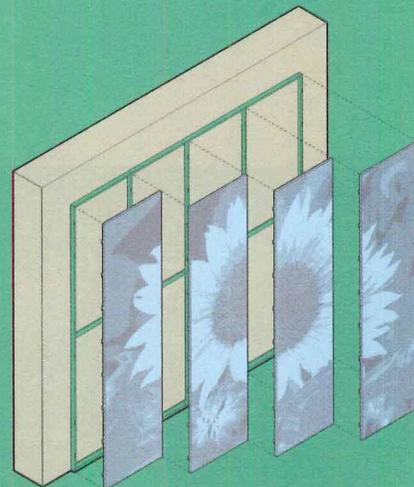
Sign up using the code below and receive dedicated support on your ShopFloor™ app:  
[ShopFloorApp.com/AR2015](http://ShopFloorApp.com/AR2015)

\* Zahner Patent No. 7,212,688 B2, Transferring an image to a building using a plurality of metal panels.



## How to Build an ImageWall™

- 1 Create a free account with **ShopFloor™**. (You can use the code below to get a dedicated support staff on your team).
- 2 Launch the ImageWall™ app.  
*Note: You may be asked to install a browser plugin called Unity which powers the ShopFloor™ apps.*
- 3 Design your heart out. The app has an **“Upload Image”** button, allowing you to create designs using your own photographs, drawings, or images.
- 4 When your design is complete, set up a purchase order within the app, and Zahner will fabricate and ship the panel system to your door.



Installing is easy. ImageWall™ ships with layout jigs, security drill bits and drivers, requiring only basic hand tools for installation.

**IMAGEWALL™**

ZAHNER  ShopFloor

[ShopFloorApp.com/AR2015](http://ShopFloorApp.com/AR2015)

CIRCLE 51

Opening just a month apart, a pair of cultural projects by OMA—one in Milan and the other in Moscow—challenge old notions of history and preservation while expanding the reach of private foundations in the exhibition of art.

Garage Museum of Contemporary Art | Moscow | OMA

# PUSHING THE ENVELOPE

Rem Koolhaas revamps an industrial-size Soviet-era cafeteria, so it now feeds Russia's desire to play a bigger role on the global art scene.

BY JUSTIN MCGUIRK

PHOTOGRAPHY BY IWAN BAAN





**SKIN DEEP** OMA took a derelict 1968 building in Gorky Park and wrapped it in a shimmering envelope of glass and polycarbonate. A pair of 36-foot-wide panels slide up to reveal the new entrance.



**F**our years ago I wandered the ruins of the Hexagon, a 1920s pavilion for exhibiting tractors in Gorky Park, which was slated to become the new home of the Garage Center for Contemporary Culture. With its temple-like colonnades, it seemed a fittingly grand setting for the art-world ambitions of Dasha Zhukova, wife of billionaire Roman Abramovich. But, shortly afterward, it was listed as a historic monument, and the project moved to another ruin nearby, a derelict cafeteria. This was not quite the demotion it may sound. The 1968 structure was once able to feed 1,200 people in a sitting—Soviet proportions can easily accommodate the 21st-century culture industry.

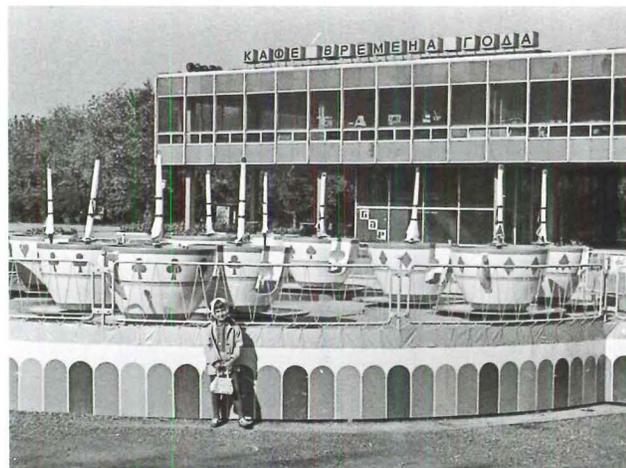
Today, the Seasons of the Year cafeteria is enclosed in a skin of glossy poly-

carbonate. This semitranslucent box, designed by OMA, is utterly inscrutable, and yet it could only be one thing: a gallery. A raised cargo door signals the entrance to the hangar-like building—as though industrial motifs are de rigueur even when the original building was not technically industrial.

Rem Koolhaas describes this project as a work of preservation. He invokes OMA/AMO's 2010 exhibition at the Venice Biennale, *CronoCaos*, in which he argued with characteristically intricate contradiction that the world has gone preservation mad and yet we must preserve the socialist and social-democratic architecture of the postwar years. With Garage, he has been able to save a piece of that legacy, though this is not preservation in the standard, precious mode.

In the central atrium the remains of

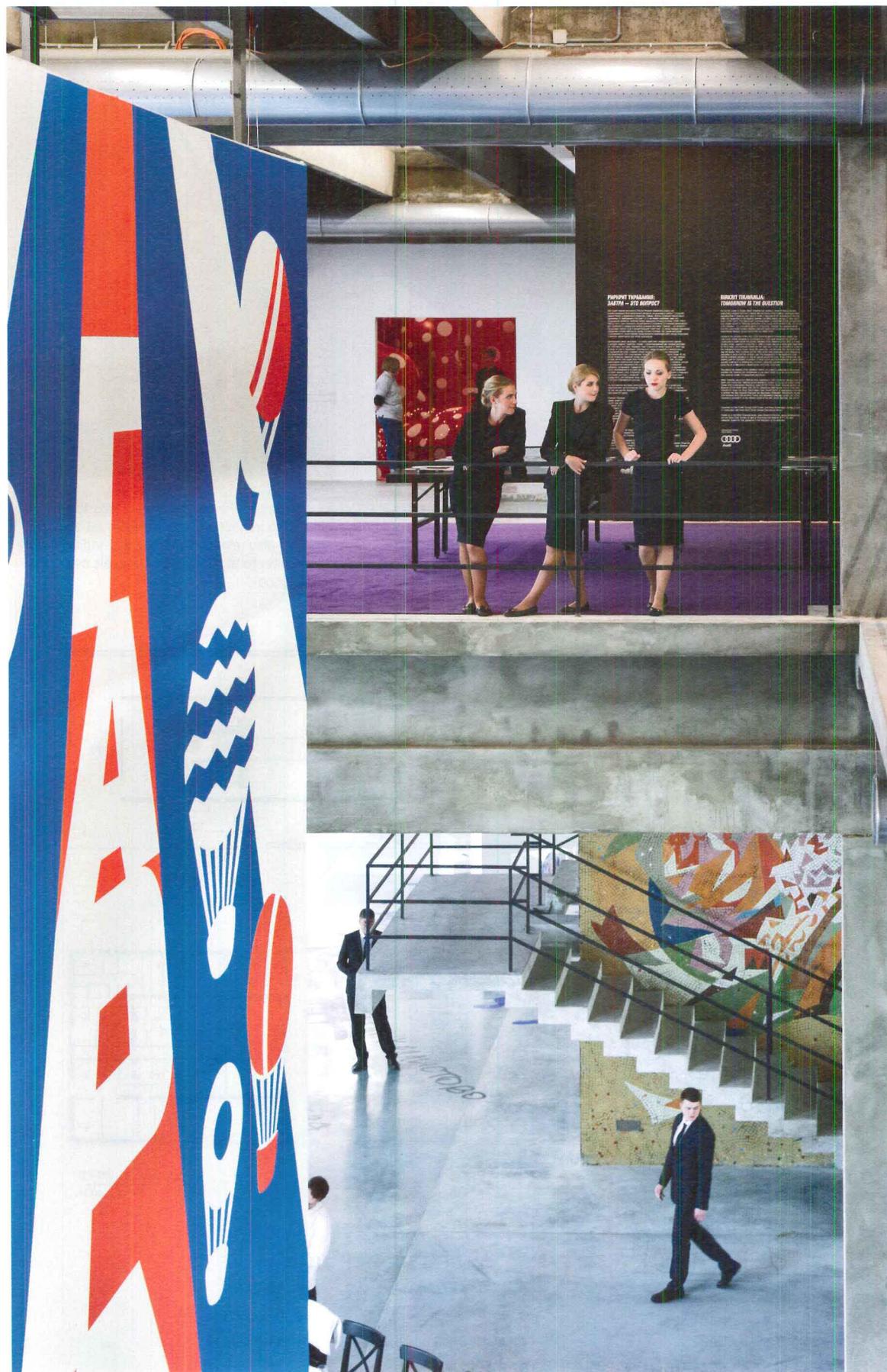
BACK IN THE USSR The Seasons of the Year cafeteria (below) could serve as many as 1,200 people at a time. Transformed into the Garage Museum (above), it beckons to people in the evening with a facade that reflects nearby lights and offers views inside. The architects cut through some floor plates to create double-height spaces that help visitors orient themselves in the 58,100-square-foot building (opposite).

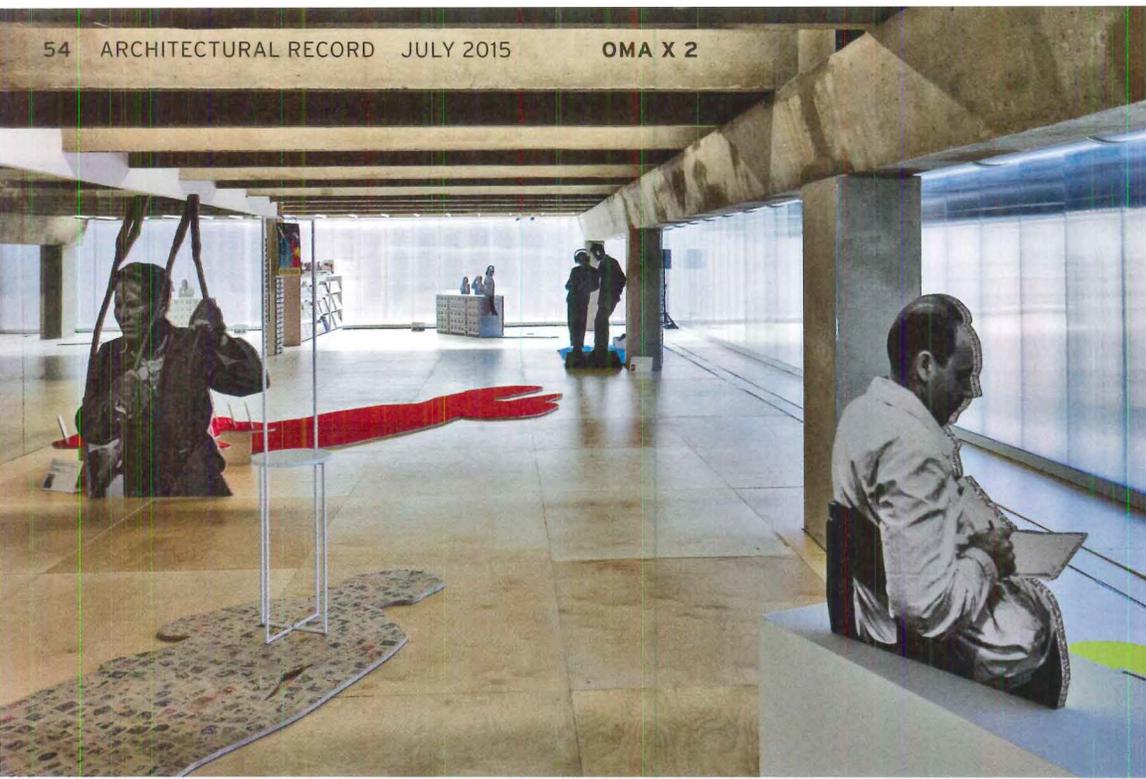




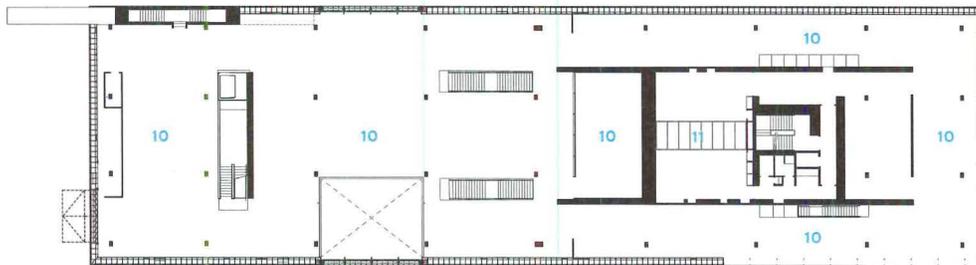
the restaurant are plainly displayed—the old brick walls, patchily covered with lovely green ceramic tiles, and a Socialist Realist mosaic depicting autumn. The two brick cores—one of which used to house a vast kitchen and the other the staircase—now contain an auditorium, education spaces, and a small café. The exhibition spaces wrap around these cores on two levels, accessed by new terrazzo staircases with black-steel railings. What has been preserved here is the texture of the interior and the public-minded generosity of space.

The shell, however, is uncompromisingly new. The relatively cheap polycarbonate skin was chosen because this was supposed to be a temporary home for Garage in advance of the move to the tractor temple, but it became permanent. Koolhaas has presented the

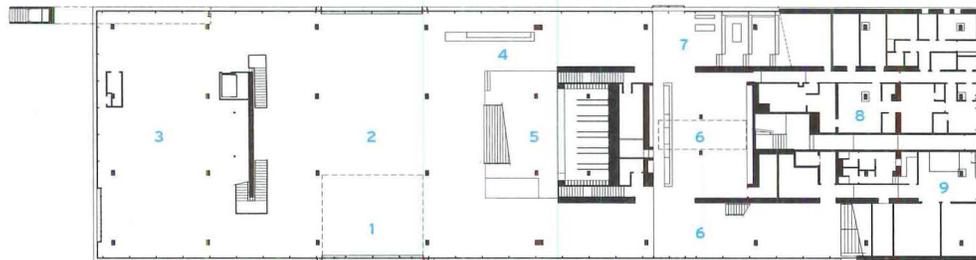




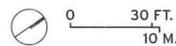
**LIMITED INTERVENTION** OMA tried to keep intact as much of the old building as possible, retaining the concrete frame and exposing it in places such as second-floor galleries (above) and the shop on the ground floor (opposite, bottom). The firm also restored old mosaics and brickwork that had not been given much respect previously by architectural historians. A mosaic depicting autumn now holds pride of place in a new café (opposite, top).



SECOND FLOOR



GROUND FLOOR



- |             |              |             |
|-------------|--------------|-------------|
| 1 ENTRY     | 5 CLOAK ROOM | 9 LOADING   |
| 2 LOBBY     | 6 BAR/CAFÉ   | 10 GALLERY  |
| 3 LAB       | 7 BOOKSHOP   | 11 WORKSHOP |
| 4 RECEPTION | 8 KITCHEN    |             |

modesty of materials and form as the antidote to so much “spectacular” architecture, but it is also practical. One meter deep, the translucent double skin contains the services that provide the necessary climatic conditions for showing art. And thus—much to the bemusement of the Russian contractors—the wires, pipes, and such remain visible through the facade. The architects describe this skin as the “machine” that enables a ruin to work as a museum.

And that is what this now is. Garage has become the Garage Museum of Contemporary Art—a shift from private gallery to the status of a public institution. Consequently, the program also has a new orientation toward research and education, with archival exhibitions exploring Soviet-era art and international cultural relations.

Whether this is a good space for showing art is not yet proven. Apart from the open central spaces—in one of which artist Rirkrit Tiravanija has installed Ping-Pong tables and old ladies serving dumplings—the galleries are slightly cramped. There is much less exhibition space here than in the 1926

#### credits

**ARCHITECT:** OMA – Rem Koolhaas, partner in charge; Ekaterina Golovatyuk, project architect; Giacomo Cantoni, Nathan Friedman, Cristian Mare, John Paul Pacelli, Cecilia del Pozo, Timur Shabaev, Chris van Duijn, Yashin Kemal, Timur Karimullin, Federico Pompignoli, Marek Chytil, Salome Nikuradze, Boris Tikvarski, team

**LOCAL ARCHITECTS:** Form Bureau (concept phase); Buromoscow (construction phase)

**ENGINEERS:** Werner Sobek (structural, facade, and m/e/p)

**CONSULTANTS:** dUCKS and Les Éclaireurs (scenography, lighting, museum devices)

**CLIENT:** Iris Foundation/Park Development

**SIZE:** 58,100 square feet

**CONSTRUCTION COST:** withheld

**COMPLETION DATE:** June 2015

#### SOURCES

**POLYCARBONATE FACADE PANELS:** Dott Gallina

**METAL-FRAME WINDOWS:** Lumitex

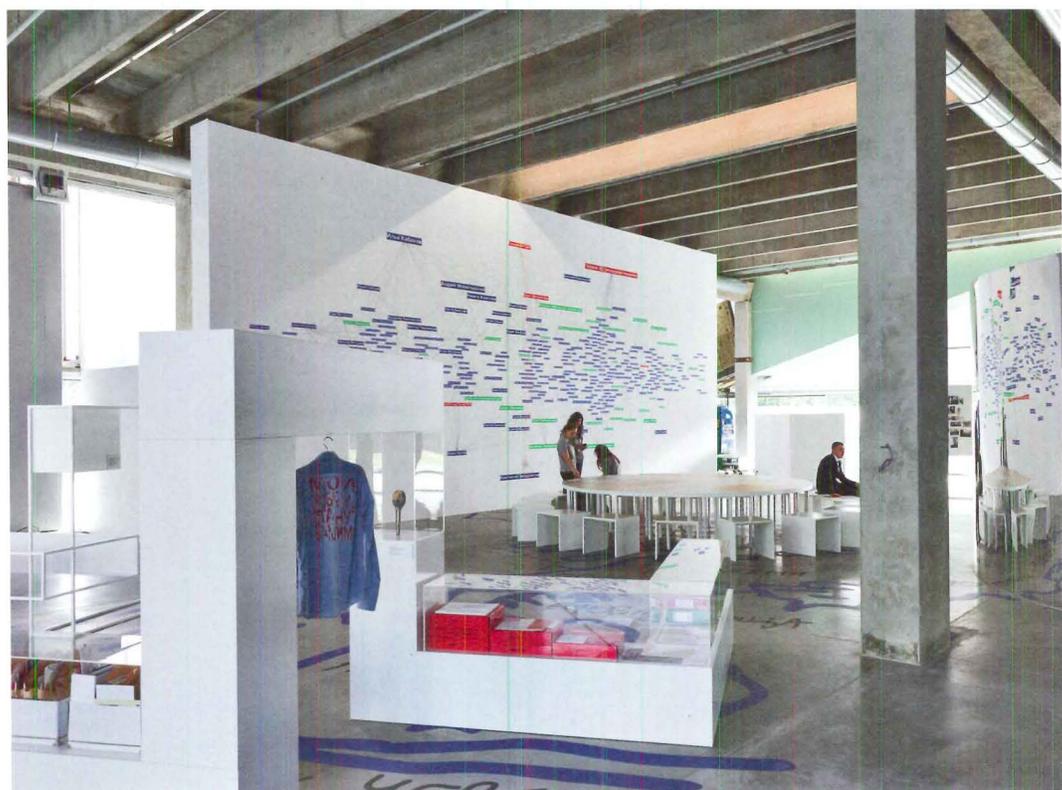
**PLYWOOD AND METAL INTERIOR FINISHES:** Nayada



Konstantin Melnikov–designed bus garage where Garage began (and got its name). And the curators are a little anxious about the lack of white-cube spaces. Hinged display panels can be raised up to the ceiling to offer a choice of white-wall or exposed-brick hanging surfaces, a nice idea that may not stand the test of time.

Still, the building feels good. The glazed ground floor is entirely open to the greenery of the surrounding park, and the expansive sense of space is inviting. Perhaps not quite a contradiction, it is certainly curious to see a relic of Soviet public-spiritedness transformed into a symbol of oligarchic patronage. But in the new Russia, it seems, it falls to billionaires to create the public institutions of contemporary culture. ■

*Justin McGuirk is a writer and curator based in London. His book *Radical Cities: Across Latin America in Search of a New Architecture* was published by Verso in 2014.*



Prada Foundation | Milan | OMA

# FASHION FORWARD

At an old distillery complex, Rem Koolhaas's Prada Foundation mixes one part creative preservation with one part bold new architecture.

BY FRED BERNSTEIN



**LIFTED SPIRITS** OMA has transformed a 100-year-old former distillery complex into a sprawling new art venue that combines old and new buildings.





**T**he Rem Koolhaas of such monumental buildings as the CCTV tower—which looms over central Beijing—is gone, replaced by a Rem Koolhaas who wants his buildings to blend in. As director of the Venice Architecture Biennale in 2014, Koolhaas suggested that he was tired of architectural pyrotechnics. Now comes the Prada Foundation, a 100-year-old distillery complex turned contemporary art center. It boasts some 120,000 square feet of exhibition space (more than Renzo Piano's new Whitney Museum), much of that in new buildings. But Koolhaas repeatedly described the project as if it were just a renovation.

"Architecture in the last 20 years has been focused too much on individual expression," he said, somewhat surprisingly, at a press conference during the foundation's opening in May. Perhaps in deference to his client and muse Miuccia Prada, he repeatedly described himself as working, almost in the background, to create a seamless mix of old and new.

But can Koolhaas be a background architect? Can Beyoncé be a backup singer? If not quite CCTV, the Prada Foundation is a spectacular display of architectural prowess. And it is precisely the contrast between old and new—as when a giant steel beam supporting the second floor of a new gallery seemingly comes to rest on the wall of a quaint stucco building with a red-tile roof—that makes this art venue exciting. He may have wanted to create a seamless mix, but Koolhaas's architecture is too striking to be mistaken for anything but Koolhaas's architecture.

The client is a foundation created by Mrs. Prada (as she is generally known) and her husband, Patrizio Bertelli, who together rule the fashion empire. In their spare time, the pair collects contemporary art, which the foundation has

shown in a Venetian palazzo and at a variety of sites around Milan. In 2008, they decided to build a permanent home for their collection in Milan and brought in Koolhaas's OMA, with which they first began collaborating 15 years ago on a series of high-profile Prada stores.

The complex OMA created, covering 3.3 acres, comprises seven buildings. Two existing low-rise structures bracket the site; they now contain enfilades of galleries, along with event spaces and offices. (Another perimeter building houses a café, which was designed by the movie director Wes Anderson and is described by Koolhaas as a self-contained "insert.")

Between the perimeter buildings are two large new structures. One is a huge glass-walled gallery called the Podium, which is almost Miesian in its simplicity, though its vertical surfaces are composed of aluminum foam whose bubble patterns counter the sparseness of the architecture.

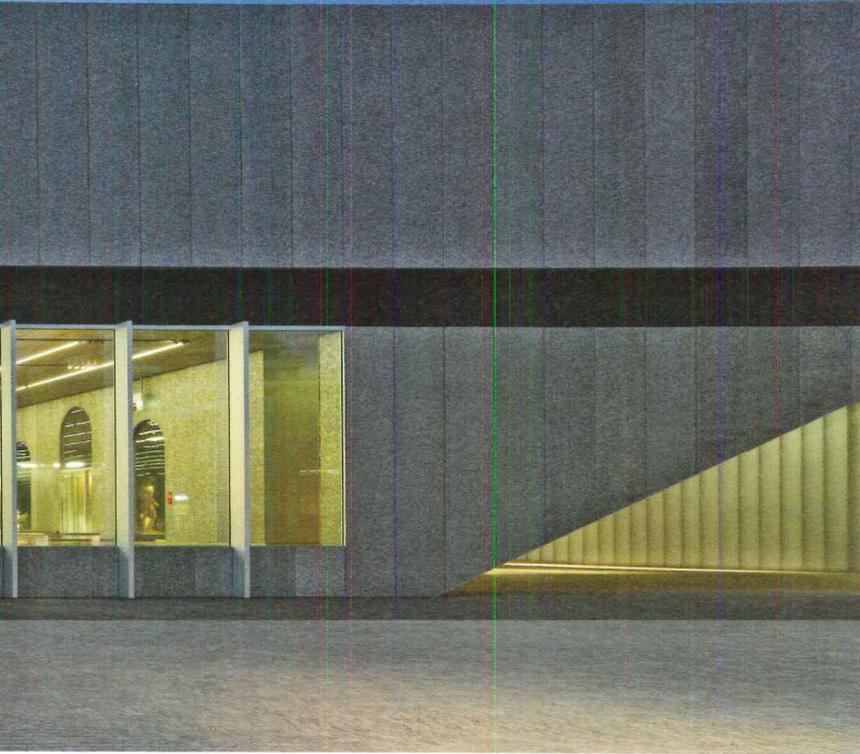
Another new creation is a 200-seat theater that Koolhaas partially covered in stucco, as if to suggest that it had been there all along. But this is a high-tech marvel inside and out, with a long wall of mirror-polished stainless steel that opens up, garage-door style. That allows indoor theatrical events to happen, essentially, under the stars (an idea Koolhaas explored, less successfully, at the Wylie Theater in Dallas).

A third new building, a large nine-story tower, is still under construction: it will contain additional gallery space, as well as a restaurant. (When complete, the buildings will encompass more than 200,000 square feet. Neither architect nor client will reveal anything about the budget.)

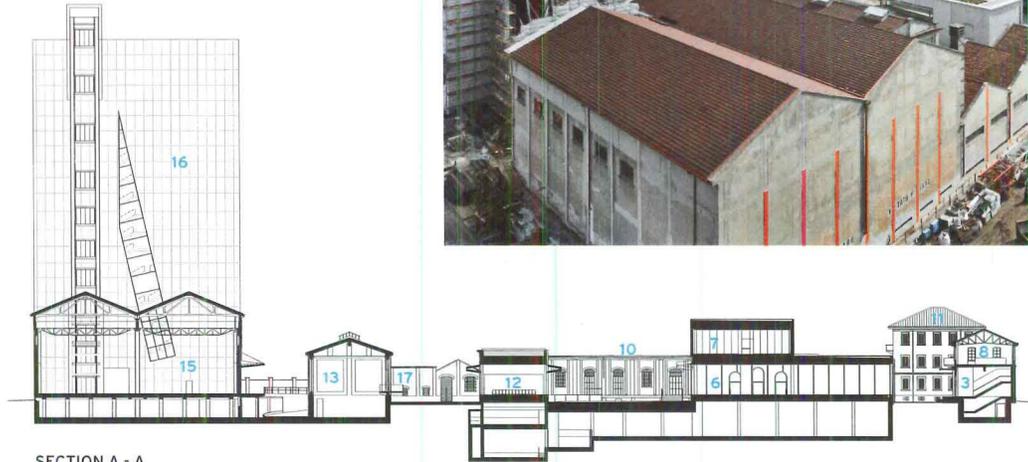
At the center of the complex is a diminutive tower, part of the original complex that was in such bad shape that Koolhaas took to calling it the haunted house. Almost at the last minute, Koolhaas said, he had the idea to cover that

#### SILVER AND GOLD

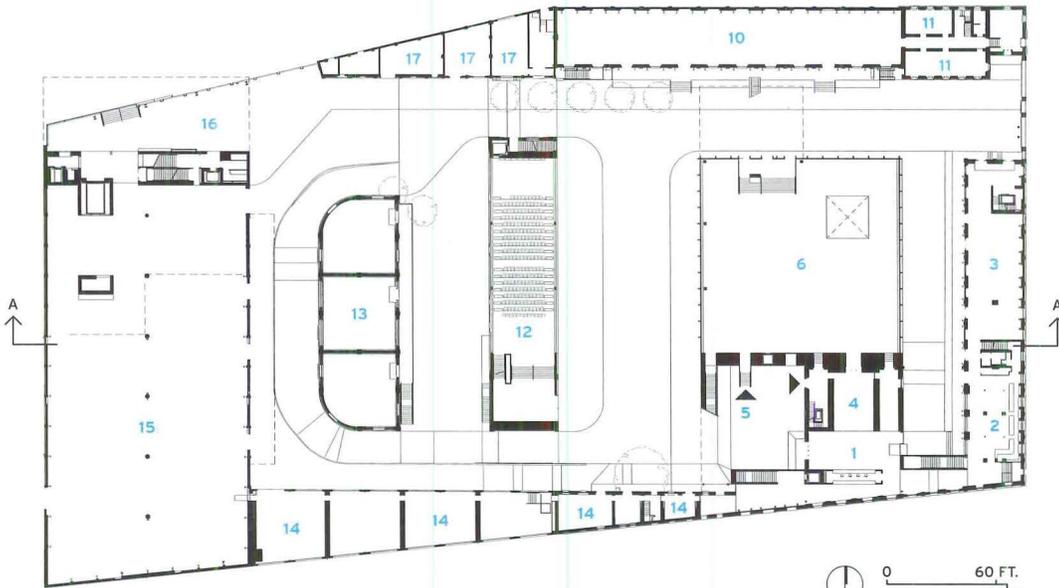
The floor of the Podium gallery is lifted about 4 feet above grade, allowing passersby to view installations—currently a show of classical statuary—from below (above). The "haunted house" has been patched up and dedicated to permanent installations by Robert Gober and other artists (opposite top, right), its 24-carat gold-leaf exterior contrasting with the aluminum facades of the new buildings (opposite, bottom).



**SITE SPECIFIC**  
The complex is located in a once-industrial area of Milan, overlooking a rail yard. A nine-story tower at a corner of the site is still under construction (right).

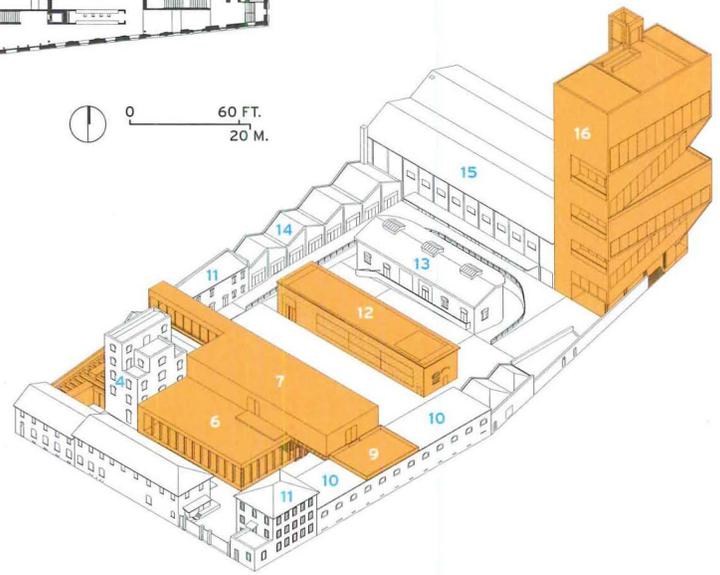


SECTION A - A



GROUND FLOOR

- |                     |   |
|---------------------|---|
| 1 MAIN ENTRANCE     | 10 NORTH GALLERY                        |
| 2 CAFÉ/BAR LUCE     | 11 OFFICES                              |
| 3 LOUNGE            | 12 MULTIMEDIA AUDITORIUM                |
| 4 HAUNTED HOUSE     | 13 CISTERNA GALLERY                     |
| 5 COVERED COURTYARD | 14 SOUTH GALLERY                        |
| 6 PODIUM GALLERY    | 15 GREAT HALL (EXHIBIT & STORAGE SPACE) |
| 7 BEAM GALLERY      | 16 TOWER (UNCOMPLETED)                  |
| 8 LIBRARY           | 17 TECHNICAL AREA                       |
| 9 TERRACE           |   |



AXONOMETRIC DRAWING





**OUTDOOR THEATER**  
 The auditorium's long wall of mirror-polished stainless steel opens up garage-door style to bring performances to the plaza, between the theater and the Podium gallery (above). Exterior paving materials include metal, wood, and masonry. Alleyways and plazas are newly planted with mature trees (right)—the mulberry are 100, with linden and fig age 40.





**COLLECTION HIGHLIGHTS** Vertical supports, painted orange and visible on the facades of existing buildings, are new steel inserts to bring the old buildings up to current code (left). The foundation exhibits mostly contemporary art (below), but more recently has begun acquiring historic pieces such as a 15th-century study interior from Tuscany.

#### credits

**ARCHITECT:** OMA – Rem Koolhaas, Chris van Duijn, partners in charge  
**ENGINEERS:** Favero & Milan (structural); Favero & Milan, Prisma Engineering (m/e/p); GAE Engineering (fire)  
**CONSULTANTS:** Level Acoustics (acoustics); Ducks Scéno (scenography)  
**GENERAL CONTRACTOR:** Colombo Costruzioni  
**CLIENT:** Fondazione Prada  
**SIZE:** 203,000 square feet  
**PROJECT COST:** withheld  
**COMPLETION DATE:** May 2015

#### SOURCES

**ALUMINUM CLADDING:** Cymat Technologies, AZA Aghito Zambonini  
**MIRROR CLADDING:** AZA Aghito Zambonini  
**TRAVERTINE:** Fantini Group  
**GOLD LEAF:** Teknolitos  
**LIGHTING FIXTURES:** Erco, Zumtobel

tower—every inch of it, including downspouts and window mullions—in gold leaf. The gold, he said, is “a surprisingly effective way to distribute aura around the site,” adding that, in the way it reflects light, “it has benefits we didn’t anticipate.”

Indeed, Koolhaas said, there are many things about the complex that surprised him when the scaffolding came down. One is that with just a few gestures he was able to create very different outdoor spaces, from narrow alleyways to broad plazas. The variety in both dimensions and surface treatments makes visitors want to hang around and explore the foundation’s exterior as much as its interior spaces.

In recent years, Koolhaas has been speaking about historic preservation, seemingly complaining that there is too much of it while praising it as a refuge from the need to continuously create new forms. At the Prada Foundation, that contradiction is made manifest.

Overall, the modest new Koolhaas seems to be attributing much of the success of the complex to luck rather than talent. A terrace atop one of the perimeter buildings, he said, far exceeded his expectations. “It’s just a floor and railing,” he said, urging a reporter to be sure to check it out (and ignoring the fact that its floor is made of extraordinarily beautiful travertine). “It’s really surprising,” Koolhaas added, “how little you need to create architectural space.” ■



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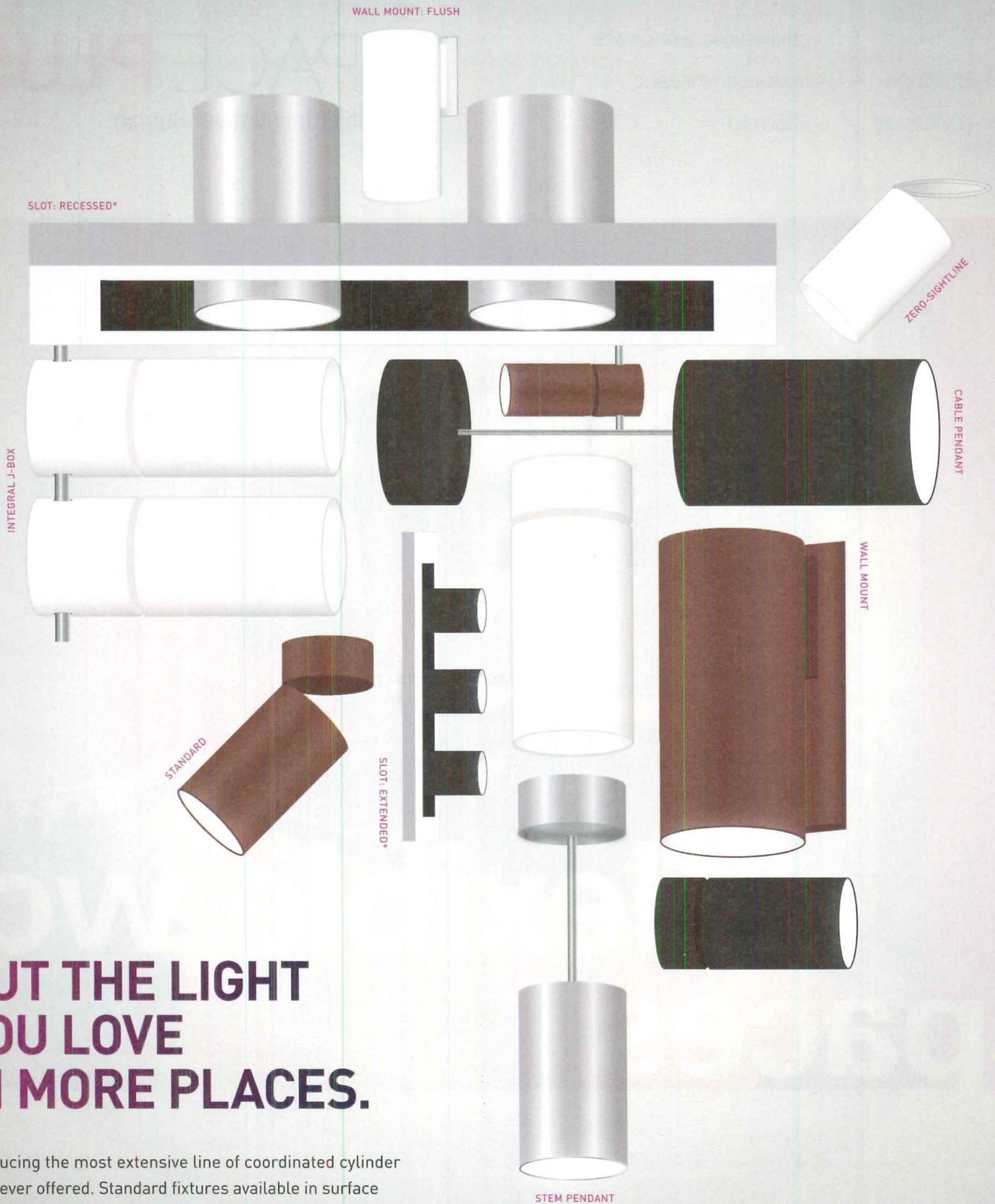
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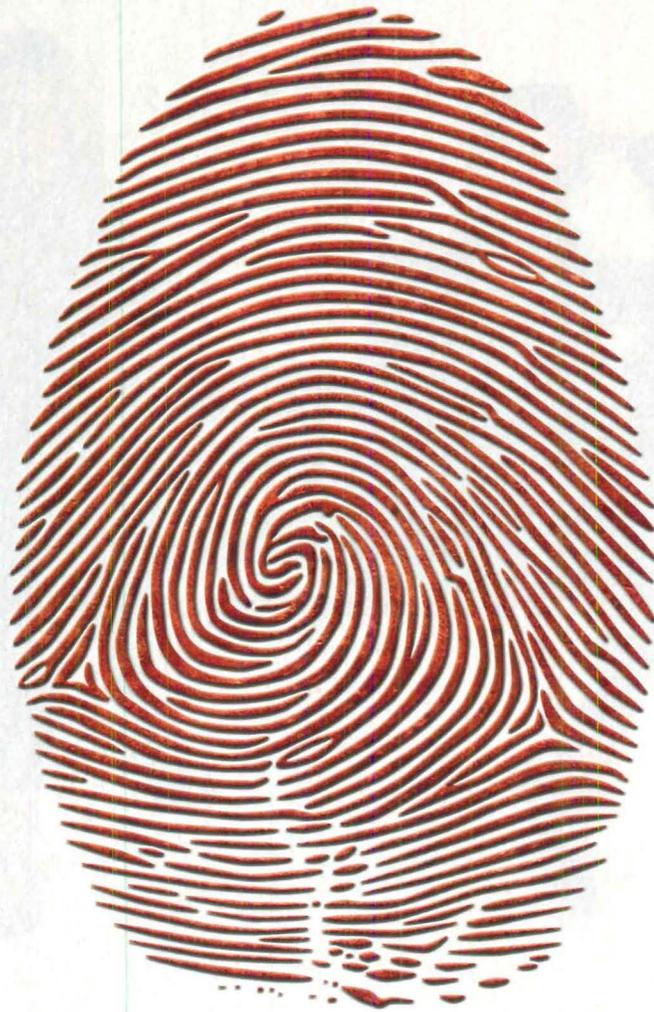
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# Pavilions

The term pavilion often brings to mind an impossibly lightweight, temporary, flexible structure. Yet a variegated assortment collected by RECORD shows a more permanent side to the building type. From a study center to a chapel, café, or exhibition space, these projects prove that simple, elegant solutions can be forged from durable materials for quite distinct functions. Each demonstrates an attention to detail and craft, and—regardless of its life expectancy—each succeeds in connecting to its surroundings and to nature.

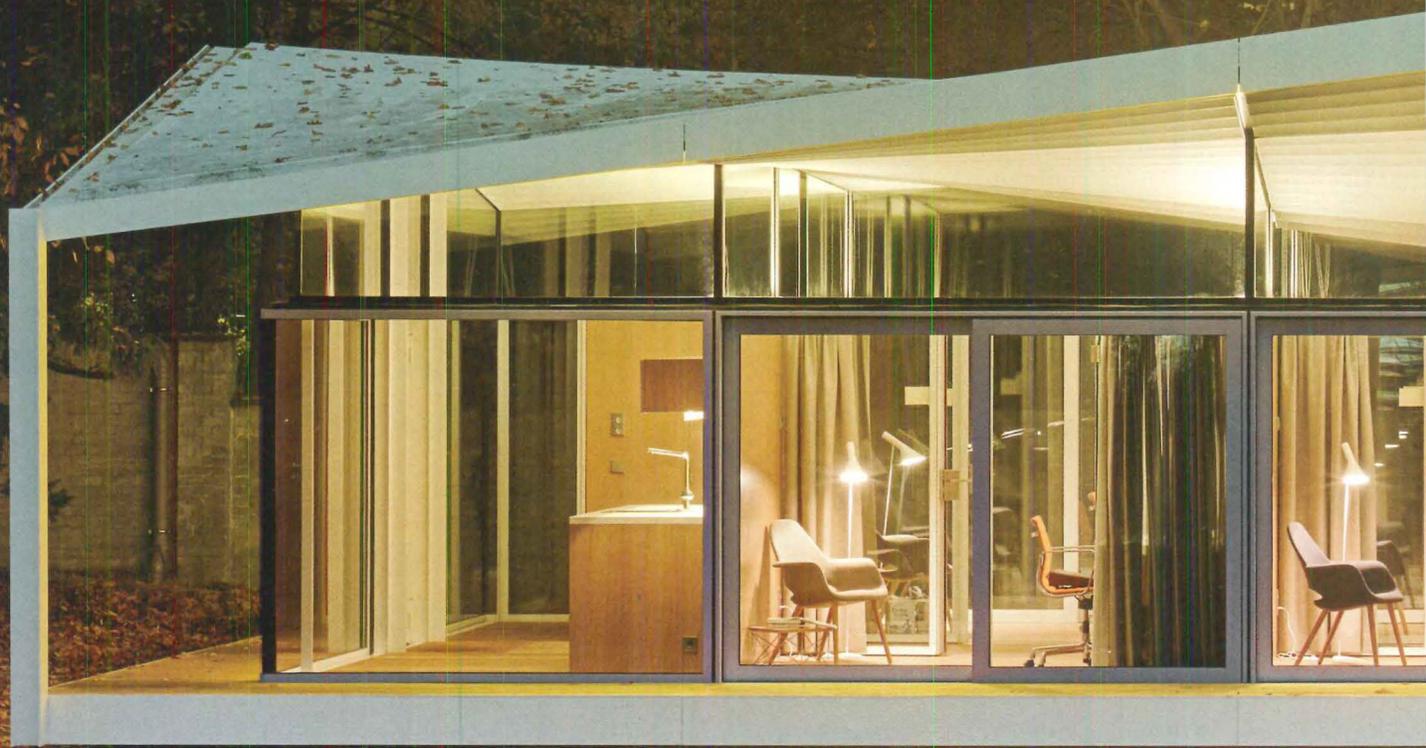
Fellows Pavilion, American Academy in Berlin | Berlin | Barkow Leibinger

# EDGE OF THE WOODS

A small glass and steel pavilion for the fellows of the American Academy in Berlin becomes an elegant essay in structure.

BY CYNTHIA DAVIDSON

PHOTOGRAPHY BY STEFAN MÜLLER



**A**t first, glancing through the tall windows of the 19th-century villa that houses the American Academy in Berlin—the center for transatlantic cultural and intellectual exchange conceived by former U.S. ambassador Richard C. Holbrooke in 1994—you see what seems to be a big white tent pitched in the Academy's spacious yard overlooking Lake Wannsee. That form turns out to be the roof of the new Fellows Pavilion, designed by the Berlin and New York architectural practice

Barkow Leibinger to provide additional workspace for some of the scholars, writers, and other professionals awarded residence fellowships at the Academy each year.

Descending from the villa to the pavilion, you discover its smallness—only 915 square feet. But the architects, who are building high-rises just 30 minutes away in central Berlin, were intrigued by the concept of a scholars' garden pavilion in the tradition of American artists' retreats like the MacDowell Colony in New Hampshire. A pavilion is not a new type for



**SYLVAN SETTING** The light, airy steel and glass structure supplements the spaces in the main villa, providing a series of studies as well as a kitchen.

Frank Barkow and Regine Leibinger, but “a provocative vehicle for testing the limits and capacities of speculative work,” as Barkow puts it. Such pavilions typically spur ideas for big work at a greater scale, but this one clearly learns from the firm’s large industrial projects, in which architectural character is achieved with the roof.

Because the envelope was defined by the volume of a then-extant 1970s bathhouse, plus a program for seven study carrels and an entrance area containing a small kitchen and half bath, it is no surprise the architects looked up to create “big” architecture. The roof of steel box-beams forms a double-curved surface that appears to float over the symmetrical layout below. Its form, produced with a “ruled geometry” rotated to make four hyperbolic paraboloids, both gives it that tentlike quality and creates splayed gables over each elevation. The pavilion sits on a steel-frame mat, but it appears to float above the ground because the floor plane extends beyond the facade to create a cantilevered porch around the entire building.

The visual games do not end there. The walls are a combination of light steel-framed transparent planes and sliding glass doors. When occupants part those doors to enjoy the air, the wall is further dematerialized. Four outboard corner I-beam columns connect the sides of the roof and the cantilevered deck, but those columns also serve as downspouts and never meet the ground, which makes them seem structurally ambiguous, even decorative.

Only by standing inside and catching an oblique view of a corner does one begin to decipher the game. The roof load is dispersed among three systems: the four exterior corner columns; the thin black steel framing that joins the glass panels; and, innermost, white, right-angle steel “sticks” set in from the corners. Viewed head-on, the three precisely aligned vertical elements conceal one another, creating a structural enigma. What is structural and what is ornamental? (We forget that, centuries ago, in his *Ten Books of Architecture*, Alberti said, “The principal ornament in all architecture certainly lies in the column.”) The fellows who occupy the pavilion seem aware only of the conveniences at hand: good light reflected off the white ceiling, built-in furniture, oak walls and floors that radiate heat, and draperies to close off views when they might distract.

Visitors aware of Mies van der Rohe’s Farnsworth House may associate it with the Fellows Pavilion. The materials are similar, the color the same. But where Mies capped his house with an abstract, flat umbrella anchored to the ground, Barkow Leibinger produces a tentlike form not visibly tethered to the earth. Mies’s scheme is more like an idea of an umbrella; Barkow Leibinger’s tented roof is an actual form. This difference sets it apart from a modernist pavilion and gives new focus to the idea of the roof and the designs made possible working with digital geometries today. ■

*Cynthia Davidson is the editor of Log and the Writing Architecture series. She is co-curator with Monica Ponce de Leon of the U.S. Pavilion for the 15th Venice Architecture Biennale to be held in 2016.*

## credits

**ARCHITECT:** Barkow Leibinger – Frank Barkow and Regine Leibinger, principals; Tobias Wenz, project architect; Gustav Düsing, Ulrich Fuchs, Annette Wagner, team

**ENGINEERS:** Hornicke-Hock-Thieroff (structural); HDH (mechanical)

**CONSULTANTS:** Capatti Staubach (landscape)

**CLIENT:** American Academy in Berlin

**SIZE:** 915 square feet

**CONSTRUCTION COST:** withheld

**COMPLETION DATE:** January 2015

## SOURCES

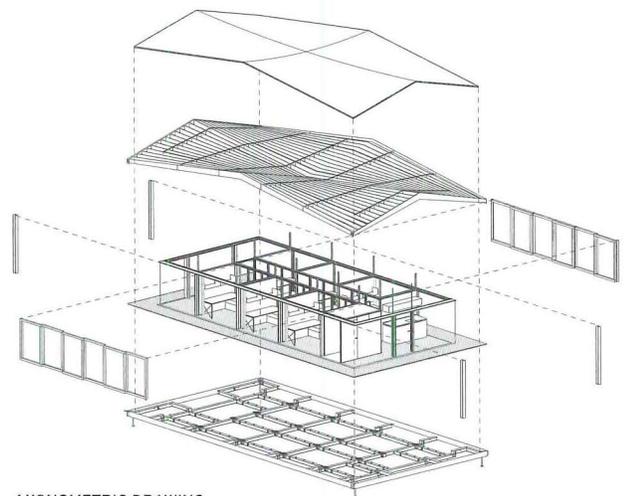
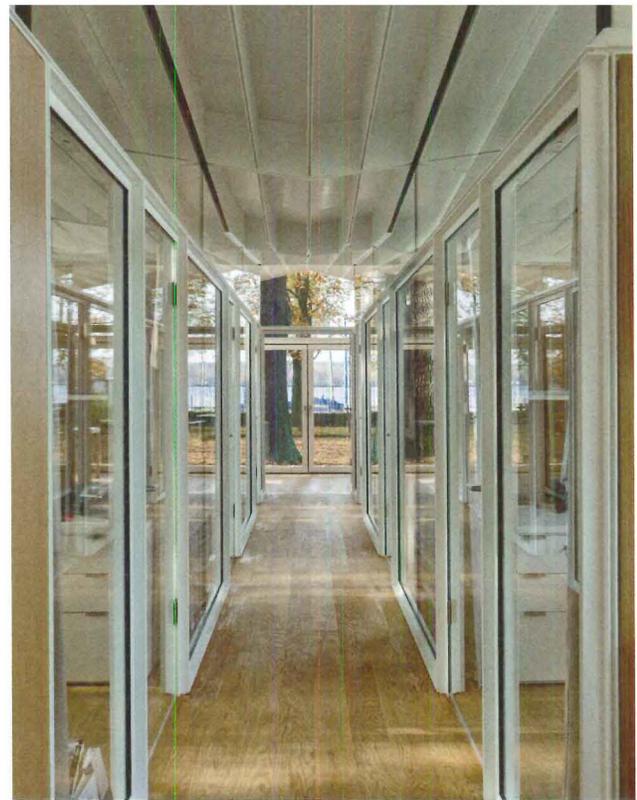
**STEEL FRAME, STEEL ROOF:** FLZ Stahl-und Metallbau Lauterbach

**GLASS SLIDING DOORS AND ENTRANCE DOOR:** Jansen

**CHAIRS AND SIDE TABLE:** Vitra

**DESK LIGHT:** Nimbus (Roxxane Home)

**FLOOR LAMP:** Louis Poulsen AJ



AXONOMETRIC DRAWING



FLOOR PLAN



1 ENTRANCE

2 PANTRY

3 STUDY

4 RESTROOM

**MESIAN RETREAT**

The studies in the Fellows Pavilion provide acoustical privacy, but clear glass allows the occupants to have access to light and views (opposite). Oak paneling and floors create a sense of continuity between the interior and nature outside (right). Four I-beams act as columns to support the steel roof of hyperbolic paraboloids, while a cantilevered deck makes the pavilion seem to hover above the ground.



The Terrace, California Academy of Sciences | San Francisco | Mark Cavagnero Associates

# HEART OF LIGHTNESS



**A** slight air of unreality hangs over the The Terrace in San Francisco, as if it were an architectural rendering sprung to life. The thin, crisp lines, the expanses of transparency, the slimmest of slim columns are able to capture the ethereality of the initial sketch. On the grounds of the California Academy of Sciences designed by Renzo Piano Building Workshop (RECORD, January 2009, page 58), the Terrace echoes the elegance of its larger neighbor.

The hugely popular science museum, which attracts 1.4 million attendees each year, had a noisy, overcrowded indoor cafeteria. The institution decided to supplement it with an outdoor venue “congruent with the Academy’s design,” says Ike Kwon, the museum’s general manager. It commissioned Mark Cavagnero Associates, a San Francisco–

**COFFEE BREAK**  
A diminutive pavilion (above) functions as a café and event space for the California Academy of Sciences in San Francisco’s Golden Gate Park. The glass and steel structure (opposite, top and bottom) seems to be an offshoot of the larger building across the way (minus the green roof) by Renzo Piano Building Workshop (2008).

For a new café, an architect re-engineers the DNA of the California Academy of Sciences next door.

BY LYDIA LEE

PHOTOGRAPHY  
BY TIM GRIFFITH

TERRACE



based firm responsible for such notable buildings as SFJAZZ (RECORD, May 2013, page 94). In this case, the architect wanted to visually tie the diminutive detached pavilion to Piano's design, which has a pronounced glass overhang. "I wanted it to be highly transparent yet delicately frame views of the Academy," Cavagnero says. Piano, who reviewed the concept drawing, deemed it "brilliant."

The lineage of glass pavilions is long and illustrious, including Philip Johnson's Glass House in New Canaan, Connecticut, but Cavagnero has pulled off a new architectural feat of strength: "It's a glass box with two sliding walls in earthquake country," he says. The \$2.7 million rectangular volume, approximately 30 feet wide by 50 feet long, anchors one corner of the museum grounds. Cavagnero's team determined its height by the tallest frameless glass

door system—11 feet, 4 inches—it could obtain, a custom system that glides along a recessed track set in the ceiling. The two walls facing the public grounds can disappear completely, while the fixed back wall of frosted glass, bisected horizontally by a clear strip, gives hints of Golden Gate Park beyond. In addition to the glass walls, the interior is brightened by five skylights, which are framed by shadow-boxes of blue plastic resin—a clever way to create the illusion of blue skies in foggy San Francisco.

As if ingratiating itself with the larger main building, The Terrace reaches out with its own glass overhang extending from the roof, where recessed structural beams help achieve a thin profile. The design team also figured out how to repurpose the museum's unused concrete former aviary for the café's back-of-house operations.



The Terrace seats nearly 90 people indoors, with the patio accommodating another 50, and its floor seamlessly joins the two spaces. Most guests feasting on fare such as roasted asparagus salad and prawn ceviche will be completely oblivious of the structural gymnastics involved: Cavagnero's office worked with Tipping Engineers to put most of the seismic bracing in the roof to minimize shear walls, and used T-shaped beams in lieu of more ponderous I-beams.

Cavagnero also noted Piano's custom design for the Academy's columns and created his own twist: pairs of slender tubes painted white. But anyone seated in The Terrace, particularly when the walls have been folded back, can appreciate the sweeping view. "Renzo would joke that he didn't like a column to be thicker than his pinky," says Cavagnero. "So we'd ask him, 'Is this thin enough?'" ■

*Lydia Lee is a San Francisco-based journalist who writes on architecture, design, and urban development.*

#### FROM THE TERRACE

Skylights in the café (above) are framed by shadowboxes of blue plastic resin. Custom frameless glass doors glide along a recessed track set in the ceiling so that the walls along the public path can disappear. A frosted-glass fixed back wall (opposite) is bisected horizontally by a clear strip to provide glimpses of the park.

#### credits

**ARCHITECT:** Mark Cavagnero Architects – Mark Cavagnero, design principal; Kang Kiang, principal in charge; Brandon Joo, associate; Charlotte Hofstetter, Olga Kozachek-Luebker, Vera Shur, team

**ENGINEERS:** KCA Engineers (civil); Tipping Structural Engineers (structural); WSP Group (m/e/p)

**CONSULTANTS:** Thornton Tomasetti (energy)

**GENERAL CONTRACTOR:** Plant Construction

**CLIENT:** California Academy of Sciences

**SIZE:** 1,600 square feet

**CONSTRUCTION COST:** \$2.7 million

**COMPLETION DATE:** October 2014

#### SOURCES

**CURTAIN WALL:** CS Erectors

**ACID-ETCHED GLASS:** Viracon

**SINGLE-TRACK GLASS**

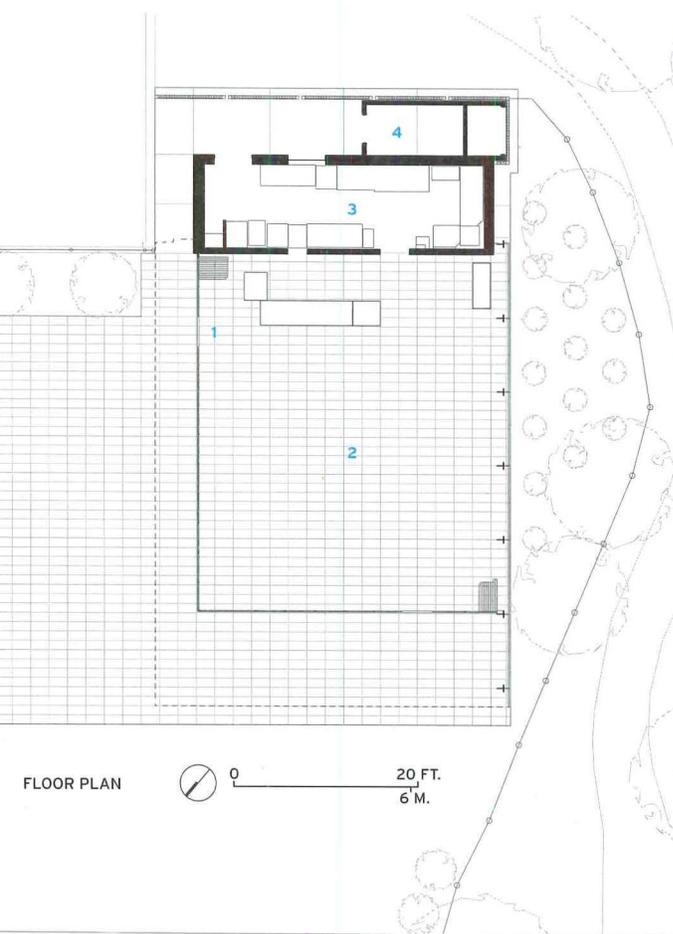
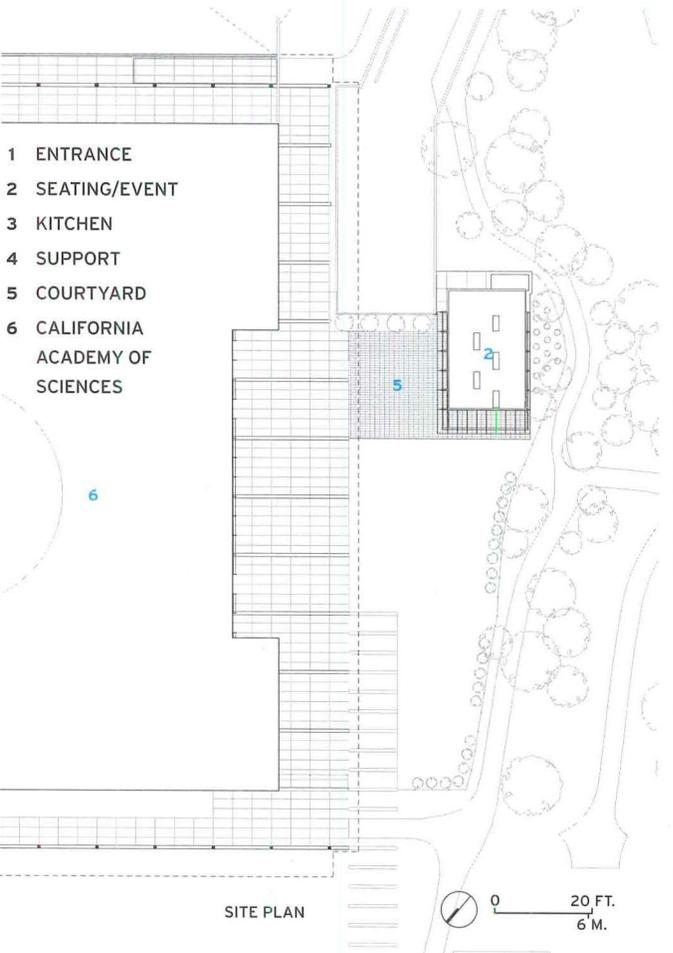
**SLIDING DOORS:** NanaWall (HSW 75)

**SKYLIGHTS:** Crystalite

**LIGHT BOXES:** 3Form

**COATINGS:** Duranar

**BUILT-UP ROOFING:** Firestone



Australian Pavilion | Venice | Denton Corker Marshall

# DRAMA IN THE GIARDINI

A dark and mysterious pavilion  
—the first new arrival in two decades—  
shakes up the Venice Biennale.

BY FRED A. BERNSTEIN

PHOTOGRAPHY BY JOHN GOLLINGS





#### POP ROCK

Every component of the steel-framed pavilion was floated under a low bridge (opposite) onto the Rio dei Giardini. Of the 12 large panels of African black granite cladding the canal-side facade, 10 are stationary. Two open, one to reveal a window, another, an LED screen.

In a series of images released to the press last year, the Australian architects Denton Corker Marshall showed their country's new pavilion for the Venice Biennale—a mysterious black granite box—being floated on a barge past Andrea Palladio's white marble church of San Giorgio Maggiore. The images turned out to be fictions, created with the help of Photoshop. In fact, the building wasn't floated into town but built from scratch on-site in the Venice Giardini.

But the effect of the pavilion's completion was almost as dramatic as if it had sailed into Venice in one piece. That's because the Giardini, the park created for the art and architecture biennales in 1895, is a sedate place, where little changes from decade to decade—Korea's building was the last to be erected there, in 1995.

That the first pavilion of the 21st century was built at all was something of a fluke: most of the Giardini is under heritage protection. But the old Australian pavilion, a white metal box designed by Philip Cox and assembled from a kit of parts in 1988, was classified as temporary. That designation allowed it to be disassembled at the behest of the Australia Council for the Arts, which was ready to retire the



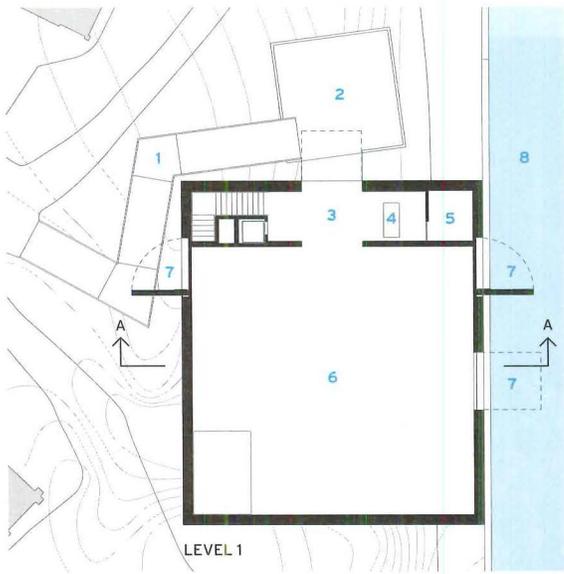
**BLACK AND WHITE** The prominent Australian artist Fiona Hall painted the interior of the "white box" gallery black (above) as part of her installation for the current Venice Art Biennale, a kind of "cabinet of curiosities." Outside (right), a zigzag ramp leads to a square terrace in front of the gallery entrance.

Cox building. Among other problems, its entrance was all but hidden between the French and Czech pavilions and, inside, tight proportions stymied artists. (It will be re-erected in Australia.)

The council chose one of the best-known firms in Australia to design the new pavilion, but didn't seem to leave the architects much room for creativity. When it came to the footprint of the building, "We were given a map with a line on the ground," recalls principal John Denton. As for the interior, he and his partner Barrie Marshall were asked to provide a white-box gallery. Moreover, Denton says, they were determined not to compete with the art by "crossing the line into architectural expression."

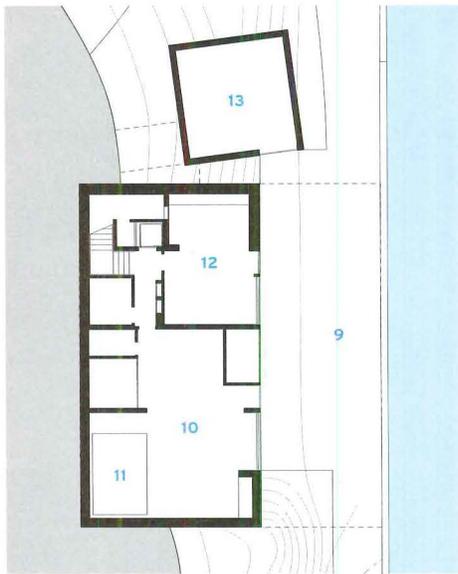




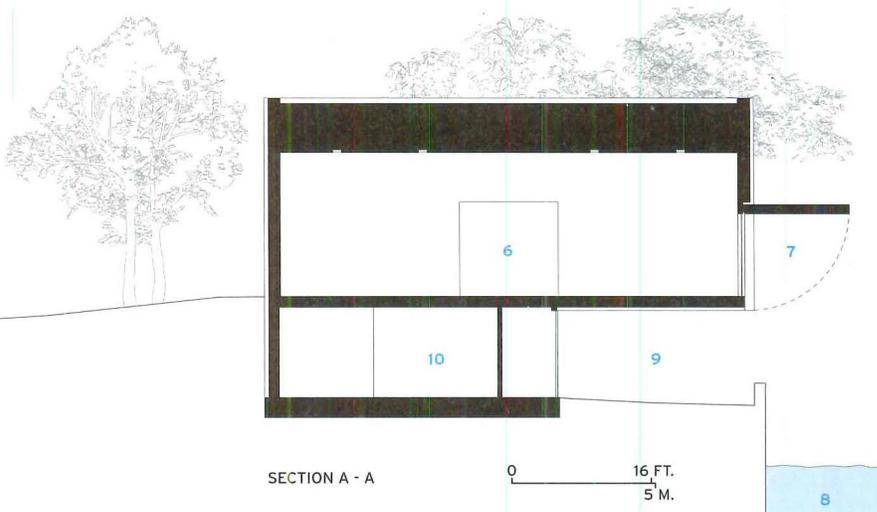
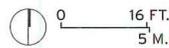


LEVEL 1

- 1 ACCESS BRIDGE
- 2 PLATFORM
- 3 ENTRANCE
- 4 RECEPTION
- 5 CLOAK ROOM
- 6 GALLERY
- 7 OPERABLE FACADE
- 8 CANAL
- 9 PATH
- 10 LOADING BAY
- 11 PLATFORM LIFT
- 12 OFFICE
- 13 MECHANICAL



GROUND FLOOR



SECTION A - A



All of this left the architects dependent on just a few moves. The first was to shift the entrance of the 3,600-square-foot building from the south to the north end of the site, where it would be easily accessible from a main walkway. The second was to place the steel-framed 50-foot-square gallery atop a much smaller lower level devoted to back-of-house functions. This approach gives the pavilion an “inverted L” shape, a deep cantilever that seems to project the building toward an adjacent canal.

But the architects’ boldest move may have been to place this white box inside a black box. The building’s exterior is made almost entirely of African granite honed to a soft finish. “We wanted to create an enigmatic building,” Denton says—and it worked: the black granite, which can be aggressive when shiny, has been made as recessive as possible. Walking through the Giardini, catching glimpses of the pavilion through the trees, one wonders if it is an object or merely a shadow.

Yet the \$6 million structure (for which most of the funds were privately raised) isn’t entirely featureless. Four large hatches swing open at the touch of a button, creating connections between inside and out while relieving the



#### GRIDLOCK

The building's carefully resolved geometry includes many squares or near-squares (the gallery itself is about 45 by 48 feet). The panel that forms a canopy over the entrance can be lowered in winter, sealing the building against vandals and inclement weather.

otherwise supremely flat facades. Two of the hatches conceal LED screens, which can serve as billboards or as extensions of video pieces, a feature intended to spark artists' imaginations. For the debut exhibition, which opened in May, the artist Fiona Hall painted the interior—the so-called white-box gallery—black and hung pieces created in collaboration with Aboriginal weavers. For the 2016 Architecture Biennale, architect Aileen Sage and urban designer Michelle Tabet will flood the gallery with water, in a tribute to Australia's coastal saltwater swimming pools.

The attention to Aboriginal weaving and Australian pool typologies introduces a note of irony, since to at least one critic the pavilion's key feature is a lack of Australian-ness. Wrote John McDonald in the *Sydney Morning Herald*, "The building could represent any nation on earth with equal efficiency. It is a statement of our contemporaneity; of our willingness to shed the clichés of Australian identity." Thus the pavilion, a beautiful object and a cleverly conceived container, highlights a difference between art and architecture: as currently practiced, the former can explore national differences, while it appears that the latter, in order to seem contemporary, must avoid them at all costs. ■

#### credits

**ARCHITECT:** Denton Corker Marshall

**ASSOCIATE ARCHITECTS:** FAREstudio

**ENGINEERS:** Italy: STEAM (services and structural); Australia: Arup (services and structural), Advanced Design Innovations (consultant for operable panels)

**PROJECT MANAGER:** INTEA

**GENERAL CONTRACTORS:** SICOP Costruzioni, S.i.r.co., FIEL

**CLIENT:** Australian Council for the Arts

**SIZE:** 6,100 square feet

**CONSTRUCTION COST:** \$5.7 million

**COMPLETION DATE:** March 2015

#### SOURCES

**CURTAIN WALL:** Monetti Group, Fischer Italia

**WINDOWS:** Schüco, Faraone (glass)

**DOORS:** Dorma, Scigno, Schüco

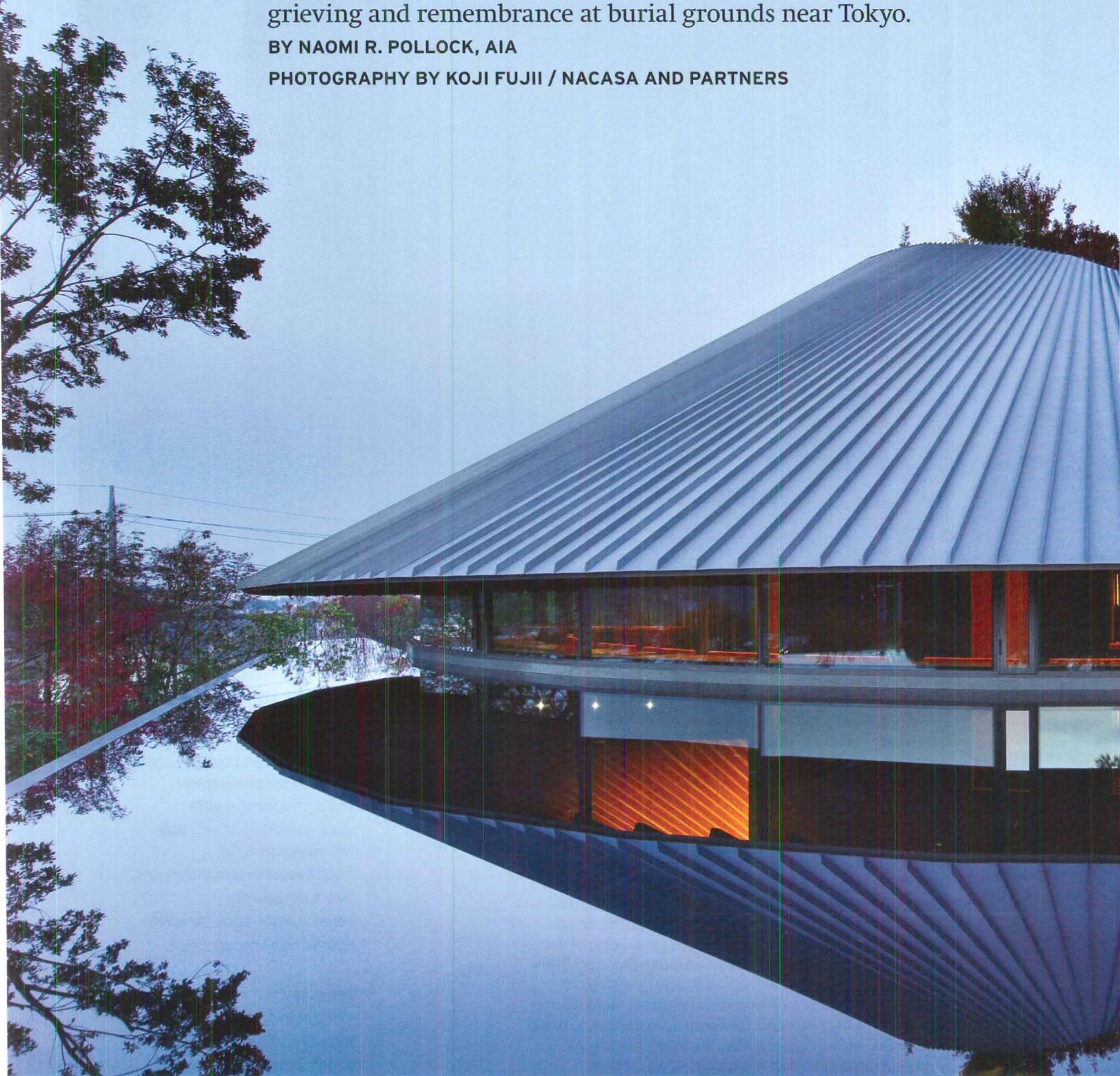
Sayama Lakeside Cemetery Park Community Hall and Forest Chapel  
Saitama, Japan | Hiroshi Nakamura & NAP Co.

# A SEPARATE PEACE

Two bold yet thoughtful structures elevate the architecture of grieving and remembrance at burial grounds near Tokyo.

BY NAOMI R. POLLOCK, AIA

PHOTOGRAPHY BY KOJI FUJII / NACASA AND PARTNERS



Contemporary religious facilities in Japan rarely draw architectural pilgrims. But Hiroshi Nakamura's Sayama Lakeside Cemetery Park Community Hall and Forest Chapel are two buildings that could change that. From their dramatic roofs down to their exquisite details, each one addresses the delicate subject of death with remarkable sensitivity and grace. Located in the Tokyo suburb of Sayama, both were constructed in honor of the burial center's 40th anniversary. Keen to replace their original but outdated buildings, cemetery officials held a competition for the Community Hall and awarded the commission to Nakamura. Delighted with the architect's scheme, they invited him to recreate the chapel too.

Situated at a bend in the road leading up from Sayama's commercial center, the Community Hall stands at the entrance to the cemetery, marking the transition from the secular to the spiritual. Nestled into the hillside, it is an irregularly circular single-story building with parking tucked underneath. Wrapped almost entirely by an exterior reflecting pool, the interior is arranged concentrically to maximize the scenic views.

Designated as a place for visitors to rest, the building's outer ring begins with a lounge and then widens to accommodate four semiprivate dining rooms, followed by an outdoor preparation area for ritual gravestone washing, a custom performed in the cemetery itself. Serving as the cemetery's administrative hub, the core houses offices and a pantry. It also contains a reception area, public washrooms and a flower shop located near the entrance for visitor convenience. Planted on top of the core is a cluster of maple trees visible through a clerestory window and encircled by the building's doughnut-shaped roof.

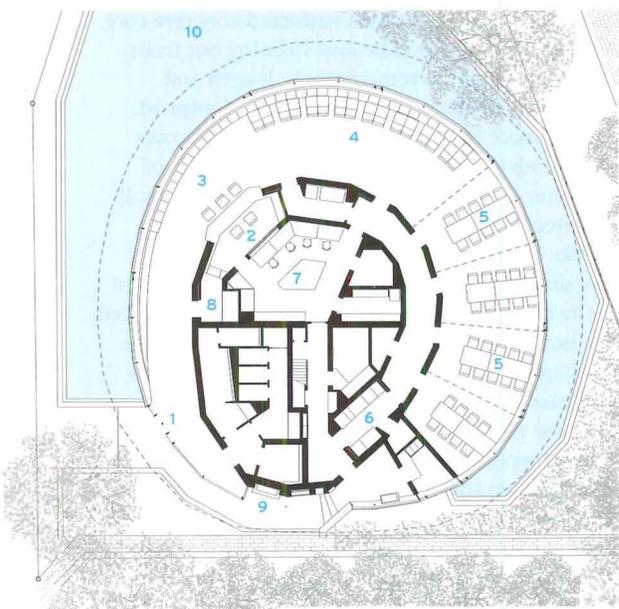
One of the building's most dramatic features, the roof has a dynamic form that follows the interior spatial flow. Ushering the bereaved inside, it rises up steadily from the foyer, reaching its apex at the end of the lounge. From there, it swoops back down over the dining area before completing its circuit at the entrance.

Supported by rings of slender steel columns, one at the outer wall and the other above the reinforced-concrete core, the roof is held up by 120 wood beams. Fanning out from above the core, they vary incrementally in length and angle to accommodate the building's irregular footprint. The beams culminate in extra-long eaves that hover over the pool, their undersides animated by the reflection of the rippling water. "A special characteristic of [traditional] Japanese architecture is that it adjusts to the way people move," remarks Nakamura. If you are standing, the low-hanging roof directs your gaze down toward the water, but out toward the distant Chichibu Mountains if you are seated.

While the horizontal Community Hall is for relaxation, the vertical chapel is for spiritual reflection. Occupying a skinny triangular site buried deep within the cemetery grounds, the new sanctuary is also defined by a spectacular roof, this time steeply angled, with planes of aluminum tile coming straight down to the ground. Resembling hands clasped in prayer, the building's peaked forms shelter a quiet, contemplative interior. They grew out of seven bays distributed around the plan perimeter, each one intended for a single newly planted tree.



**CIRCLE OF REFLECTION** Resembling a traditional Japanese umbrella, the Community Hall's dramatic standing-seam roof is mirrored in the 4-inch-deep reflecting pool. Measuring between 4 and 7 feet long, the eaves extend out over the water to limit sight lines.



COMMUNITY HALL FLOOR PLAN



- 1 ENTRANCE
- 2 RECEPTION
- 3 LOUNGE
- 4 REST AREA
- 5 DINING SPACE
- 6 PANTRY
- 7 OFFICE
- 8 FLOWER SHOP
- 9 WATERING PLACE
- 10 REFLECTING POOL
- 11 COMMUNITY HALL
- 12 CHAPEL



SITE PLAN



**FORMS & SURFACES**

The Community Hall's polished black stucco core (above) is one of several elements made by local craftspeople. Drapes, created in collaboration with textile designer Yuko Ando, divide dining areas furnished with custom tables, chairs, and light fixtures by Nakamura. A ridgeline unites the Forest Chapel roof (opposite). Loosely symmetrical in plan, the building spans from the man-made environment of the cemetery to the protected forest.





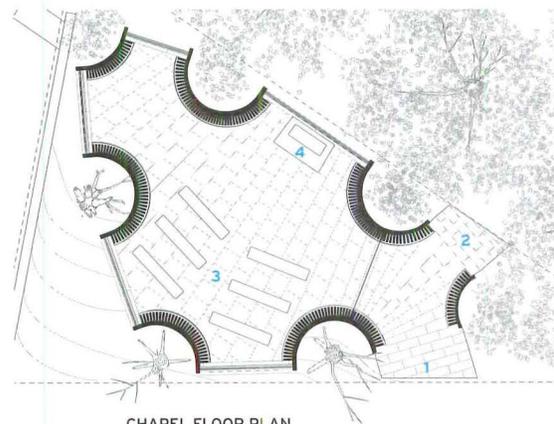
Abutting a protected forest, the nondenominational chapel was envisioned as an extension of the woods—a building close to nature, as the architect explains, is one close to the spirit. To reinforce this connection, Nakamura first determined where to plant trees, then created his building around them. Once the plan was in place, he wrapped each bay with a curved wall and tilted it inward, leaving room for the branches to grow. Between bays, triangular sheets of glass complete the exterior enclosure, visually fusing indoors with out. “For us, this form is not a strong architectural statement,” says project architect Kohei Taniguchi. “It is simply a consequence of the site.”

Merging the intricate geometries of the plan and section into a three-dimensional volume was a complicated task deftly handled by the structural system. It consists of 251 pairs of sloping wooden rafters, each one joined in an upside-down V by a hidden steel plate. Holding the rafters in place are concealed ridge beams and a steel ring attached to the chapel’s concrete foundations. Placed close together, the individual members form a continuously curving surface, resulting in a sculpted interior that soars 30 feet high.

Naturally, precise calculations and exquisite craftsmanship were essential for the successful realization of the chapel’s complex shape. This challenge was compounded by the structure’s complete exposure and the conspicuous absence of mistake-masking construction details. “We didn’t want people to be distracted,” explains Nakamura. Instead, the unfinished wood beams relate to the trees outside, while roughly hewn stone pavers angle toward an unknown vanishing point out in the forest. The only polished material is the stone altar marking the sanctuary’s center axis.

Befitting places for baring the soul, both the Community Hall and the chapel are honest expressions of material and construction. Here there is nothing to hide and nothing is hidden. The result is an unadorned architecture that consoles the heart as it uplifts the spirit. ■

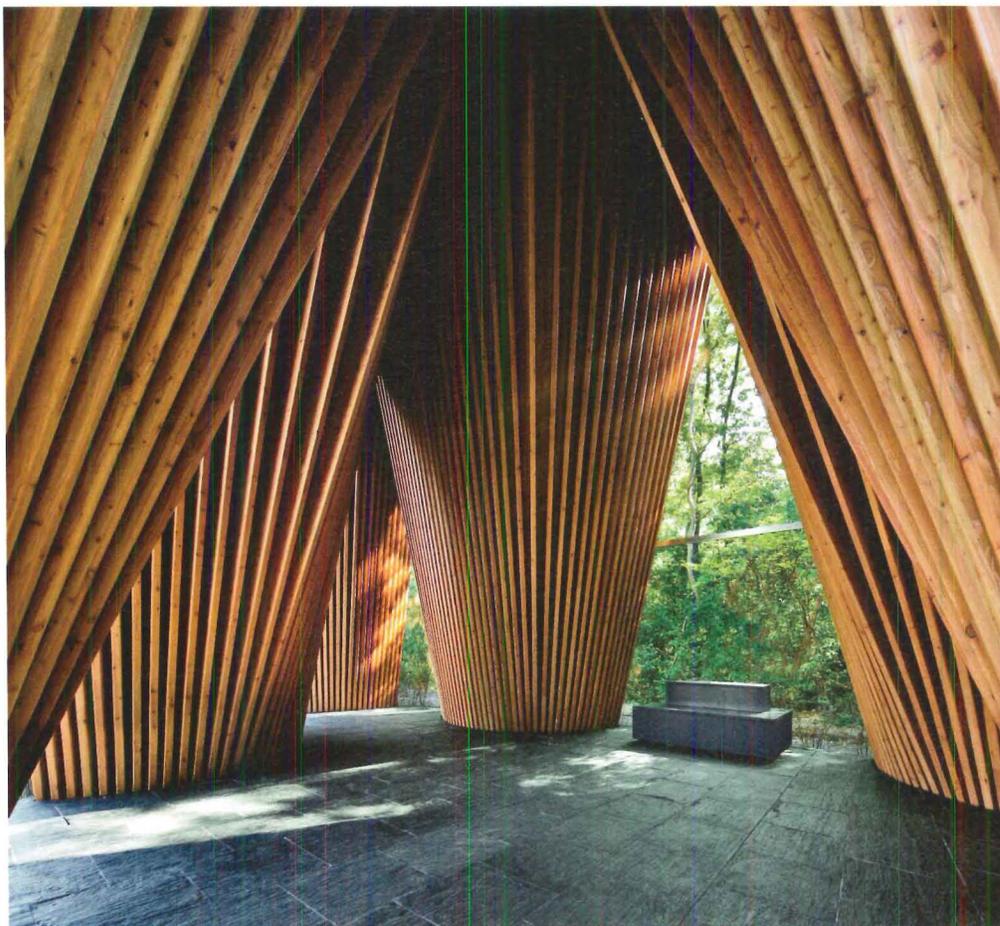
**EARTHLY MATTERS**  
Steeply angled to prevent the accumulation of fallen leaves, the chapel is clad with rough aluminum tiles that deter unsightly sap drippings. Cast in six rectangular shapes, the malleable plates were bent by hand to accommodate the building’s curves (opposite and right). Inside, a central stone altar stands amid unfinished wood rafters with gently rounded edges (below)—a detail that makes them easy on the eye and smooth to the touch.



CHAPEL FLOOR PLAN



- 1 ENTRANCE
- 2 ACCESSIBLE ENTRANCE
- 3 SEATING
- 4 ALTAR



credits

- ARCHITECT:** Hiroshi Nakamura & NAP Co. – Hiroshi Nakamura, principal; Kouhei Taniguchi, project architect
- ENGINEERS:** Ove Arup & Partners
- GENERAL CONTRACTOR:** Matsui (Community Hall); Shimizu (Forest Chapel)
- CLIENT:** Boenfuyukai Foundation
- SIZE:** 5,200 square feet (Community Hall); 1,230 square feet (Forest Chapel)
- COST:** withheld
- COMPLETION DATE:** July 2013 (Community Hall); November 2013 (Forest Chapel)

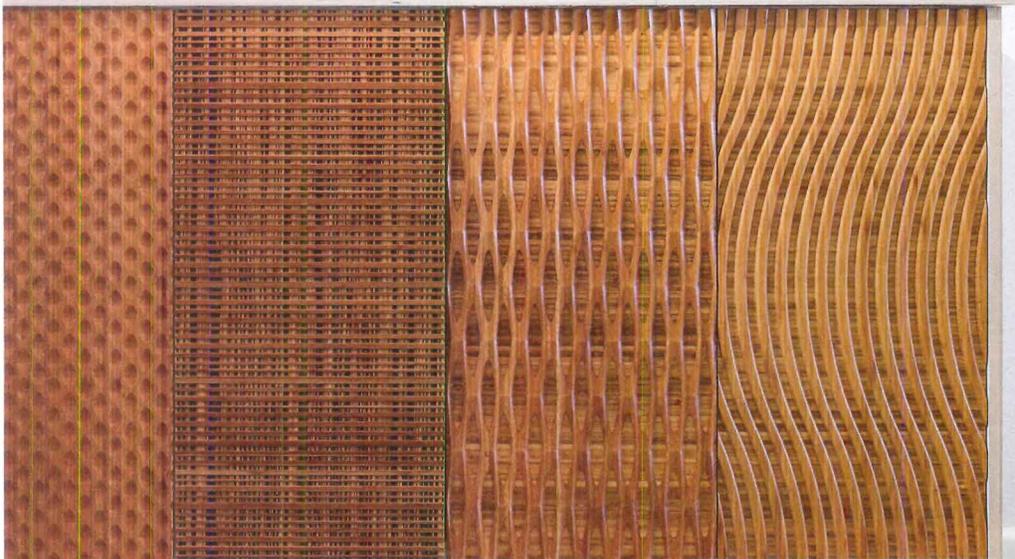


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# New Orleans Goes with the Flow

Ten Years after Katrina, the city learns to live with water.

By James S. Russell, FAIA

**THE REBUILDING** of New Orleans 10 years after Hurricane Katrina is as patchwork and kaleidoscopic as the city itself. A line of slab buildings approaching completion along Canal Street near the downtown looks impressive—an image bound for the cover of economic-development brochures. The buildings are part of a 70-acre, \$2.7 billion two-hospital replacement plan designed by two teams led by NBBJ. Like so much else about the reconstruction of the city that sat for weeks in a soup of fetid water after disastrous levee failures, the hospital project has been both controversial (displacing residents in a city awash in vacant land) and seen as a good thing for the jobs it will create.

An unpredicted wave of investment and renovation has come to the charming shotgun houses and cottages of high-ground neighborhoods like the Marigny, Bywater, and Holy Cross that line the river. Before the storm, they had languished. Many schools known for their dysfunction and dilapidation have been handsomely restored or replaced, if with ungainly but functional boxes. Population has steadily grown but remains 100,000 lower than it was pre-Katrina.

For all the destruction and lives lost or permanently altered, there's a broad consensus that the city works better and offers greater opportunity than it did before the storm. Local governance is more responsive and seems to be less corrupt.

Yet many opportunities have been squandered. "We're proclaimed a 'new' New Orleans," says Karen Gadbois, of the investigative-reporting website The Lens. Yet, she adds, "40 percent of children here live in poverty," and high crime rates persist.

**FORTIFIED CITADEL** As part of a \$14 billion effort to upgrade the city's levees, the U.S. Army Corps of Engineers has begun replacing the London Avenue Canal's temporary floodgates and pumps (shown in 2011) installed after Katrina.



The necessary reform of institutions and governance “attracted entrepreneurs, capital, and brains,” says Tim Williamson, who cofounded the nonprofit organization Idea Village in 2000 to nurture just that. Jean Nathan, executive director of the Creative Alliance of New Orleans (also a nonprofit), says the city’s low costs and welcoming attitude have drawn artists and other creatives “who feel that Seattle, San Francisco, and Brooklyn are too much about money.”

Significantly, much of the new-business fervor revolves around a subject New Orleanians are all too familiar with: water. Will Bradshaw, cofounder of Green Coast Enterprises, a property developer and management company that purposely blurs the line between business and social entrepreneurship, says a nascent green economy is growing around natural-systems solutions for landscape restoration and wetlands engineering. Such enterprises have been tenants in a modest collection of retail buildings Green Coast renovated as business-incubator space in the Broadmoor neighborhood.

So far, however, most of the resources pumped into the city to protect against flooding have been for traditional hard infrastructure. The revamp of the levees, flood gates, and pumping stations are the most conspicuous and expensive (\$14 billion) transformation of the city since Katrina. Drivers who make a wrong turn just about anywhere may confront the high concrete walls that line drainage canals and top levees. Though this extensive system is managed by local boards

that have undergone reform, the rebuilding was funded largely by federal taxpayers, and built by the U.S. Army Corps of Engineers, which had under-engineered the levee walls that failed in Katrina.

For all the cash and engineering, ordinary storms threaten livability day to day. So much of New Orleans lies below sea level that the massive pumps can’t move stormwater from the highway-size canals into Lake Pontchartrain fast enough, leaving streets throughout the city impassably flooded. Even double the pumping capacity could only handle 40 percent of the runoff from a 10-year storm. “We can’t keep making the system larger as rainfall increases,” says Ray Manning, a local architect who sits on the city’s water board. “It costs too much money.”

That’s why the city has adopted a \$6.2 billion water plan led by Waggonner & Ball

**Water management is a holistic enterprise that operates from the scale of the city to the individual lot says architect David Waggonner, of Waggonner & Ball.**

Architects that augments civil engineering with water-managing urban design. Inspired by Dutch precedents, the idea is to reduce the quantity of stormwater that must be pumped away by slowing its flow, storing it, and encouraging infiltration into the ground.

Principal David Waggonner says water management is a holistic enterprise that operates from the scale of the city to the individual lot. Neglected canals will be restored with property-value-enhancing trees and wetlands. Planted, parklike water storage (already piloted by the New Orleans Redevelopment Authority) will repurpose vacant land.

Waggonner’s firm has designed a waterway that could run 1.5 miles from Bayou St. John, near Lake Pontchartrain, to the French Quarter. It would share a corridor along a long-buried canal route that’s in the process of being turned into a bare-bones bike trail called the Lafitte Greenway. Aside from picking up stormwater from several neighborhoods, the proposed canal emulates the meandering Bayou St. John, which is lined with marsh grasses and overarching trees. The waterway would add allure to the corridor, which is already attracting new development.

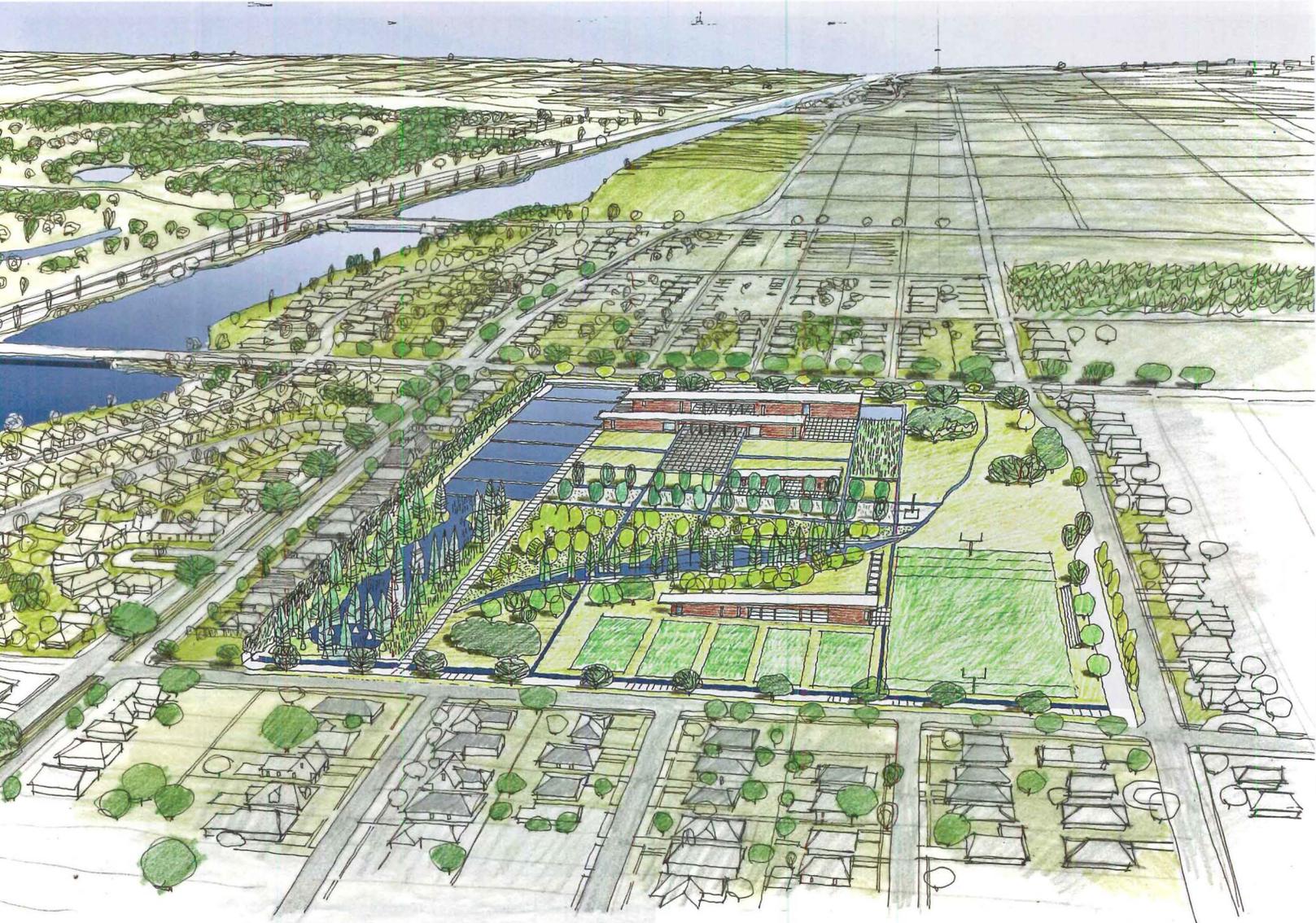
The city is proceeding with Waggonner & Ball’s design for the 25-acre Mirabeau Water Garden as a demonstration of large-scale water retention. Rather than directing runoff to storm sewers, it will store water and filter it to a sandy substrate through a series of planted terraces that range from marshes to grasslands. Between storms, the site will host neighborhood recreation and environmental education.

A recent zoning change requires owners to manage the first 1.25 inches of stormwater on-site, which may well mean enlisting the inventiveness of architects and landscape architects in the use of tactics that encourage infiltration. These include permeable pavement, backyard rain gardens (shallow depressions planted with pollutant-filtering vegetation), and parking-lot bioswales (which work in a similar fashion but are generally larger).

Water management must offer multiple benefits, as the Mirabeau site does, not just dispose of water, Waggonner says. He believes that if the billions more in funding promised from the federal government and other sources come through, the water plan can be implemented in a decade.

In addition to helping control flooding, the water plan also promises to solve a major problem induced by the current drainage and pump system—pulling too much water from the ground during dry periods, contributing to subsidence. That’s one reason why sinkhole-



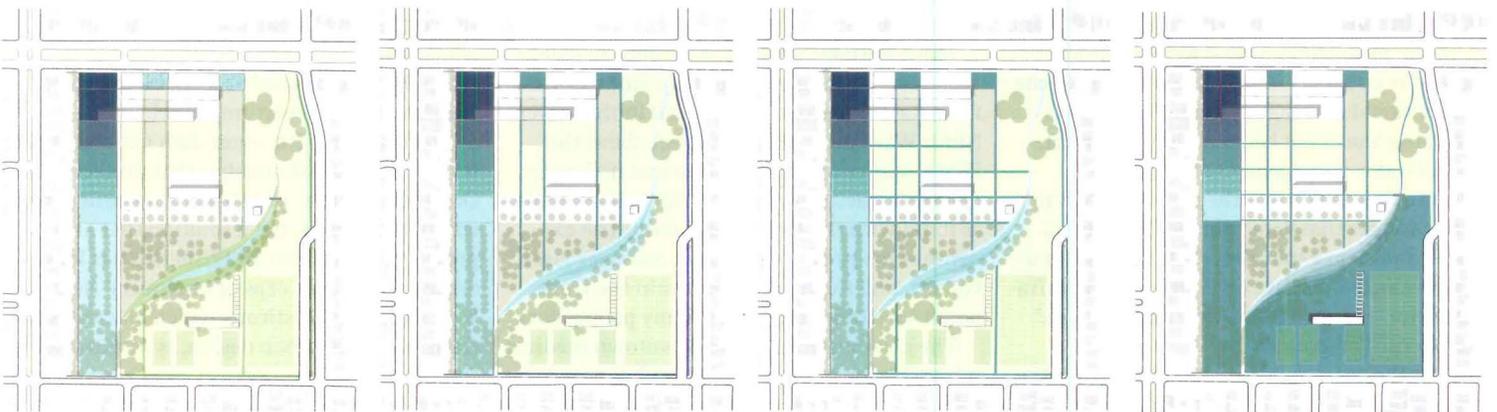


DRY CONDITION

LIGHT RAIN EVENT

AVERAGE RAIN EVENT

EXTREME RAIN EVENT



**URBAN SPONGE** The 25-acre Mirabeau Water Garden (above) will keep stormwater out of the city's overtaxed drainage system by filtering it through planted terraces and a sandy substrate. In dry conditions, the site will host neighborhood recreation and environmental education. Some high-ground neighborhoods, such as the Bywater, are seeing a wave of investment in renovation of their historic housing stock and in new construction that mimics traditional shotgun houses (opposite).



**CLOSER TO EARTH** Houses built by Make It Right in the Lower Ninth Ward illustrate how risk assessments have changed in recent years. The Hitoshi Abe duplex (center) completed in 2009 was built a full floor above grade to survive a catastrophic levee break. Newer houses are more modestly elevated, under the assumption that the nearby levee will hold.

strewn streets are ubiquitous and tilted houses are common. According to the water plan, its green infrastructure strategies will ultimately help stabilize the soil, saving more than \$10.8 billion in subsidence-related costs over 50 years.

In the meantime, several key streets are now torn up for a \$1.5 billion expansion of the conventional drainage system. The projects are going ahead not because they aid an integrated water-management strategy but because Congress, after the storm, rushed to fund projects that date from before Katrina. The reliance on expensive, dysfunctional, and maintenance-intensive civil-engineering infrastructure “is a ship that’s very hard to turn,” comments Waggonner.

Over the years, people have come to take the protection offered by the levee fortifications for granted, even though they were not designed to repel the worst storms. The majority of owners follow the most recent guidance from

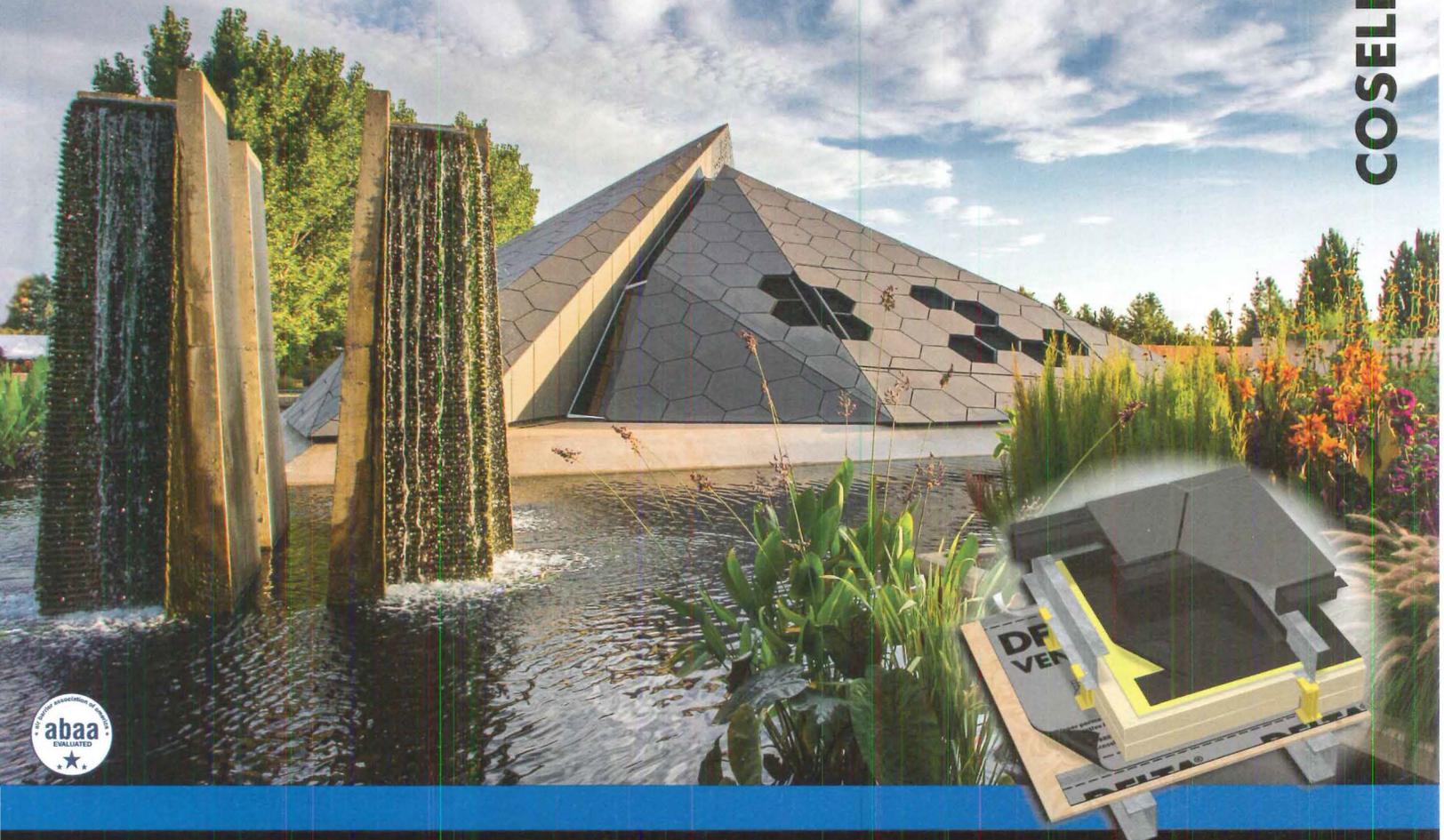
the Federal Emergency Management Agency (FEMA), which usually means elevating structures 2 or 3 feet. The agency’s base flood elevations bet that catastrophic levee failure will not recur.

Make It Right, which has brought in global architects to design 110 houses a stone’s throw from Katrina’s worst levee break in the Lower Ninth Ward, now builds at 2 feet above the FEMA 100-year-flood elevation and no longer perches structures at 10 or 12 feet above grade, as it did with the first houses built. The expense is too great, says project manager Jason Pollard, and the high floors strain the front-porch sociability that lured many people back.

The new hospitals of the downtown medical center, by contrast, are built much more robustly, a response to the horror of hospitals completely disabled by Katrina. NBBJ, with Blich Knevel Architects, has designed the Alexander Academic Research Hospital to

run for a week without outside support or supplies. No critical functions are located lower than 21 feet above the base flood elevation. Eskew+Dumez+Ripple has similarly raised the New Orleans East Hospital emergency room. It is reached by an ambulance ramp that can be used as a boat launch should flooding make streets impassible.

The concern with water does not end at the levees. The coastal marshes that protect New Orleans and other parishes from storm surges continue to erode, but a solution that also preserves navigation and fisheries has long eluded the Army Corps of Engineers. New York’s Van Alen Institute, which advocates for transformative urban design, is working with the Environmental Defense Fund, supported by several foundations, on a multiyear, in-depth design competition called Changing Course: Navigating the Future of the Lower Mississippi River Delta. A winning solution is



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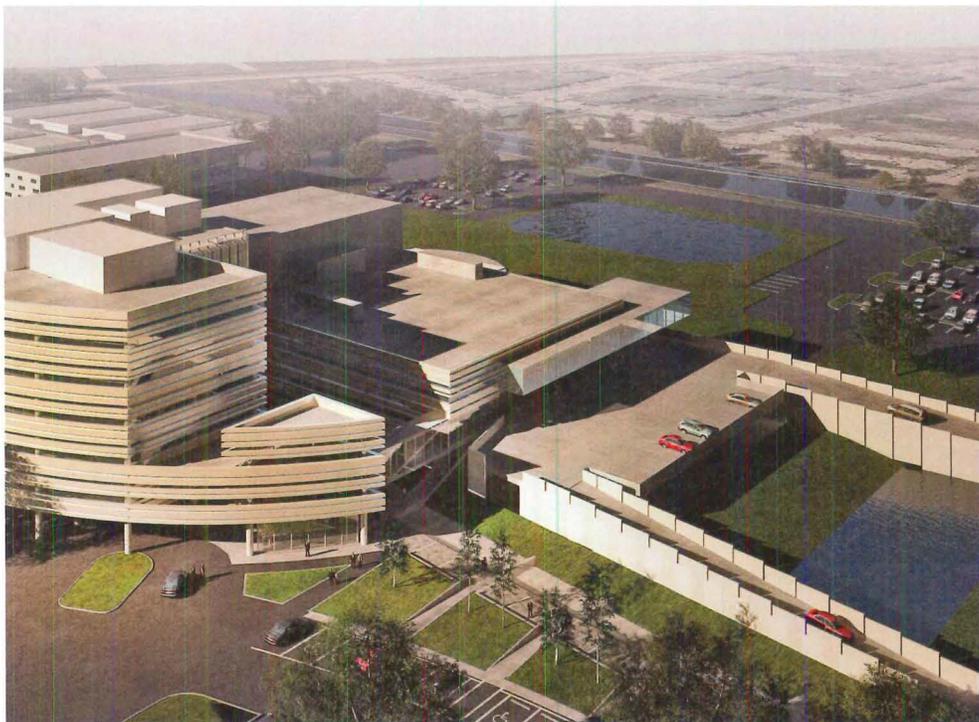
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**MISSION CRITICAL** At University Medical Center (above), the NBBJ-led design team placed no critical functions or essential mechanical systems on the ground floor. Eskew+Dumez+Ripple designed an emergency suite above flood level at New Orleans East Hospital (below). A vehicle access ramp can double as a boat launch if needed.



far from fully developed, but the three competing interdisciplinary teams all recognize that miles of the river below New Orleans will ultimately have to be substantially reconfigured. Saving the coast, regrettably, may accelerate the abandonment of many of its rural communities.

Given all of the challenges and uncertainties, it is extraordinary that the allure of New Orleans is not only undimmed but enhanced. Reflecting on the wisdom of defiantly rebuilding near a catastrophic levee breach, Make It Right's Pollard says, "If you are not from New Orleans, the necessity of returning is hard to understand. But people who have lived here for generations know that storms destroy and people rebuild. It's the hurricane 'tax' people pay to stay."

New Orleans's survival has depended on deep social bonds and its unique culture—both thought in danger after the storm. Yet the city's culture made it resilient, even in the face of enormous destruction and the displacement of hundreds of thousands of people. ■

*James S. Russell, FAIA, writes about architecture for several publications and blogs at [JamesSRussell.net](http://JamesSRussell.net).*

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# Befriending the Floods

A Chinese landscape architect restores the ecology of an urban wetland and creates an innovative, ever-changing park.

By Michael Cockram

AS THE principal of China's largest landscape architecture firm and head of Peking University's architecture and landscape architecture department, Kongjian Yu has a spacious corner office in a sleek office building in Beijing's Haidian district. Turenscape, his 600-employee firm, fills three floors with conventional cubicles. But a handwritten sign taped to the doorjamb of Yu's private office hints at an unconventional design philosophy. It reads "rain forest this way."

The space is a jungle of ceiling-height potted plants that surround a desk, tables, and piles of books. It's a fitting metaphor for Yu's "messy" and holistic alternative to China's typical land- and water-management practices. Yu aims to make public open spaces that are resilient in extreme events by incorporating what he refers to as "the wisdom of the farmer."

A recent Turenscape project that demonstrates this low-tech approach is the 50-acre Yanweizhou Park, situated at the confluence of the Yiwu and Wuyi rivers in Jinhua, a city of over a million people in Zhejiang Province, in the eastern part of the country. The Jinhua municipal government hired Turenscape to restore wetland areas that were damaged by sand quarrying, and to connect the park to the north and south districts of the city.

Yu and his team convinced skeptical city officials to replace the park's unsightly concrete floodwalls—which can cause downstream damage—with cut-and-fill terracing along the sloped riverbanks. The terraces, retained with undulating stone walls and sown with native riparian plants, absorb nutrients from the floodwaters. Similarly, the flat areas of the site, once mined for sand, were formed into a series of ponds. "Capturing water in this way allowed the farmer to retain it for irrigation during the dry season," says Yu, who grew up on a farm outside of Jinhua.



**CULTURAL CONNECTION** Yanweizhou Park, in Jinhua, China, includes a 2,300-foot-long pedestrian bridge that crosses two rivers and links it to the city's north and south districts. The bridge, with its curves and colorful railings, is intended to recall the dragon of traditional festival dances.



The ponds also provide habitat for waterbirds and other wildlife.

As in the west, the typical approach to prevent flooding and control stormwater in China is to build defensive barriers and to pipe and channel runoff away from protected areas as quickly as possible. In contrast, at Yanweizhou, the landscape “makes friends with the flood” by allowing floodwaters into the park, which is designed, like a natural wetland, to thrive even when inundated. In this way the high water becomes an observable event, and the landscape, instead of being damaged, is replenished, according to Yu.

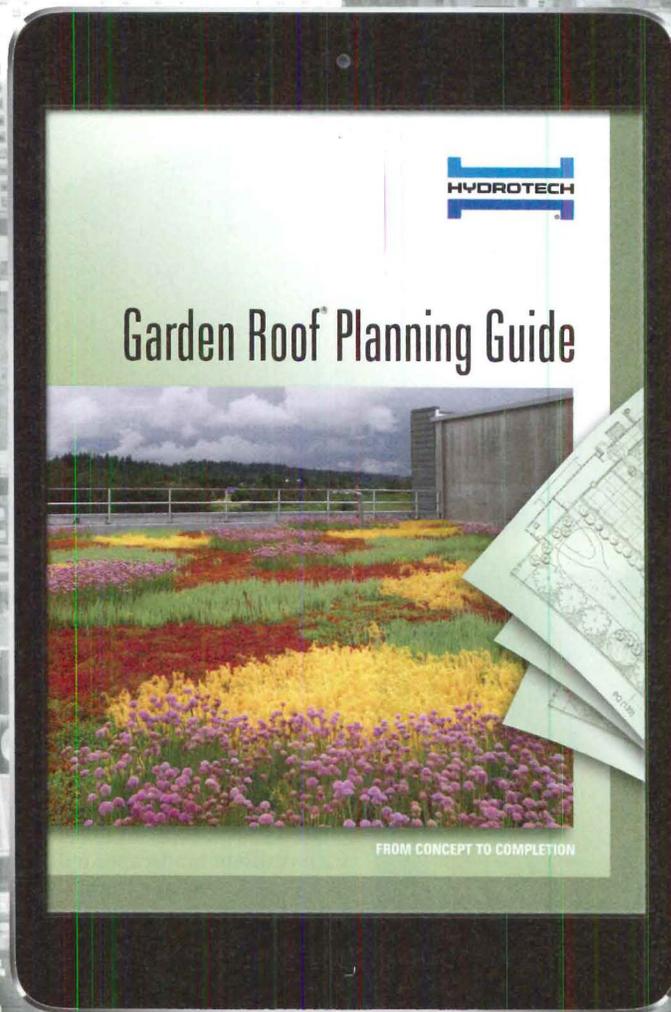
The park can be enjoyed by the public during all times of year, even in monsoon season, since Turenscape’s design includes a sinuous 2,300-foot-long pedestrian bridge that hovers over the water. The colorful structure, with its yellow and red tubular fiberglass railing meant to recall the dragon used in traditional festival dances, serves as a link across the river and to the site’s existing opera house.

Even though the region, which receives 80 percent of its rainfall during the summer, is subject to frequent flooding, it also suffers from rapidly decreasing groundwater supplies. According to Yu, groundwater levels in much of the country are falling by 1 to 2 meters a year, in large part due to industrial-scale agricultural practices. Unlike typical park

#### HEALING WATERS

The park is designed to perform ecologically restorative functions, such as cleaning stormwater, in addition to serving as a place for respite and recreation (above). It can be visited during dry periods (right) and when it is flooded (below), since its sinuous pedestrian bridge hovers above the water. The landscape, like a natural wetland, thrives even when inundated.





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**TERRACED TERRAIN**  
Along the sloped river banks (middle), Turenscape replaced concrete flood barriers with terraces retained by undulating stone walls and sown with native riparian plants. This new landscape can be enjoyed from a series of steel-and-glass pavilions that are lifted above the 200-year-floodplain (left).



At Yanweizhou, ecologically restorative open spaces attuned to the cycles of nature have replaced the aesthetic of the decorative garden. Yu is applying these principles to projects across China, and internationally—from a master plan for the Moscow River to a national water-management plan for Bangladesh. He maintains that, as environmental problems grow more urgent, building such resilient landscapes will become a matter of survival. “The key,” says Yu, “is to make them not only functional and productive but also beautiful.” ■

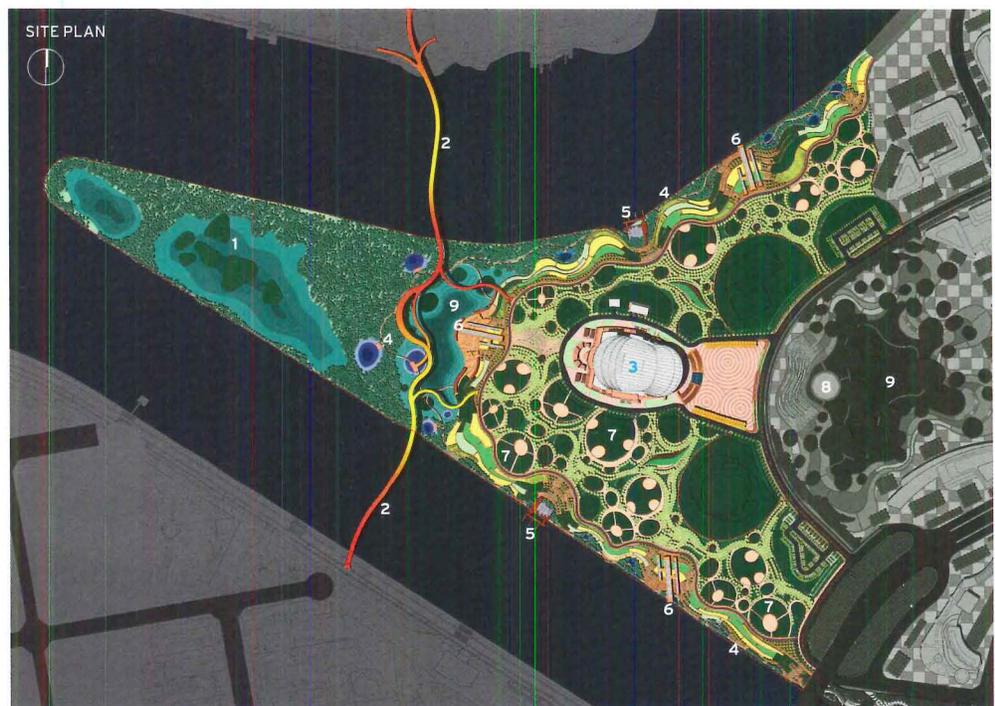
*Michael Cockram is a freelance writer and director of Bowerbird Design in Fayetteville, Arkansas.*

- 1 WETLAND
- 2 PEDESTRIAN BRIDGE
- 3 OPERA HOUSE
- 4 BOARDWALK
- 5 DOCK
- 6 PAVILION
- 7 BIOSWALE
- 8 AMPHITHEATER
- 9 POND

landscapes, Yanweizhou requires very little maintenance and no fertilization or irrigation. It also helps recharge the aquifers, using features such as permeable gravel, which contributes to the percolation of stormwater into the ground.

The park acts like a green sponge, purifying the water by absorbing pollutants. According to Yu, 75 percent of China’s surface water is contaminated by industrial pollutants, organic waste from agriculture, and sewage.

“We can’t just depend on sewage plants,” he says. Conventional wastewater treatment is expensive and contributes to air pollution, since it often relies on electricity from coal-fired power plants. But 2.5 acres of open space, using ecological strategies such as planted terracing, can clean about 260,000 gallons of water a day—the equivalent of a \$1 million wastewater treatment system, according to Yu’s estimates. Organic pollutants such as sewage damage the ecology of waterways, but they can serve as nutrients for vegetation, he explains.



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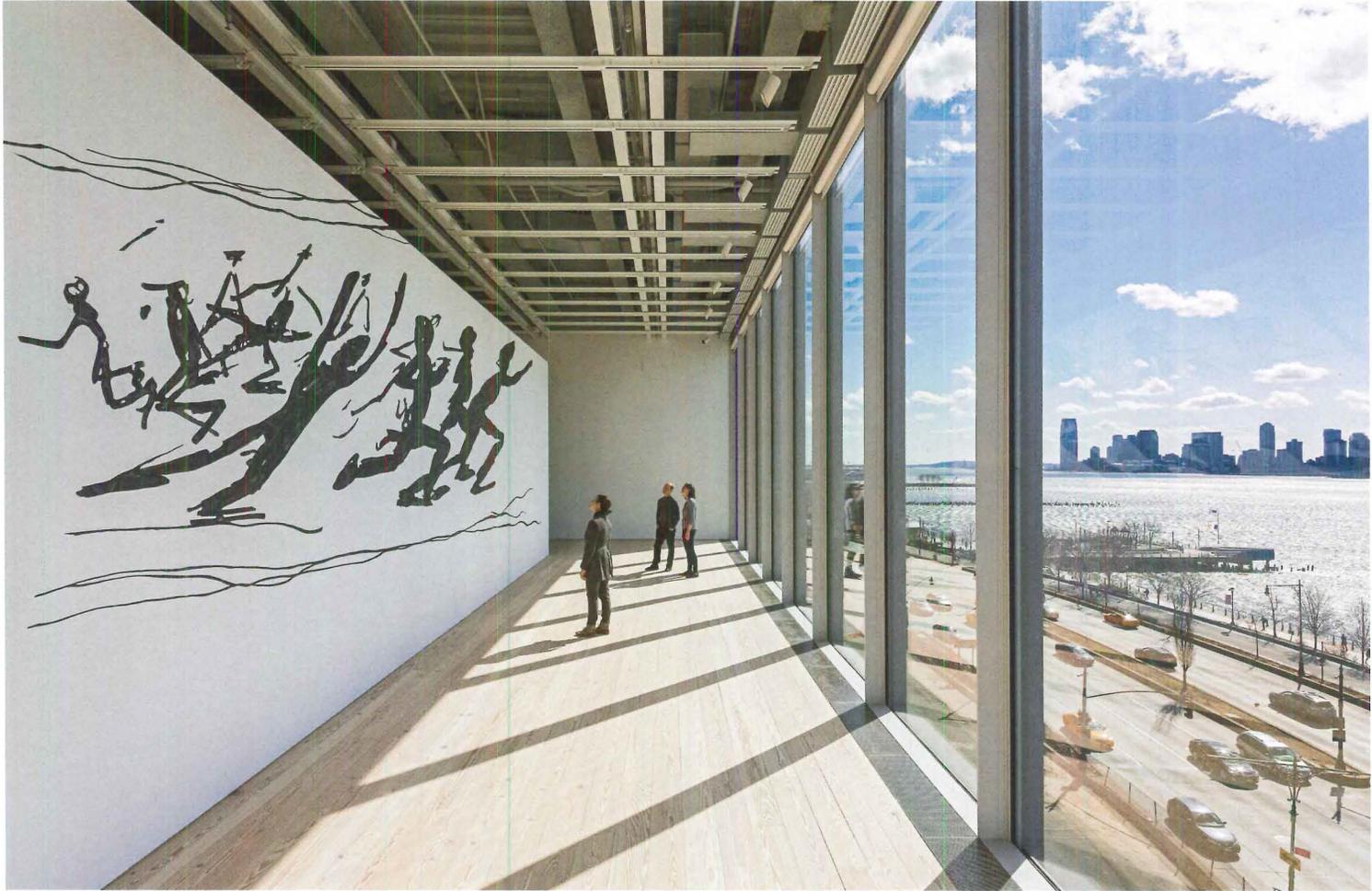
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# Flirting with Disaster

Two recent art museums with prime waterfront sites protect their buildings and collections from severe weather and rising water levels. **By Joann Gonchar, AIA**



**THE MOVE** of the Whitney Museum of American Art from its Marcel Breuer–designed quarters on Manhattan’s Upper East Side to the city’s Meatpacking District presented a host of challenges, flooding among them. The museum knew that the new downtown site—sandwiched between the Hudson River and the increasingly popular High Line—would be at risk in an intense storm. That’s one of the reasons why the building’s architects, Renzo Piano Building Workshop (RPBW) and Cooper Robertson, opted to locate the permanent galleries and art storage for the recently opened museum (RECORD, May 2015, page 181) in the upper reaches of the eight-story structure. It is also why they raised the lobby a foot and a half above the 500-year-flood plain.



**RISKS AND REWARDS**  
One advantage of the Whitney’s location is the Hudson River view from a 5th-floor gallery space (above). The space, which features a work by Jonathan Borofsky, has a glazed wall and projects from the west facade (opposite). A vulnerability associated with the proximity to the Hudson is the risk of flooding: during Hurricane Sandy, while the museum was still under construction, its basement filled with more than 6 million gallons of water (left).



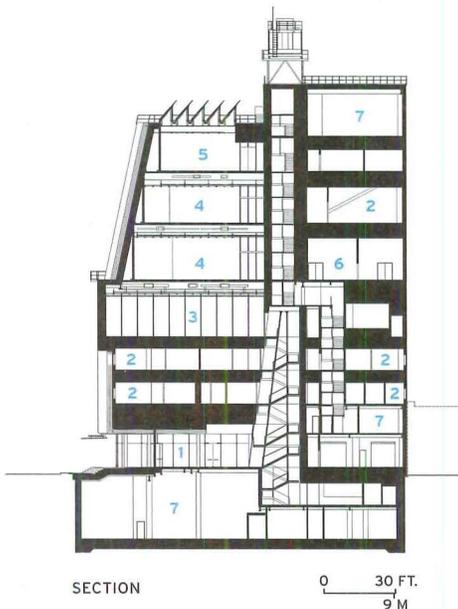


But when Hurricane Sandy slammed New York in October 2012, while the new museum was under construction, the storm surge brought more than 6 million gallons of river water into the basement. Although the building was already framed to the fifth-floor level (making it impractical to radically rethink the design), the project team insists that the event provided an opportunity in disguise. “We were lucky it happened when it did,” says Tom Wittrock, a Cooper Robertson partner.

Sandy was the impetus for the museum to seek the help of a German team of engineers—WTM, which has a specialty in port and marine structures—along with experts in storm mod-

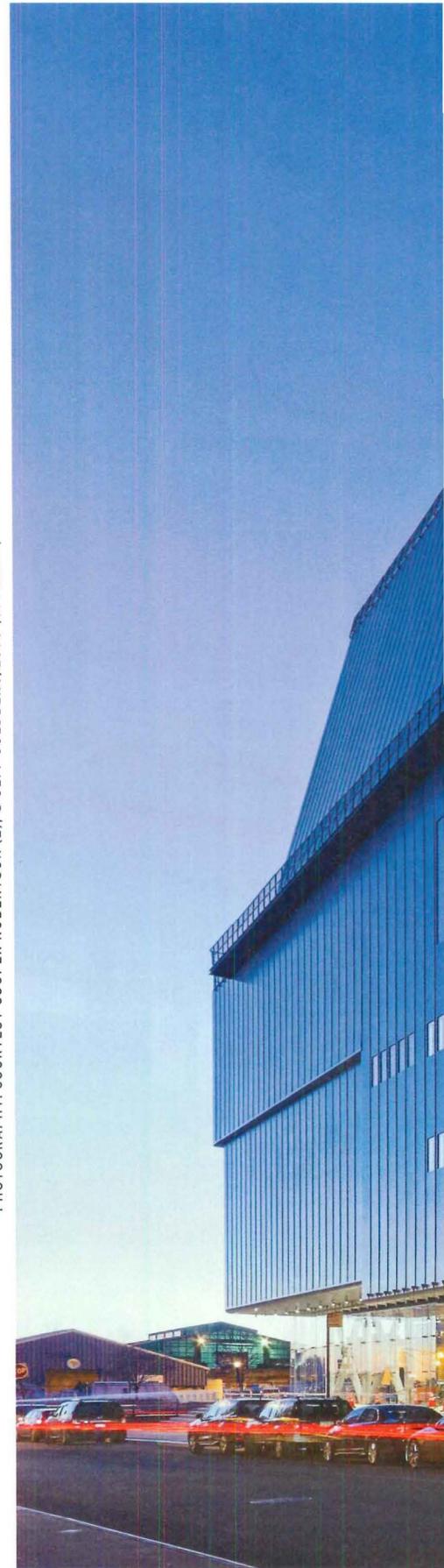


**BATTENING THE HATCHES**  
If a severe storm is expected, the Whitney will protect its glass-enclosed lobby (right) with a temporary flood barrier of aluminum “logs” stacked between vertical anchors (top). It will also close the loading dock’s 5,000-pound floodgate (above), which was made by a fabricator of doors for naval vessels.

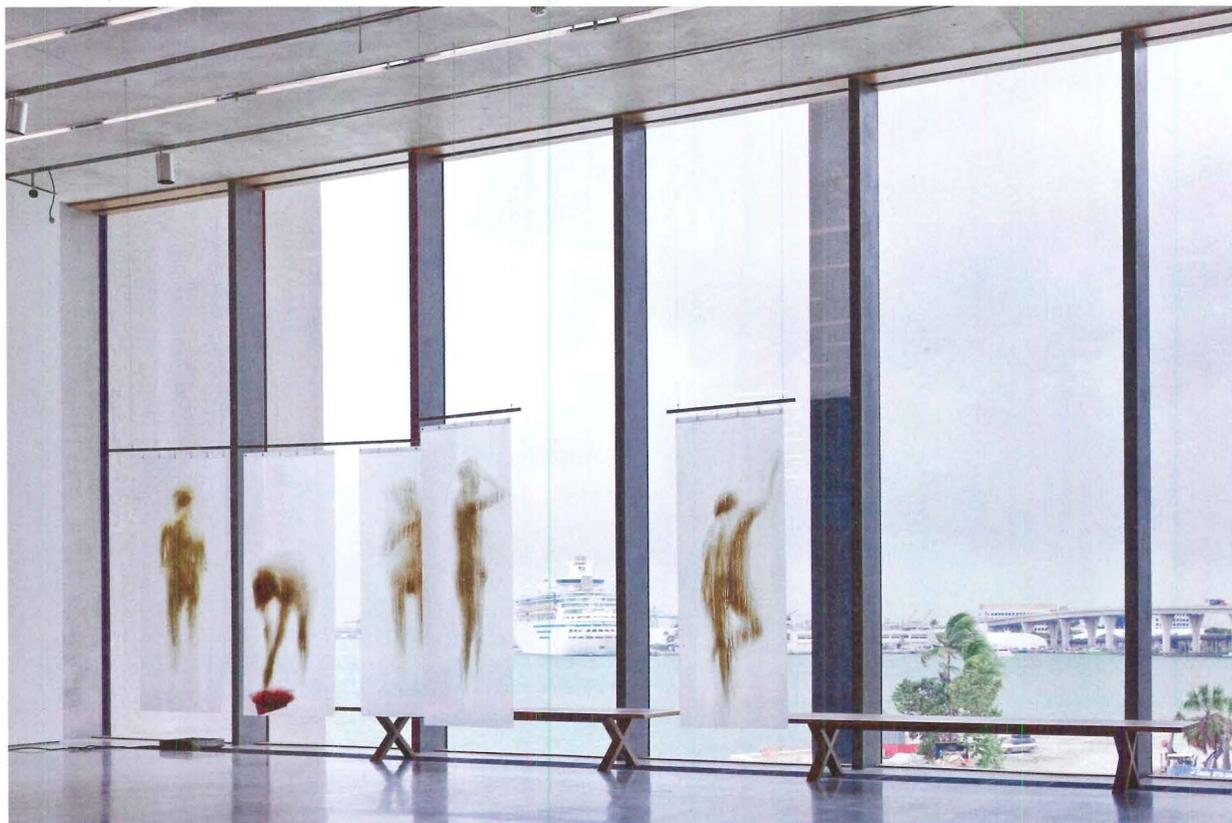
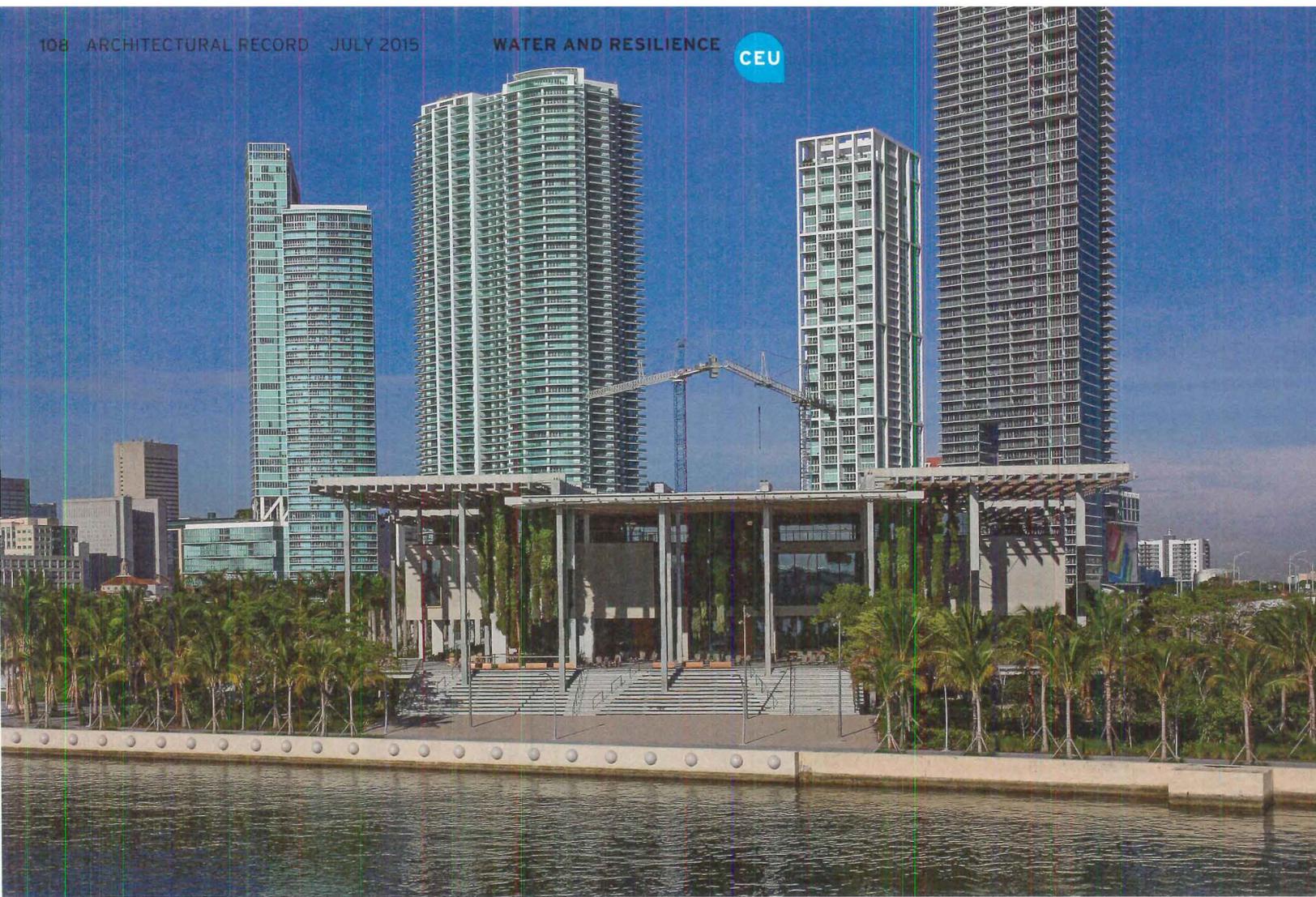


- 1 LOBBY
- 2 OFFICE
- 3 TEMPORARY EXHIBITIONS
- 4 COLLECTION GALLERY
- 5 SPECIAL PROJECTS
- 6 WORKS ON PAPER
- 7 MECHANICAL

PHOTOGRAPHY: COURTESY COOPER ROBERTSON (2); © JEFF GOLDBERG/ESTO (OPPOSITE)





**TOUGH TRANSPARENCY**

To protect the Perez Art Museum Miami from storm surges, architects Herzog & de Meuron placed the three-story building on a plinth (above). Arguably, the museum's most notable hurricane-resistant features are its windows, which are as large as 7 feet 6 inches wide and 17 feet 3 inches tall. They flood the galleries with daylight and help show off pieces like *Cortinas de Baño* (left) by Oscar Muñoz. The Perez's glazing assemblies are considered the largest to undergo a "missile impact test," which entails firing a two-by-four from a cannon at the glass (opposite).

eling from the Franzius Institute at the Leibniz University of Hanover. They came up with a plan for protecting the museum up to 16.5 feet above the Manhattan Datum—a level 6.5 feet higher than the lobby floor and more than 5 feet higher than Sandy’s floodwaters. They accomplished this with strategies that should go unnoticed by visitors.

For example, the loading-dock entry, which sits at street level and faces the river, is protected by a 27-by-14-foot hinged floodgate. Made by a fabricator of watertight doors for naval vessels, the 8-inch-thick steel door, weighing approximately 15,000 pounds, requires two people to close it.

One of the Whitney’s most vulnerable features is the lobby, which is enclosed by floor-to-ceiling glass on three sides. Here the engineers devised a deployable watertight barrier of stackable aluminum “logs.” If a severe storm is predicted, a crew of 20 workers can erect the temporary wall in about 7 hours. The demountable nature of the barrier preserves a key aspect of the design: “The idea was to create an open and transparent ground floor and treat the outside and inside as one,” explains Elisabetta Trezzani, an RPBW partner. The lobby, she says, was conceived as a “big piazza for the city.”

The Whitney is not the only art museum that has grappled with flood mitigation. Just one of several such institutions is Herzog & de Meuron’s Perez Art Museum Miami, which sits on the edge of Biscayne Bay. To protect the three-story glass and concrete building and its art exhibits from storm surge, the architects raised it above sea level on a plinth, with the space below dedicated to parking.

But in addition to water, the other severe weather threat that the Perez design team had to consider was hurricane-force wind, and any material it could carry with it. To safeguard against damage in an intense storm, the impossibly thin-looking concrete piloti that support an expansive trellis have been heavily reinforced to withstand both lateral forces and the impact of wind-borne debris. The suspension and irrigation systems for the hanging gardens, designed by green-wall pioneer Patrick Blanc, have also been carefully braced.

Arguably, the Perez’s most notable hurricane-resistant features are its windows, the largest of which span 7 feet 6 inches between their ultra-high-performance reinforced concrete mullions and 17 feet 3 inches from slab to slab. By code, the double-glazed units were required to undergo a battery of tests, including a so-called “missile impact test.” This entails firing an 8-foot-long two-by-four at a speed of 50 feet per second at the glass assemblies. The Perez windows are said to be the largest so far to



undergo this testing regimen in the U.S.

The code dictates that the missile-impact test must be conducted by an independent laboratory. But the project’s facade contractor, Seele, opted to perform its own “pretesting” in its glass-fabrication facility in Germany in order to help determine the optimal glazing assembly. Ultimately Seele settled on an outer lite of two layers of 12 millimeter heat-strengthened glass and an inner one of two layers of 8 millimeter fully tempered glass. Both included a reinforced PVB interlayer.

Results from the company’s pretesting of the glazing system were consistent with the official preconstruction test subsequently performed in a lab in York, Pennsylvania. In both instances, the two-by-fours caused significant damage to the unit’s outer lite, while the inner one remained intact, as the code mandates. The inside layers of glass are considered the last line of defense. “They are sacrosanct,” explains Bruce Nichol, a partner with Front, the project’s facade consultant, while the outer lite is thought of as “sacrificial,” he says.

The Perez has yet to undergo a real-life test. The storm seasons since its opening in late 2013 have been unusually calm, notes interim director Leann Standish. But that doesn’t mean that she and her staff are just waiting for the next one to hit. Annually, they reevaluate their emergency procedures, including plans for moving or securing the regularly changing outdoor sculpture. “The only good thing about a hurricane,” she says, “is that you know it is coming.” ■

#### Continuing Education



To earn one AIA learning unit (LU), including one hour of health, safety, and welfare (HSW) credit, read the three stories in the “Water and Resilience” section: “New Orleans Goes with the Flow” (page 90); “Befriending the Flood” (page 98); and “Flirting with Disaster” (page 104). Then complete the test at [architecturalrecord.com](http://architecturalrecord.com). Upon passing the test, you will receive a certificate of completion, and your credit will be automatically reported to the AIA. Additional information regarding credit-reporting and continuing-education requirements can be found online at [ce.construction.com](http://ce.construction.com).

#### Learning Objectives

- 1 Explain how green infrastructure can be used to bolster traditional hard infrastructure for flood control.
- 2 Describe how green infrastructure tactics can be used to remove pollutants from stormwater.
- 3 Discuss measures implemented by two recent art museums as protection from flooding.
- 4 Outline the testing regimen for hurricane-resistant glazing.

AIA/CES Course #K1507A

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# 2015 CALL FOR ENTRIES Design Vanguard



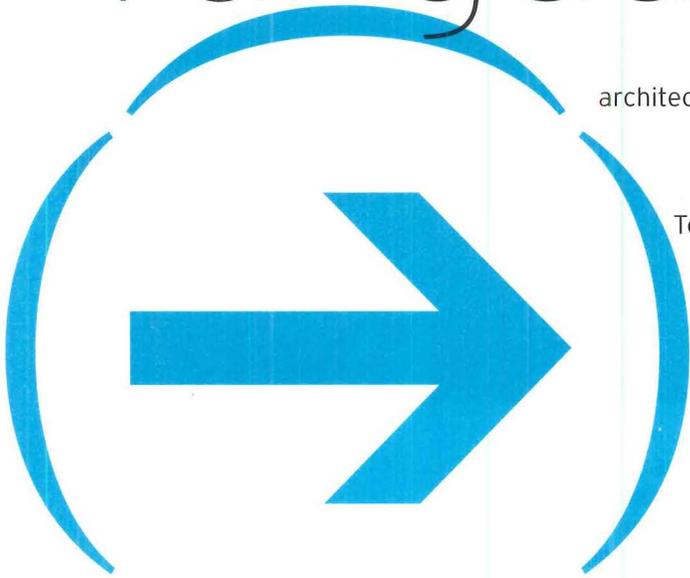
The editors of ARCHITECTURAL RECORD are looking for the best emerging architecture firms from around the world to feature in our **Design Vanguard** coverage. Although we do not have an age limit, we try to select architects who have had their own practices for no more than 10 years.

To enter the competition, send a low-resolution PDF (no larger than 10 MB) with a portfolio containing five to eight projects (both built and unbuilt), CVs of your firm's partners, a short statement of your firm's design philosophy, and the date your firm was founded.

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(put *Design Vanguard* in the subject line). There is no fee to enter.



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Winning entries—the best and most innovative offerings—will be featured in the December 2015 issue.

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**CONTRACTOR:** Mealy Company Builders

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CIRCLE 62

# ROCKY MOUNTAIN

H A R D W A R E



# Hospitality

Sometimes the best new places are old ones that have assumed fresh identities thanks to architectural makeovers. Three of the projects shown here involve radical transformations: an Art Deco commercial building in North Carolina that's now a hotel showcasing contemporary art; a seaside warehouse in Japan that's now a place where bicyclists can eat, sleep, and shift to a slower gear; and a sawmill in Milan that's now an inventive restaurant. The fourth project uses history in a different way—reinterpreting the language of mid-20th-century Modernism to create a sprawling family hotel in Florida. Together, these designs demonstrate that a spirited dialogue between past and present can make dinner or an overnight stay a memorable experience.

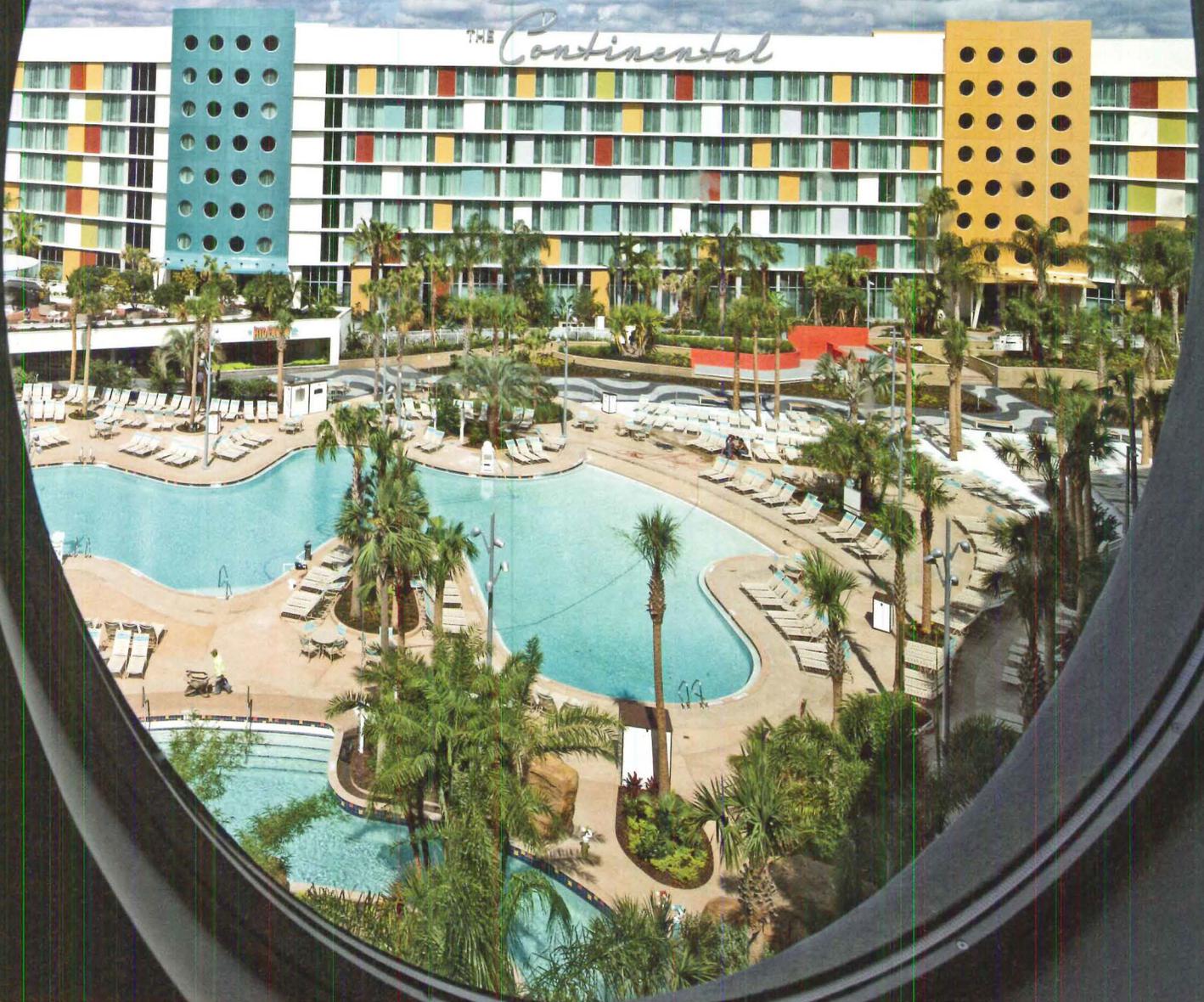


# Sunshine State of Mind

Universal's Cabana Bay Beach Resort | Orlando, Florida  
Shulman + Associates

A colossal destination hotel riffs on midcentury design to create a new family vacation experience.

By Beth Broome



**SINCE THE WALT DISNEY** Company imported its brand from Anaheim, California to Orlando, Florida, in 1971, its themed empire has become synonymous with the family vacation. A trip to Disney World is a childhood rite of passage, and, for some adults, akin to the fulfillment of a religious pilgrimage. But over the decades, other entertainment enterprises have edged in for a piece of the action, and now 62 million tourists flock to Orlando—the most-visited U.S. destination—every year. Comcast, which owns Universal Parks & Resorts, has played aggressively, winning significant market share. Contributing to Universal’s expansion is the recent arrival of Diagon Alley, its second Harry Potter-themed attraction. Also making an impact is the nearby Cabana Bay Beach Resort, a sprawling, fanciful, midcentury-themed family hotel designed by Miami-based Shulman + Associates that, with 1,800 rooms, is Universal Orlando’s fourth and largest such facility.

Universal recognized the need for a moderately priced amenity (the company’s three other local properties—which, like Cabana Bay, are shared ventures with Loews—are classified as deluxe). “We kept coming back to the ‘drive-to’ vacation

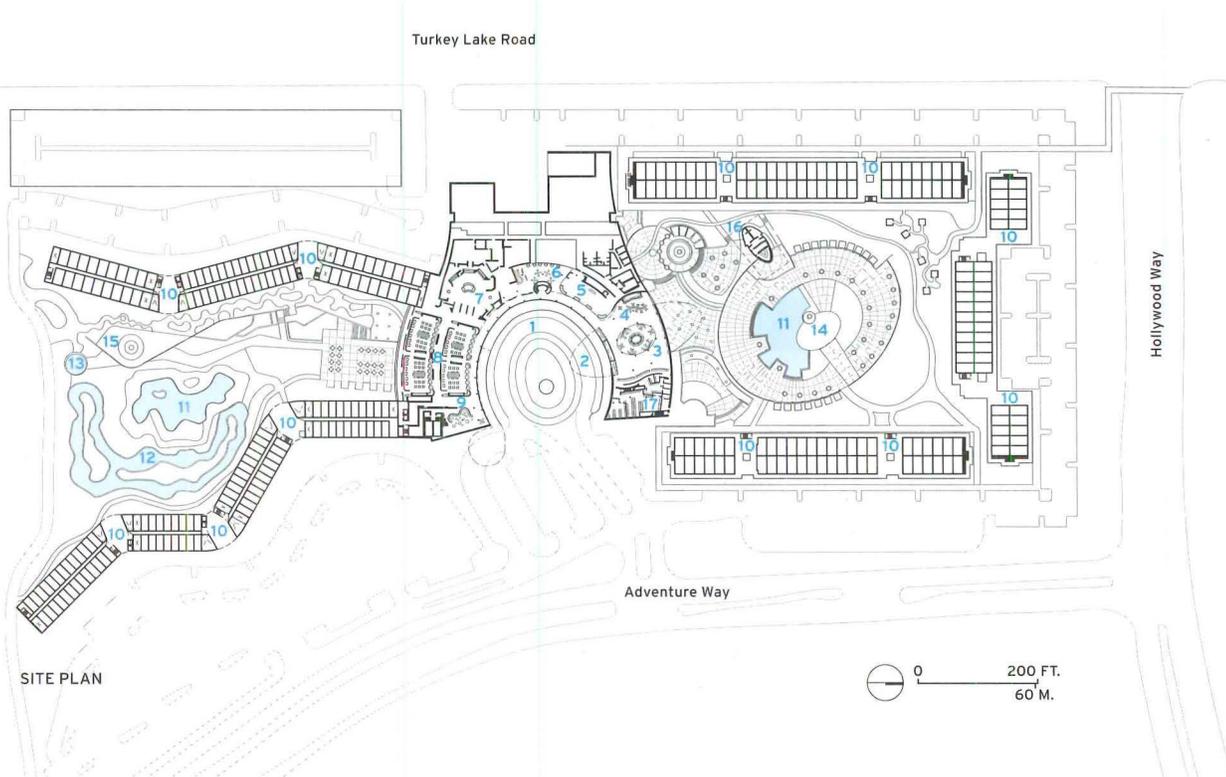
urban planner as well as an architect.” And while Universal saw the theming as an extension of its mission to create immersive experiences, Shulman was intrigued by the possibility of honoring the languages of the Florida Modern period in a contemporary reinterpretation.

Approaching this massive project, Shulman riffed on his deep knowledge of midcentury hotel design. “The most important component, which we elevated to the major organizing feature, was the pool deck,” he says, referring to the ubiquity of this element as lifestyle space in the postwar era at Florida institutions from Miami’s luxurious Fontainebleau to the smallest motel on the strip in Sunny Isles Beach. Traditionally, follies were scattered around this sheltered area—shade structures, diving platforms, barbecue pits—features that animated the open space and became



of the '50s and '60s that represented a simpler time,” says Russ Dagon, vice president and executive project director for Universal Parks & Resorts. “We fell in love with the idea of the motel building—one that would resonate with anyone who’s been to a coastal hotel.” The corporation’s creative group found Allan Shulman, who has researched and written extensively on Miami Modernism and whose firm has considerable hospitality and midcentury restoration and adaptive-reuse projects in its portfolio. But its hotels have been in the urban boutique category. Surrounded by exurban bleakness on 40 acres, Cabana Bay, with its swimming pools, water follies, bowling alleys, and 650-seat dining hall, is another beast altogether (and there are already plans to expand). “This is a hotel of another order—it’s more of a campus or a complex,” says Shulman. “I had to think like an

**CHECKOUT TIME**  
Seven-story guest room wings (opposite) face each across an open space animated with pools, sunning decks, and other amenities. The elliptical porte cochere (above) sweeps guests from the entry court into the lobby.



- 1 ENTRY COURT
- 2 PORTE COCHERE
- 3 LOBBY/TERRARIUM
- 4 SWIZZLE LOUNGE/BAR
- 5 GIFT SHOP
- 6 STARBUCKS
- 7 BAYLINER DINER FOOD COURT
- 8 DINING HALL
- 9 LOUNGE
- 10 GUEST ROOMS
- 11 POOL
- 12 LAZY RIVER
- 13 JACUZZI
- 14 "DIVING TOWER" STRUCTURE
- 15 HIDEAWAY BAR & GRILLE
- 16 ATOMIC TONIC BAR
- 17 STORAGE

SITE PLAN





**POOL PARTY**  
 Guest room bars with motel-style exterior corridors (opposite) form a room around a pool and the follies that surround it, such as concrete-shaded picnic benches. The curvilinear arrival building (top, right), screened with perforated metal panels, connects a double-height concourse inside with the entry court. A water slide (right) deposits riders beneath a sculptural precast concrete "diving tower."



distinguishing features of each hotel. True to this model, at Cabana Bay the architects created a kind of “great room,” with a large pool at the north end, by enclosing the space with four-story orthogonal bars of guest rooms that open to exterior walkways. To the south, the seven-story guest room wings (with interior corridors) extend out as long zigzagging arms embracing the breezy green space and pools in between. Projecting concrete floor plates and colorful grids of aluminum panels provide depth and character to the huge facades, stylistic moves that borrow from popular midcentury architecture, which often relied on simple means and legible functionality for expression. “In Florida,” notes Shulman, pointing to the shadows cast across the elevations, “architects who could not indulge in expensive materials understood that they had the sun to work with.”

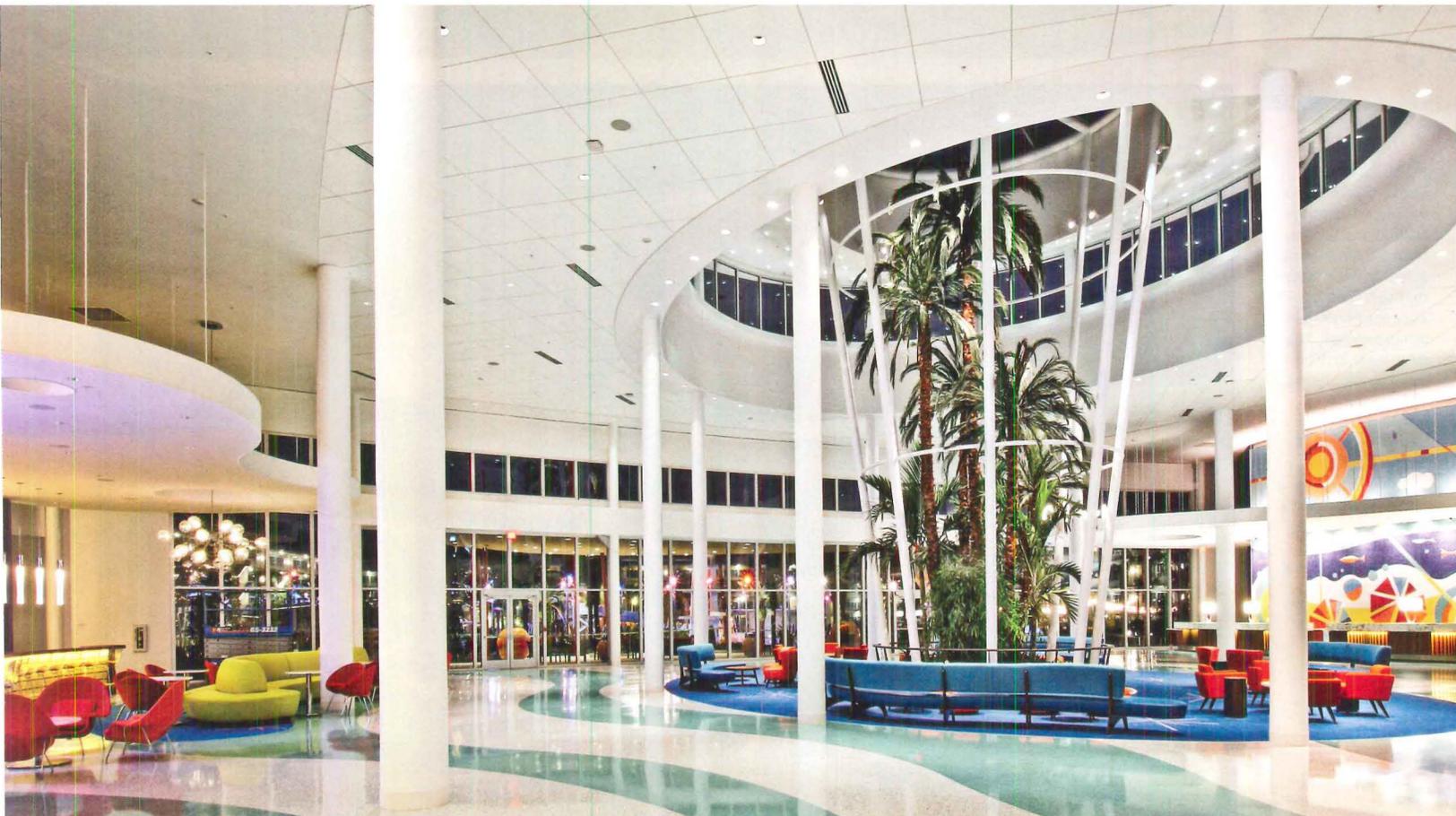
Linking the north and the south is a curvilinear arrival building that contains the lobby, restaurants, lounge, and recreation spaces. Recalling grand entry sequences of the past, a broad circular drive-up space with a swoopy porte cochere whisks guests into a soaring, white, terrazzo-floored lobby with a giant palm-tree “terrarium” as its focal point. This space hums throughout the day as guests come and go from the theme parks and spill out in bathing suits to the enormous pool area beyond. A mall-like “concourse” also leads from the lobby, linking a gift shop, Starbucks, food court, double-height 14,000-square-foot dining hall, and, on a mezzanine level, an arcade and bowling alley. (The program developed over the rapid, 26-month design and construction

period, notes Shulman.) Big, open public spaces are complemented with smaller environments: conversation areas, cabanas, fire pits, and other amenities that break down the scale and facilitate intimate gatherings.

In sync with Shulman’s approach, Philadelphia-based Daroff Design considered the interiors also as a modern interpretation of the time. “Every element of the lobby was imagined to be ‘bigger than life’ rather than a slavish recreation of the period,” says principal designer Karen Daroff. Sprightly finishes and motifs throughout the resort underscore the pursuit of leisure. The conceit is potent, but it doesn’t quite go over the top: a vibrant palette of aqua, orange, and lime green is tamed by terrazzo, teak, walnut, and bronze. And the smartly designed guest rooms, the suites in particular, evoke the traditional motel room while correcting its missteps, offering added daylight, privacy, and flexibility with logical floor plans and screening devices.

With Cabana Bay, the design team has taken an outside commercial venture and used it to elevate the experience of the middle-market family vacation. Despite the staff’s bowling shirts, the ’50s pop soundtrack, and vintage cars out front, the hotel does not lapse into nostalgia. “For me, the midcentury era represented a time of optimism, the feeling of endless possibilities,” says Shulman. The complex, with its logical spatial organization, clean lines, and jaunty vibe saluting simple pleasures, communicates this idealism while bringing dignity to a building type that typically lacks this quality. ■

**DREAM VACATION**  
Morris Lapidus’s terrarium for Bal Harbour’s Americana Hotel inspired the one in Cabana Bay’s lobby (below), set against terrazzo floors and a whimsical tile mural behind check-in. For the interiors, Daroff Design researched midcentury pop culture, furniture, and craft. The color palette carries into guest rooms, including family suites (opposite, top), which include kitchenettes and sitting areas. Rows and rows of cabanas and deck chairs (opposite, bottom) accommodate the thousands of guests.





### credits

**ARCHITECT:** Shulman + Associates – Allan Shulman, design principal; Derek Sommers, Juan Alvarenga, Brand Gonzalez, Luis Sanchez, Herman Courrau, Michelle Bilbao, Wesley Kean, project managers/designers; Jason Walker, Claudia Aguado, Andres Camacho, Mike Galea, Smitha Vasam, Monica Socorro, graphics

**ARCHITECT OF RECORD:** Lindsay Pope  
Brayfield Clifford & Associates

**INTERIOR DESIGN & ARCHITECTURE:** Daroff Design – Karen Daroff, principal designer; Katie Pass, associate designer; Richard Lanning, senior architect

**LANDSCAPE:** ESciences

**CLIENT:** Universal Parks & Resorts/Universal Creative/Loews Hotels

**SIZE:** 1,250,000 square feet

**COMPLETION DATE:** March 2014

### SOURCES

**GLASS:** Oldcastle BuildingEnvelope

**METAL PANELS:** McNichols

**ELEVATORS:** Otis

**SPECIAL SURFACING:** Formica



# Two-Wheel Drive

Onomichi U2 | Hiroshima Prefecture, Japan | Suppose Design Office

A seaside warehouse shifts gears to become a new hotel for cyclists.

By Naomi R. Pollock, AIA

Photography by Toshiyuki Yano



WITH A NAME that sounds like a rock band and a program inspired by the current biking boom, Onomichi U2 is an uber-cool hotel where cyclists can stay with their wheels. A repurposed warehouse erected in 1943 in a town 45 miles from the city of Hiroshima, Japan, the building includes 28 bike-friendly guest rooms plus assorted shops and eateries. The project is the product of Suppose Architects, the Hiroshima firm headed by Makoto Tanijiri. An avid cyclist himself, Tanijiri scored the commission after winning a competition hosted by Hiroshima Prefecture. What the client had was an old building and an objective of luring visitors to Onomichi, a town of 145,200 on the Inland Sea. What the architect offered was a clever solution that combines history with the here and now.

Intended as both a tourist draw and a town amenity, the project, whose name derives from the warehouse's original designation, Uwaya Storage #2, sits on the waterfront. It is just a short distance from Onomichi's train station, a frequent launch point for bike enthusiasts heading to the nearby Shimanami Kaido, a 45-mile-long cycling course spanning eight small islands. Facing the station, the main entrance is at one end of the 304-foot-long structure. It leads into a cavernous 21-foot-high lobby and a cycle shop off to one side. Straight ahead are an open-kitchen restaurant, a bakery, shops, and a café where bikers wheel up to order lattes from a takeout counter outside.

The two-story hotel fills the warehouse's west end, starting with a reception desk designed so guests can check in while still in the saddle. From there, extra-wide corridors and stairs with narrow bike ramps lead to 14 rooms on each floor. Styled like a traditional *engawa*, or porch, a raised platform running the length

of the first-floor hall gives guests a place to sit and chat with fellow cyclists.

The individual accommodations fit neatly within notches on the building perimeter—former loading areas now filled with greenery. They include 22 standard rooms plus six deluxe ones distinguished by a raised floor and spa-style bathtub. Each room is equipped with a wall-mounted bike hook, heavy-duty flooring, and plenty of dark-gray paint to conceal the inevitable scuffs and scratches. Located along the windowed outer wall, the bathrooms are separated from sleeping areas by privacy curtains and clear-glass partitions that allow daylight into both spaces.

While Tanijiri designed Onomichi U2 for bikers, the original 25,000-square-foot structure was built for trucks carrying cargo to ships going out to sea. Despite its industrial origins, the warehouse did not meet the current earthquake code and required supplemental below-grade beams. Yet even after these reinforcements were installed, the existing reinforced-concrete structure could not support any new loads. So Tanijiri inserted a new lightweight-steel frame to support his architecture, essentially creating a building within a building. "We treated the inside like an outside site," explains the designer.



**MARITIME ROOTS**  
 The 25,000-square-foot dockside warehouse has been converted into a 28-room hotel for bicyclists (opposite). The architect retained the industrial look of the building (top), including original painted signage, inside, however, he created new spaces for eating, drinking, and shopping (this photo).

credits

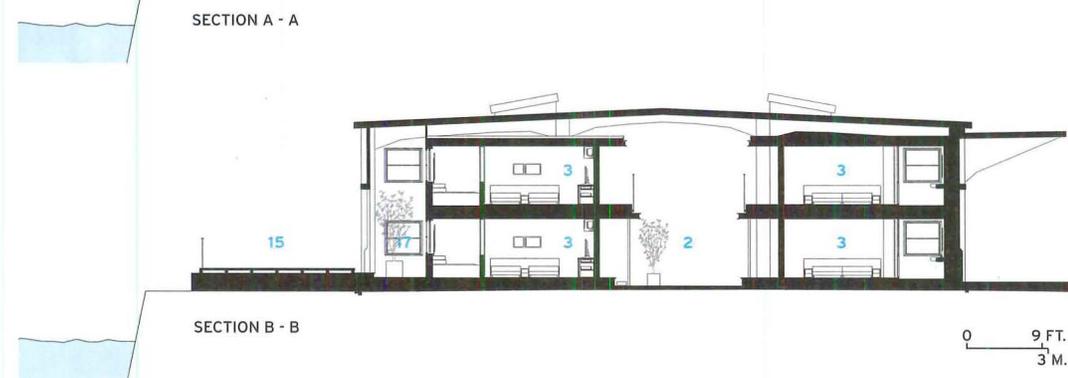
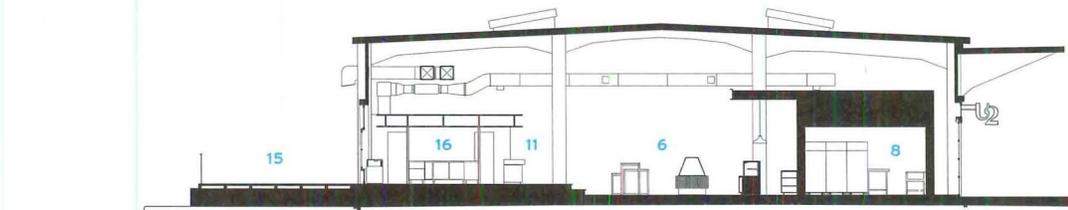
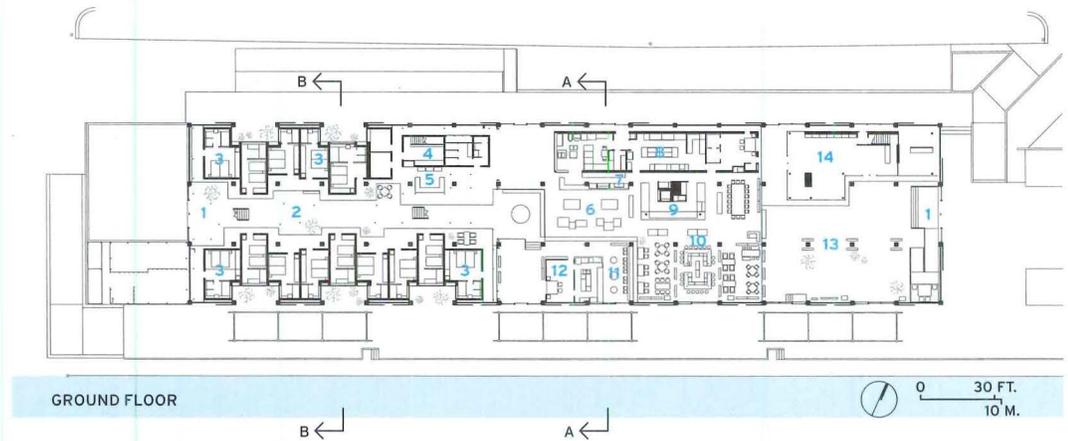
**ARCHITECT:** Suppose Design Office – Makoto Tanijiri, Ai Yoshida, Yuji Okanishi, Toshinori Iwatake, Kinuyo Sugiura, design team  
**ENGINEERS:** Arup (structural and environmental design)  
**CONSULTANTS:** Landscape Niwatan (landscape); UMA/design farm (graphics)  
**GENERAL CONTRACTOR:** Daiwa Construction  
**CLIENT:** DiscoverLink Setouchi  
**SIZE:** 25,000 square feet  
**CONSTRUCTION COST:** withheld  
**COMPLETION DATE:** March 2014

SOURCES

**SKYLIGHTS:** Sanyo Industries  
**WINDOWS:** IH Wood Window  
**RECEPTION FURNITURE:** Marukei Woodworks  
**SEATING AND TABLES:** E&Y



- 1 ENTRY
- 2 HOTEL LOBBY
- 3 GUEST ROOM
- 4 OFFICE
- 5 RECEPTION
- 6 STORE
- 7 BAKERY
- 8 KITCHEN
- 9 OPEN KITCHEN
- 10 RESTAURANT
- 11 CAFÉ
- 12 STORAGE
- 13 EVENT SPACE
- 14 CYCLE SHOP
- 15 PEDESTRIAN DECK
- 16 CYCLE-THROUGH COUNTER
- 17 GARDEN





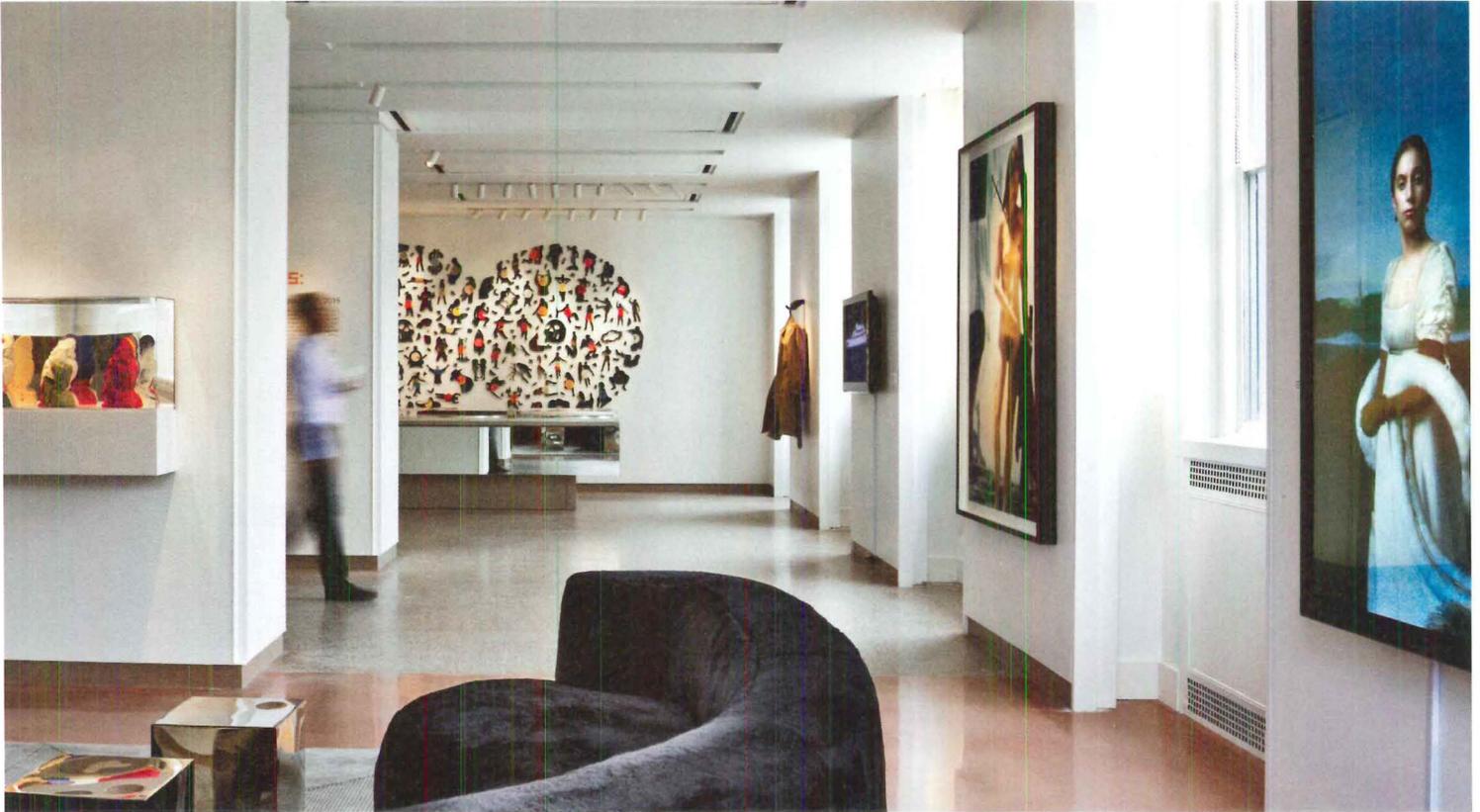
#### PEDAL POWER

Guests can bring their bikes almost everywhere in the hotel. Even guest rooms are equipped with wall-mounted bike hooks (opposite). A platform running through the center of the hotel recalls a traditional Japanese *engawa* or porch and allows guests to socialize and fuss over their cycles (above). The east side of the building provides space for a restaurant, café, bakery, and store (right).

Where nonstructural elements were concerned, however, Tanijiri endeavored to incorporate the old into the new. Capitalizing on the site's shoreline winds, the existing skylights not only bathe the interior with soft daylight but facilitate natural ventilation by drawing hot air up and out. And instead of camouflaging the aged concrete ceiling, the architect left it as is. "We like the feeling of history," he says. To that end, he kept the wooden bumpers affixed to the interior walls, the sliding dockside doors (now pinned in place), and painted signage on the building's exterior.

Against this backdrop, Tanijiri's custom furnishings and light fixtures are a refreshing contrast. "Its like pairing vintage jeans with a new jacket," comments the architect who even advised on the design of pajamas for the hotel guests. More distressed denim than Issey Miyake Pleats Please, Onomichi U2 finds beauty in things that weren't meant to be beautiful. ■





## Artistic License

21c Museum Hotel | Durham, North Carolina  
Deborah Berke Partners

A hotel in a renovated commercial building draws guests with contemporary art and Southern charm.

By Clifford A. Pearson  
Photography by Chris Cooper

A **FULL-FRONTAL** nude of Jackie O. greets guests in the lobby of the 21c Museum Hotel in Durham, North Carolina. Some people remember the original grainy photographs taken by a paparazzo of the former First Lady skinny-dipping on a Greek island and still get angry at the invasion of her privacy. Using art, such as the large T.J. Wilcox collage of Jackie O., to provoke thought and emotion is part of the hotel's mission, along with making guests comfortable in a converted 1937 bank building. Balancing those dual roles was the challenge facing architect Deborah Berke as she turned a 17-story tower into a 125-room hotel.

"The idea is to use Southern hospitality to make contemporary art more accessible," says Berke. Architecture provides the context for both, while keeping them in a dynamic state of equilibrium. In the lobby, for example, the art takes

precedence, giving that space the feeling of a gallery. But a plush couch at one end and a reception desk at the other remind everyone that this is a hotel. Similarly, white walls and track lights say "museum," while tall windows and plenty of daylight help relax the mood.

The fourth in a growing chain of 21c hotels, the Durham property follows incarnations in Louisville, Cincinnati, and Bentonville, Arkansas (*RECORD*, June 2014, page 146). Two more are in construction—in Lexington, Kentucky, and Oklahoma City—and two are in design: Kansas City and Indianapolis. The company's founders, Laura Lee Brown and Steve Wilson, developed the Louisville project as a way of sharing their collection of 21st-century art with the public and reviving their hometown's urban core. The success of that first property has led them to create one of the largest museums of contemporary art in the country—42,000 square feet and counting—albeit spread out over multiple locations. Now the Durham hotel is injecting new life into a town of 245,000, where Duke University is top dog.

Berke renovated the late-Art Deco Hill Building, which sits at a strategic location near a cluster of other urban-renewal projects—such as the Durham, a new boutique hotel opening soon, and the old American Tobacco complex where Lucky Strike and Bull Durham tobacco facilities have been converted into stores, restaurants, bars, and office space for

**CULTURAL LURE**  
The hotel lobby hosts rotating art exhibits, such as the current one, *Pop Stars* (above). Different exhibits take place in the restaurant (opposite), where the art tends to be less provocative and more dining-friendly.

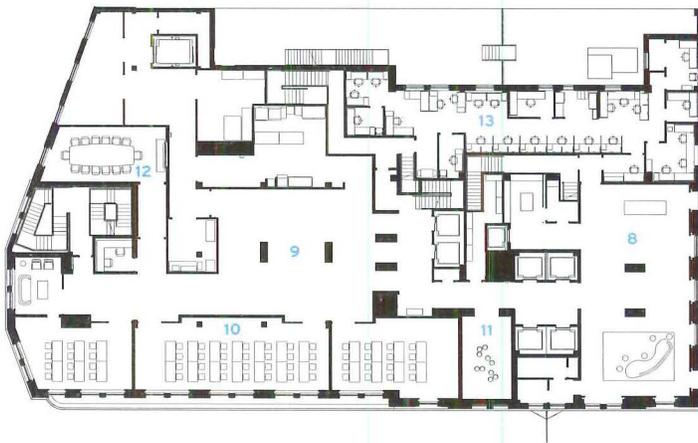




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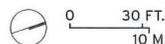
THIRD FLOOR



SECOND FLOOR



FIRST FLOOR



- |                        |                   |
|------------------------|-------------------|
| 1 ENTRY                | 8 LOBBY GALLERY   |
| 2 RESTAURANT RECEPTION | 9 GALLERY         |
| 3 BAR                  | 10 MEETING        |
| 4 LOUNGE               | 11 VIDEO GALLERY  |
| 5 RESTAURANT           | 12 BOARDROOM      |
| 6 PRIVATE DINING       | 13 ADMINISTRATION |
| 7 BALLROOM             | 14 GUEST ROOM     |

credits

**ARCHITECT:** Deborah Berke Partners – Deborah Berke, partner; Stephen Brockman, principal; Terrence Schroeder, senior associate; Stephen Lam, project manager; Virginia Gray, designer

**ARCHITECT OF RECORD:** Perfido, Weiskopf, Wagstaff + Goettel

**ENGINEERS:** KLH Engineers (m/e/p); Stewart Inc. (structural); Coulter Jewell Thames (civil)

**CONSULTANTS:** Illumination Works (lighting); Judith B. Williams (historic preservation)

**CONSTRUCTION MANAGER:** Skanska NC

**CLIENT:** 21c Museum Hotels

**SIZE:** 134,000 square feet

**CONSTRUCTION COST:** withheld

**COMPLETION DATE:** March 2015

SOURCES

**ENTRY CANOPY:** Acurlite System

**STOREFRONT WALL:** Kawneer

**STONE CLADDING**

**RESTORATION:** Baker Restoration

**CASE GOODS IN GUEST ROOMS:** Kimball Hospitality



**INSIDE JOB**  
 A vault in the basement now serves as a retreat (opposite). Guest rooms (left) range from 300 to 1,120 square feet and use a color palette that echoes the silvery tones of Art Deco architecture. Colored light from bathroom vanities enlivens the exterior (below).

creative companies. Designed by Shreve, Lamb and Harmon, who did the Empire State Building, in association with the Durham architect George Watts Carr, the Hill Building was an imposing landmark housing the Ellis Stone Department Store and the Home Savings Bank and Trust Company on the ground floor, with offices above.

Berke found new uses for the building's major features, turning the high-ceilinged department store into the hotel's restaurant and bar, and fitting out the wood-paneled banking hall as a special-events venue. While these spaces benefit from the graceful proportions and windows of the original structure, they are treated as new elements, with contemporary light fixtures and materials. "We're not restoration architects," says Berke. "We creatively redeploy old buildings for new uses." But she kept the ground-floor elevator lobby much the way it was in 1937, retaining its silver-leaf ceiling, terrazzo floor, marble walls, and even the Deco mail chute. She also restored the safe-deposit boxes in a vault in the basement and furnished the space with new couches, so it can serve as a bar retreat. "By contrasting the new with the old, you can get the character of history without being beholden to it," says the architect.

The hotel's function as a museum is integrated throughout the building, with art almost everywhere. Rotating exhibitions occupy all the public spaces, including the hotel's lobby on the second floor, galleries on the first and second floors, and the restaurant. In addition, six site-specific pieces in key places like the main stairwell and the reception area remain in place permanently. In the elevator lobbies of guest room floors, work by local artists is displayed in wall niches, called vitrines. Alice Gray Stites, the vice president and museum director for 21c, curates the shows and commissions the site-specific work, by artists who are invited to install the pieces and talk to guests about them. "Our goal is to make museum-quality art available to communities 365 days a year, 24/7," says Stites.

Open since March, the hotel is attracting guests from the region and locals who come for the dining, event spaces, and free art. The buzz is back in downtown Durham. ■



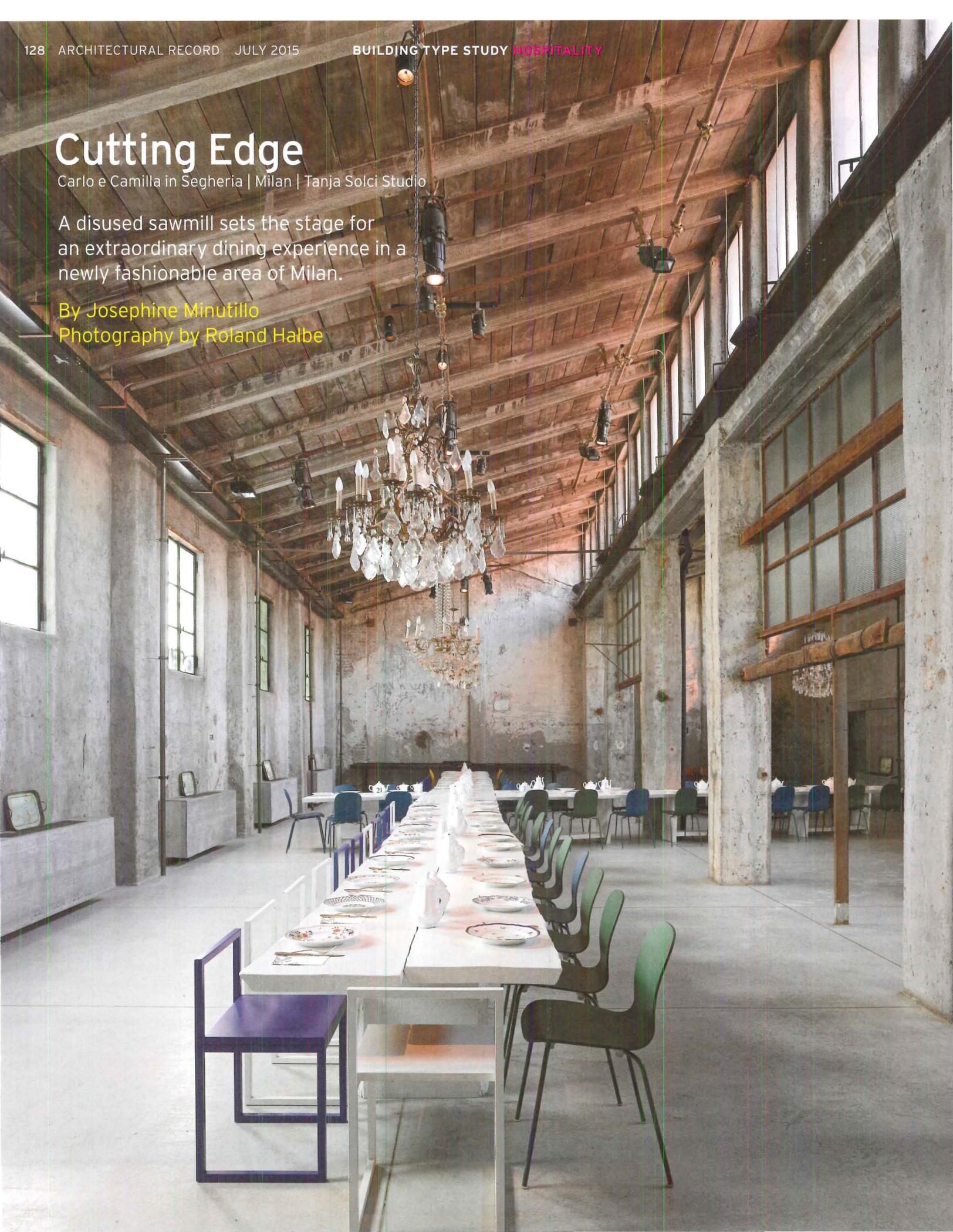
# Cutting Edge

Carlo e Camilla in Segheria | Milan | Tanja Solci Studio

A disused sawmill sets the stage for an extraordinary dining experience in a newly fashionable area of Milan.

By Josephine Minutillo

Photography by Roland Halbe



**"IT'S ALL** about irony," Tanja Solci says rather matter-of-factly about Carlo e Camilla in Segheria, the Milan restaurant she opened last year. From its name—translated to Charles and Camilla, of royal British fame—to its location (*segheria* is *sawmill* in Italian), nothing about this dining experience is straightforward.

The building had been around for nearly a century, and, in the hands of Solci's grandparents, was operated as a sawmill from the end of World War II through the 1970s. After letting the industrial facility sit vacant for decades, Solci's father—also, not coincidentally, named Carlo—entertained offers from the likes of McDonald's and Dolce e Gabbana to rent and refurbish it. But the scion convinced Carlo to hand the structure over to her and, in 1999, oversaw its complete restoration. "I was in love with the atmosphere," recalls the youngest Solci, still in her 20s then. "The idea was to stop time."

Treating the neglected facility as if it were an "important historic building," according to Solci, restorers painstakingly cleaned the masonry walls and replaced the wood roof. For nearly 15 years, Solci, an artistic director, used the renovated



**MEAL TICKET**  
In the main space, the long, intersecting dining tables are lined by "masculine" chairs on one side, and "feminine" ones on the other. The angular Fronzoni '64 chair, designed by A.G. Fronzoni in 1964, contrasts with Jasper Morrison's curvy Tate chair, designed in 2000 (opposite). Vintage chandeliers hanging from the restored wood roof provide ambience, but no illumination (left).

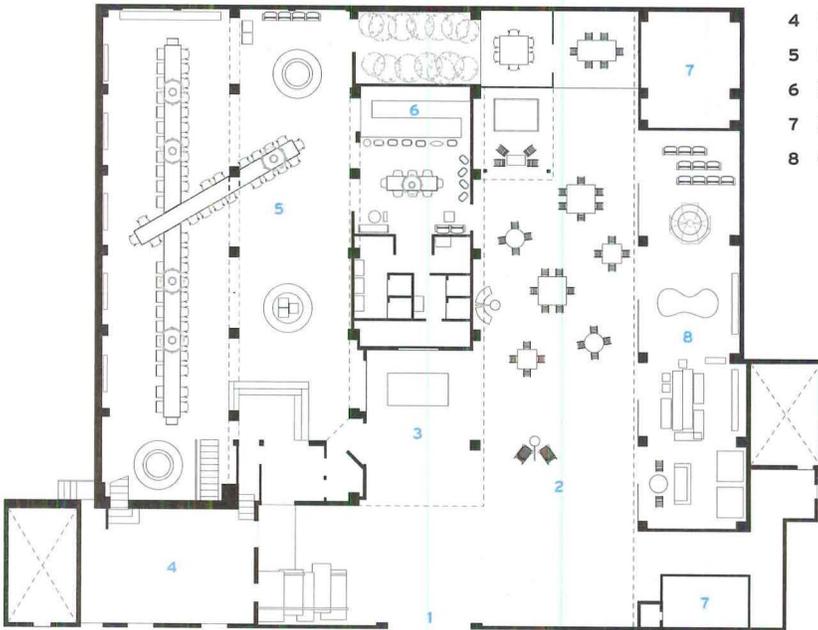
PHOTOGRAPHY: © NATHALIE KRAG

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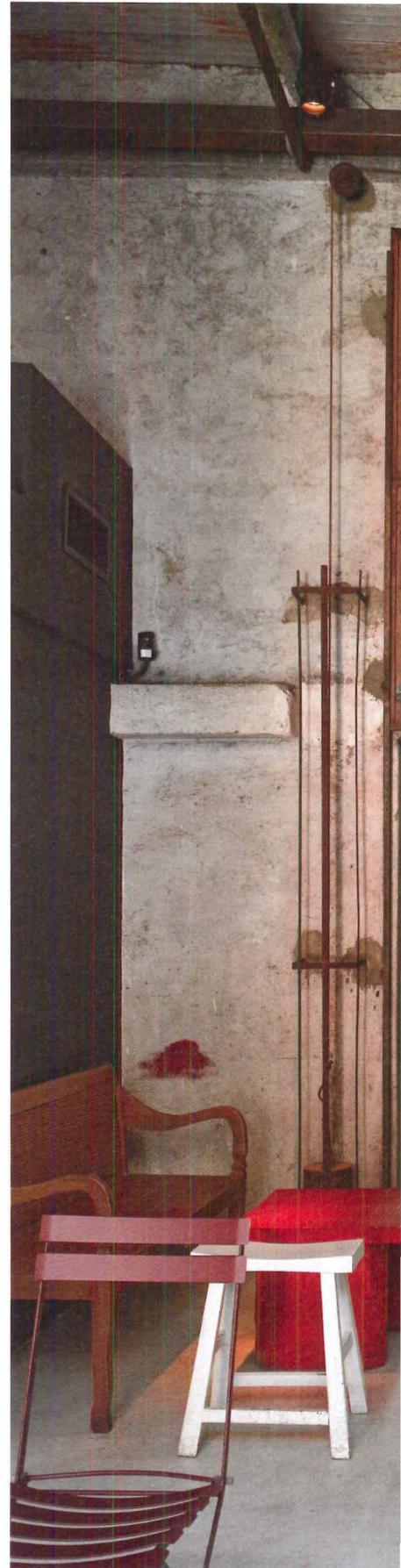


**INDUSTRIAL CHIC** The 10,000-square-foot former sawmill complex includes several brick-and-concrete buildings. A long outdoor courtyard separates the main space from smaller rooms for more casual dining (above). Weathering steel lines interior portals between the dining space and the cocktail bar, where furnishings are more playful (right).

- 1 COURTYARD ENTRY
- 2 COURTYARD
- 3 INDOOR ENTRY
- 4 KITCHEN
- 5 DINING
- 6 BAR
- 7 STORAGE
- 8 COLONNADE



FLOOR PLAN







**EAT OUT** If communal tables are not your thing, separate rooms for small groups offer a more private dining experience (left).

restaurateur she first encountered by watching Italy's version of *MasterChef*, who runs a popular eponymous Milan establishment. ("This place would be like his mistress," Solci jokes.)

The resulting restaurant is less an architectural achievement than a brilliant work of scenography. Two rectangular tables—one 82 feet long—intersect at the center of the main space to accommodate over 60 diners, seated communally—on one side, on angular "masculine" chairs, along the other, curvy "feminine" ones. On the tables, food is served on 25 different out-of-production patterns by historic Italian dinnerware brand Richard Ginori (now owned by Gucci). Over them, vintage crystal chandeliers set the stage within the soaring space but actually provide no illumination. A modular metal grid of theatrical lighting above the chandeliers houses the real luminaires. "The idea was to have these bodies floating for a magical atmosphere," says Solci. "That's exactly the concept of the whole project." By the windows, more trompe l'oeil lighting fools diners and guests seated at the bar, in a room adjacent to the dining space, into thinking sunlight is pouring in during the dark of night. Less formal areas for eating and drinking are located across a wide courtyard, the whole complex giving off an air of "aristocratic decadence," as Solci describes it, shielded from the street by a rather imposing gate.

With the major restoration completed years before, construction this time around focused on transforming an office space into a professional kitchen and replacing the pavement to accommodate under-floor radiant heating. Solci took a hands-on approach to make sure the new surface looked exactly as it did after the 1999 renovation, personally dispersing the soft white quartz dust during the pre-dawn concrete pour to achieve the perfect color blend.

Having played such an integral role in the creation and design of Carlo e Camilla, Solci has become accustomed to the nickname Camilla, though she admits, somewhat reluctantly, that the original inspiration for that moniker, aside from the Duchess of Cornwall, was her dog. ■

#### credits

**DESIGNER:** Tanja Solci Studio

**CONSULTANTS:** Giambattista Buongiorno (theatrical lighting); Roberto Da Pozzo (graphic and art direction)

**GENERAL CONTRACTOR:** Montorfano Renato

**COMPLETION DATE:** March 2014

#### SOURCES

**PAINT:** Farrow & Ball

**TILE:** Cerim

**FURNITURE:** Cappellini (chairs)

**CABINETWORK:** Benfenati Allestimenti

10,000-square-foot space as her office and as an occasional venue, particularly during Milan's annual Design Week in April, for special events and exhibits she orchestrated for clients including electronics company Bang & Olufsen, designer Ross Lovegrove, and architect Claudio Silvestrin.

As Solci contemplated a change in career and scenery, she, like her father before her, considered renting the building to someone in the food or fashion industries. Instead, the creative spirit in Solci led her to once again opt to reinvent the space. She partnered with another Carlo—Cracco, a Michelin-starred

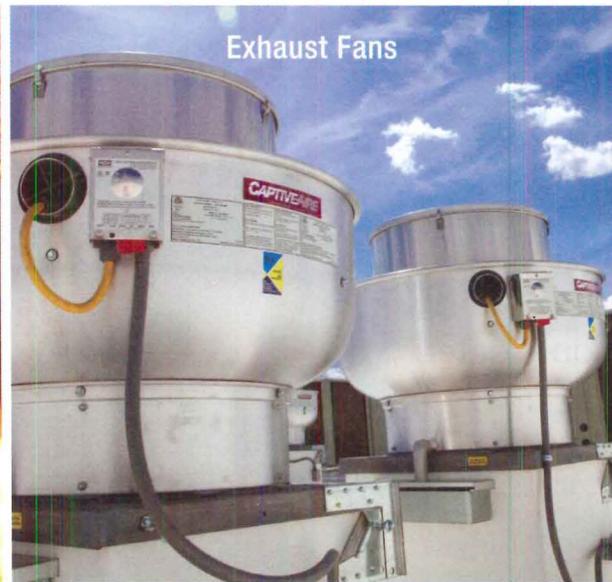
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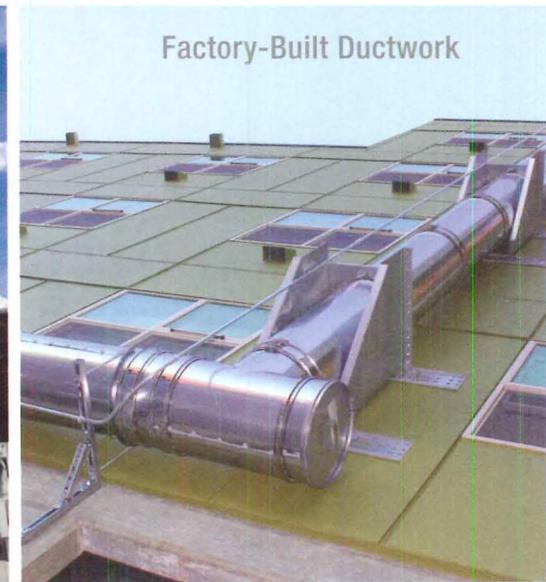
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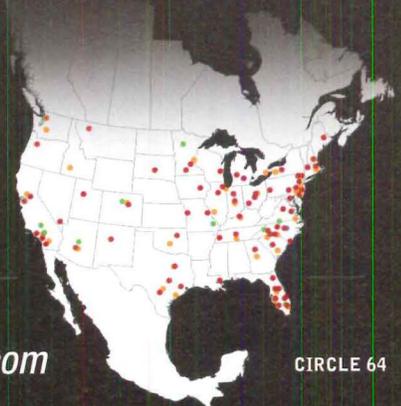
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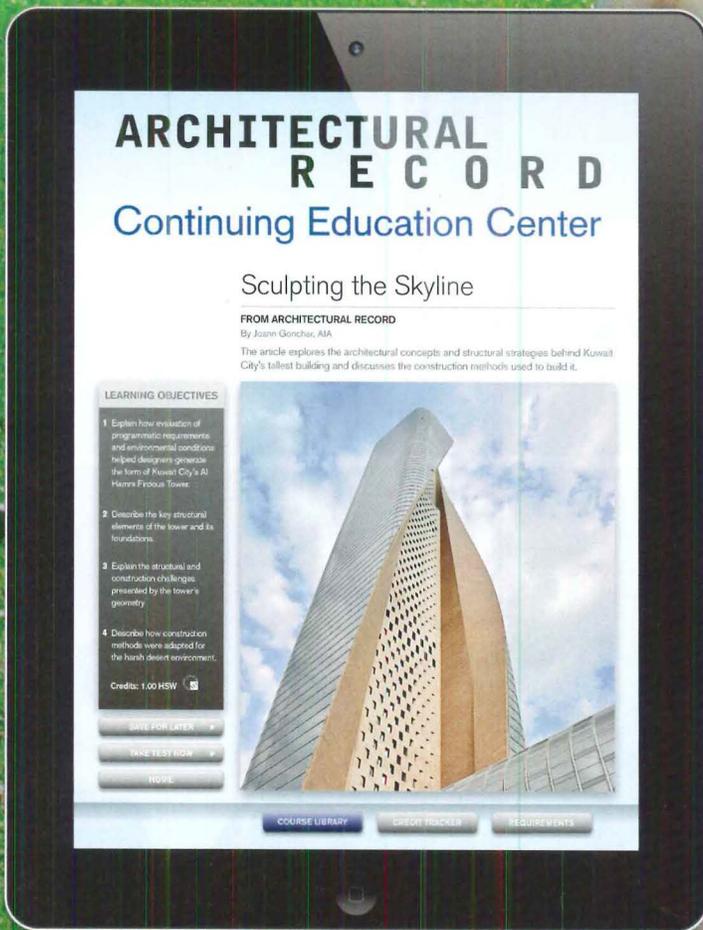


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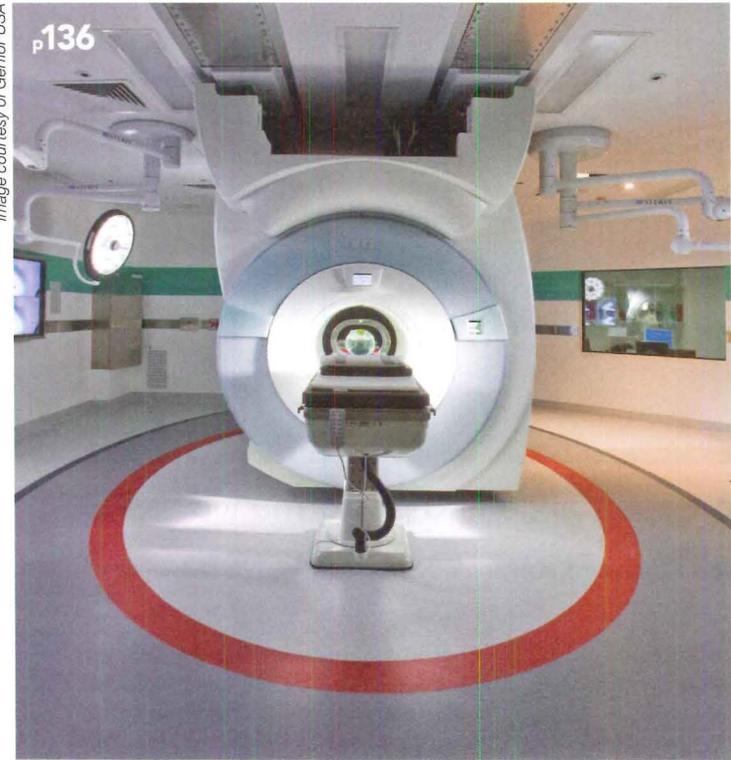
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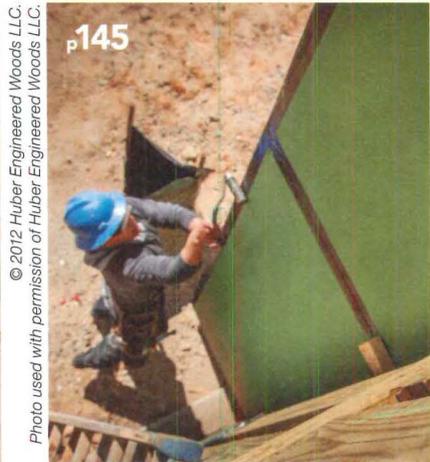
Image courtesy of Gerflor USA

## Enhancing Design Excellence with Innovative Surface Solutions

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p145

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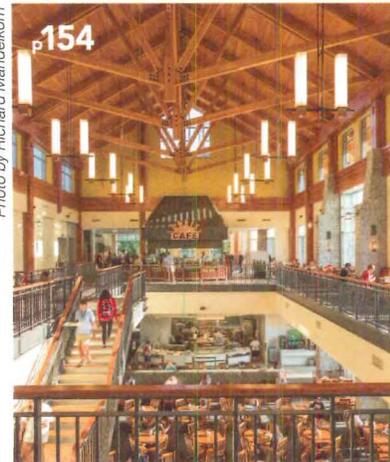
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- ST STRUCTURAL
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# Enhancing Design Excellence with Innovative Surface Solutions

The significance of interior floor and wall surfaces lies in both their aesthetic design impact and their ability to perform as intended in the spaces where they are used.

Interior wall and floor treatments can improve appearance and performance

Sponsored by Eldorado Stone, Gerflor USA, and MP Global Products | By Peter J. Arsenault, FAIA, NCARB, LEED AP

Interior wall and floor surfaces can be viewed as a design medium. In virtually every building, they are opportunities to create the overall look and feel of a space in concert with the surrounding areas and connections to the outdoors. The texture, color, materiality, and form of the surfaces benefit from the palette of choices used by the architect or interior designer to create a variety of results. Beyond the appearance, however, the performance of those surfaces initially and over time is usually critically important to the users and owners of the building. The ability to clean, maintain, and rely on the long-term use of the finished surfaces is important. Similarly, the coordination between individual materials and other building components and spaces is critical for proper performance. From a construction standpoint, the choice of floor and wall surface materials can make a notable difference in the overall time schedule and cost of a building project. Creating a successful project, therefore, depends on a proper understanding of both the design traits and performance characteristics of the products and materials used.

## INTERIOR DESIGN

When discussing interior wall and floor surfaces, we are really talking about interior

design whether carried out by a licensed architect or a certified interior designer or both. The Council for Interior Design Qualification, or CIDQ, is recognized as a leader in establishing standards of competence for interior design professionals. Accordingly, it asserts to “protect public health, safety, and welfare by identifying interior designers who have the knowledge and experience to create interior spaces that are not just aesthetically pleasing, but also functional and safe.” Hence it recognizes the two-fold role of interiors which we have categorized here as design and performance. The council also administers the rigorous NCIDQ Exam for interior designers who meet the eligibility requirements of education and experience. Those who pass the exam are assigned a unique NCIDQ Certification number that attests to their qualifications.

The CIDQ defines interior design as “a multifaceted profession in which creative and technical solutions are applied within a structure to achieve a built interior environment.” This means that solutions are sought that are functional, enhance the quality of life of the occupants, and are aesthetically attractive. The process of designing interiors typically follows a rather systematic approach

based on coordination of the interiors with the overall project and building goals as well as the human and functional needs of the owners or users. Of course interior building designs must also adhere to code and regulatory requirements and increasingly embody principles of environmental sustainability and healthy indoor spaces. Products selected and specified for interiors can make significant contributions toward building and commercial interior projects, achieving green certifications through programs such as the LEED rating system and others. That means they can have positive impacts on the people in the buildings while minimizing any negative impacts on the natural environment.

Beyond certification qualifications, the International Interior Design Association (IIDA) is a preeminent association for commercial interior design professionals. Jessica Mann Amato, president-elect of the IIDA NY Chapter and senior project manager, NELSON, New York, N.Y., sums up her perspective on design this way: “Design is the expression of the envelope that surrounds you at work, at home, at play, everywhere. It’s creating an experience, an emotion, or a story of your surroundings; helping life’s functions to be pleasing to the senses while organizing you.” Based on this

perspective, it is clear that the decisions that are made related to the design of interior spaces are interrelated to decisions made for the rest of the building, the people, and the environment too.

### DESIGN CONSIDERATIONS

As a practical matter, once a building space is defined in terms of size, volume, access, and flow, time is spent on selecting materials or products to finish the surfaces of those spaces. The range of choices can be staggering with regular updates by manufacturers on colors, styles, sizes, etc. Firms that can systematically access the most up-to-date information and stay abreast of the available products for different building types are most likely to be at the forefront of innovative and timely design solutions. Sometimes, that means being aware of new products or materials while other times that may mean using well-known materials in a different way. It may also mean paying attention to particular details of not only the finish material on the surface, but the underlying construction to assure or even enhance the intended use of a finish.

We will look at examples of these approaches to innovative interiors in three areas—wall surfaces, floor underlayment, and floor surfaces. In so doing, they will demonstrate some of the latest thinking and available types of products that can contribute to truly dynamic and sustainable interiors.

#### Wall Surfaces

The surface of a wall is clearly a very visible and influential element of any interior design. The wall can be smooth or textured, subdued in color or bold, natural in appearance or clearly processed. Selecting the most appropriate material from among all of the choices can help express design values about the building or touch on emotional and cultural triggers by the users. Accordingly, designers that can stay on top of the available options and choices are

typically the ones that become the most creative in final solutions.

As an example of an innovative choice, let's look at architectural stone veneer used on an interior wall. Solid stone has been common in many historical buildings and exudes a sense of permanence and durability. Cost realities of current construction usually favor lighter-weight alternatives that employ manufactured products with a believable, authentic appearance that still elevates the sense of quality in design. Toward that end, manufacturers have refined their products to be cost-effective while still allowing them to look authentic, natural, and most of all, beautiful. They point out that their products can elevate any space, adding depth, dimension, and texture unlike any other finish.

Like other wall surface treatments, architectural stone veneer is available in an extensive range of products from individual manufactured stone veneers to brick veneers to panelized stacked stone veneer—each intended to complement a variety of architectural styles. They often use stylized brick or stone appearances that range from old-world to contemporary with the intent of providing an appropriate choice for everything from a traditional stone breezeway to a modern, sleek manufactured stone wall.

One of the most common design techniques in the product is the texture of the stone. This can be achieved by casting from a mold made from actual natural stone. To make the molds, craftsmen sort through stone piece by piece and select only the rocks that complement each other with just the right shape, texture, size, and detail. State-of-the-art mold manufacturing then allows manufacturers to capture textural details down to the smallest level. This creates dozens of profiles in terms of shape, size, and texture available on the market today.

Equally important, the color of the stone can be controlled to suit design needs. Some may be the color of the formed and manufactured

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#### Learning Objectives

After reading this article, you should be able to:

1. Identify and recognize the aesthetic significance of wall and floor surfaces as part of the overall interior design of a space.
2. Assess the health and safety performance aspects of wall and floor surfaces as they relate to durability and sustainability.
3. Explain the importance of proper subfloor preparation and installation techniques to enhance acoustic and moisture control.
4. Determine ways to incorporate principles presented into buildings as shown in case studies.

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products, but some of the most appealing are literally hand painted piece by piece by highly trained artisans. As a manufactured stone product, natural mineral oxides are commonly used to infuse the surface with rich, authentic tones. This produces depth and variation of colors such as hints of rust, mossy greens, russet browns, and golden umbers. At least one manufacturer offers an extensive line of stone and brick veneer with over 150 color palettes to choose from.

#### Floor Underlayment

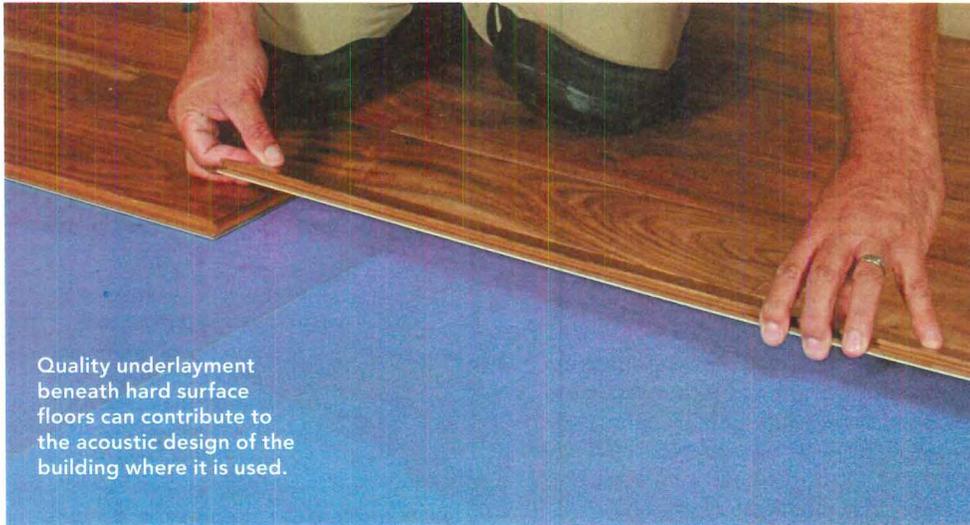
Turning our attention from walls to floors, we begin by looking at a significant component that can influence design as much as performance. Regardless of what finish flooring material is

Photos courtesy of Eldorado Stone



An example of a "before" and "after" interior transformation. On the left, this room contains smooth white walls creating a particular look and feel. On the right, architectural stone veneer is innovatively used to create a space that is warmer in color and provides a more textural quality.

Photo courtesy of MP Global Products



Quality underlayment beneath hard surface floors can contribute to the acoustic design of the building where it is used.

used, that material needs to be installed over something else. Hence, the choice of a suitable substrate with an appropriate underlayment material deserves proper attention. In the case of hard surface flooring in particular, such as wood or tile, the use of a performance-enhancing underlayment can help with design issues related to acoustics.

Quality fibrous underlayment that addresses acoustical control can quiet sound from impacts, dampen ambient noise, and inhibit sound transfer from traveling to the room

below. As explained by Duane Reimer, technical director of MP Global Products, "This can be especially important for the design of rental units, condos, and multifamily housing." As one component of a complete floor/ceiling assembly, the underlayment can contribute to the tested values of the assembly. The commonly referred to Sound Transmission Class (STC) rating stated for an assembly is typically determined by testing standards set forth by ASTM International. STC is a single number rating system used to qualify the performance

of a floor/ceiling assembly's ability to reduce airborne sound transfer—speaking, laughing, etc.—within established frequencies. Generally, the higher the STC rating, the better the floor assembly blocks noise from transmission through a wall or floor assembly.

The ASTM also has a test for Impact Insulation Class (IIC) values. IIC is also a single number rating but it tells how well a floor/ceiling assembly deadens or absorbs impact sounds such as footsteps. The IIC value of underlayment can often play the largest role in sound control between spaces in multistory buildings. As with the STC rating system, the higher the IIC number, the more sound that is deadened. Knowing what STC and IIC ratings are available, and what they stand for, is important when choosing the correct underlayment to go with a flooring system. Quality underlayment can also muffle the hollow sound and undesirable clicking noise that some engineered wood or laminated flooring can have when walked upon, thus enabling it to sound more solid. If the project owner or designer is specifically concerned with acoustic performance as part of the design, then check sound ratings of the underlayment. Manufacturers that test their products and get good results typically include them in company literature, on product packaging, and/or on the company website.

## LUXURY HIGH-RISE AND THE NEED FOR QUIET BETWEEN FLOORS



**Project:** Trump International Sonesta Beach Resort Hotel

**Location:** Sunny Isles Beach, Florida

**The challenge:** Trump International Sonesta Beach Resort in Sunny Isles Beach, Florida, has 355 hotel rooms and guest suites, each with a private balcony with views of the Atlantic Ocean or the Intracoastal Waterways. An appropriate flooring system needed to be specified to meet or exceed the standards of the building industry for sound abatement within the state of Florida and Miami-Dade County and have other performance capabilities, as well.

**Design criteria:** The developers of the resort, Donald Trump and Dezer Properties, wanted an underlayment that would address noise abatement, crack suppression, and potential mold issues. It also had to meet code requirements set by the industry within the state of Florida and Miami-Dade County plus be easy to install and cost effective. In Florida, there are code requirements for the floor assembly to address abatement of floor-to-floor noise between dwelling units in high-rise buildings or between units and public or service areas.

**The solution:** A fibrous underlayment was selected, specified, and installed. This high-performing earth-friendly fiber acoustic underlayment was selected for its ability to be used under glue-down and nail-down hardwood and engineered wood floors. It was also

properly used under ceramic, porcelain, and stone tile, where it acts as an isolation barrier. The underlayment selected is engineered to provide noise abatement, aid in crack suppression, and help minimize potential mold issues—all areas of concern for the project.



up to ¼ inch from concrete subfloors to the covered flooring material. It also includes an antimicrobial additive that inhibits mold growth and, with an R-value of approximately 0.50, adds a bit of a thermal break to the flooring assembly.

Angel Acosta, construction project manager, Trump Grande Ocean Resort and Residences, observed, "The underlayment was easy to install, cost effective, and met all the code requirements set by the industry within the state of Florida and Miami-Dade County."

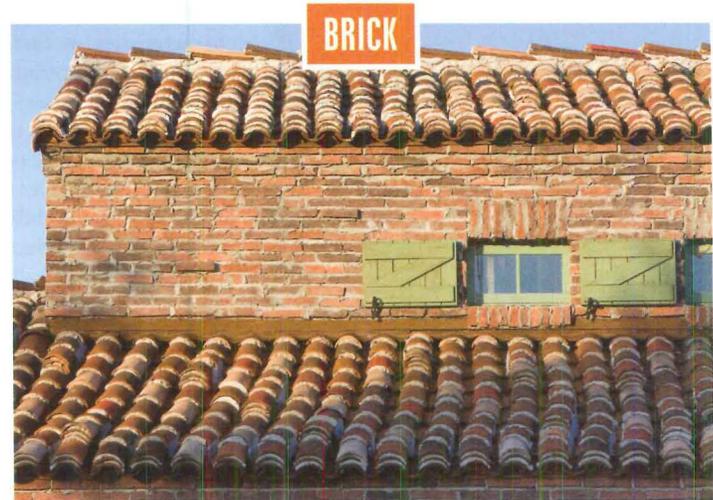
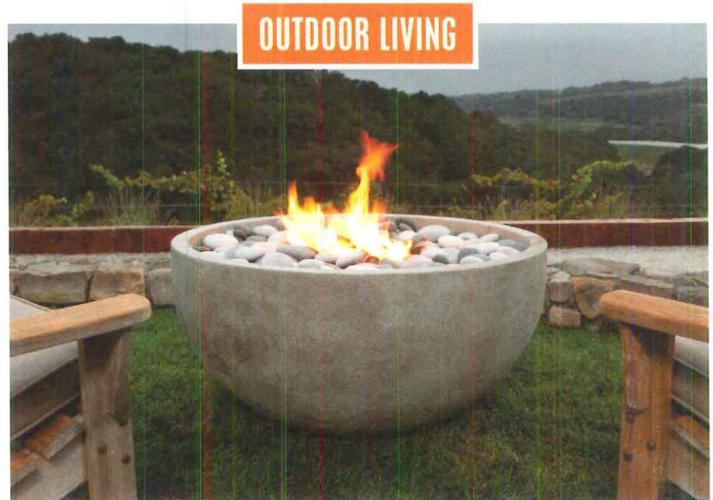
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## Floor Surfaces

Selecting a flooring material for many commercial and industrial installations is often heavily dependent on performance but that doesn't mean that appearance and design have to suffer as a result. Quite the contrary, the flooring industry has developed many dynamic and attractive products that can be used quite creatively and innovatively with performance characteristics to suit a variety of light-, medium-, and heavy-duty installations. This is probably most evident in the use of the variety of commercial resilient flooring products that are available, from high design luxury vinyl tile (LVT) to technically focused resilient sheet products that can be made with 100 percent bio-based plasticizers. From a design standpoint, resilient flooring products are available with homogeneous makeup using non-directional designs and colors which can make more of a bold design statement than some common directional patterns. Manufacturers offer literally dozens of tone-on-tone non-directional colors to choose from.

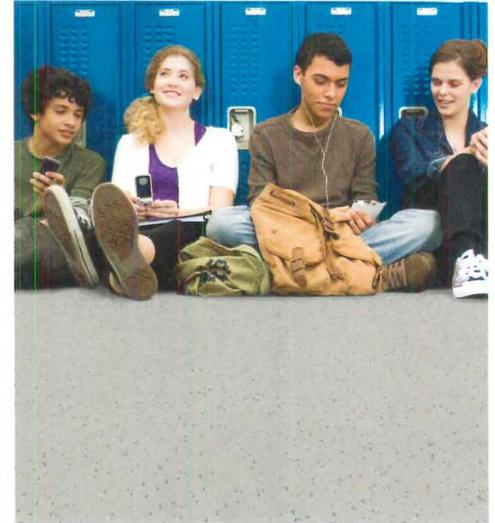
These state-of-the-art resilient flooring products are also suitable for a variety of building types. Available as roll goods and ISO 22196 certified to inhibit the spread of bacteria, they can be ideal for healthcare and school environments. In these settings, products are also available that are FloorScore™ certified with low volatile organic compound

*Photos courtesy of Eldorado Stone*



The performance of architectural stone veneer makes it suitable for a wide range of applications such as limestone veneer panels around a fireplace (bottom photo) or rugged brick masonry veneer panels used to enhance a kitchen design (top photo).

*Photos courtesy of Gerflor USA*



Resilient flooring can provide the design benefits of non-directional color and enhanced surface finish treatments even in high-demand environments such as healthcare settings and schools.

(VOC) content, are 100 percent allergen-free, antimicrobial, and even compliant with the European REACH system for chemical safety. Advanced surface treatments on this type of flooring provide the best stain and chemical resistance in the industry as well as no wax properties for easy maintenance.

Benjamin Bachman, CEO of Gerflor USA, says, "We've seen a trend where 70 percent of our sales are from products developed within the last three years. Innovations in technical features have allowed a number of new resilient flooring products including one which is the only homogenous sheet flooring made with a 100 percent bio-based plasticizer, making it a sustainable choice."

### PERFORMANCE CONSIDERATIONS

Moving on from our discussion of design characteristics, we turn our attention to the performance of surface finish materials. Here we are concerned with the way the materials or products resist the forces imposed on them from people or machinery and generally hold up over time. Essentially, this is a measure of durability that assumes that the appropriate product or material has been specified for a particular application.

### Wall Performance

Vertical interior walls are generally regarded as needing less performance strength than horizontal surfaces. However, that will really depend on the type of building being designed. Architectural stone veneer creates a strong focal point on interior walls that may get viewed and scrutinized more than other surfaces since

designers can use stone to bring nature inside and draw attention to elements of their design. Hence, the material needs to perform both from a technical and aesthetic point of view. The aesthetic performance is based on using flat pieces and corner pieces together to wrap walls and window surrounds, creating the look of full-depth stone. On the installation and quality side, the color depth, texture detail, and use of high-quality materials are important to withstand normal wear and tear and potential abrasive contact.

Part of the performance can be based on the surface characteristics of the architectural stone veneer. For example, fairly smooth veneer products emulating limestone in large panels on the order of 12 inches x 24 inches or similar will have fewer joint lines and a flatter texture that may be well suited for areas that are exposed to more activity. Similarly, brick patterned veneers with rugged textures and intentionally mixed colors may be appropriate for areas that need regular cleaning or more durability such as in kitchens or other higher-usage rooms. Yet, at just an inch thick, either of these veneers is thinner and significantly lighter than traditional brick or stone panels. That means that installation is simplified and if repairs are ever needed, those will be easier to handle as well.

▶ Continues at [ce.architecturalrecord.com](http://ce.architecturalrecord.com)

*Peter J. Arsenault, FAIA, NCARB, LEED AP, is an architect and green building consultant who has authored over 100 continuing education and technical publications as part of a nationwide practice. [www.linkedin.com/in/pjaarch](http://www.linkedin.com/in/pjaarch)*



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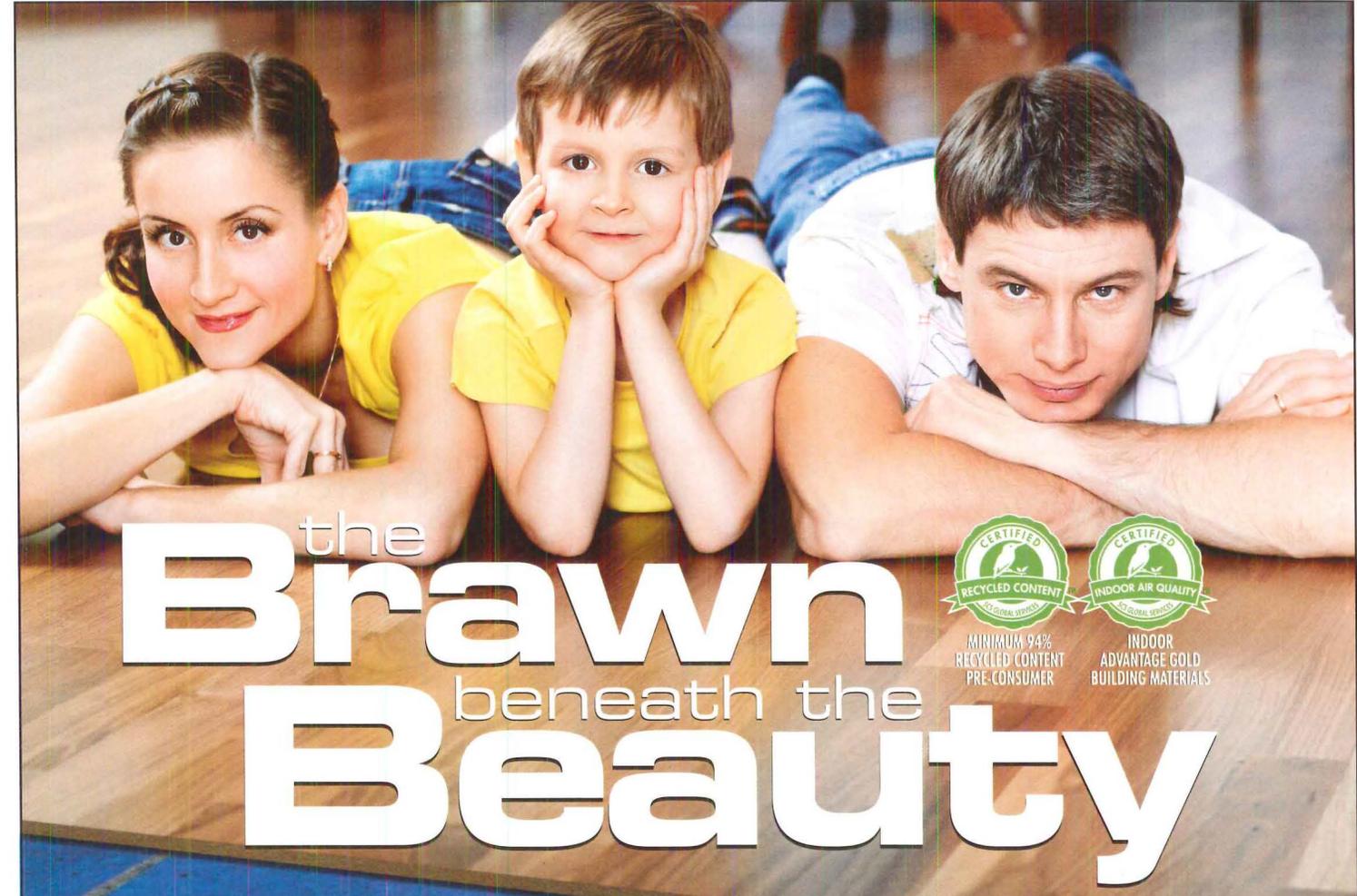
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## Gerflor USA



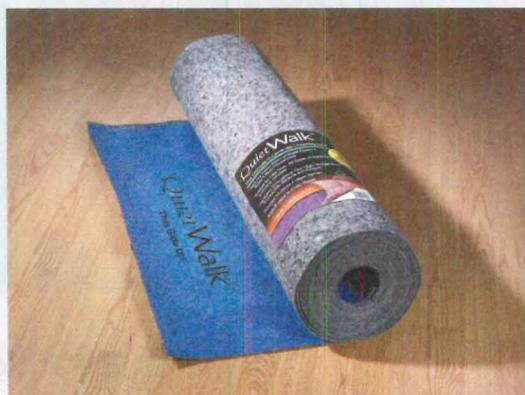
### Commercial Resilient Sheet Flooring

Gerflor USA's Mipolam Premium Dry-Tex™ System is the industry's only commercial resilient sheet flooring resisting up to 98 percent RH with a one-step, full-spread adhesive installation. Ideal for new construction projects with tight deadlines, it provides maximum wear resistance to high traffic and the best chemical stain resistance on the market.

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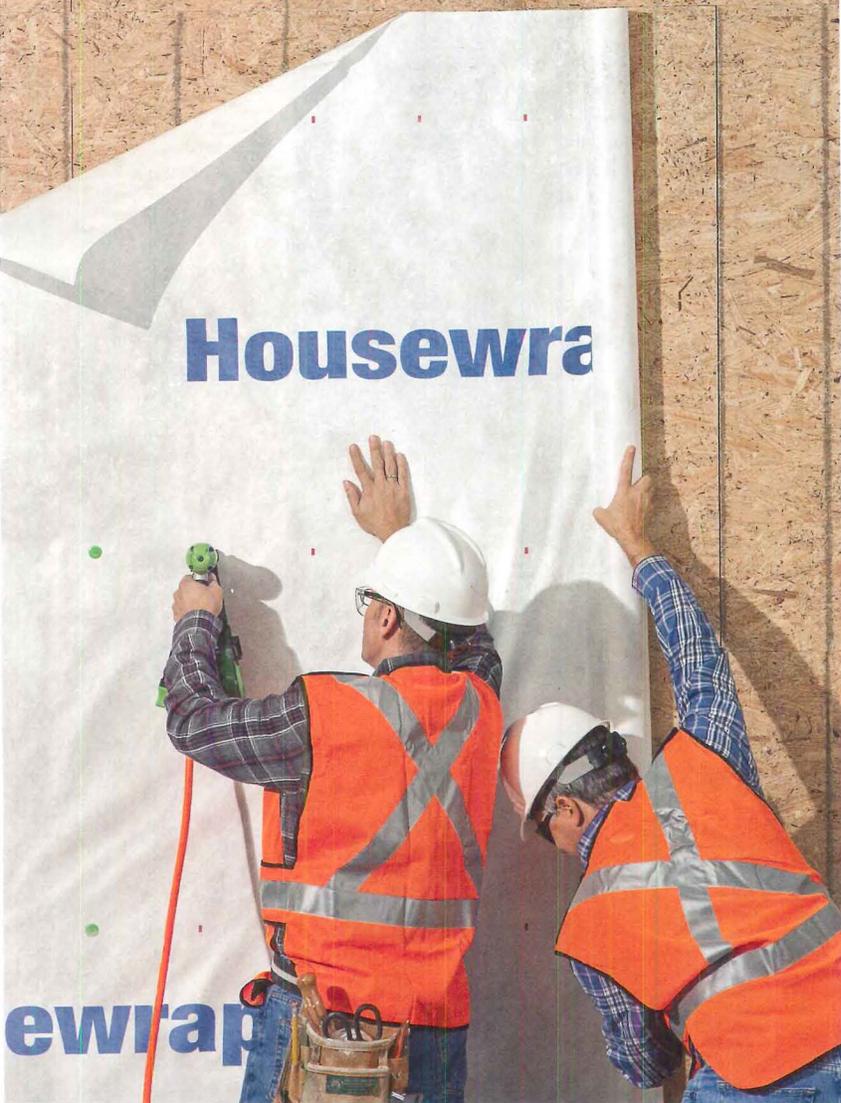
### Laminate Floor Underlayment

QuietWalk® laminate floor underlayment smooths out little subfloor imperfections while quieting impact sound and floor-to-ceiling noise. The recycled fibers that comprise QuietWalk® are randomly air laid which offers the most cost-effective foundation and premium sound control for laminate floating flooring in the marketplace today.

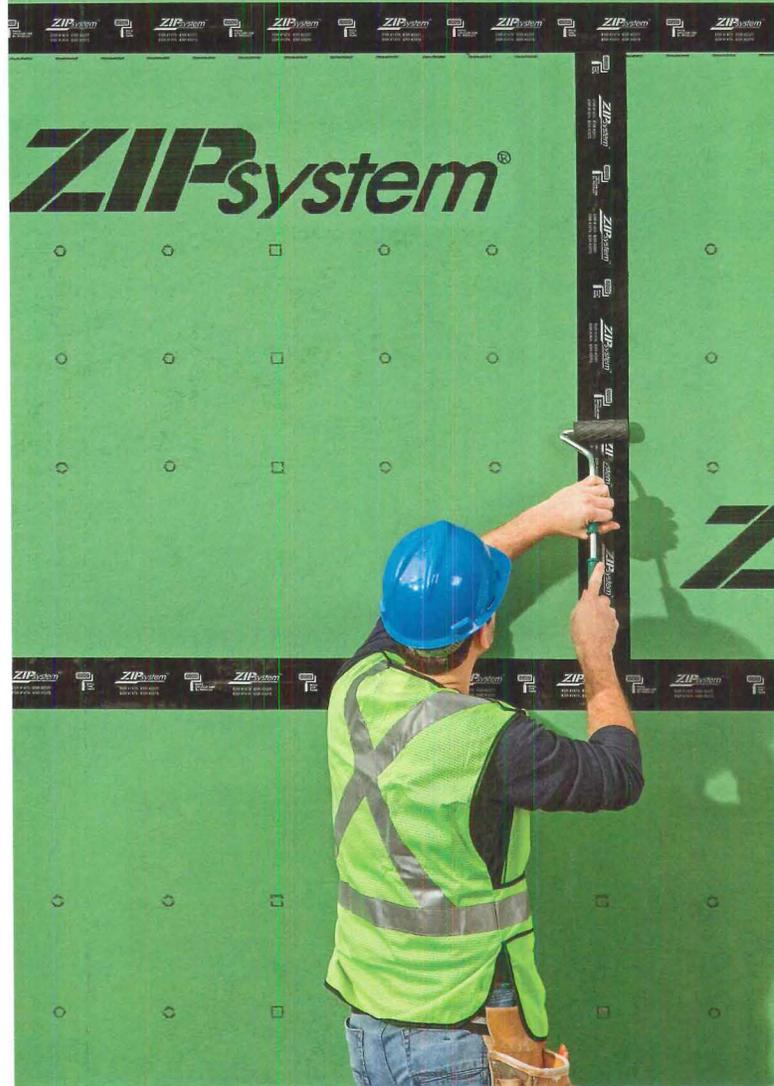
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# Mitigating Risk with High-Performance Structural Wood Panels

Next-generation building materials are durable, easy to install, and offer integrated moisture control

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**T**hings have changed in the housing industry. Traditionally, the American dream meant 2.3 children per household, suburban living, and driving to work. Then came the economic downturn from 2005 to 2010. With the loss of jobs and a soaring number of foreclosures, the homebuilding industry collapsed and the landscape changed for homeownership. Many traditional homeowners quickly became renters out of economic necessity.<sup>1</sup> This growing number of renters created a shift in demand from single family to multifamily dwellings.

Traditional single-family dwellings created risk for one family, one builder. One family assumed the risk for the entire property with a traditional mortgage. One builder was responsible for failures in design and construction. The shift to multifamily construction has magnified these risks exponentially. Today the risks involve hundreds of millions of dollars and affect thousands of lives, and are shouldered almost exclusively by the developers and their designers and builders. These risks are exacerbated by the state of the construction industry.

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### Learning Objectives

After reading this article, you should be able to:

1. Delineate the primary risks inherent in the design and construction of floor, wall, and roof systems in light frame wood single-family and low-rise multifamily construction.
2. Evaluate the pros and cons of existing construction solutions to mitigate these risks and enhance the health and welfare of building occupants.
3. Discuss potential failures associated with traditional floor, wall, and roof systems.
4. Define a best practice approach to mitigate risk during the product specification and selection process for the purpose of building safe and sustainable dwellings.

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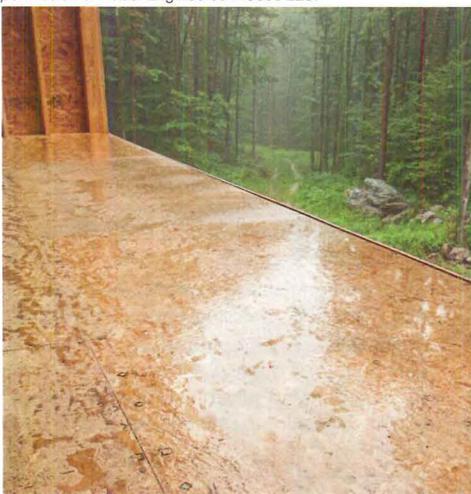
The Great Recession and subsequent downturn in the construction industry led to a shortage of skilled labor. The Associated General Contractors of America estimates that a majority of the 2 million construction workers who lost their jobs during the recession have either retired or found work in other industries.<sup>1</sup> Yet today's less experienced workforce is still required to build very sophisticated building envelopes with increasingly complex core structural elements. In addition, cost-conscious developers are influencing contractors to focus on speed and quantity of work finished, to the detriment of quality and attention to detail, making for a higher probability of installation failure.

This article will discuss three primary risks inherent in building a light wood frame structure that meets the demands of today's buyer, both in small-scale single-family homes and large-scale multifamily dwellings. Risk mitigation will be explored from the standpoint of the three main elements of the building envelope—floors, walls, and roofs. Various solutions will be comparatively assessed, incompatibilities between systems addressed, and a best practice approach that utilizes high-performance panels proposed.

### THE RISKS IN LIGHT WOOD FRAME CONSTRUCTION

As in all types of construction, there are inherent risks in building light frame wood structures. Three consistent risks being addressed in building science communities are moisture management, improper installation and, potentially, structural failure. These risks can have disastrous effects on the building and

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High-performance panels can give the building community a better chance of creating structures that are more weather resistant, durable, and reduce rework construction time.

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on occupant comfort and safety, not to mention expensive rework and potential litigation against developers, builders, and design professionals. How best to minimize these risks is the focus of this article, beginning with a review of the risks themselves.

### Moisture and Air Management

For centuries, builders have worked to manage moisture issues during construction and prevent the intrusion of unwanted moisture and air into their structures through the building envelope. High-performance panels provide solutions to these problems based on their ability to resist moisture absorption and intrusion and on their ability to promote drying. High-performance subfloor panels are highly resistant to moisture absorption, which translates to superior performance by minimizing any damage to finished flooring due to moisture-related swelling and movement beneath them. High-performance wall and roof panels manage moisture by creating a barrier that repels bulk water intrusion, yet allows moisture in the form of water vapor to diffuse through the panel once the structure is occupied. Exfiltration (air/vapor leakage out of a structure) can also create risks, resulting in the condensation of moisture within wall cavities or other parts of the structure. Inadequate air barriers may allow heated or air-conditioned air to leak to the outside, carrying the cost of heating or cooling that air with it. This air leakage vulnerability can put building owners at a competitive disadvantage

against other properties that have built in energy efficiency controls to provide homeowners lower heating and cooling benefits.

### Improper Installation

Improper installation of roof coverings, improperly fastened structural wood sheathing, faulty flashing, open seams between sheathing or subfloor panels, poorly flashed windows or tape that fails to make a weather-tight bond are all significant threats in today's building environment and can contribute to improper function of a structure. Misuse of materials and lack of attention to the details in the installation process significantly increase the likelihood of problems in the future, and can lead to more complex and expensive problems like floor bounce or squeaks, water condensing within wall cavities, air leakage, mold and mildew, increased energy bills, and other conditions that are unacceptable to both the developer and dwelling occupant. Building envelope and subfloor problems that lead to structural damage or impact the finished materials that rest upon the structural elements could result in millions of dollars of rework to rectify the problems. The repair process costs the developer time and money, takes profit dollars out of the contractor's wallet, and can cause disruption in the life of the property owner. These situations can sometimes end up in a courtroom to determine where the opportunity was missed to mitigate risk upfront.

Specifying high-performance roof, wall, and subfloor panels provides added assurance in strength and moisture management and can help mitigate risk in these performance areas during and after construction.



### Failure Modes

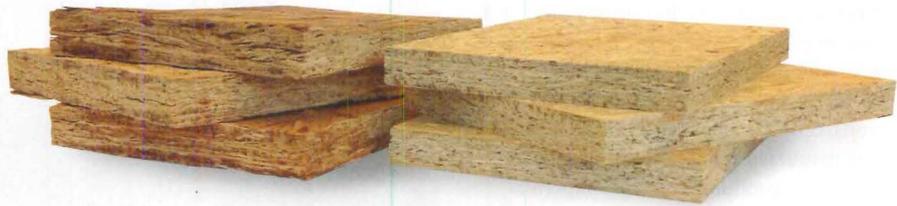
According to the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), the overwhelming majority—90 percent—of all building and building material failures involve moisture damage, with industry watchers claiming that some 80 percent of construction litigation concerns failures related to moisture.<sup>2</sup> Structural failure can take the shape of an unhealthy home environment if mold is an issue or disrupt occupant comfort due to inconsistent surfaces affected, like an uneven floor with nail pops, squeaks, and bounce. While not all incidences of moisture intrusion or improper installation lead to severe damage, structural failure is possible. Prolonged exposure to moisture results in the weakening and decay of structural members.

### FLOORS—THE IMPORTANCE OF A PROPER SUBFLOOR

The finished floor is only as good as the subfloor beneath it. Underneath the finished floor is the structural system that supports it and allows it to perform as designed. The ideal subfloor minimizes moisture absorption during the construction process, which can be one of the biggest risks to the integrity of a subfloor. Exposure to snow and rain during construction constitutes a significant moisture issue and can result in edge swell, thickness swell, and possible delamination in the subflooring.

Another consequence of excessive moisture in flooring panels is a reduction in fastener

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High-performance engineered wood panels show considerably less swelling from moisture absorption after a 24-hour water soak test, when compared to traditional OSB.

holding strength. The problem usually shows up in the form of swelling and buckling hardwood floors. Excessive moisture in the panel transfers to the unfinished backside of the hardwood, resulting in the hardwood floor moving and pulling away from the subfloor due to reduced fastener holding strength. Even if the floors don't buckle visibly, moisture absorption in the subfloor can lead to loss of structural strength that could affect the safety and durability of the project, as well as the overall performance of the floor system and, certainly, result in squeaking and cracking of the floor finish.

Further, unusually heavy materials such as marble or concrete countertop surfaces create excessive loading on the subfloor that can result in unwanted deflection over time, a phenomenon called dead-load creep. Moisture absorption in subfloor panels weakens the panel, further exacerbating the problem. Due to the weight of the materials, the floor continues to deflect (creep) over time, causing cracking of floor surfaces well after the building is complete and the unit occupied. The weight of a traditional 1 ¼-inch-thick granite countertop is 18 pounds per square foot (psf). Most wood framed floors are designed to resist 10 to 15 psf of material weight. This overstress can lead to movement issues later in the life cycle of the floor system.

The likelihood and severity of subfloor problems is highly dependent on the type of subfloor used. The existing options are oriented strand board (OSB), plywood, and engineered high-performance panels (HPP). Historically, OSB has been particularly susceptible to moisture absorption through the face and edges of the panel leading to edge swell, which can require increased sanding of the subfloor panels, increasing the finished flooring costs. Plywood may wick moisture at the seams and therefore is prone to warping, cupping, and veneer delamination.

HPPs designed with advanced moisture-resistant resins and higher wood density than traditional OSB offer better moisture resistance than commodity OSB and plywood, and can come with better exposure warranties.

For instance, one manufacturer offers up to 500 days of exposure with a guarantee of no sanding needed due to edge swell. Further, some high-performance panels are designed to offer up to 10 percent better calculated fastener holding power than either plywood or OSB. In addition, they are engineered to exceed PS 2 code standard design values of plywood and commodity OSB in strength and stiffness.<sup>3</sup> To help minimize installation defects, some manufacturers of high-performance panels offer precisely milled self-spacing tongue and groove profiles plus a fastening guide for easier installation. To specify these types of high-standard panels, especially in high-traffic or weight-bearing areas, consider subfloor products that have been tested and reported to have higher design values above PS 2 standards discussed in more detail below.

### PS 2 vs. ESR 1785—Using Standards to Specify High Performance

Designers can use higher-performing products to meet the demands of today's buyers for achieving durability, efficiency, and structural integrity in subfloors. Standards can help guide in achieving this objective. The minimum standard for structural wood panels is PS 2, a performance standard initiated by the American Plywood Association (now called The Engineered Wood Association) and published by National Institute of Standards and Technology in accordance with the U.S. Dept. of Commerce. The first edition of PS 2, PS 2-92, was published on August 27, 1992. The most current version is PS 2-10. The goal of this standard is to establish structural criteria for assessing the acceptability of wood-based structural use panels for sheathing and single-floor applications. To build risk-mitigating steps into the design process, designers may consider selecting subfloor panels with design properties tested and proven to produce greater, more consistent levels of panel strength, stiffness, and fastener holding power than those required by minimum PS 2 standards. While high-performance materials cannot compensate fully for every risk in the construction process,

selecting products that are designed to perform above PS 2 minimum requirements adds a layer of protection into the building design and construction process.

The International Code Council (ICC) Evaluation Service (ES) provides technical evaluations, called Evaluation Service Reports (ESR), for manufacturers that want to validate and qualify their products as having superior design properties beyond those that only meet the PS 2 industry standard. An example of one of these reports is ESR-1785. It signifies that the high-performance panel product evaluated has passed a battery of testing protocols proving greater levels of panel strength, stiffness, and fastener holding power than PS 2. These high-performance panels have been shown to have more than 60 percent better bending strength than OSB or plywood panels of the same dimensions only meeting the minimum PS 2 standards; more than 25 percent better bending stiffness than OSB meeting PS 2 standards; more than 15 percent better bending stiffness than plywood meeting PS 2 standards; and as much as 10 percent better fastener holding power than both PS 2 performing plywood and OSB.

### WALLS AND ROOFS—INTEGRATED SYSTEMS VS. BUILDING WRAP PRODUCTS

Designing moisture resistance into wall and roof systems is also key. Three subcomponents, all of which pertain to the adequacy of the moisture and air barrier, must be considered. First is the bulk water barrier, which keeps water from the outside from getting to the inside. Bulk water entering a structure can not only damage contents, but can lead to mold and structural failure if structural elements are not allowed to dry properly. Next is vapor permeability. This allows airborne moisture from showers, kitchens, and occupants to migrate through the building envelope to the outside. Controlling exfiltration, which carries air out of the building, is just as important as controlling infiltration. Air leakage can carry moisture into unwanted places, which could lead to rot, mold, increased energy loss, and indoor air quality problems. An air barrier system is composed of materials that form and seal the building envelope to prevent unwanted air movement. To be effective, the system must be continuous with no holes, openings, or penetrations and resistant to air pressure differentials. Attention should be paid particularly to inadequately sealed penetrations in the exterior wall, such as electrical outlets

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**High-performance engineered wood panels maintain strength and stiffness values, even after exposure to elements throughout construction, which ultimately helps provide consistently quiet, stiff finished floors.**

or mechanical openings—places where air typically leaks into and out of a building.

The traditional methods of managing moisture and air intrusion such as caulking, building felt, and traditional building wraps can be problematic. They must be properly sealed at all penetrations, which is often complicated and time consuming. Building wraps can be prone to tearing from mishandling or exposure to the elements, particularly wind. There is often poor adhesion of flashing material and tape as well as complex installation details to accommodate in order to effectively install some of these products. Some perforated wraps may result in the passage of water and air or have low abrasion and tear resistance. With macro porous perforated building wraps, the dilemma is that the macro holes in the film provide vapor permeance, but sacrifice air and water resistance. Some micro-porous products may not be sufficiently abrasion- and tear-resistant. Asphalt papers and felts, on the other hand, may be more moisture resistant but less pliable. Rolled- or sprayed-on, water-resistive barriers are another option, with the main advantage being that these applications will stay on the wall without ripping or tearing. However, these products must be installed at a specific thickness, require different installation instructions for different substrates, require a dry time, may require multiple coats, have temperature restrictions, and must be applied to a completely dry surface—a potential problem during rainy seasons. Achieving consistency can

be challenging. All of these processes require multiple steps to achieve high-quality air and moisture protection and leave room for error during the installation process.

In view of these problems, one manufacturer is offering a new approach: high-performance panels with an integrated weather-resistive barrier (WRB) that install easily with minimal environmental installation restrictions. Water has the opportunity to become trapped between traditional building wrap and a structural panel since the wrap is not fully sealed to the surface of the panel. With high-performance panels that have integrated WRBs, there is no risk of water being trapped between the panel and the water-resistive layer as they are fused together. Further, integrated systems are specially engineered to allow permeability. To allow for outward drying, a water-resistive barrier must have a higher permeance.

Because the sheathing's WRB is permanently fused to each panel, there is little to no risk of it being ripped or torn, ensuring that the structure panel is not exposed to potential damage or detrimental weather. By contrast, the wood surface of a traditional OSB and building wrap system can be compromised when a building wrap is ripped or torn, as a break in the wrap may expose the entire wood surface underneath to detrimental weather or moisture.

*See endnotes in the online version of this article.*

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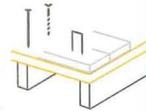
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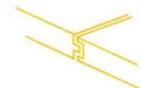
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# NSF/ANSI 347: The Architect's Guide to Specifying Sustainable Single-Ply Roofing Membranes

The first sustainable certification for single-ply roofing membrane materials includes points for design, recycling, durability, and more

Sponsored by Duro-Last | By Kathy Price-Robinson

Until recently, specifying a sustainable roofing membrane was a tricky business. Lacking a comprehensive, multi-attribute and certifiable assessment of the product, architects and specifiers had to decide which single attribute fit into their sustainability goals: Was it the roofing membrane's durability that mattered most? Or its potential to handle long-term heat exposure? Or its long-term maintenance and repairability? Or its lack of

VOCs? Or did the packaging matter most?

Today, all those attributes are contained in one internationally recognized certification: NSF/ANSI 347: Sustainability Assessment for Single-Ply Roofing Membranes.<sup>1</sup>

The purpose of this article is to explain the significance of the first sustainable certification assessment for single-ply roofing membrane materials, and discuss how a manufacturer earns a certification for a Compliant, Silver, Gold, or Platinum rating. This understanding will give architects and specifiers more options to reach their sustainability goals.

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### Learning Objectives

After reading this article, you should be able to:

1. Explain the evolution of standards and rating systems from single-attribute to multi-attribute certifications.
2. Describe NSF/ANSI 347: Sustainability Assessment for Single-Ply Roofing Membranes.
3. Define the key areas measured by the NSF/ANSI 347 standard.
4. Discuss how architects and specifiers can use NSF/ANSI 347 to achieve sustainability goals.

To receive credit, you are required to read the entire article and pass the test. Go to [ce.architecturalrecord.com](http://ce.architecturalrecord.com) for complete text and to take the test for free.

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## HOW WE GOT HERE

The evolution of the green building movement in the United States in some ways mirrors the maturing of a human being. We begin our lives quite innocent and unaware (infant), eventually gain some awareness and perhaps wild ambitions (youth and teenage), face realities of life (young adult), and eventually settle in for what is hopefully a long period of productivity (adulthood).

Likewise, unaware could have described the collective U.S. mindset before the Santa Barbara oil spill of 1969 (which spawned the first Earth Day), and the oil embargo of 1973. As abrupt as puberty, a vigorous green building movement arose in the country, with a back-to-the-earth mentality of yurts and berm homes and organic farming.

In the built environment, some good ideas born in that period persisted, such as tight houses and energy-efficient light bulbs and windows. A plethora of "green" products emerged, but the green claim became notoriously watered down and unreliable.

Single-ply membrane roofs are known for their durability and long life. The new assessment quantifies those qualities and adds more measurable criteria for use in specifying a sustainable roofing material.



According to *The Dictionary of American Slang* (Harper Collins Publishers),<sup>2</sup> greenwash is "the practice of promoting environmentally friendly programs to deflect attention from an organization's environmentally unfriendly or less savory activities."

In the 1990s and 2000s, interest grew in verifiable sustainable building practices, thanks in part to green building rating programs such as the U.S. Green Building Council's LEED®, Leadership in Energy and Environmental Design program, helped along by the American Institute of Architects' vigorous promotion of sustainability. Later, the Green Building Initiative's Green Globes® program and others offered alternatives.

As green building moved into adulthood, highly scientific and rigorous certifications for

All photos courtesy of Duro-Last



product sustainability arose, with the initial focus on single attributes such as low VOC, energy saving, or recyclable.

The single-attribute mindset often left specifiers wondering: What is the story of this product during its life cycle, from cradle to gate, cradle to grave, or cradle to cradle?

### Life-Cycle Assessment and Multi-Attribute Certifications

And thus emphasis on a product's life-cycle analysis (LCA) emerged, along with Environmental Product Declarations (EPD).

According to Stanley Graveline, who sits on the technical committee of the CFFA, Chemical Fabrics and Film Association – Vinyl Roofing Division, “Today’s emphasis on green measurement systems and labels has led to a proliferation of unsubstantiated product marketing claims...The availability of verified EPDs helps architects, roofing consultants, contractors, and owners accurately assess a product’s impact on the environment.”<sup>3</sup>

In recent years, interest in creating EPDs has grown. The CFFA – Vinyl Roofing Division recently announced a new EPD for white, single-ply polyester-reinforced PVC roofing membrane.<sup>4</sup> Of course, the newest version of the U.S. Green Building Council’s LEED rating system awards new Building Product Disclosure and Optimization credits for projects that include at least 20 building products with published EPDs. Plus, the Green Building Initiative’s Green Globes rating system provides a prescriptive path with reference to industry-wide or product-specific EPDs.<sup>5</sup>

Multiple attribute standards are a growing trend among industries like roofing, resilient flooring, commercial furnishings, gypsum board, and flooring tiles.

### HOW THE NSF/ANSI 347 STANDARD WAS CREATED

Within the roofing membrane industry—which includes the manufacturers as well as those who specify and install it—appreciation of the material’s favorable and robust LCA is widespread. The goal within the industry was to quantify and document the material’s sustainable qualities using established scientific principles and standards. The objective in developing the standard was to have a comprehensive standard that would fully consider all relevant elements of sustainability.

In a multi-year effort, a large number of stakeholders developed the NSF/ANSI 347 standard in a publicly transparent voting process through NSF’s international consensus-based and ANSI-accredited standard development process. They included membrane manufacturers, architects, and engineers who specify roofing materials,

## ASSESSMENT CRITERIA FOR EARNING POINTS

### Product design

- Enlightened design process
- Environmentally sustainable material inputs
- Chemicals of concern
- Informed selection of suppliers
- Product recyclability into durable products
- Post-consumer single-ply roofing membrane reclamation
- Pre-consumer single-ply roofing membrane reclamation

### Product manufacturing

- Environmental policy and management
- Conservation of energy resources
- Management of water resources
- Optimization of material resources
- Protection of air resources

### Membrane durability

- Fitness of purpose
- Durability
- Membrane surface contribution
- Process based

### Corporate governance

- General public disclosures
- Employer/employee responsibility
- Roofing contractor installation training
- Design professional outreach and education
- Standards and code organizations participation
- Community responsibility

### Innovation

- General criteria

roofing industry consultants, trade associations, national regulatory agencies that regulate either environmental practices or roofing specifications, and non-governmental organizations.

The products that fall under the scope of this standard include polyvinyl chloride (PVC), thermoplastic polyolefin (TPO), ethylene propylene diene terpolymer (EPDM), ketone ethylene ester (KEE), and polyisobutylene (PIB) products.

The benefits for membrane manufacturers who achieve a rating under this standard are numerous. If a manufacturer claims their product is environmentally preferable and has a superior sustainable “score,” that claim can be backed up by science and data, eliminating incidences of greenwashing. Transparency is the goal.

In the end, the requirements of the standard



Architects and specifiers can now choose a single-ply roofing membrane based on a new, wide-reaching sustainability assessment.

## MANY ROADS TO RECYCLING

A company whose single-ply roofing membrane achieved a Gold rating in the NSF/ANSI 347 standard recycles manufacturing scrap in different ways to support positive waste management practices. First, the company's manufacturing process allows scrap to be recycled back into production, allowing virtually all of its manufacturing waste to be recycled and reducing landfill usage.

The second more innovative way this company recycles roofing membrane material is by re-grinding leftover material and producing resilient commercial flooring. The recycled vinyl used in this process provides long-lasting durability for a variety of applications, while keeping millions of pounds of vinyl waste out of landfills annually.

Lastly, this company uses pieces of membrane scrap to make a line of prefabricated roof accessories, including scuppers, collector boxes, pitch pans, wall vents, ATR hubs, and more. These products come with roofing membrane pre-welded to them, making manufacturing scraps a perfect fit to be reused in this manner. An added benefit of these accessories is that they eliminate the need for roofers to fabricate them in the field, which eliminates a lot of jobsite waste.



Single-ply roofing membrane is known in the industry to have a very robust life cycle. But it took an NSF/ANSI standard created to document those facts.

are intended to form the basis of conformity assessment programs, such as third-party certification or registration.

### HOW NSF/ANSI 347 CERTIFICATION IS ACHIEVED

To achieve a rating according to the NSF/ANSI 347 standard, products are rated in five areas of focus:

Product Design	42 points
Product Manufacturing	27 points
Membrane Durability	40 points
Corporate Governance	7 points
Innovation	7 points
Total	123 points

As you can see, the first three subject areas that comprise the bulk of the points available follow the same trajectory as does a manufactured product from design, to manufacture, to its use in the field. Further points are available for actions on the corporate level, as well as implementation of innovative solutions.

The levels that can be reached are:

Compliant	Minimum 35 points
Silver	Minimum 45 points
Gold	Minimum 56 points
Platinum	Minimum 75 Points

We'll discuss the criteria topics one by one. But first, there are several prerequisites for all single-ply roofing membrane manufacturers who seek a rating. First and foremost, the membrane manufacturer must have a plan for making a sustainably preferable product, and that plan must be implemented early in the process, in the design stage. Product developers and designers should be looking into environmental impacts of their proposed product across its entire life cycle, from raw material extraction to manufacturing, use, and end of life. Both longevity and performance are highly valued in the standard.

#### Product Design—Where It All Begins

To encourage membrane manufacturers to focus on environmental and life-cycle issues from the beginning, the point system starts at the stage of product design. The standard refers to it as an "enlightened design process."

Once a manufacturer has achieved the prerequisite of planning, points are available for a wide variety of criteria, from source materials to chemicals used and all the way to reclamation.

#### Life-Cycle Assessment (LCA)—The Membrane from Cradle to Gate or Cradle to Grave

If a membrane manufacturer can demonstrate that one of several materials assessments was done within five years of the product undergoing this assessment, a maximum of 8 points can be earned.

It is here that the Environmental Product Declaration (EPD), conducted in accordance with ISO 14025, comes into play, validated by a third party and meeting the requirements of a consensus-based Product Category Rule (PCR). This PCR was published by ASTM International and the Single Ply Roofing Industry (SPRI) to detail the rules and guidelines for making an environmental declaration for single ply roofing membranes. More points can be earned by participating in a cradle-to-gate or cradle-to-grave ISO 14044 conforming LCA. And it should analyze the environmental impacts of the product for global warming, greenhouse gas loadings, acidification, ozone layer depletion, photochemical smog formation, and eutrophication or nitrogen loading. Life expectancy is the biggest single driver in any LCA analysis and NSF 347 recognizes that and awards points for it.

### Where Did It All Begin? Environmentally Sustainable Source Materials

The purpose of this section is to make sure the membrane manufacturer is informed about the environmental implications of the material composition of its products, and this includes the packaging. This then encourages the use of component materials from sustainable inputs, such as recycled materials and bio-based resources. At the very least, the manufacturer should report materials at certain chemical measurements that would, upon disposal, cause the product to be classified as hazardous waste.

The standard puts a lot of emphasis on using recycled content, or content from a bio-based source. Most emphasis is put on post-consumer recycled content, which is

### SUSTAINABLE PACKAGING EARNS POINTS

Shipping and packaging materials are another part of the sustainability puzzle that can have a big impact on landfill contribution. It is a challenge to find ways to minimize the materials used in packaging while still keeping products safe during transport.

A company whose single-ply roofing membrane achieved a Gold rating in NSF/ANSI 347 standard uses cores—the material around which rolls of membrane are wrapped for shipping—that contain 100 percent recycled content and also uses plastic banding that contains 100 percent recycled content, 60 percent of which is made from post-consumer recycled bottles. All packaging materials at this company are also 100 percent recyclable.



valued at 100 percent of its weight, with a lesser emphasis on pre-consumer recycled content, valued at 50 percent of its weight. The bio-based content is more valuable, point wise, when it's from such certified operations as organic, sustainable agriculture, or sustainably certified forestry. Other bio-based content is given half the points per weight.

### Concern with Chemicals

Not all chemicals are created equal, and not all chemicals are toxins and carcinogens. The "Chemicals of Concern" section of the standard has as its goal to encourage the use of more environmentally friendly chemicals and

eliminating the use of chemicals of concern. The latter grouping includes those listed on some of the most widely recognized, science-based hazard lists from the International Agency on the Research of Cancer, the National Toxicology Program, U.S. Occupational Safety and Health Administration, California Proposition 65, and the U.S. Environmental Protection Agency Integrated Risk Information System database. Companies can earn points by avoiding the chemicals on these hazard lists in concentrations greater than 1000 ppm or, 0.1 percent. The manufacturer, to earn one credit, may create a report evaluating its product formulation against the hazard lists. Further eliminating or reducing the concentration of any known hazardous substance can earn up to another 5 points. The purpose of this section is to inform the manufacturer of the human health and ecological hazards associated with the product's raw materials. The credits are weighted heavier on the reduction and elimination credits to encourage the manufacturer to use environmentally compatible products and eliminate the use of chemicals with known hazards.

See endnotes in the online version of this article.

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**Kathy Price-Robinson** is a longtime building and design journalist and a multimedia education developer.



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# Wood and Indoor Environment

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The objectives of sustainable design are broader than just environmental effects, having come to embrace issues of human health and performance. As sedentary and service-related work becomes more prevalent in our society, the amount of time people spend inside buildings increases—the average North American spends 90 percent of his or her time indoors, another 5 percent in cars and only 5 percent outside. This not only makes the design of building interiors ever more important, but calls for the buildings themselves to provide a connection to nature that will only get harder to come by.

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### Learning Objectives

After reading this article, you should be able to:

1. Define the relationship between a building's sustainability and the health and performance of the building's occupants.
2. Explore how wood was used to enhance the experience of building occupants in projects from around the country.
3. Recognize how wood used as a structural and finish material contributes to key elements of occupant environment including indoor air quality, acoustic performance, and physical health.
4. Examine evidence confirming the positive human response to wood for its aesthetic qualities and connection to nature.

To receive credit, you are required to read the entire article and pass the test. Go to [ce.architecturalrecord.com](http://ce.architecturalrecord.com) for complete text and to take the test for free.

AIA/CES COURSE #K1306D  
GBCI COURSE #0090009829

Photo by Richard Mandelkorn

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Athens, Georgia  
Smith Dalia Architects,  
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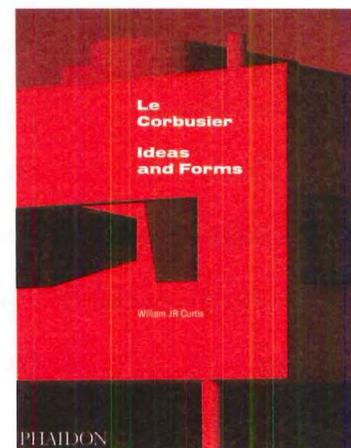
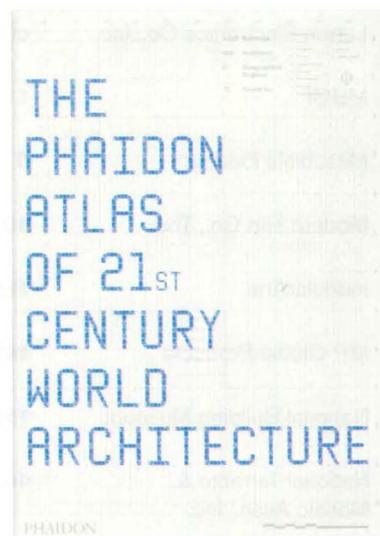
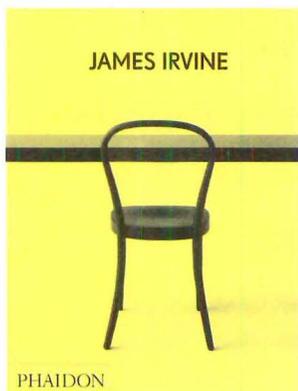
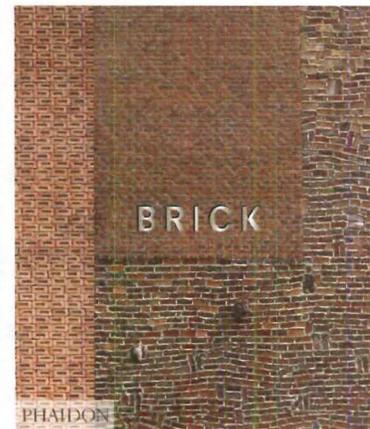
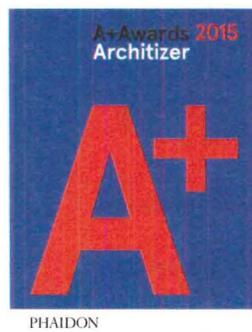
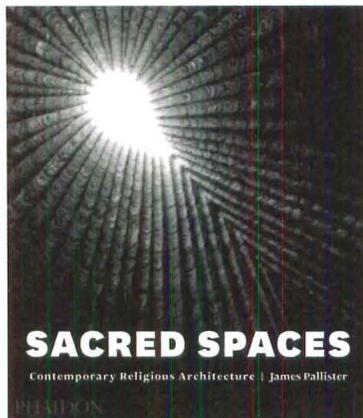
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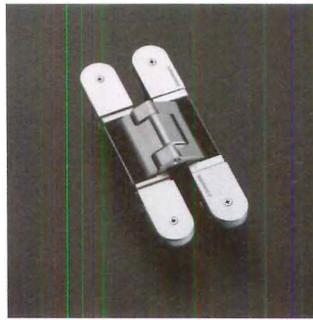
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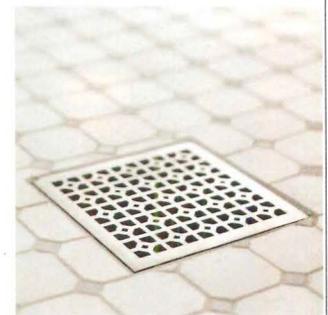
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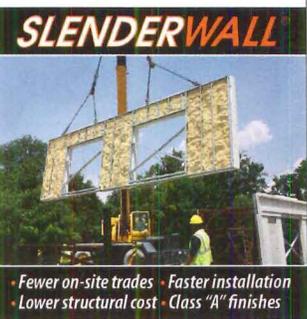
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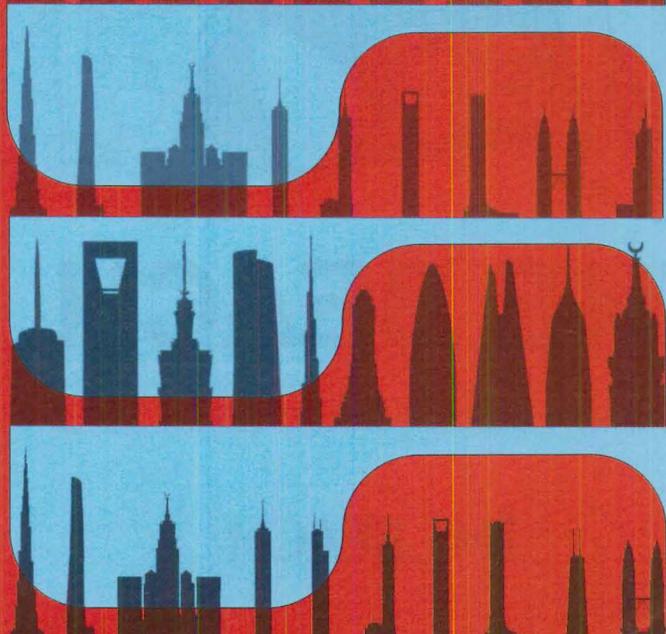
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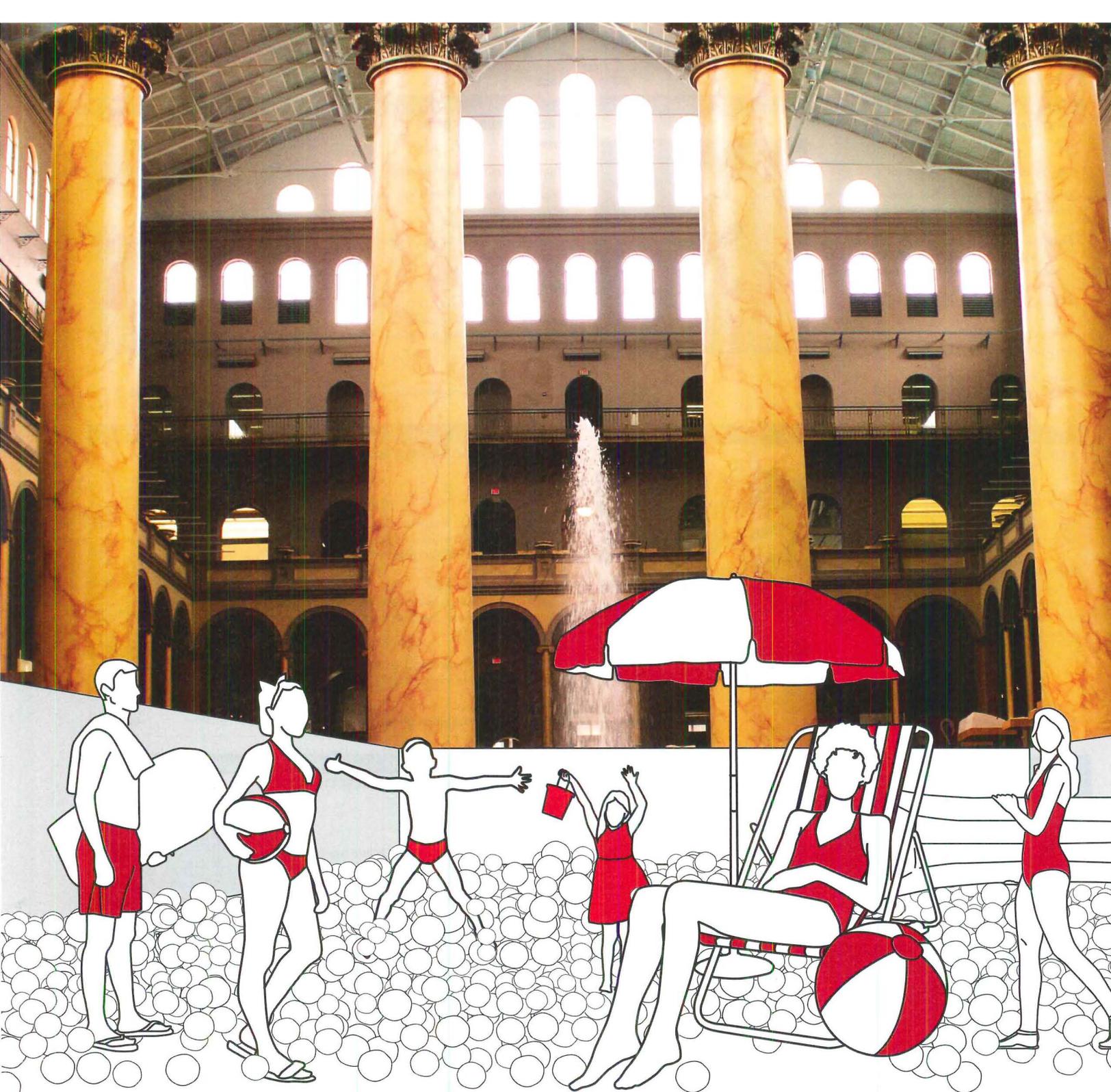
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Top Tens. © Council on Tall Buildings and Urban Habitat

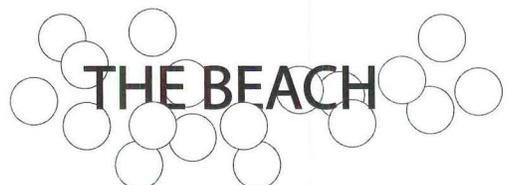
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## New and Upcoming Exhibitions

### HACLab Pittsburgh: Imagining the Modern Pittsburgh

September 12, 2015–May 2, 2016

The city of Pittsburgh underwent an ambitious program of urban revitalization in the 1950s and '60s. *HACLab Pittsburgh: Imagining the Modern* untangles the city's complicated relationship with modern architecture and urban planning at that time. In this experimental presentation at Carnegie Museum of Art's Heinz Architectural Center, architects-in-residence "over,under" unearthen layers of history and a range of perspectives through abundant archival materials, an active architecture studio on-site, and a salon-style discussion space. For more information, visit [cmoa.org](http://cmoa.org).

### Frank Gehry

Los Angeles

September 13, 2015–March 20, 2016

Frank Gehry's buildings have altered architecture's relationship to the city, both socially and aesthetically, and his pioneering work in digital technologies set in motion the practices employed by the construction industry today.

This Los Angeles County Museum of Art exhibition is a comprehensive overview of Gehry's extraordinary body of work. The show begins in the early 1960s—Gehry established his firm in Los Angeles in 1962—and runs to the present. Many of the 200 drawings have never been seen publicly, and 65 models illuminate the evolution of Gehry's thinking. Visit [lacma.org](http://lacma.org).

### David Adjaye: Architecture for Social Change

Chicago

September 19, 2015–January 3, 2016

With more than 50 projects constructed across the world, David Adjaye is rapidly emerging as a major figure in architecture and design. This first-ever retrospective, at the Art Institute of Chicago, spans from furniture and housing to public buildings and master plans; it features drawings, sketches, models, and building mock-ups. The exhibition also immerses viewers in Adjaye's distinct approach and visual language through a dynamic installation conceived by his eponymous studio. Visit [artic.edu](http://artic.edu).

## Ongoing Exhibitions

### Chatter: Architecture Talks Back

Chicago

Through July 12, 2015

Architecture is a perpetual conversation between the present and the past, with the knowledge that the future is listening. So what happens when this exchange is influenced by contemporary modes of communication such as texting, Twitter, and Instagram? For *Chatter*, the Art Institute of Chicago looks at the approach to dialogue of five emerging architects: Bureau Spectacular, Erin Besler, Fake Industries Architectural Agonism, Formlessfinder, and John Szot Studio. For the exhibition, Iker Gil, director of the design publication *MAS Context*, also conceived an installation to explore the myriad ways in which architecture is conveyed. Visit [artic.edu](http://artic.edu).

### Design for Healthy Living

Atlanta

Through August 9, 2015

The physical environments in which humans live, work, and play greatly impact well-being. Too often, however, design does not support healthy habits and practices. The active design movement responds to this problem by advocating the development of buildings, streets, and neighborhoods that make daily physical activity and healthy eating more accessible and inviting. Held at the Museum of Design

Webb Martin, Director of Technical Services  
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## dates&events

Atlanta, *Design for Healthy Living* explores specific active-design strategies through case studies, videos, models, and activities. Visit [museumofdesign.org](http://museumofdesign.org).

### **Everything is Design: The Work of Paul Rand** New York City

*Through July 19, 2015*

The Museum of the City of New York showcases the monumental career of Paul Rand, who is often called the “Picasso of graphic design.” The exhibition includes 150 pieces of Rand’s work, among them his pioneering corporate communications and rebranding campaigns for IBM, as well as groundbreaking logos for ABC, UPS, Westinghouse, Morningstar, and Steve Jobs’s NeXT project. Visit [mcny.org](http://mcny.org).

### **Lina Bo Bardi: Together**

Chicago

*Through July 25, 2015*

The Graham Foundation is pleased to announce the first U.S. presentation of *Lina Bo Bardi: Together*, which pays tribute to the work and legacy of 20th-century Italian-Brazilian architect Lina Bo Bardi. Featuring new works by artist Madelon Vriesendorp, filmmaker Tapio Snellman, and photographer Ioana Marinescu, this exhibition endeavors to inspire new conversations around her work. It brings to life the experience of Bo Bardi’s buildings and illuminates an inclusive approach to design that aimed to eschew aesthetic and social hierarchies to create a genuine Brazilian experience. Visit [grahamfoundation.org](http://grahamfoundation.org).

### **Le Corbusier**

Paris

*Through August 3, 2015*

The Centre Pompidou is devoting a retrospective to the work of Charles-Édouard Jeanneret, known as “Le Corbusier.” A visionary architect, urban planner, and theorist of modernity, and also a painter and sculptor, Le Corbusier made a profound impression on the 20th century by dramatically changing the scope of architectural design. The Centre Pompidou invites audiences to explore the impact of this major figure in modernity through the idea of human proportions and spatial composition (how the human body defines all aspects of architecture). For more information, visit [centrepompidou.fr](http://centrepompidou.fr).

### **Folly 2015: Torqueing Spheres**

Long Island City, New York

*Through August 30, 2015*

The Architectural League and Socrates Sculpture Park present the winning proposal—

now built and on display—for the 2015 Folly Program, an annual juried competition targeted to early-career architects and designers. Cambridge and Philadelphia-based firm IK Studio won this year’s competition with their proposal, *Torqueing Spheres*, which transforms a series of intertwining sculpted forms into a meandering curved folly that encourages social interaction. *Torqueing Spheres* combines a simple concept—a straight line—with complex spherical pods that become deep, self-supporting chambers to create experiences for both the collective and the individual. At the Socrates Sculpture Park. For more information, visit [archleague.org](http://archleague.org).

### **COSMO**

Long Island City, New York

*Through September 7, 2015*

The Museum of Modern Art and MoMA PS1 have announced Andrés Jaque / Office for Political Innovation as the winner of their annual Young Architects Program (YAP) in New York. The winning project, COSMO, is this year’s unique construction on view at MoMA PS1 in Long Island City. COSMO is a movable artifact, made out of customized irrigation components, that makes visible and enjoyable the hidden urbanism of pipes surrounding us. Based on an advanced environmental design, COSMO is an assemblage of ecosystems engineered to filter and purify 3,000 gallons of water to eliminate suspended particles and nitrates, balancing the PH and increasing the level of dissolved oxygen. For more information, visit [momaps1.org](http://momaps1.org).

### **Saving Place: 50 Years of New York City Landmarks**

New York City

*Through September 13, 2015*

The Museum of the City of New York presents an exhibition exploring the roots and impact of landmark preservation. The movement developed over many years but was galvanized by large historic losses in the early 1960s, most notably the demolition of Pennsylvania Station in 1963. Through original documents, drawings, paintings, photographs, building pieces, and more, the exhibition surveys how landmarking has been an engine of New York’s growth and success. Visit [mcny.org](http://mcny.org).

### **Pathmakers: Women in Art, Craft and Design, Midcentury and Today**

New York City

*Through September 27, 2015*

This Museum of Arts and Design exhibition considers women’s significant contributions to Modernism in postwar visual culture. In the

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1950s and '60s—an era when painting, sculpture, and architecture were dominated by men—women had considerable impact on alternative creative disciplines like textiles, ceramics, and metals. Featuring more than 100 works, *Pathmakers: Women in Art, Craft and Design, Midcentury and Today* focuses on the achievements of a core cadre of women that includes Ruth Asawa, Edith Heath, Sheila Hicks, Karen Karnes, Dorothy Liebes, Alice Kagawa Parrott, Toshiko Takaezu, Lenore Tawney, and Eva Zeisel. At the Museum of Arts & Design. Visit [madmuseum.org](http://madmuseum.org).

#### **Snøhetta—World Architecture**

Copenhagen

Through September 27, 2015

Snøhetta was founded in the 1980s, when a group of both building and landscape architects joined forces to form a community that embraced their two fields and created cohesion between buildings and landscapes. Snøhetta is known primarily for building the Oslo Opera House. As is characteristic of their work, the structure connects with contextual landscape and natural features. It is also democratic in intent, with an accessible roof where all can relax and look at the adjacent fjord. Their holistic and social-democratic approach resonates in Seoul and New York; soon Copenhagen will get a Snøhetta building too. At the Danish Architecture Centre. For more information, visit [dac.dk](http://dac.dk).

### **Lectures, Conferences, and Symposia**

#### **2015: The Inaugural Chicago Architecture Biennial**

Chicago

October 3, 2015—January 3, 2016

The Chicago Architecture Biennial provides a platform for groundbreaking architectural projects and spatial experiments that demonstrate how creativity and innovation can radically transform our lived experience. Through its constellation of exhibitions, full-scale installations, and program of events, it will invite the public to engage with and think about architecture in new and unexpected ways, and to take part in a global discussion about the future of the field. At five different locations in Chicago. For more information, visit [chicagoarchitecturebiennial.org](http://chicagoarchitecturebiennial.org).

#### **Architectural Record Innovation Conference**

New York City

October 7, 2015

Innovative architecture requires expanding the boundaries of the discipline by spurring creativity through design and technology. At this year's conference, ARCHITECTURAL RECORD brings together key figures who have generated a range of imaginative solutions for the built world of today and tomorrow. From architects practicing outside the discipline to principals of large firms to materials experts and graphic designers, the event's participants represent different approaches to original problem-solving in a rapidly changing world. At the Time-Life Building. For more information, visit [construction.com/events/2015](http://construction.com/events/2015).

#### **DesignPhiladelphia Festival 2015**

Philadelphia

October 8–18, 2015

The DesignPhiladelphia Festival annually showcases the work of more than 400 practicing architects, designers, and creative professionals to

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## dates&events

demonstrate Philadelphia's reemergence as a 21st-century city shaped by design, technology, and collaborative business practices. Over the course of 11 days, universities, cultural institutions, civic associations, city agencies, retailers, manufacturers, and startups across the city will participate in more than 130 events: talks, panel discussions, exhibitions, tours, workshops, and public happenings. At the Philadelphia Center for Architecture. For more information, visit [philadelphiacfa.org](http://philadelphiacfa.org).

### Competitions

#### 3D Printed Habitat Challenge

*Registration deadline: July 15, 2015*

America Makes, the 3D Printing Innovation Institute, and Maker Media, creators of *Make* magazine and Maker Faire, have partnered to provide this open-innovation challenge, with prize funding provided by NASA. The goal of the competition is to use advanced technology to create safe and sustainable housing solutions for earth and beyond. The competition aims to demonstrate the power of 3-D printing and additive construction, and to recognize new potential in the ability of these technologies to use locally sourced building material, reducing the need for shipping. For more information, visit [americamakes.us/challenge](http://americamakes.us/challenge).

#### SEED Competition

*Submission deadline: July 31, 2015*

SEED calls for the creation of a temporary environmentally friendly housing unit for one to two inhabitants. Chinese architect and competition creator Qingyun Ma says, "The design should find equilibrium between individual livability and ecological sustainability, celebrating the moment between human intervention and nature." For more information, visit [spamall.com.cn/competition](http://spamall.com.cn/competition).

#### Eleven Magazine Competition: Cambodia's Tonle Sap Lake

*Submission deadline: September 11, 2015*

The aim of this competition is to design a structure, or series of structures, within Cambodia's Tonle Sap Lake, located just south of the Angkor temples and the city of Siem Reap. It is the largest freshwater basin in Southeast Asia, and has had UNESCO Biosphere Reserve status since 1997. The designed structures must be mobile so that they can service floating villages. Each participant is free to interpret what this might mean. For more information, visit [eleven-magazine.com](http://eleven-magazine.com).

#### The Negro Building Remembrance Competition

*Submission deadline: November 1, 2015*

The Negro Building Remembrance Competition aims to bring the Negro Building, a forgotten landmark of the 1895 Cotton States and International Exposition in Atlanta, Georgia, into public memory. The competition invites architects, landscape architects, artists, playwrights, poets, musicians, and writers from every discipline, as individuals, teams, students, or professionals, to propose imaginative, bold, and provocative ways to commemorate the Negro Building. For more information, visit [negrobldgcompetition.com](http://negrobldgcompetition.com).

*E-mail information two months in advance to [recordevents@construction.com](mailto:recordevents@construction.com). For more listings, visit [architecturalrecord.com/news/events](http://architecturalrecord.com/news/events).*

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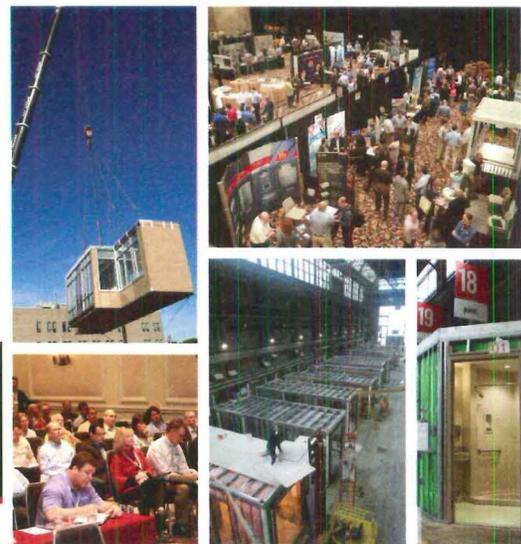
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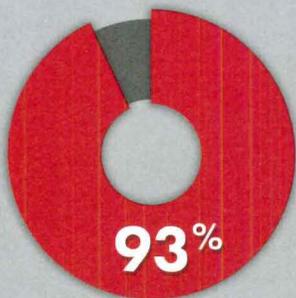
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- Materials suppliers
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LOCATION ESSEX, ENGLAND  
DESIGNERS GRAYSON PERRY AND FAT

**THIS WHIMSICAL** vacation house is styled as a secular chapel. The strange brief was requested by Living Architecture, a nonprofit that commissions notable architects and rents the buildings to the public. The house, designed by artist Grayson Perry and now-disbanded architecture firm FAT, mixes formal and informal, sacred and nonreligious precedents, canonizing a fictional local woman by using architectural details. These include the eclectic symbols on the exterior's green and white tiles, each of which represents aspects of her identity, and tapestries inside that commemorate events in her life. FAT's Charles Holland cites the house as a rare collaboration where contemporary art and architecture "speak the same language to explore a concept together." *Zachary Edelson*

